# Traffic Noise Mitigation Plan

(Ref. EP-467/2013/A)



Agreement No. CE 13/2014 (CE)

# Development of Kwu Tung North and Fanling North New Development Areas

Phase 1 - Design and Construction



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## INTRODUCTION

- 1.1 Background
- 1.1.1 The North East New Territories (NENT) New Development Areas (NDAs) Planning and Engineering (P&E) Study, after consideration and incorporation of comments from the threestage public engagement programme, planned to proceed with development in the Kwu Tung North (KTN) and Fanling North (FLN). The NENT NDAs P&E Study is a designated project under Item 1 Schedule 3 of the Environmental Impact Assessment Ordinance (EIAO), and covers a total of thirteen individual designated projects which require environmental permits under Schedule 2 of EIAO.
- 1.1.2 An EIA Report was prepared to assess the environmental impacts associated with the proposed construction and operational works of the NENT NDAs. The EIA Report (Register No. AEIAR-175/2013) was approved by the Director of Environmental Protection (DEP) on ZLWK DSSURYDO FRQGLWLRQV VWLSXODWHG LQ in EP2/N7/S3/57 Pt.3). There are twelve Environmental Permits (EPs) and one Further Environmental Permit (FEP) issued by DEP on 21 November 2013 and 3 January 2014 to cover all the identified designated projects in NENT NDAs. Construction and operation of KTN NDA Road P1, P2 and Associated New Kwu Tung Interchange and Pak Shek Au Interchange Improvement KHUHLQDIWHU NHQ R3 ZUOR MDHVF W3 WKZKLFK LV Designated Project 3 (DP3) in EIA Report, is governed by EP-467/2013.

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- 1.1.3 During the planning and engineering (P&E) review under Agreement No. CE 13/2014 ± Development of Kwu Tung North and Fanling North New Development Areas, Phase 1 ± Design and Construction (D&C), minor changes in the road alignment of the Project were proposed based on the findings of the planning and engineering review such as latest engineering design. The traffic noise mitigation measures proposed in the P&E review is provided in Appendix 1.1. Variation of environmental permit (VEP) for the Project was subsequently applied for the proposed changes and the latest Environmental Permit (EP No: EP-467/2013/A) was issued by DEP on 27 January 2017. Location of the Project is shown in Figure 1.1.
- Pursuant to EP Condition 2.6, the Permit Holder, Civil Engineering and Development 1.1.4 Department (CEDD), shall no later than one month before the commencement of construction of the Project, submit four hard copies and two electronic copies of Traffic Noise Mitigation Plan (the Plan) to the DEP for approval. If there is any change proposed to the traffic noise mitigation measures in the approved Plan, the Permit Holder shall, no later than one month before the implementation of any such change, submit to the Director for approval four hard copies and two electronic copies of an update to the Plan (the Updated Plan). The Plan or any Updated Plan shall demonstrate that the traffic noise performance requirements set out in the EIA Report (Register No.: AEIAR-175/2013) will not be exceeded with the mitigation measures in place.
- AECOM Asia Co Ltd has been commissioned by the CEDD to prepare the Plan for 1.1.5 submission to DEP for approval.
- 1.2 Objective of this Traffic Noise Mitigation Plan
- This Traffic Noise Mitigation Plan (the Plan) has been prepared to demonstrate that the 1.2.1 traffic noise performance requirements set out in the EIA Report (Register No.: AEIAR-175/2013) for the Project will not be exceeded with the mitigation measures in place.

**April 2019** 

## 2 REVIEW ON TRAFFIC NOISE MITIGATION MEASURES

## 2.1 Introduction

- 2.1.1 As mentioned in Section 1.1.3, a set of traffic noise mitigation measures was developed under P&E review (Appendix 1.1 refers). A review on the traffic noise mitigation measures has been conducted and the potential cumulative traffic noise impact within 300m study area of the Project has been evaluated and discussed in the following sections.
- 2.2 Environmental Legislation, Standards and Criteria
- 2.2.1 The criteria for assessing road traffic noise are given in the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). The road traffic noise criterion is 70dB(A) for domestic premises, hotels, hostels and offices, and 65dB(A) for educational institutes and places of worship. For hospitals, clinics etc, a more stringent criterion of 55dB(A) is stipulated. It should be noted that all these criteria only apply to Noise Sensitive Receivers (NSRs) that rely on opened windows for ventilation.
- 2.3 Representative Noise Sensitive Receivers
- 2.3.1 The representative NSRs generally follow the same assessment points as adopted in the Engineering Review for Accommodating Additional Population in KTN and FLN NDAs and for Remaining Packages of NDAs ± 5 H S R U W R Q (Q Y L U R Q P H Q W D O 5 H Y L H Z (5 5 ´ except that the assessment points at KTN Sites A1-2, A1-4, A1-5, A2-2, A2-7, A3-2, A3-3 and A3-4 have been updated based on the updated information of blocking layout. Details of the revised representative NSRs for residential development are presented in Table 2.1 with all the proposed assessment points shown in Figure s 2.1a ±2.1e.
- 2.3.2 Except for the proposed Residential Care Home for the Elderly (RCHE) in KTN Site B2-5, the exact locations for other proposed social welfare facilities, home for the elderly and kindergarten within the KTN NDA are not yet confirmed during this review. Therefore, following same assessment approach as adopted in the EIA Report, sensitivity test on the potential road traffic noise impact has been conducted at the proposed social welfare facilities, home for the elderly and kindergarten. The locations of social welfare facilities, home for the elderly and kindergarten have been updated according to the best available information during this review. It should be noted that, during the design of the social welfare facilities and kindergarten, noise sensitive uses should be located to avoid exceedance as far as practicable. While the layout of RCHE at KTN Site B2-5 is being developed and yet to be finalized, the locations of the assessment points for the proposed RCHE are same as those adopted in P&E ERR. Details of the revised representative NSRs for social welfare facilities, home for the elderly and kindergarten are presented in Table 2.1 with all the proposed assessment points for the proposed social welfare facilities, home for the elderly and kindergarten presented in Figures 2. 1f ±2.1h and Figures 2.1j ±2.1l respectively.

Table 2.1 Details of Revised Representative Noise Sensitive Receivers

NSR	Assessment Point (AP) (1)	Revised / New AP <sup>(2)</sup>	Land Use <sup>(3)</sup>	Status	No. of Floor	Traffic Noise Criterion, L <sub>10(1hr)</sub> , dB(A)	Remarks
	N2500 ±N2506 (Residential)	N2500 ± N2510	PRH		36-39	70	Undated
A1-2	N6681 ±N6683 (Social Welfare)	N6681 ± N6683	FKH	Planned	5	70	Updated information from HA <sup>(4)</sup>
	N6161 ±N6183 (Kindergarten)	N6161 ± N6175	E		1-2	65	l IA
	- (Residential)	N2542, N2545	R		27	70	Updated
A1-4	R6268 ±R6270 (Kindergarten)	N6269 ± N6270, N6315 ± N6318	E	Planned	1-2	65	information from CEDD

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NSR	Assessment Point (AP) (1)	Revised / New AP (2)	Land Use <sup>(3)</sup>	Status	No. of Floor	Traffic Noise Criterion, L <sub>10(1hr)</sub> , dB(A)	Remarks	
A1-5	R2542 (Residential)	N2543 ± N2544	CDA	Planned	27	70	Updated information from	
A1-5	R6315 ±R6318 (Kindergarten)	-	Е	Planned	-	65	CEDD	
	N2621 ±N2625, N2626a-b, N2627 ±N2629 (Residential)	N2621 ± N2640	PRH		40	70		
A2-2	N6717 ±N6719, N6740 ±N6742 (Social welfare)	-		Planned	1	70	Updated information from HA	
	N6201 ±N6242 (Kindergarten)	N6201 ± N6213, N6220 ± N6238	Е		1-3	65		
	N2681 ±N2683 (Residential)	N2681 ± N2683	R		40	70	Undated	
A2-7	- (Social Welfare)	N6613 ± N6614	K	Planned	7	70	Updated information from HA	
	R6113 ±R6128 (Kindergarten)	N6113 ± N6132	E		1-7	65	I IA	
A3-2	R3301 (School)	N3301 ± N3302	E	Planned	8	65	New APs based on updated layout	
A3-3	N2721 ±N2725, N2726a-b, N2727a-b, N2728 ±N2730, N2731a-b (Residential)	N2721 ± N2723, N2724a-e, N2725, N2726a-b, N2727a-b, N2728, N2729a-b, N2730, N2731a-b	PRH	Planned	39-40	70	Updated information from HA	
	N6001 ±N6004, R6520 ±R6537 (Social Welfare)	N6520 ± N6522			7	70		
	N6001 ±N6019, N6040 ±N6052, R6020 ±R6037 (Kindergarten)	N6020 ± N6035	E		1-7	65		
A3-4	R3381 (School)	N3381 ± N3382	E	Planned	8	65	New APs based on updated layout	

## Notes:

- (1) Reference was made from Planning and Engineering Review for Accommodating Additional Population in KTN and FLN NDAs and for Remaining Packages of NDAs ±Report on Environmental Review (July 2017) 3 3 ( (55 )
- (2) The revised / new representative NSRs, where applicable, have been identified for road traffic noise assessment according to best available information during the preparation of this Plan.
- (3) R ±Residential; PRH ±Public Rental Housing; E ±Educational; CDA: Comprehensive Development Areas.
- (4) Layout of KTN Site A1-2 was based on the updated information provided by HA though this site has been handovered to Hong Kong Housing Society (HKHS) and the layout is being developed by HKHS during the preparation of this Plan.
- 2.4 Traffic Noise Impact Assessment Methodology
- 2.4.1 Same road traffic noise assessment methodology as presented in Section 4.6.2.1 of the EIA Report has been adopted in this noise impact assessment.

- 2.4.2 As the commencement year of all the proposed road network for KTN and FLN NDA remains in 2029, the year with maximum traffic flow within a 15-year period upon commencement of operation of the road works remains 2044 (i.e. same as that stated in the EIA Report and P&E ERR). For the purpose of this review, traffic noise impact at the representative NSRs in Year 2044 has been assessed to evaluate the traffic noise compliance and the required mitigation measures for ultimate scenario. Traffic forecast for the Year 2044 (Appendix 2 .1 refers) as adopted in P&E ERR has been used for this traffic noise impact assessment. For without project scenario, the predicted overall noise levels at the design year (i.e. Year 2044) are extracted from the EIA Report.
- 2.5 Traffic Noise Impact Assessment
- 2.5.1 A computer plot of the road scheme and a plan showing the location of existing roads, new roads and other roads is presented in Appendi x 2.2. Appendi x 2.3 presents the unmitigated road traffic noise impacts on NSRs and the locations where direct noise mitigation measures should be provided on the proposed project roads in order to alleviate the adverse noise impacts at those affected NSRs.
- 2.5.2 Based on the best available information during the preparation of this Plan, the latest recommended mitigation proposal as presented in Figur es 2.2a ±2.2e has been reviewed. The mitigated noise levels of the representative NSRs within 300m of the Project are summarised in Table 2.2, with detailed road traffic noise levels presented in Appendix 2.4.

Table 2.2 Predicted Road Traffic Noise Levels under Mitigated Scenario at KTN in Year 2044 (At Residential Premises, Primary School and Secondary School)

NSR	Assessment Point	nent Point Use <sup>(1)</sup> L <sub>10(1hr)</sub> dB(A)		hr) dB(A)	Compliance [Y/N]	Mitigation Measures
			Criterion (3)	Predicted Noise Levels		Required [Y/N] <sup>(2)</sup>
KTN -1	R1001-1005	W, E, R	65 - 70	59 - 67	Y	N
KTN -2	R1021-1034	E, R	65 - 70	59 - 65	Y	N
KTN -4	R1041-1043	R	70	68 - 70	Y	N
KTN -7	R1061 <sup>(4)</sup>	Е	65	62 - 64	Y	N
KTN-9	R1085-1090	R	70	56 - 69	Y	N
KTN-11	R1102-1107	R	70	58 - 70	Y	N
KTN-12	R1121	R	70	67	Y	N
KTN-20	R1161-1162	R	70	21 - 23	Y	N
KTN-32	R1181-1186	R	70	59 - 68	Y	N
KTN-33	R1201-1202	R	70	68 - 70	Y	N
KTN-45	R1501-1502, R1504, R1506 N1505	R	70	66 - 70	Υ	N
KTN-46	R1241	R	70	51 - 52	Y	N
KTN-48	R1281-1282, R1284-1290	R	70	57 - 70	Y	N
KTN-49	R1301	R	70	61	Υ	N
KTN-50	R1681-1682	R	70	69 - 70	Y	N
KTN-P2	R1541-1546	R	70	61 - 68	Υ	N
KTN-P6	R1521, R1523-1527	R	70	60 - 70	Y	N
A1-2	N2500-2510	PRH	70	56 - 70	Y	N
A1-4	R2521-2522, N2542, N2545	R	70	62 - 67	Y	N
A1-5	R2541, N2543- 2544	CDA	70	62 - 67	Y	N
A1-6	R2561	R	70	65 - 67	Y	N
A1-8	N2581-2583	HOS	70	63 - 68	Y	N
A1-9	R2601-2611, N2612	R	70	53 - 70	Y	N
A2-2	N2621-2640	PRH	70	59 - 69	Y	N
A2-4	N2641	HOS	70	66 - 70	Y	N

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NSR	Assessment Point	Use <sup>(1)</sup>		1D(V)	Compliance	Mitigation
			L <sub>10(1</sub>	<sub>hr)</sub> dB(A)	[Y/N]	Measures
			2 - 1 (3)	Predicted Noise	1	Required
			Criterion (3)	Levels		[Y/N] (2)
A2-5	R2661	R	70	63 - 68	Υ	N
A2-7	N2681-2683	PRH	70	58 - 70	Y	N
A2-9	R2701-2707	R	70	54 - 68	Y	N
A2-11	R3222-3223	Е	65	62 - 65	Y	N
A2-12	R3241	Е	65	61 - 63	Υ	N
A2-13	R3264-3265	Е	65	55 - 65	Y	N
A3-1	R3282	Е	65	59 - 63	Y	N
A3-2	N3301-3302	Е	65	52 - 65	Y	N
	N2721-2723,					
	N2724a-e, N2725,					
A3-3	N2726a-b,	PRH	70	52 - 71	<b>Y</b> (5)	N <sup>(5)</sup>
A3-3	N2727a-b, N2728,	FIXIT	70	52 - 71	1.7	in.
	N2729a-b, N2730,					
	N2731a-b					
A3-4	N3381-3382	Е	65	59 - 62	Y	N
A3-6	R2741-2747	R	70	63 - 70	Y	N
A3-7	R2141	R	70	41	Y	N
B1-1	N3001-3003	E	65	59 - 65	Y	N
B2-6	N3421-3422	E	65	52 - 64	Υ	N
B2-7	N3441-3442	E	65	56 - 64	Υ	N
B2-8	N3401-3403	Е	65	59 - 65	Y	N
B2-10	R2761-2764	CDA	70	36 - 70	Y	N
C1-3	R2021-2024	CDA	70	64 - 70	Y	N
C1-4	R2001,	R	70	62 - 67	Y	N
C1-4	R2102-2103	K	70	02 - 07		IN
D1-5	R3481	R	70	63	Υ	N
D1-7	R2781-2783,	R	70	61 - 70	Υ	N
D1-7	N2784-2794	K	70	01-70	Į.	IN
	R2041-2043,					
D1-9	R2046-2047,	R	70	51 - 69	Y	N
	N2046-2047					
D1-11	R2821-2830,	R	70	56 - 70	Y	N
	N2831-2835		• •		·	
E1-2	R2862-2863	Е	65	60 - 63	Y	N
E1-3	R3701-3704	G	70	59 - 67	Y	N
E1-4	R3721	Е	65	60	Y	N
F1-3	R2841-2848	OU	70	60 - 69	Y	N
H1-1	R1504, R1506, N1505	R	70	66 - 70	Υ	N

## Notes:

- (1) R ±Residential; E ±Educational; G ±Government; CDA ±Comprehensive Development Areas; PRH ± Public Rental Housing; HOS ±Home Ownership Scheme; W ±Place of Worship; OU ±Other Specified Uses.
- (2) For existing and planned NSRs outside and within the non-development area of NDA, direct mitigation measures are required when "With Project Overall Noise Level exceeds Noise Criteria" AND, either "With Project : L W K R X W 3 U R M H F W 2 Y H U D O O r "New Robads letxcets NoiseGCrites a" or R"New 5 R D G V & R Q W U L E X W L R Q G % \$
- (3) Relevant environmental standards/criteria: TM-EIAO noise standards for road traffic noise.
- (4) Based on latest information (<a href="https://www.legco.gov.hk/yr17-18/english/fc/pwsc/papers/p18-19e.pdf">https://www.legco.gov.hk/yr17-18/english/fc/pwsc/papers/p18-19e.pdf</a>), the existing Lady Ho Tung Welfare Centre (KTN-7) will be revitalised as Lady Ho Tung Welfare Centre Eco-Learn Institutes. Hence, R1061 will be changed for educational use.
- (5) As advised by HD, architectural fin or similar measures will be adopted at assessment points N2724d as the further noise mitigation measures in public housing site at KTN Site A3-3 to mitigate the residual noise impacts. With the implementation of architectural fin or similar measures, the traffic noise levels at NSRs would comply with noise limit of 70dB(A). As such, no further direct mitigation measures are required.
- 2.5.3 The mitigated traffic noise levels at all planned and existing residential premises will comply with the relevant noise criterion except KTN Site A3-3. As discussed in Section 2.3.2, the exact locations for the proposed social welfare facilities, home for the elderly and kindergarten are not yet confirmed except the RCHE at KTN Site B2-5. Hence, a sensitivity test on the possible locations has been conducted with findings presented in Table 2.3 and 2.4. Similar to the findings of the EIA Report, the predicted road traffic noise levels at some of the NSRs would exceed the relevant noise criterion, and thus non-sensitive use at that particular façade or acoustic insulation should be adopted. In addition, during the design of the social welfare facilities and kindergarten, noise sensitive uses should be located to avoid

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exceedance as far as practicable. Figure 2.3 and Figure 2.4 show the façades of potential locations for the proposed social welfare facilities, home for the elderly and kindergarten at KTN respectively which can rely on open window for ventilation without exceeding the traffic noise criteria.

2.5.4 Road traffic noise levels at the representative NSRs of proposed RCHE in KTN Site B2-5 were also predicted based on 2029 traffic flows with consideration of the year of population intake as worst case scenario in view of the provision of noise mitigation measures at Fanling Highway. Details of the results are provided in Appendix 2.5. During P&E study, various lengths of architectural fins have been proposed at critical assessment points SI-1, SI-4, W-1 and W-2, and also noise mitigation measures in the form of provision of airconditioning and insulated glazed unit have been considered to further mitigate the residual noise impact at SI-1, W-1 and W-2 to meet the relevant noise criteria. If there is any change in layout plan during detailed design stage, the noise mitigation measures should be further reviewed by the Engineer / Design & Build (D&B) Contractor of RCHE to ensure that the stipulated criteria at the NSRs can be met in the future. Details of proposed noise mitigation measures on the proposed RCHE are presented in Appendix 2.5.

Table 2.3 Road Traffic Noise Sensitivity Analysis for Potential Locations of Social Welfare under Mitigated Scenario at KTN in Year 2044

NSR	Assessment Point	Use <sup>(1)</sup>	L <sub>10(1hr)</sub> dB(A)		Compliance [Y/N]	Mitigation Measures
			Criterion (2)	Predicted Noise Levels		Required [Y/N]
A1-2	N6681-6683	Н	70	53 - 60	Υ	N
A1-6	R6831-6851	R	70	17 - 68	Y	N
A2-5	R6581-6592	R	70	19 - 71	Y <sup>(3)</sup>	N <sup>(3)</sup>
A2-7	N6613-6614	R	70	66 - 70	Y	N
A3-3	N6001-6004, N6520-6522	R	65 - 70	58 - 67	Y <sup>(3)</sup>	N <sup>(3)</sup>
B2-5	N-1 to N-6, E-1 to E-5, SI-1 to SI-6, W-1 to W- 5, W-G, NI-1 to NI-6	R/ H	55 - 70	38 - 70	Y <sup>(4)</sup>	N <sup>(4)</sup>
B2-8	N6781-6784	R	70	51 - 69	Y	N
B2-10	R6861-6867	R	70	55 - 67	Y	N

## Notes:

Table 2.4 Road Traffic Noise Sensitivity Analysis for Potential Locations of Kindergartens under Mitigated Scenario at KTN in Year 2044

NSR	Assessment Point	Use <sup>(1)</sup>	L <sub>10(1hr)</sub> dB(A)		Compliance [Y/N]	Mitigation Measures
			Criterion (2)	Predicted Noise Levels		Required [Y/N]
A1-2	N6161-6175	Е	65	42 - 70	Y <sup>(3)</sup>	N <sup>(3)</sup>
A1-4	R6261-6267, R6271, N6269-6270, N6315-6318	E	65	32 - 70	Υ(3)	N <sup>(3)</sup>
A1-5	R6301-6314	Е	65	17 - 68	Y <sup>(3)</sup>	N <sup>(3)</sup>
A1-6	R6331-6351	Е	65	17 - 68	Y <sup>(3)</sup>	N <sup>(3)</sup>

<sup>(1)</sup> R ±Residential; H ±Hospital.

<sup>(2)</sup> Relevant environmental standards/criteria: TM-EIAO noise standards for road traffic noise.

<sup>(3)</sup> Non-sensitive use at the particular façade that would exceed the traffic noise limit or acoustic insulation should be adopted during the design stage. Figure 2.3 shows the façades of potential locations for the proposed social welfare facilities and home for the elderly at KTN respectively which can rely on open window for ventilation without exceeding the traffic noise criteria. With the implementation of proper design, there would be no exceedance anticipated at these NSRs.

<sup>(4)</sup> As confirmed by Architectural Service Department (ArchSD), appropriate noise mitigation measures would be proposed and adopted by the D&B contractor to mitigate the traffic noise impact at RCHE. A Noise Impact Assessment (NIA) will be conducted separately by the contractor as engaged by ArchSD/Social Welfare Department (SWD) to demonstrate that the latest RCHE layout would comply with relevant noise criteria.

NSR	Assessment Point	Use <sup>(1)</sup>	L <sub>10(1hr)</sub> dB(A)		Compliance [Y/N]	Mitigation Measures
			Criterion (2)	Predicted Noise Levels		Required [Y/N]
A1-8	R6381-6392	Е	65	42 - 69	Y <sup>(3)</sup>	N <sup>(3)</sup>
A2-2	N6201-6213, N6220-6238	Е	65	29 - 74	Y <sup>(3)</sup>	N <sup>(3)</sup>
A2-4	N6141-6148	Е	65	25 - 67	Y <sup>(3)</sup>	N <sup>(3)</sup>
A2-7	R6113-6132	E	65	39 - 70	Y <sup>(3)</sup>	N <sup>(3)</sup>
A3-3	N6001-6035, N6040-6052	Е	65	43 - 73	Y <sup>(3)</sup>	N <sup>(3)</sup>

#### Notes:

- (1) E ±Educational
- (2) Relevant environmental standards/criteria: TM-EIAO noise standards for road traffic noise.
- (3) Non-sensitive use at the particular façade that would exceed the traffic noise limit or acoustic insulation should be adopted during the design stage. Figure 2.4 shows the façades of potential locations for the proposed kindergarten at KTN respectively which can rely on open window for ventilation without exceeding the traffic noise criteria. With the implementation of proper design, there would be no exceedance anticipated at these NSRs.
- 2.5.5 The noise mitigation proposal for the Project has been reviewed during the preparation of this proposal. Summary of traffic noise mitigation measures for the Project are presented in Appendi x 2.7. Locations of road traffic noise mitigation measures are shown in Figures 2.2a ±2.2e. While the façades of the potential locations of proposed social welfare facilities, home for the elderly and kindergarten which can rely on open window for ventilation without exceeding the traffic noise criteria are shown in Figure 2.3 and Figure 2.4 respectively. Provision of architectural fins, air-conditioning and insulated glazed unit will be adopted during the detailed design stage of the RCHE at KTN Site B2-5 (Appendix 2.5 refers).
- 2.5.6 To study the noise performance of the Project, traffic noise levels at the residential premises, educational institutions and places of public worship which have direct line of sight to the Project have been reviewed. The numbers of dwellings, classrooms, places of public worship that would be benefited from and protected by the provision of recommended noise mitigation measures have been calculated with estimated results and details of calculation presented in Table 2.5 and Appendix 2.6 respectively.

Table 2.5 Summary of Protected and Benefitted Land Uses

NSE <sup>(1)</sup>	Total No. of	Unmitigated Scenario	M	litigated Scenario	
	NSE	No. of Exposed NSE	No. of Exposed NSE	Protected NSE	Benefitted NSE
KTN ±Existing NSE					
Dwellings	1143	629	0	629	629
Classrooms	31	31	0	31	31
KTN - Planned NSE					
Dwellings	41429	9346	O <sup>(3)</sup>	9346	9338
Classroom <sup>(2)</sup>	578	351	0	351	351

## Notes:

- (1) NSE ±Noise sensitive element
- (2) As the school layouts showing classrooms are not available during the preparation of this report, a total of six classrooms has been assumed for each floor.
- (3) As advised by HD, architectural fin or similar measures will be adopted at the exposed dwellings (i.e. Assessment points N2724d) as the further noise mitigation measures in public housing site at KTN Site A3-3 to mitigate the residual noise impacts. With the implementation of architectural fin or similar measures, the traffic noise levels at NSRs would comply with noise limit of 70dB(A). As such, there will be no more exposed NSE among the existing and planned NSE in KTN NDA.
- 2.5.7 With the implementation of recommended direct mitigation measures including the provision of noise barrier and LNRS, no exceedance is predicted at the planned dwellings in KTN NDA. The noise mitigation measures required and the building layout assumed in this Plan will not affect the development potential of those concerned sites for residential premises.

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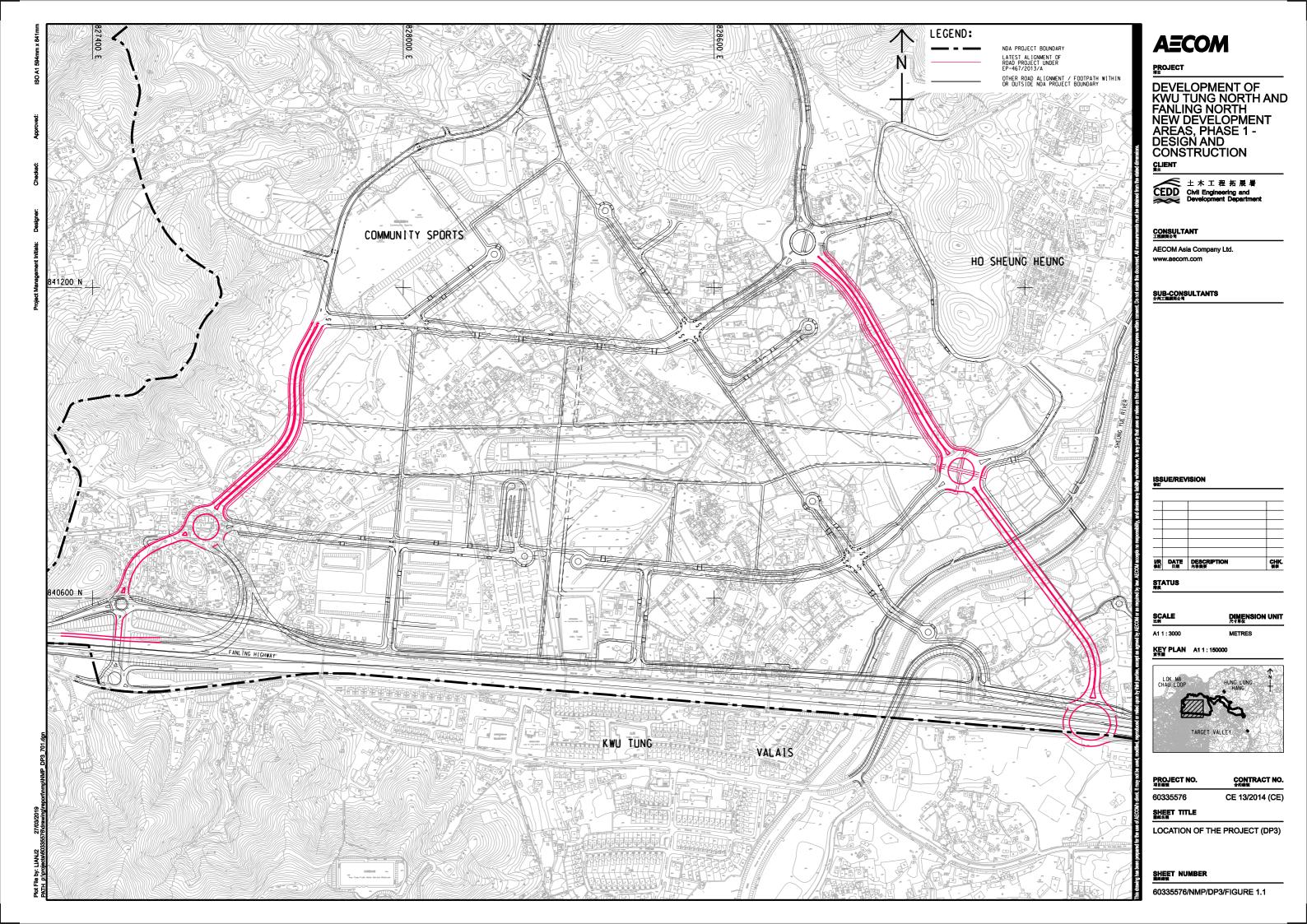
- 2.5.8 The eligibility of the affected premises for indirect technical remedies (ITR) has been UHYLHZHG DFFRUGLQJ WR WKH WAT KOVER HINGS LEVEN HEX LEVEN LEVE
- 2.6 Evaluation of Residual Impact
- 2.6.1 During the operational phase, the impact arising from the Project can be mitigated by implementing the proposed noise control measures such as barrier, enclosure, low noise road surfacing and thus residual noise impacts are not anticipated.
- 2.7 Implementation Programme of Mitigation Measures
- 2.7.1 In view of the extensive scale of development and substantial land area involved, the KTN NDA will be developed in two phases, i.e. advance and remaining phases. As such, the implementation programme of noise mitigation measures has been developed according to implementation programme of the KTN NDA. The recommended noise mitigation measures should be in place before the occupation of corresponding areas in KTN NDA in order to protect the planned NSRs from adverse traffic noise impact. A summary of Road Traffic Noise Mitigation Proposal for the Project, together with the implementation programme, is presented in Appendix 2.7.
- 2.7.2 If there is any change proposed to the traffic noise mitigation measures in the approved TNMP, the Permit Holder shall, no later than one month before the implementation of any such change, submit to the DEP for approval of an update to the TNMP.

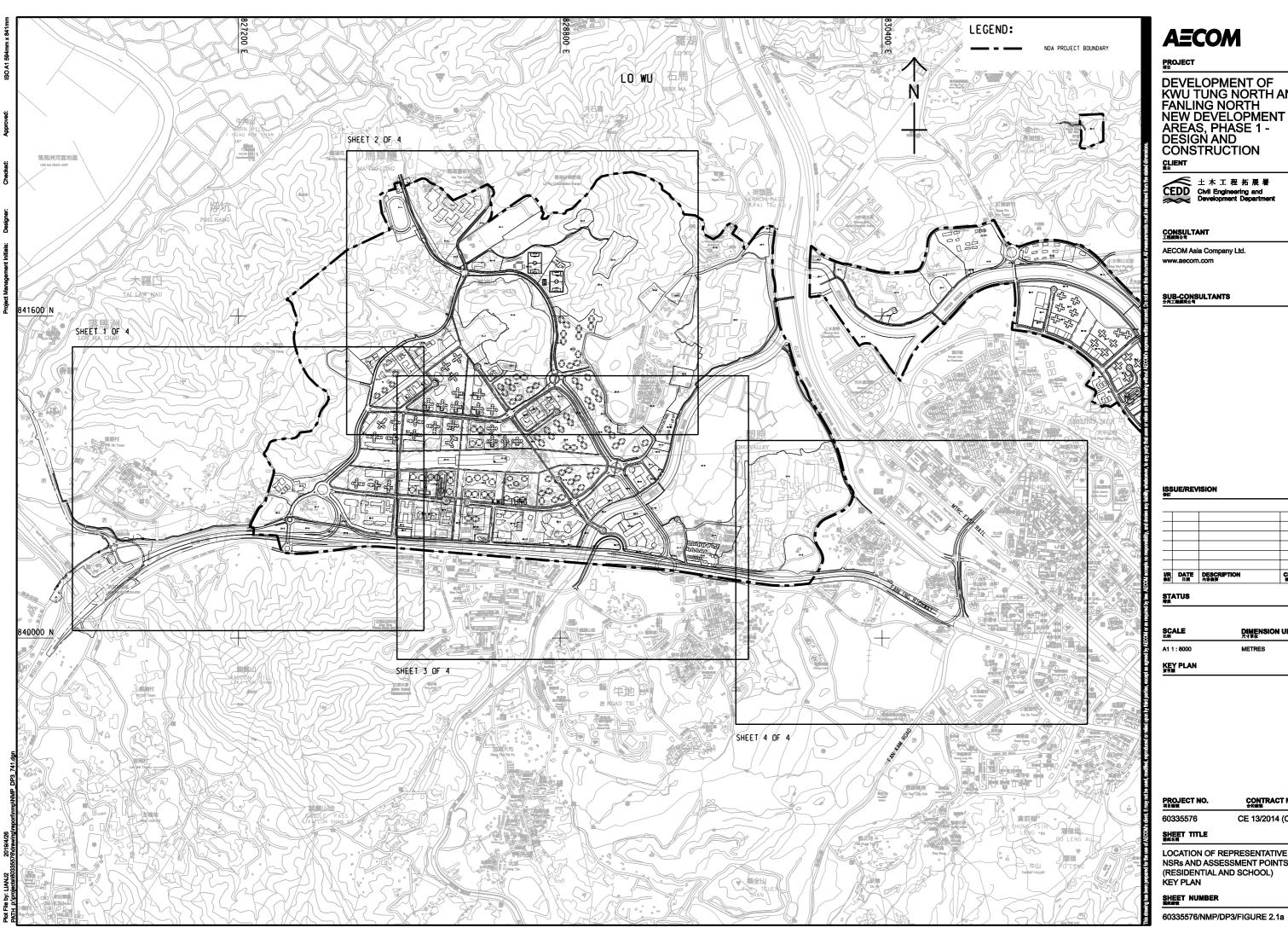
**ΔΞCOM** 8 April 2019

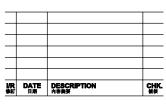
# 3 CONCLUSION

- 3.1.1 The traffic noise mitigation measures for the Project have been reviewed based on latest available information of the development layouts. Assessment results indicate that traffic noise performance requirements set out in the EIA report (Register No.: AEIAR-175/2013) will not be exceeded with the mitigation measures in place.
- 3.1.2 All mitigation measures recommended in this Plan will be fully implemented and properly maintained throughout the operational phase(s) of the Project. If there is any change proposed to the traffic noise mitigation measures in the approved TNMP, the Permit Holder shall, no later than one month before the implementation of any such change, submit to the DEP for approval of an update to the TNMP.





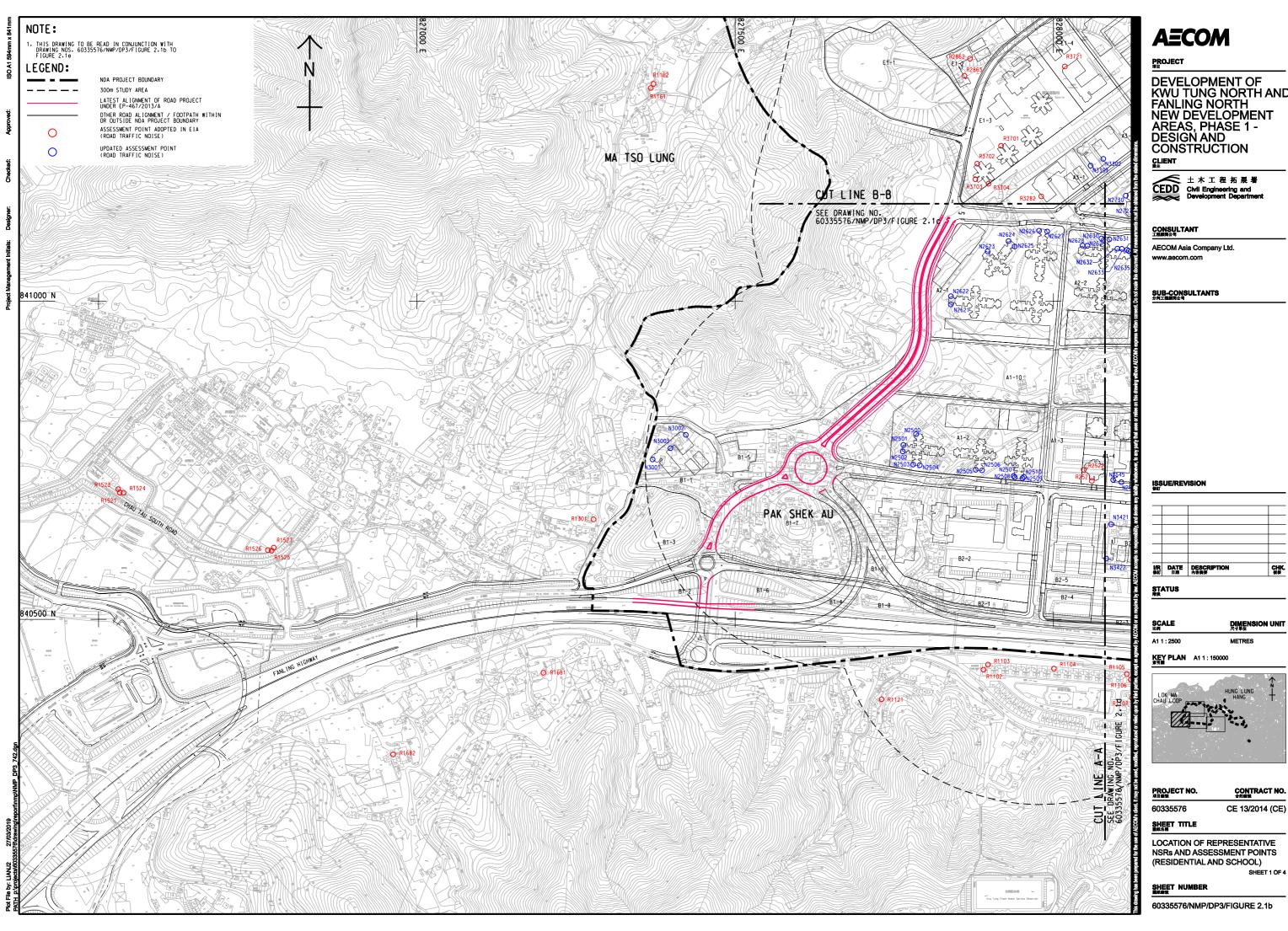


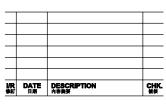


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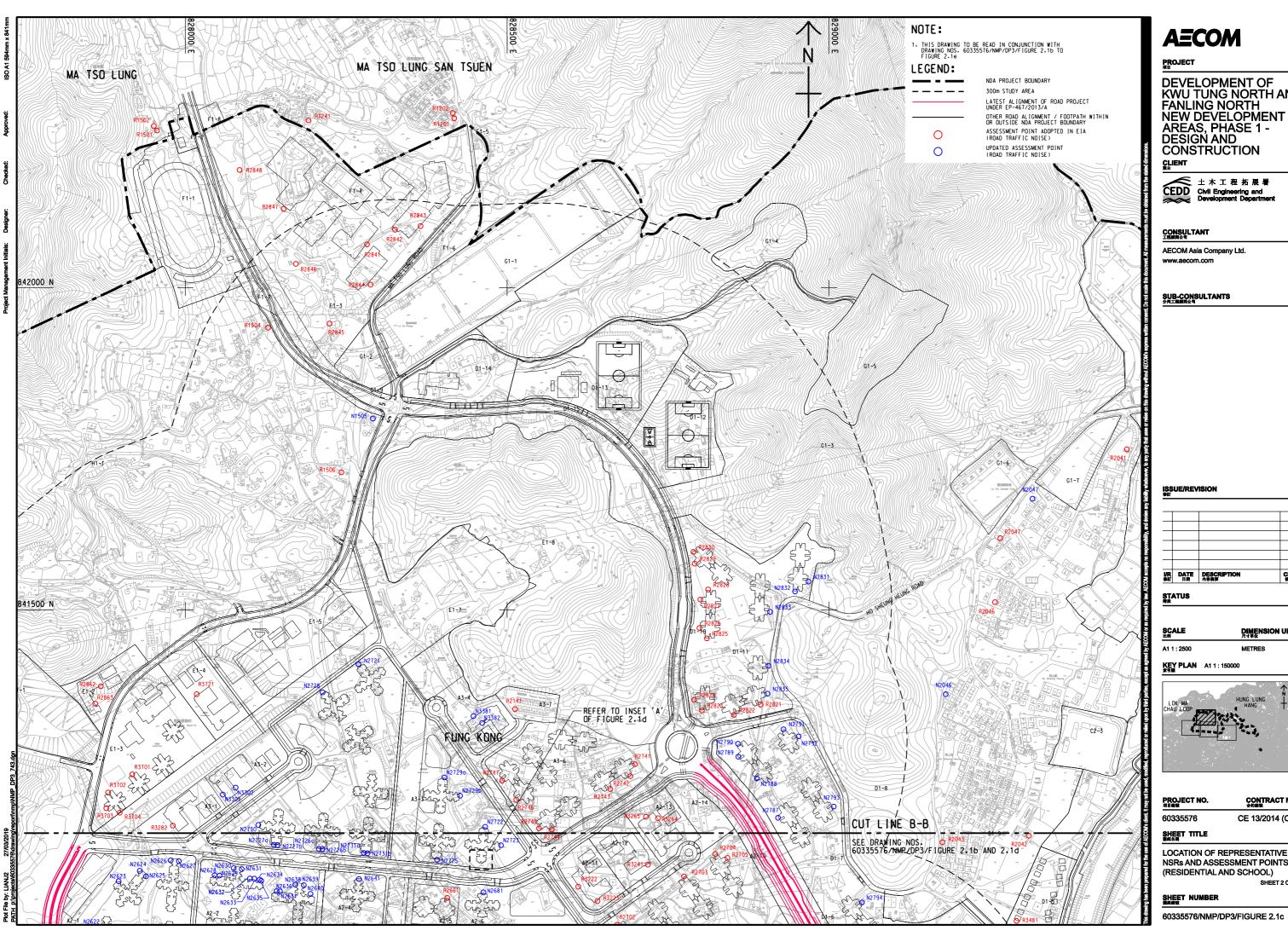
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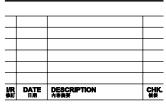


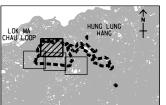


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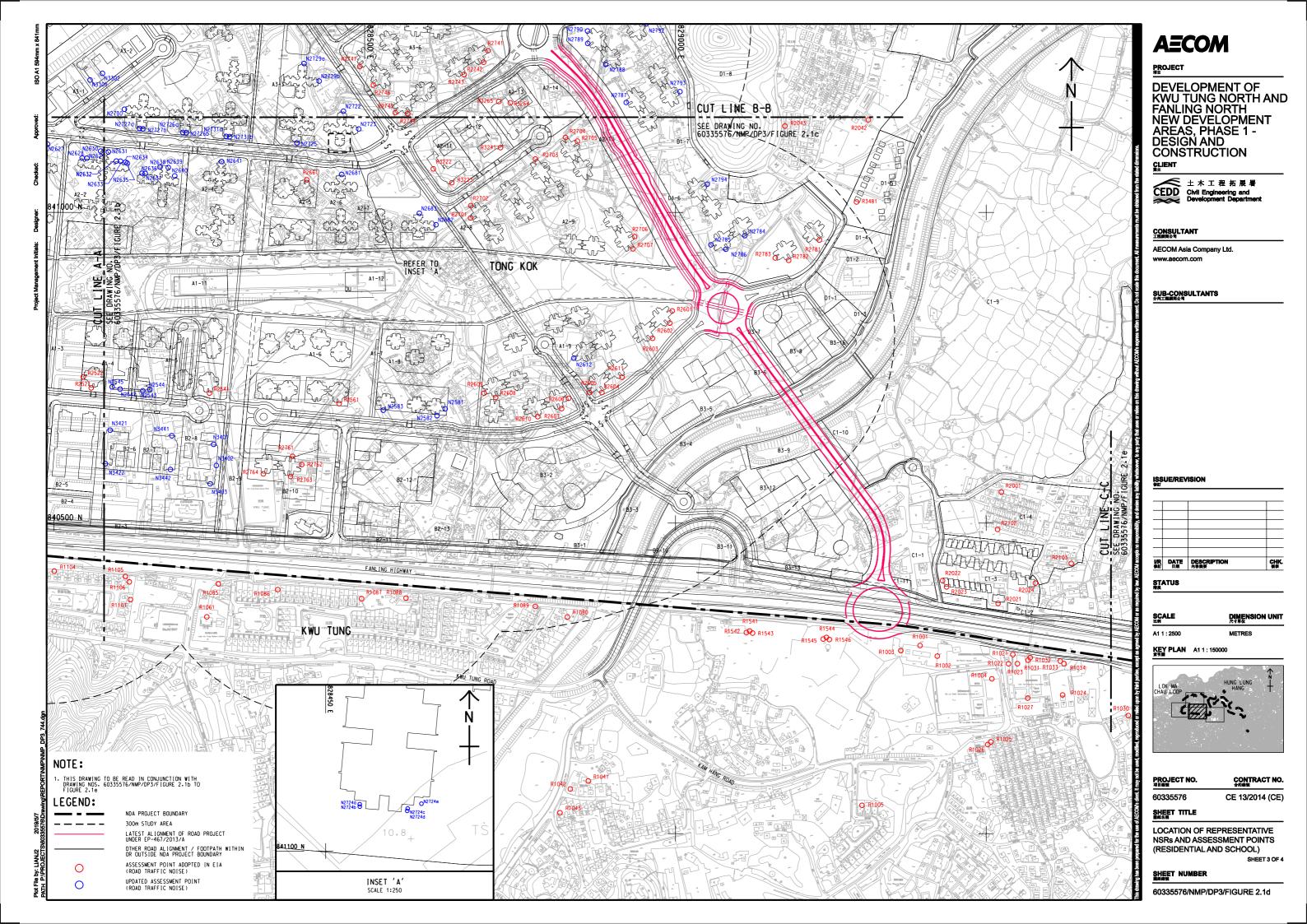


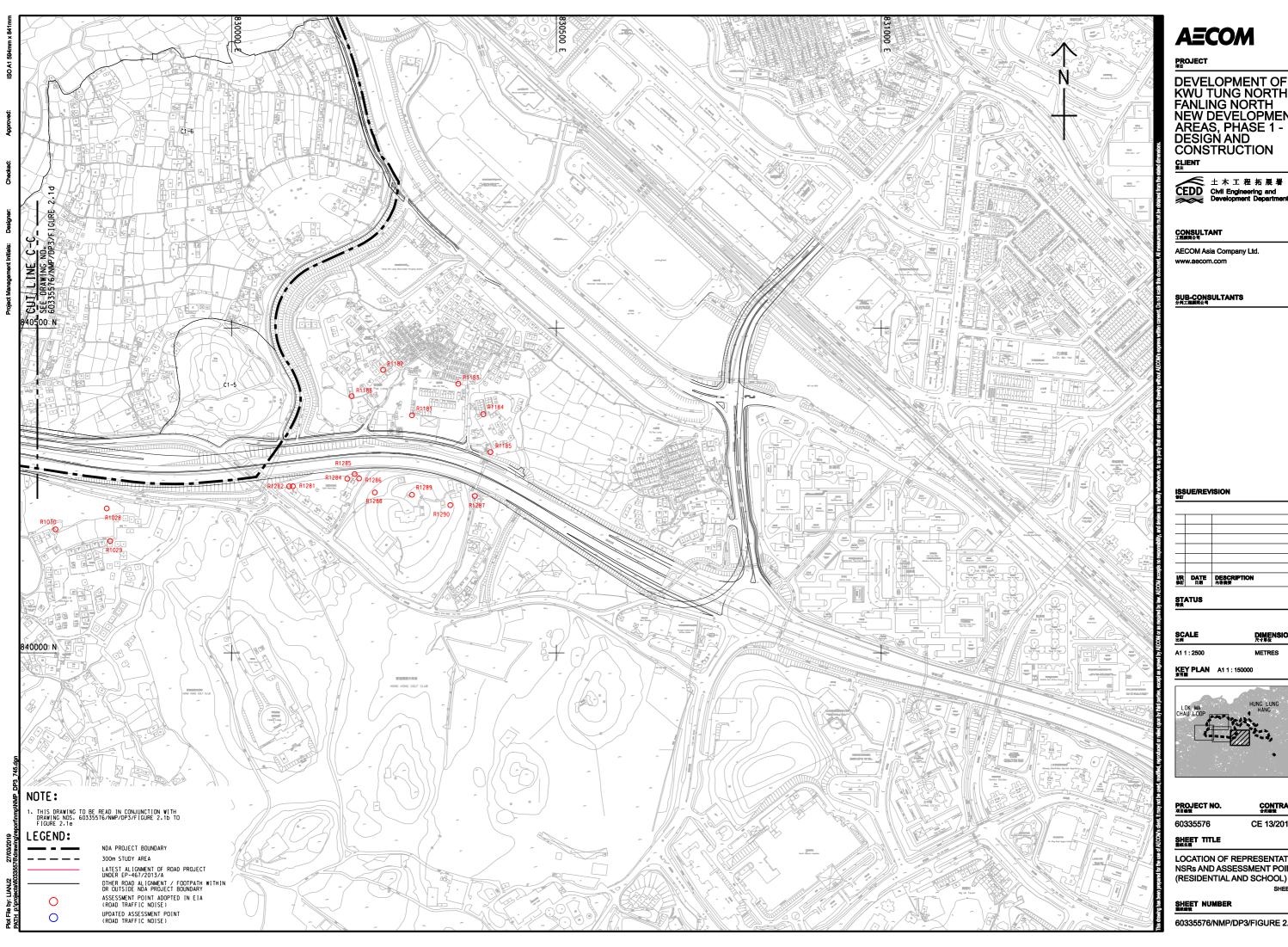


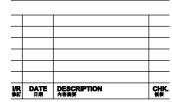
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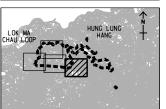
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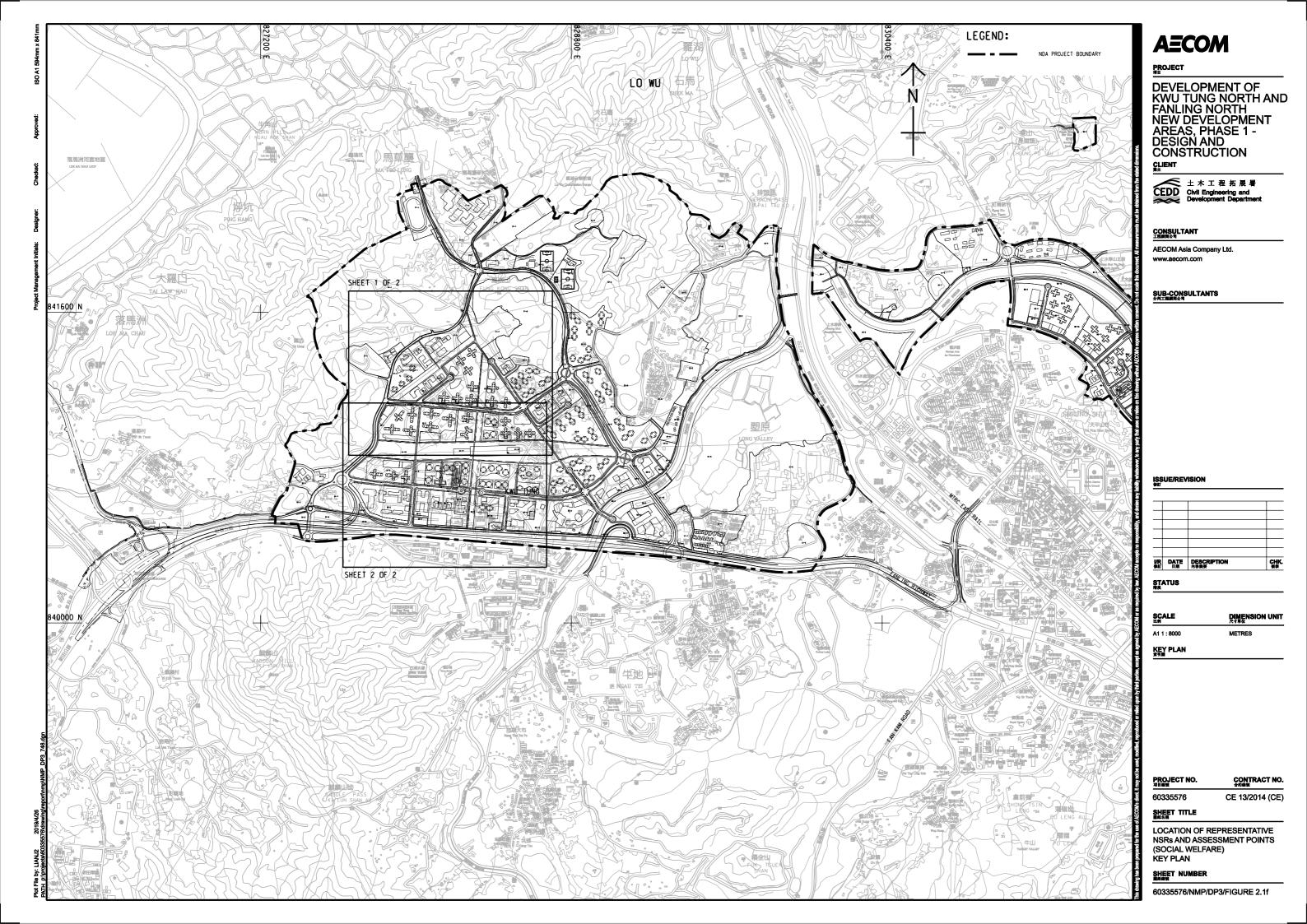


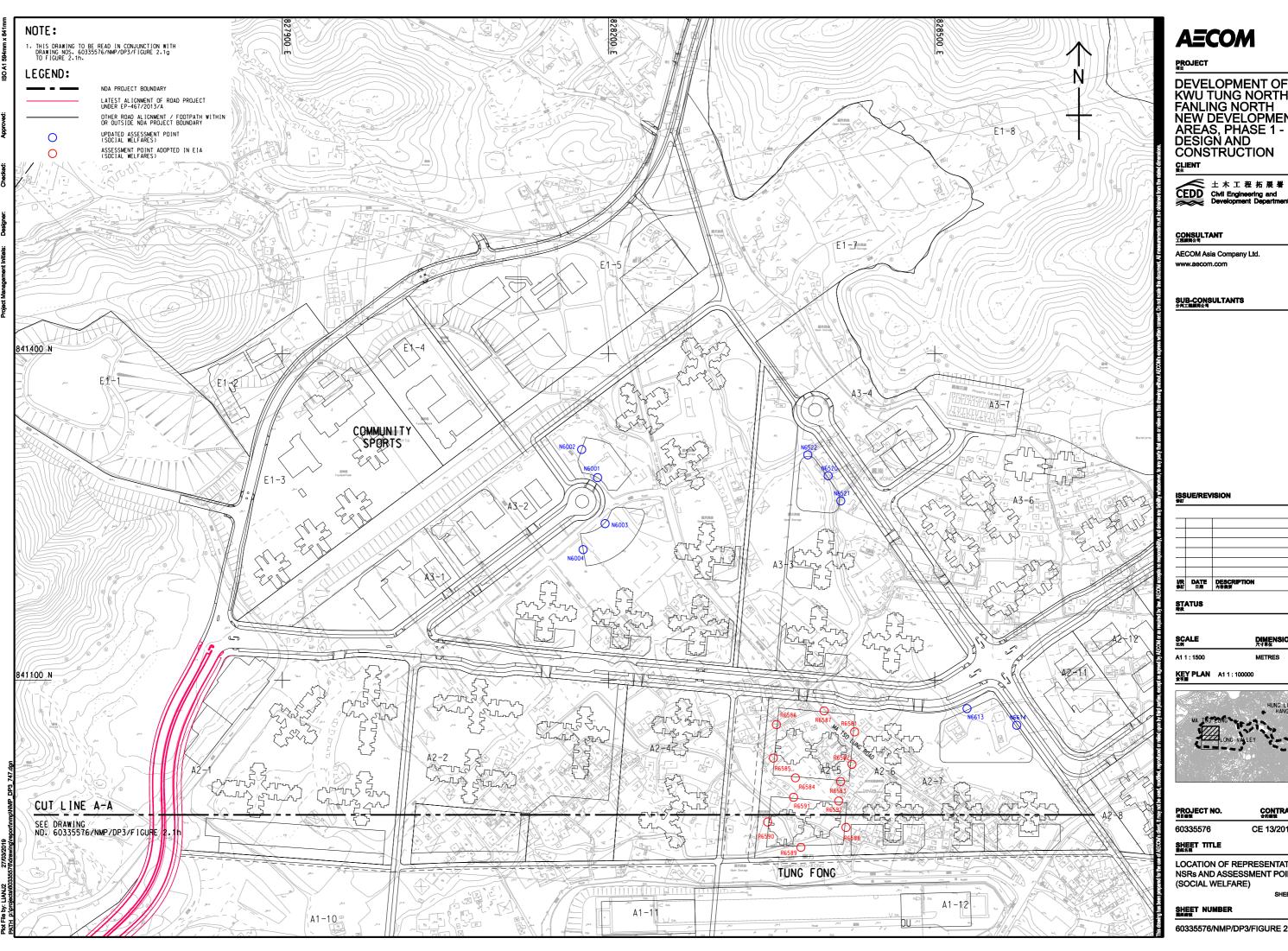
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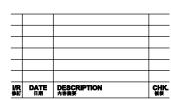
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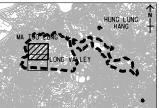
LOCATION OF REPRESENTATIVE NSRs AND ASSESSMENT POINTS (RESIDENTIAL AND SCHOOL)

60335576/NMP/DP3/FIGURE 2.1e







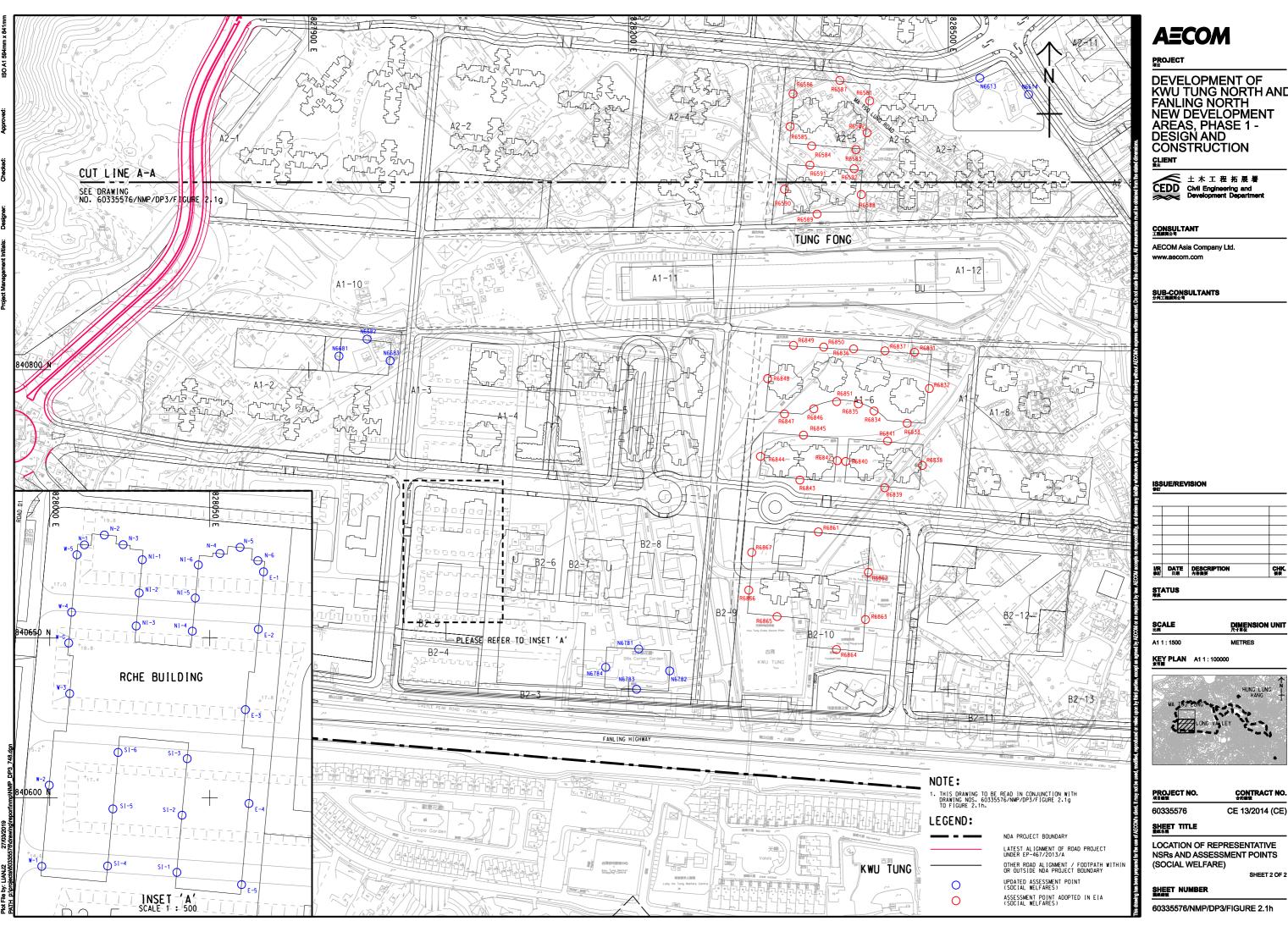


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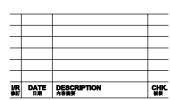
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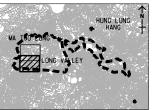
LOCATION OF REPRESENTATIVE NSRs AND ASSESSMENT POINTS

60335576/NMP/DP3/FIGURE 2.1g



DEVELOPMENT OF KWU TUNG NORTH AND FANLING NORTH NEW DEVELOPMENT

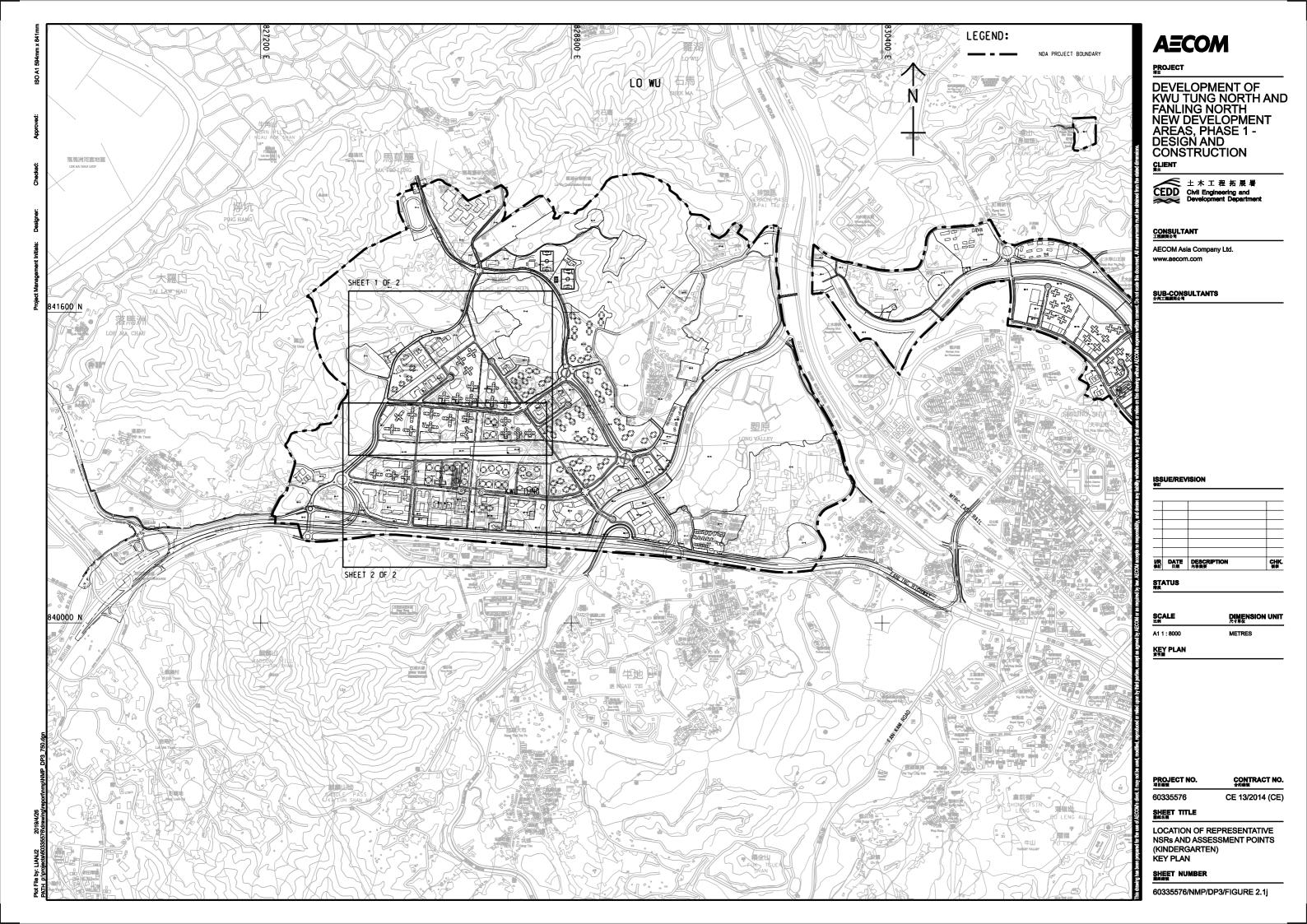


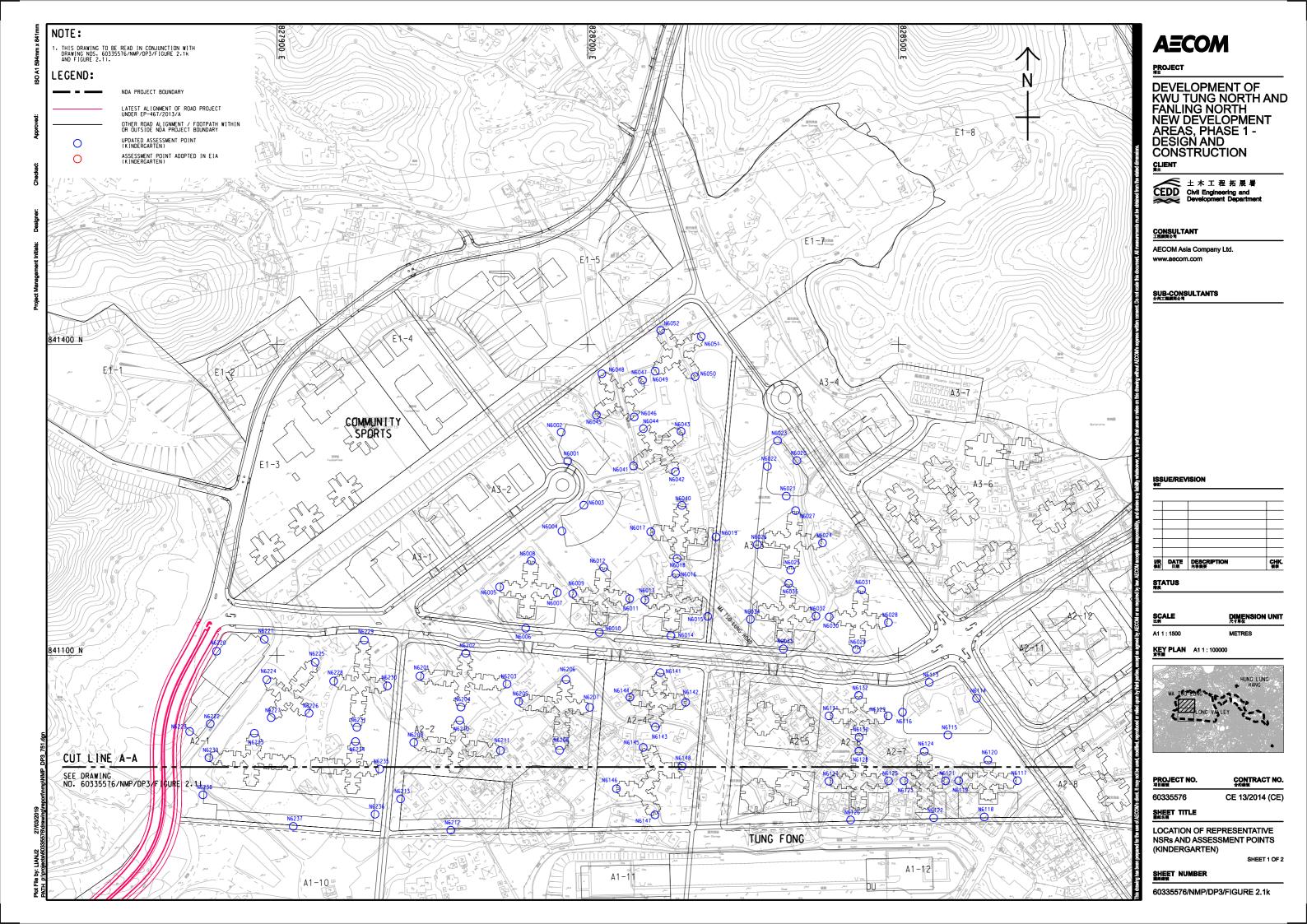


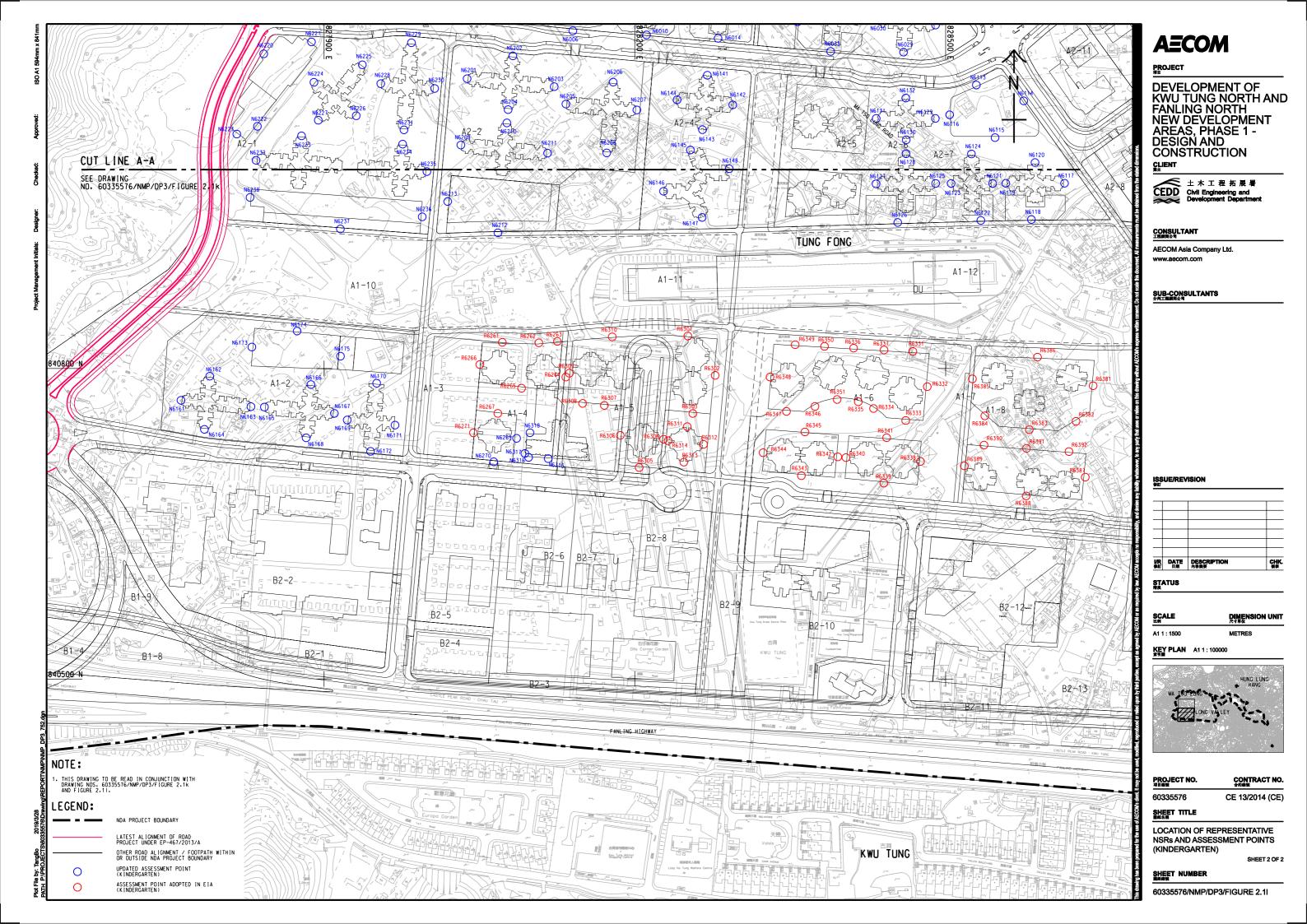
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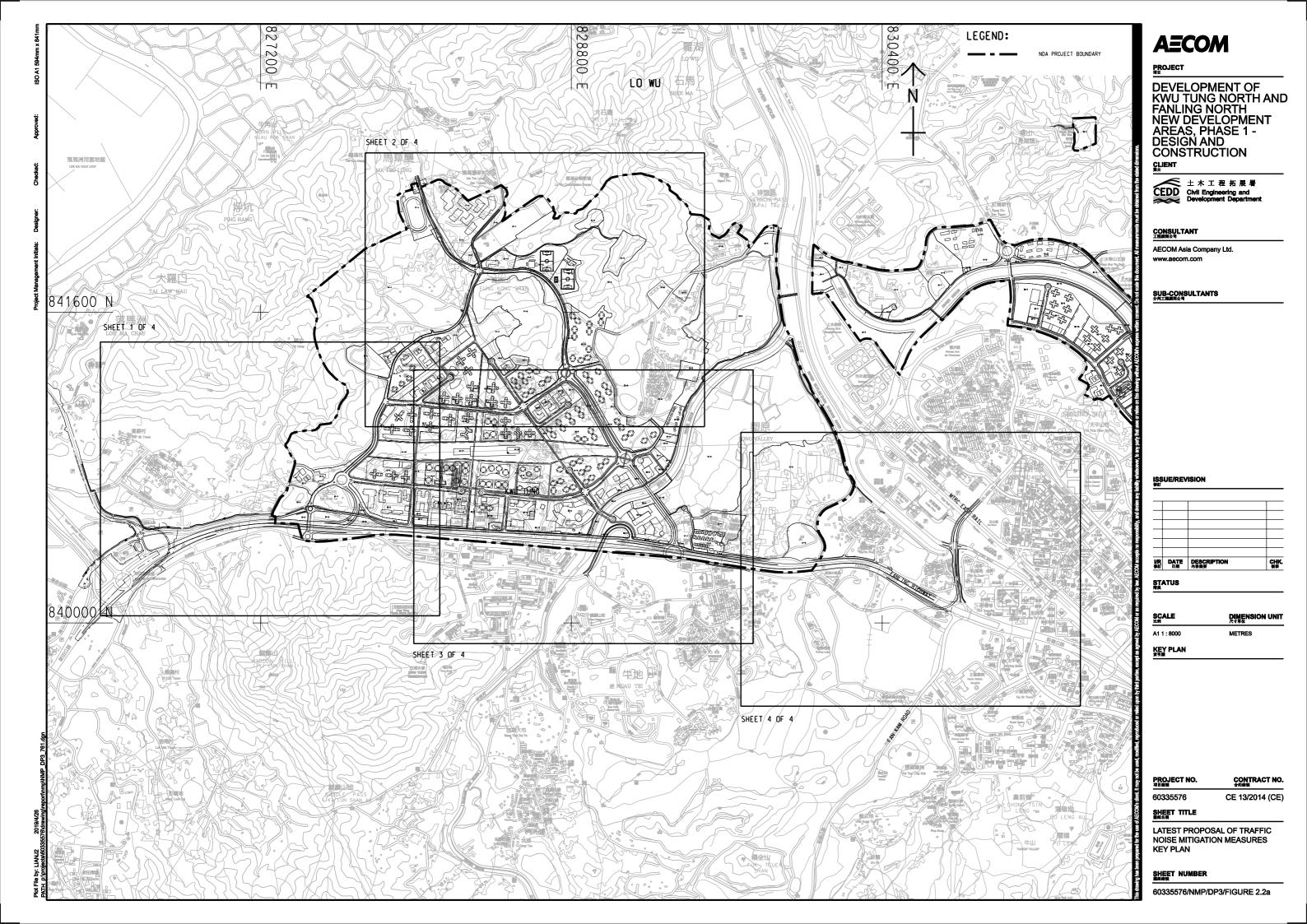
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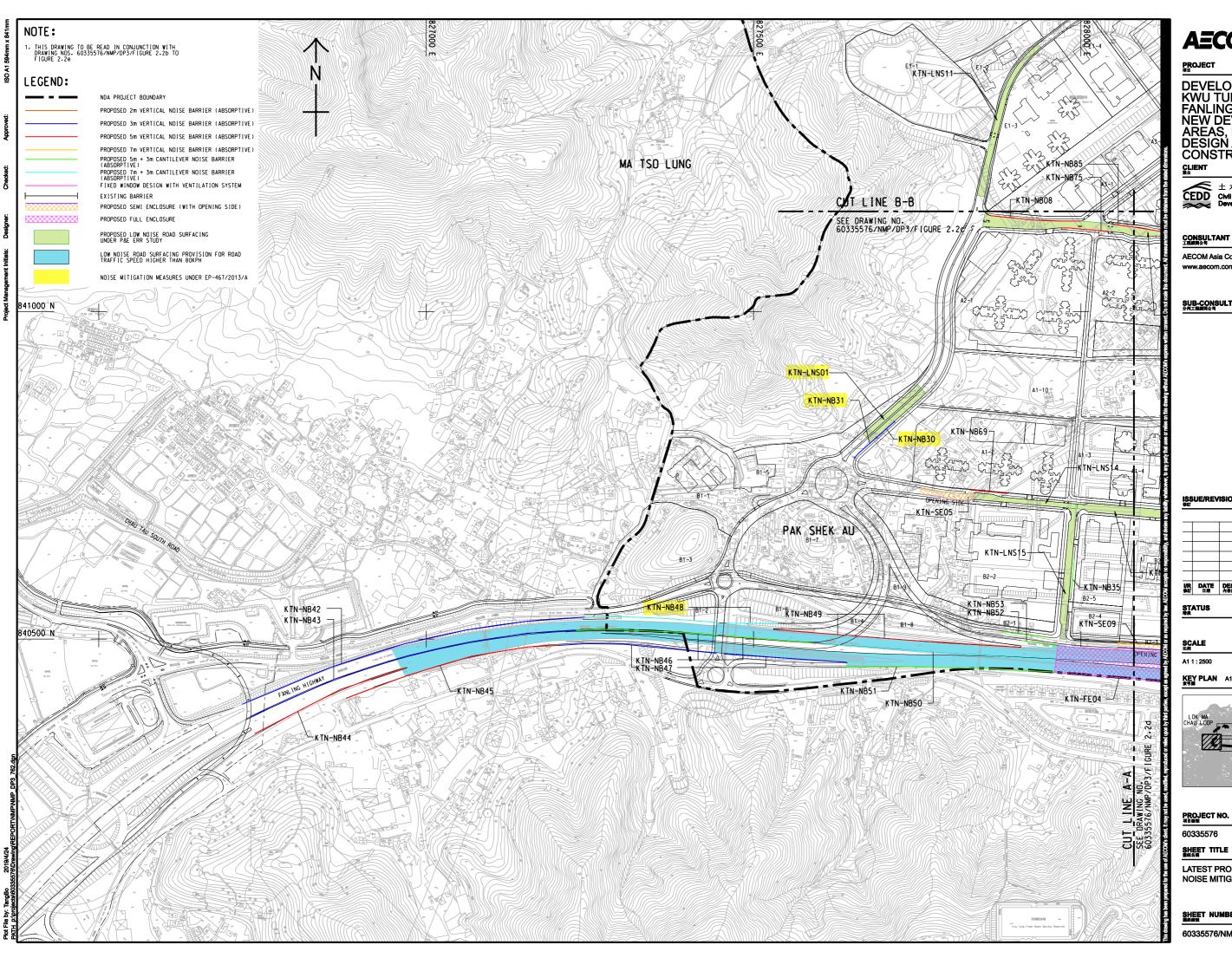
60335576/NMP/DP3/FIGURE 2.1h











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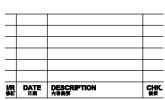


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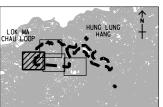
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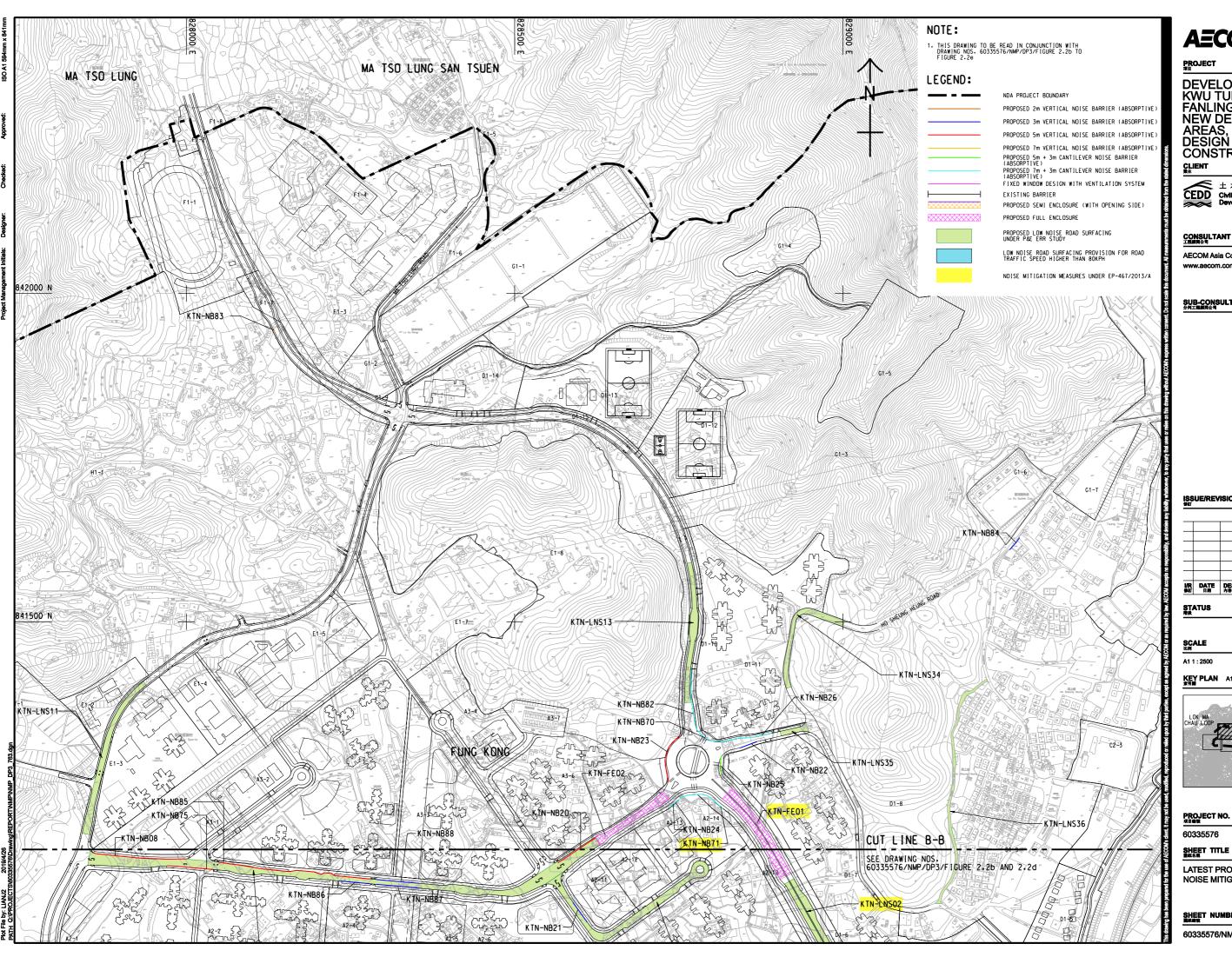
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LATEST PROPOSAL OF TRAFFIC NOISE MITIGATION MEASURES

SHEET 1 OF 4

SHEET NUMBER

60335576/NMP/DP3/FIGURE 2.2b



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DEVELOPMENT OF KWU TUNG NORTH AND FANLING NORTH NEW DEVELOPMENT AREAS, PHASE 1 -DESIGN AND CONSTRUCTION



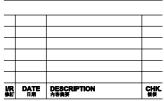
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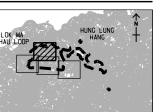
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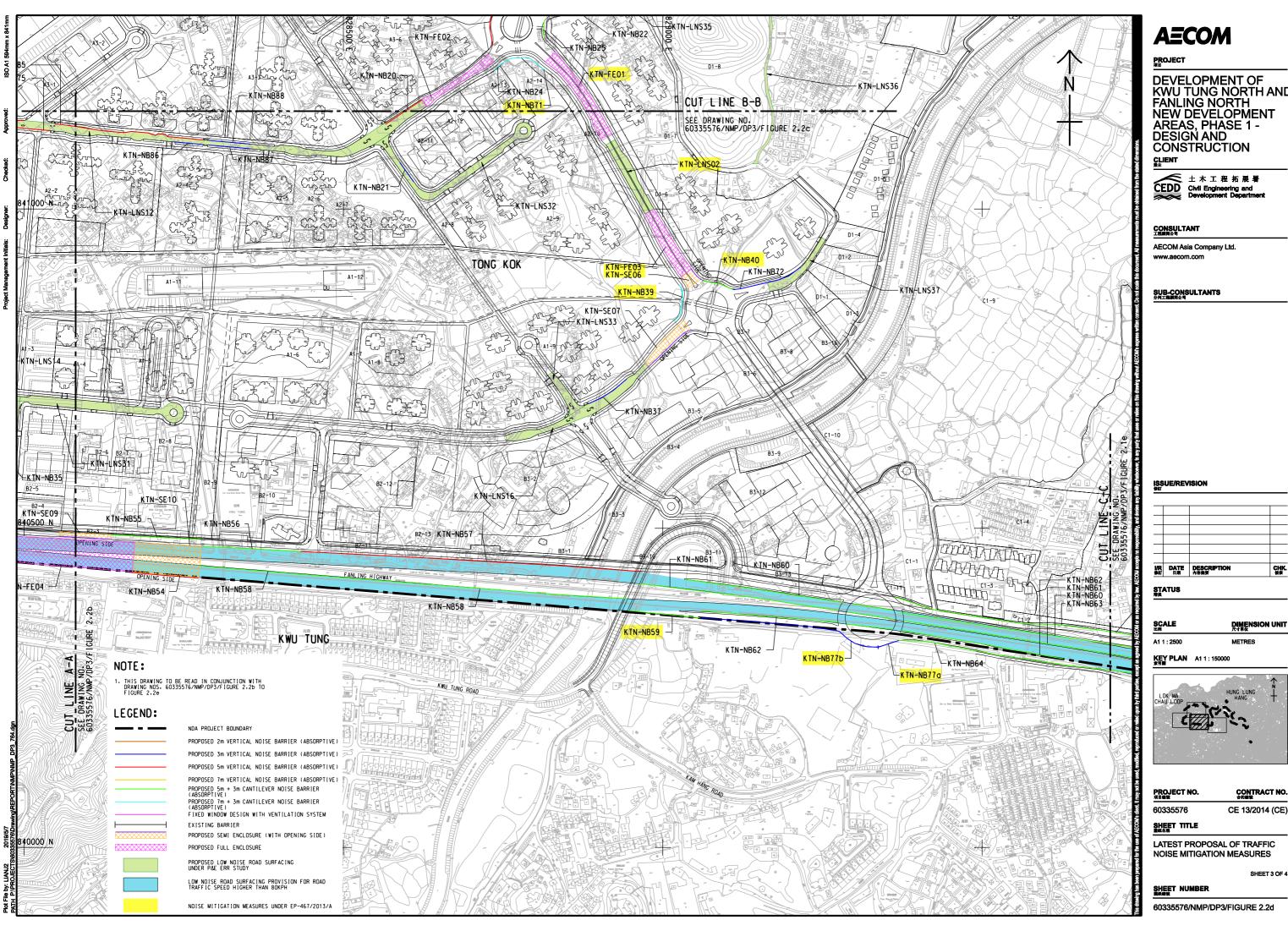
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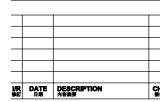
LATEST PROPOSAL OF TRAFFIC NOISE MITIGATION MEASURES

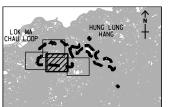
SHEET 2 OF 4

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60335576/NMP/DP3/FIGURE 2.2c

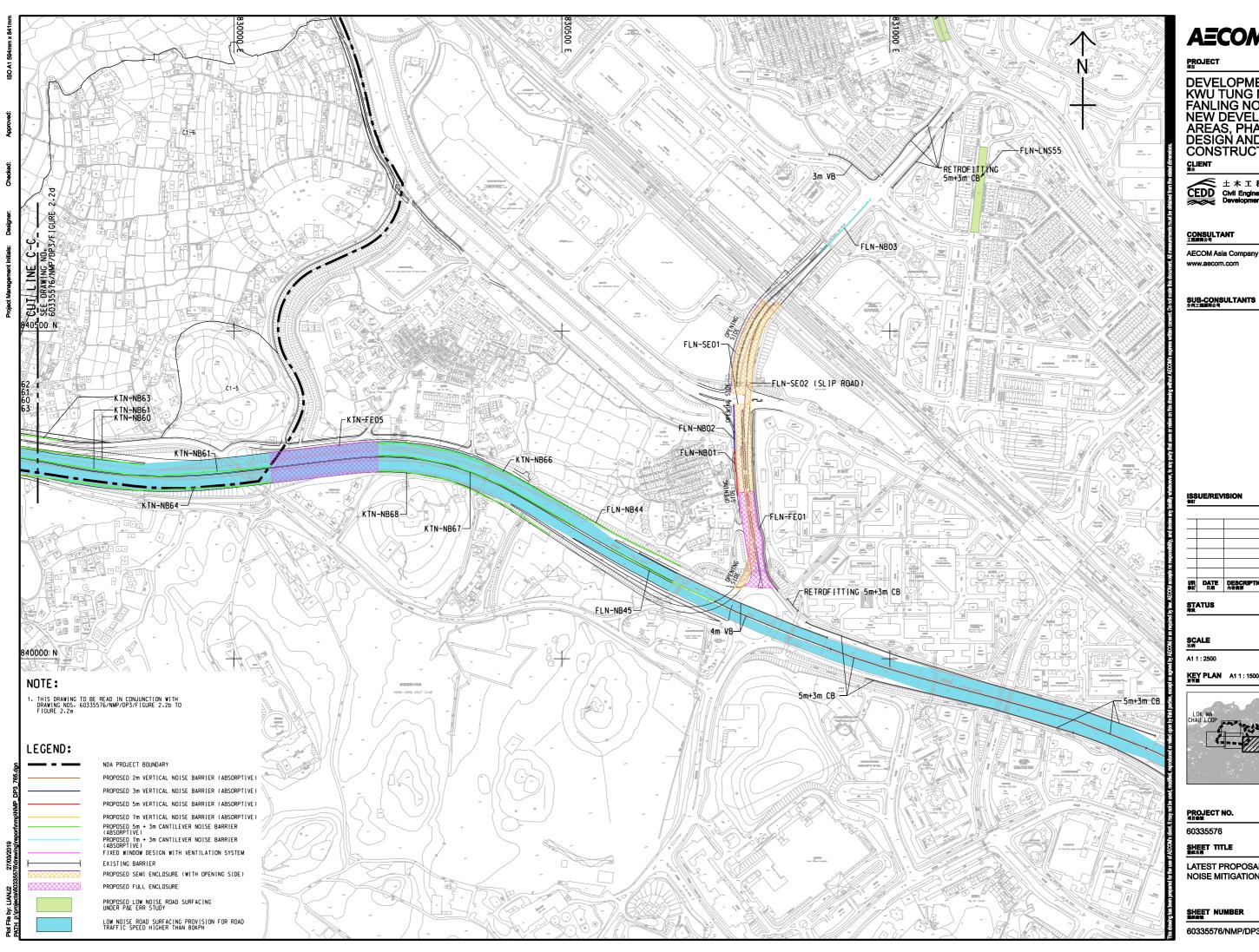






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LATEST PROPOSAL OF TRAFFIC NOISE MITIGATION MEASURES



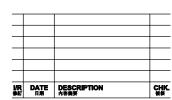
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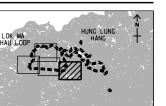
DEVELOPMENT OF KWU TUNG NORTH AND FANLING NORTH NEW DEVELOPMENT AREAS, PHASE 1 -DESIGN AND CONSTRUCTION

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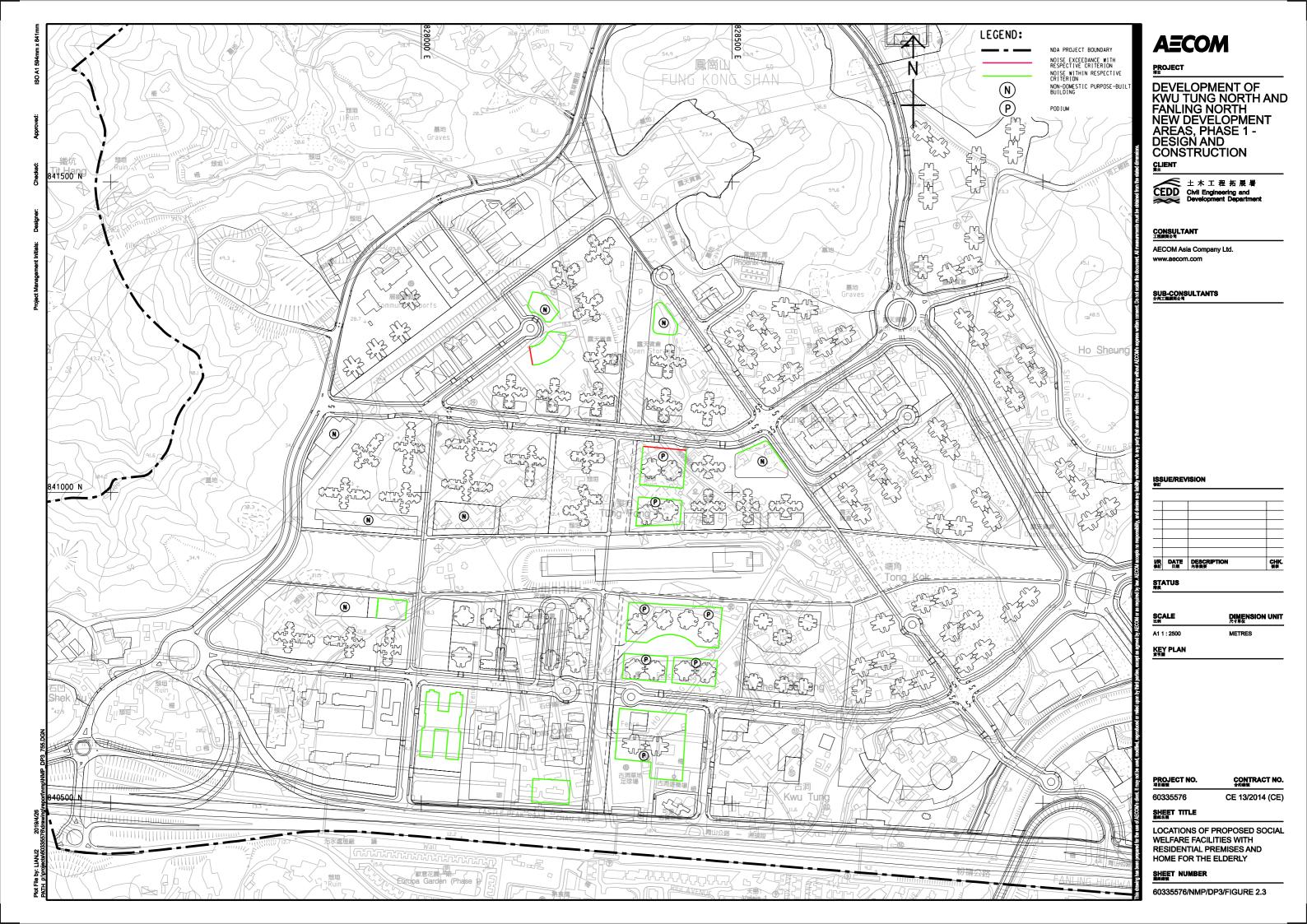


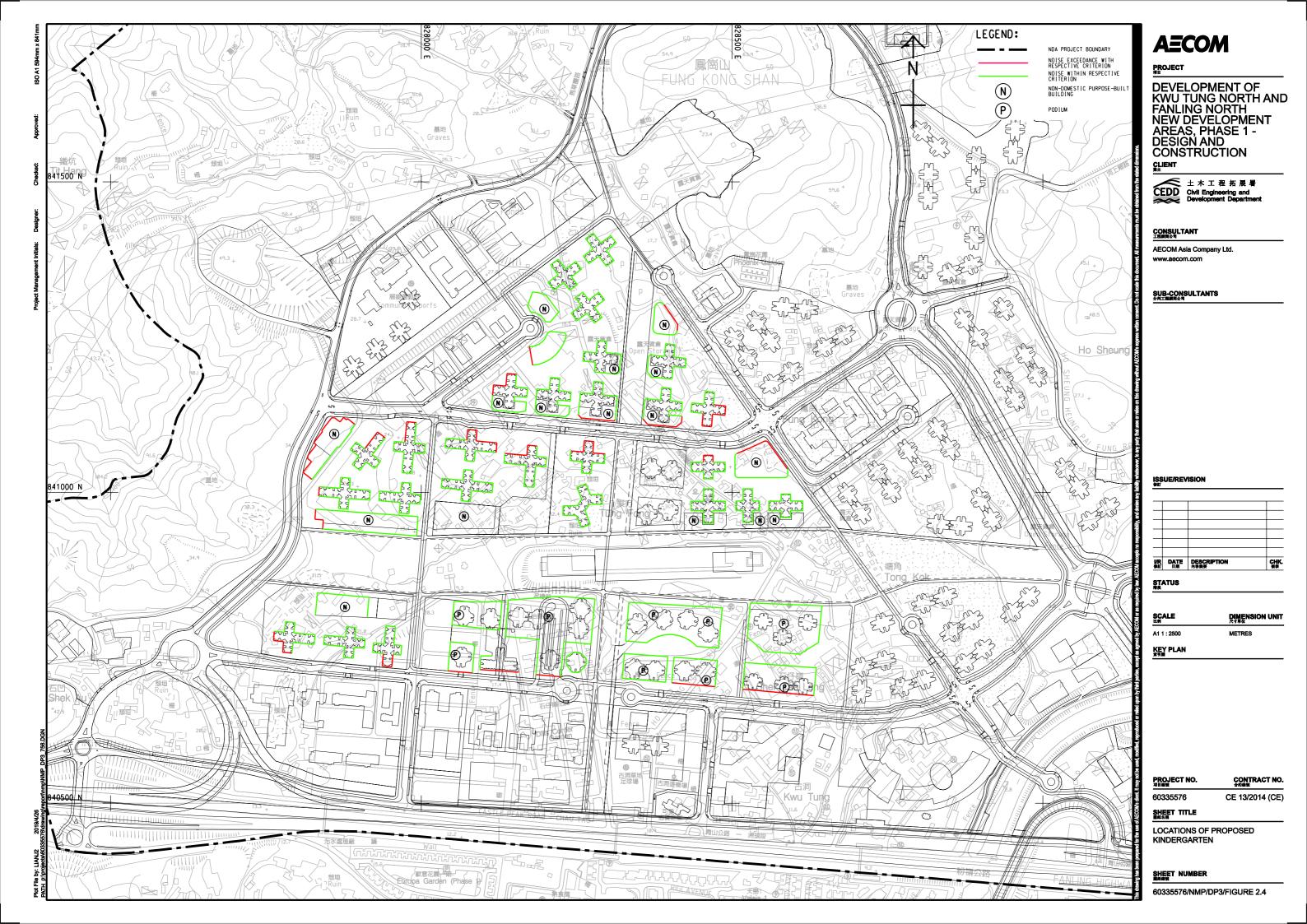
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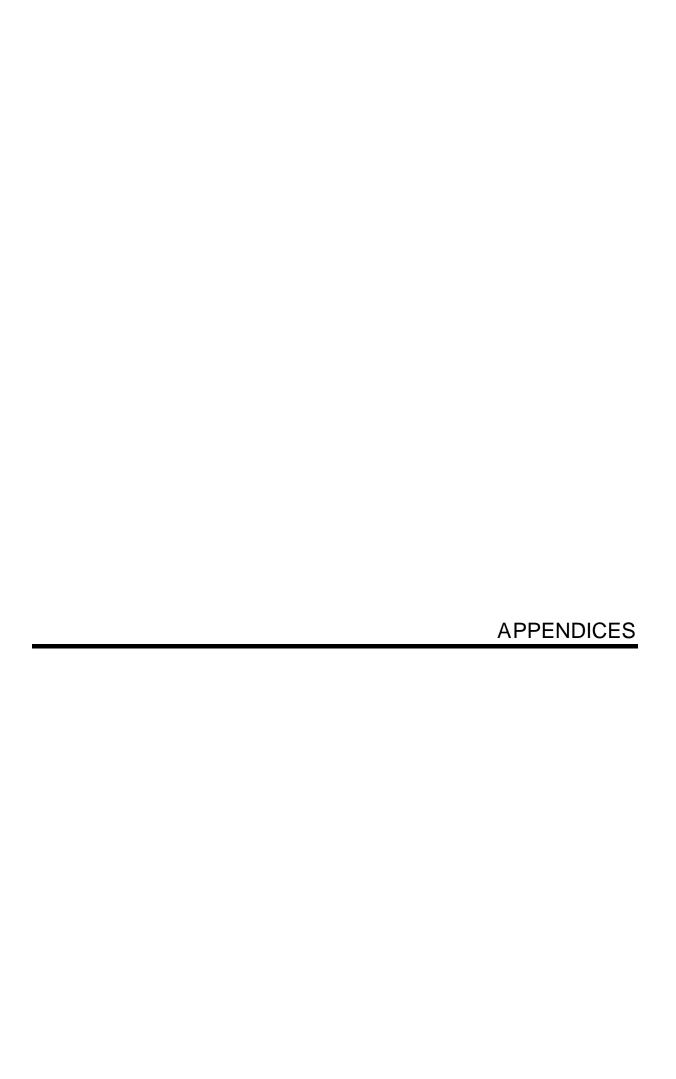
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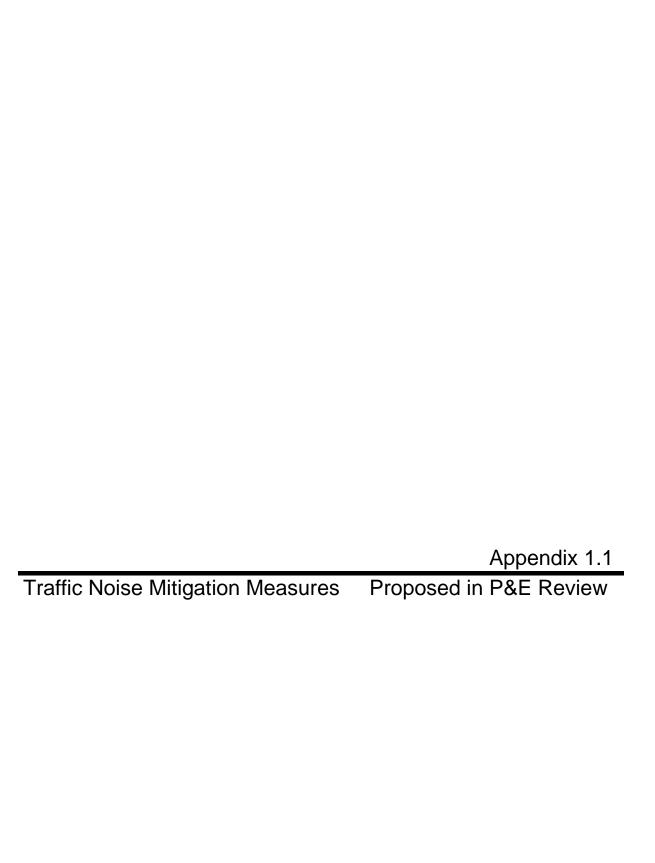
LATEST PROPOSAL OF TRAFFIC NOISE MITIGATION MEASURES

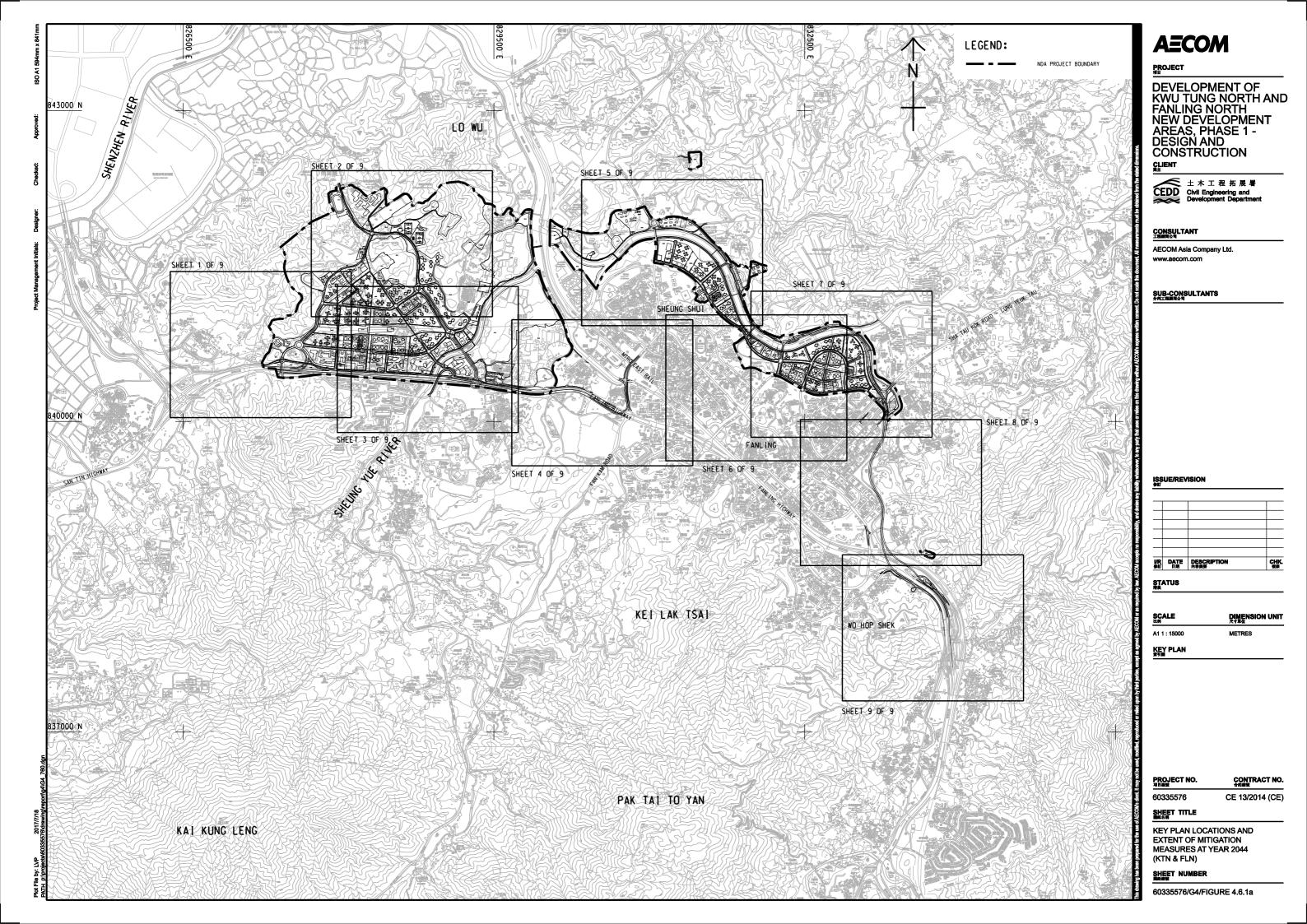
60335576/NMP/DP3/FIGURE 2.2e

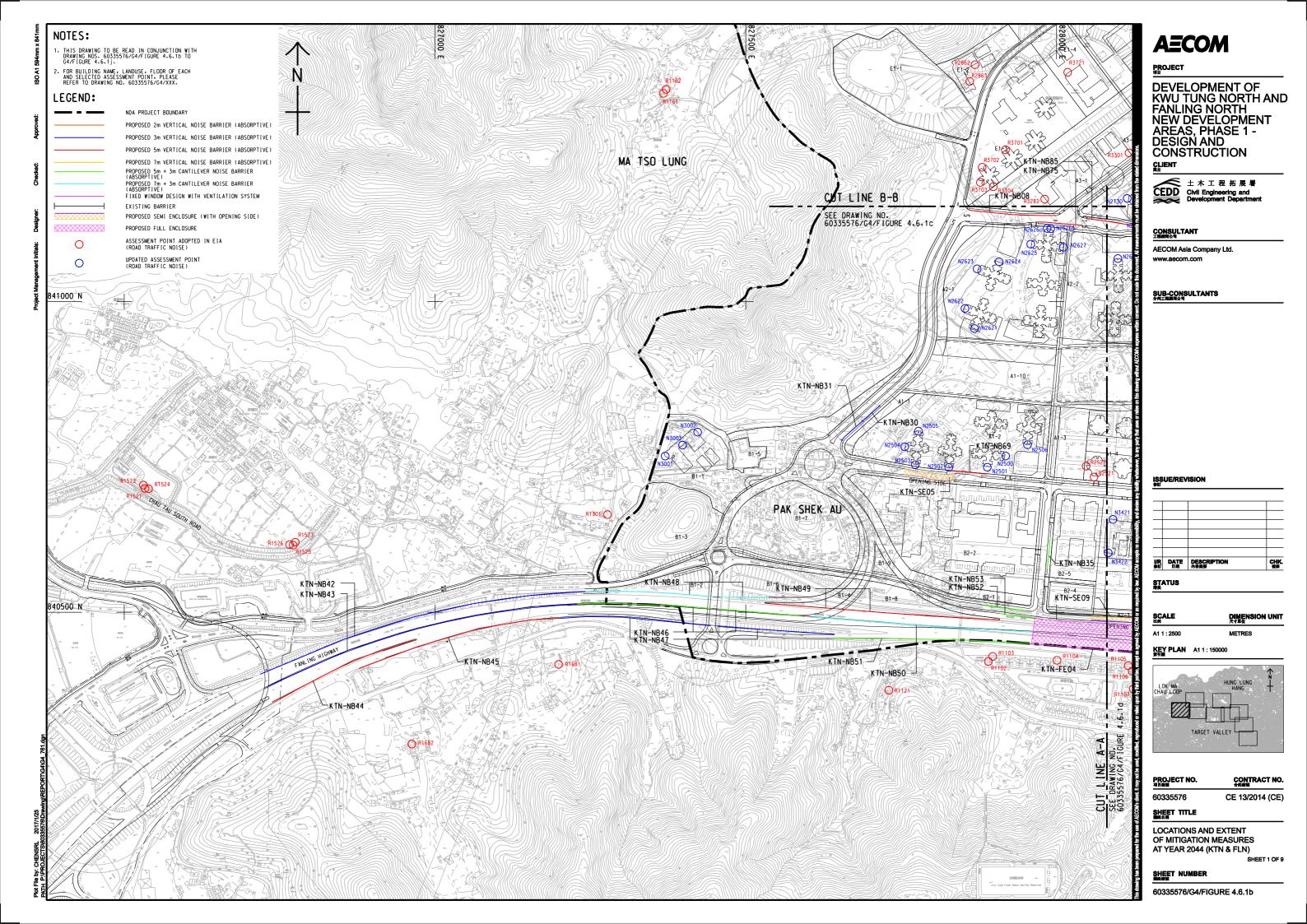


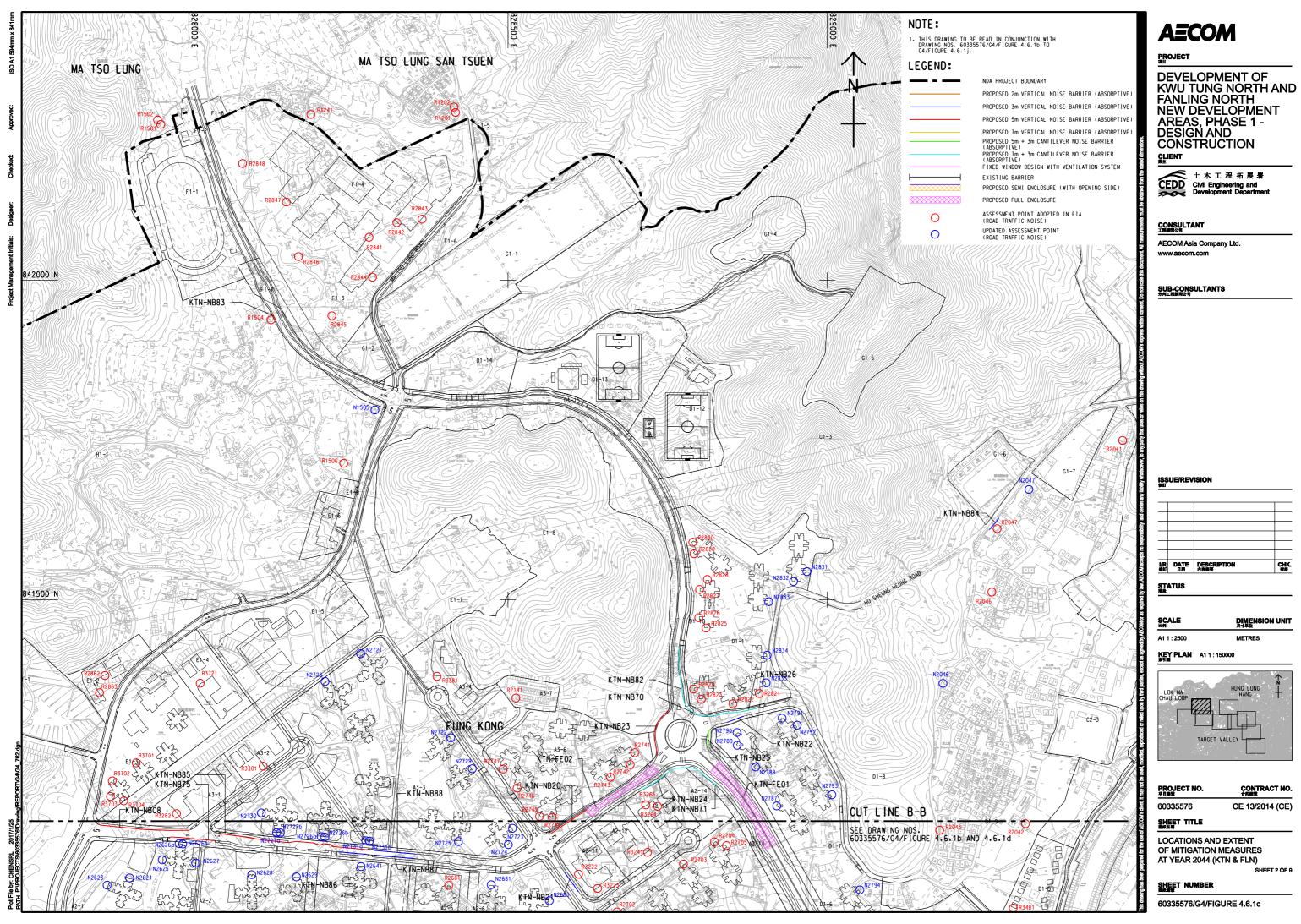


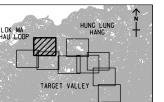


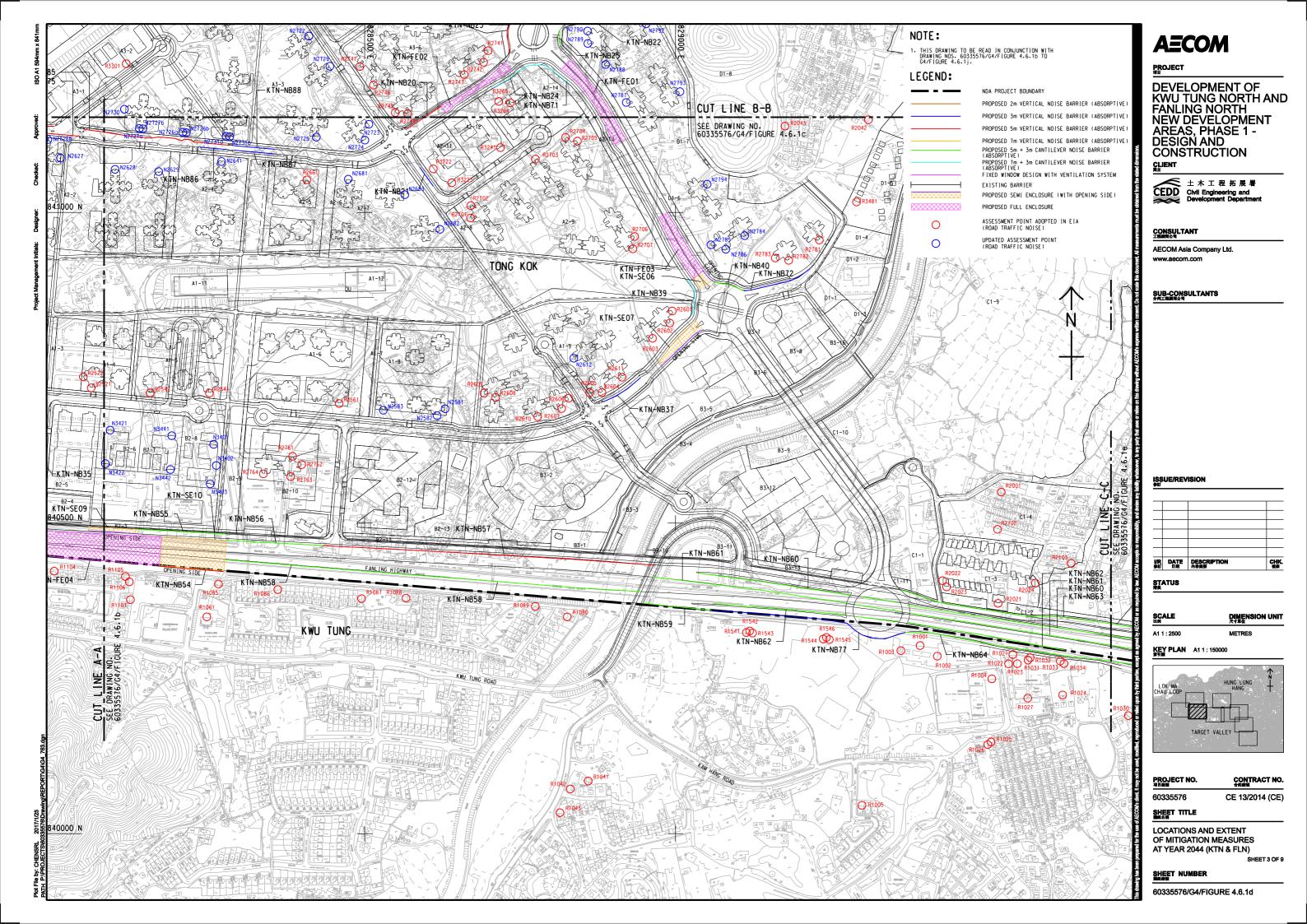


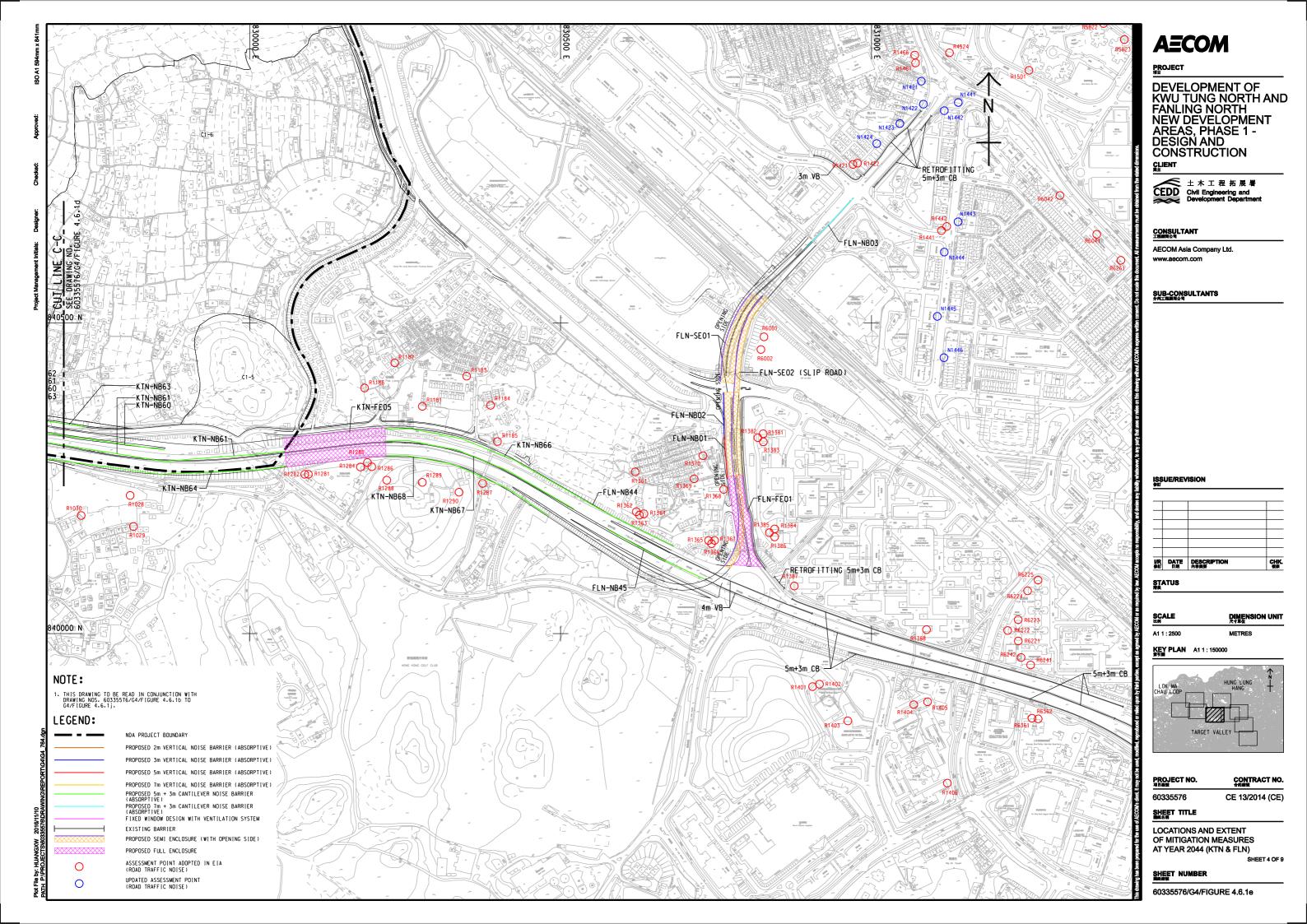


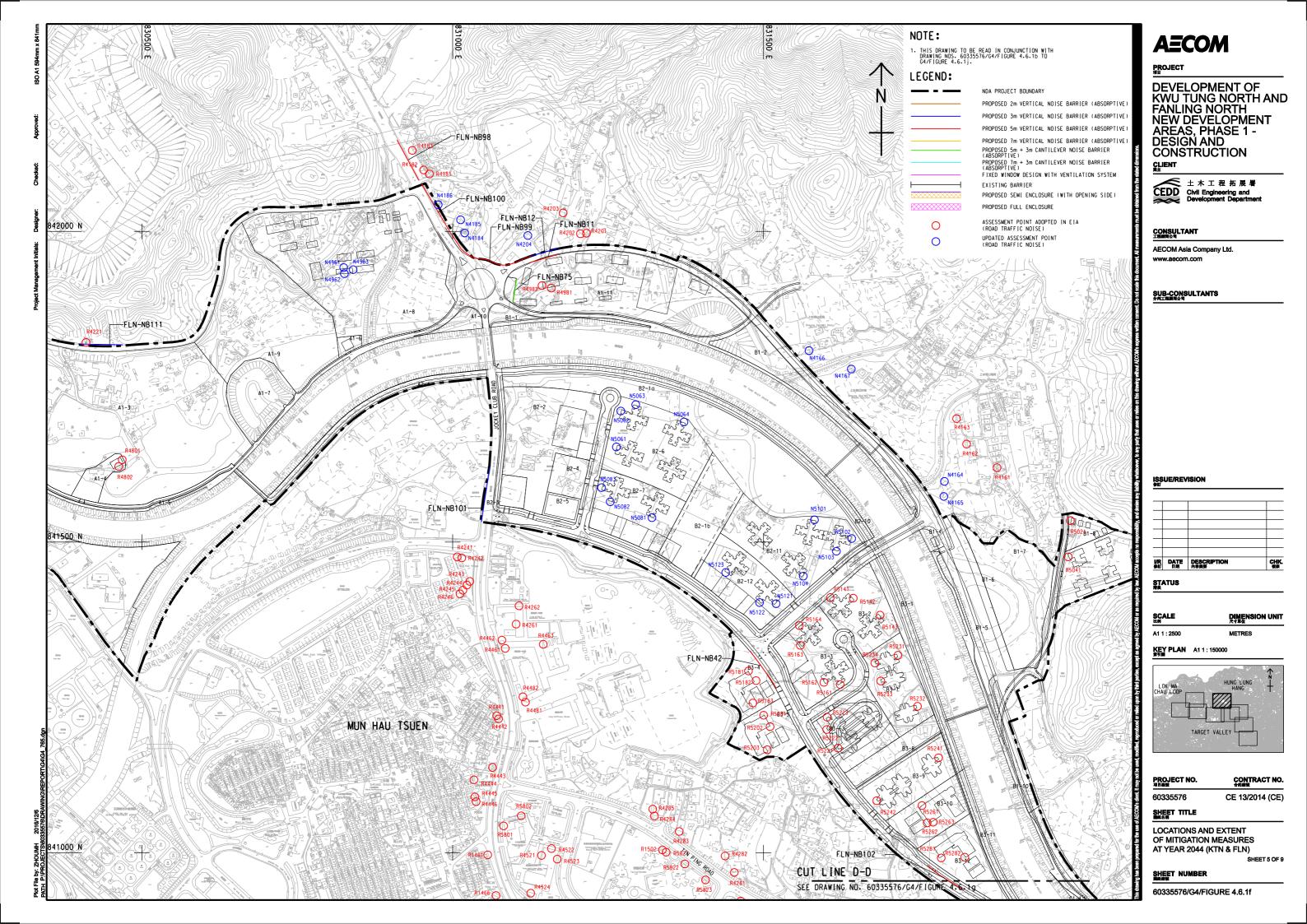


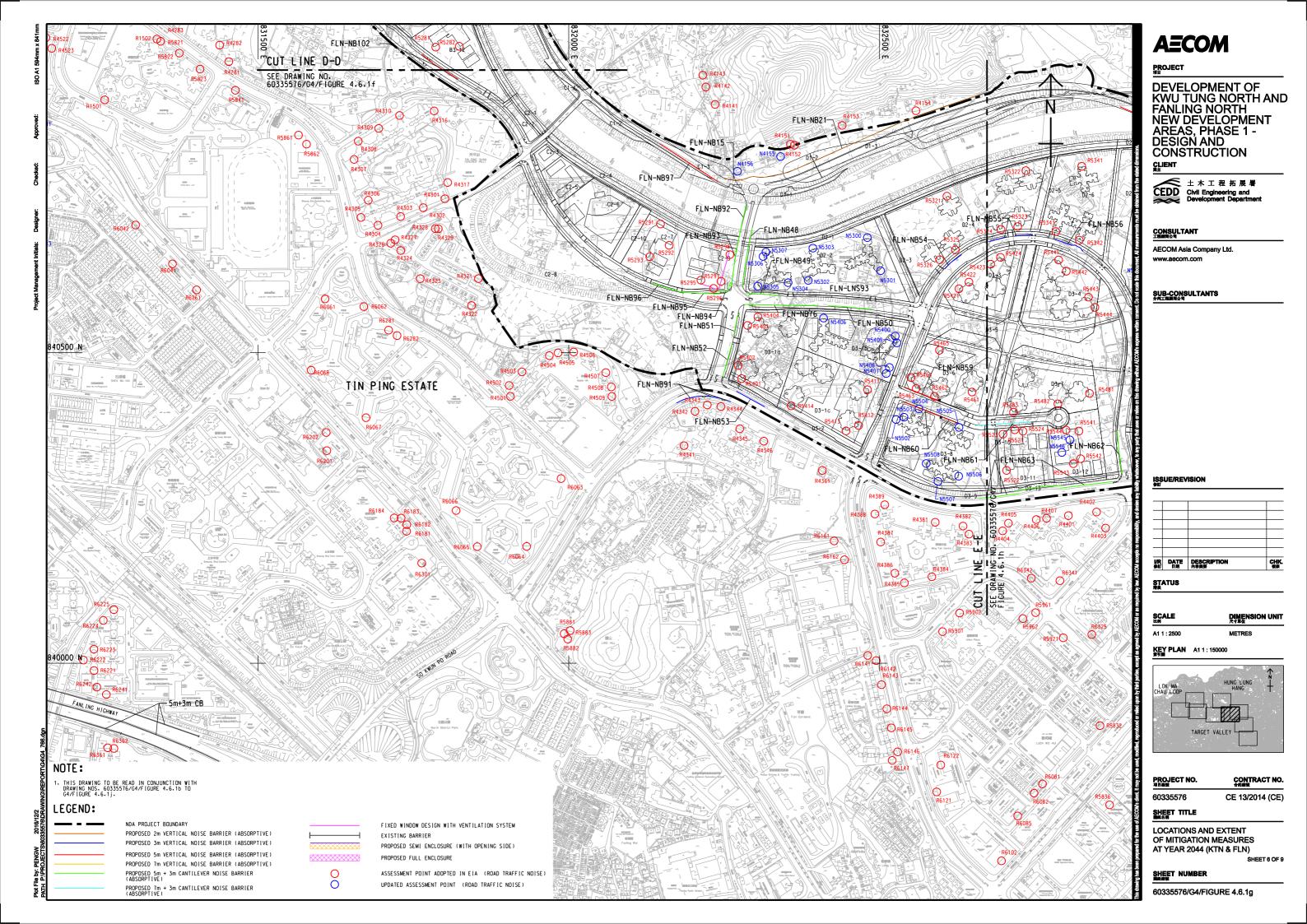


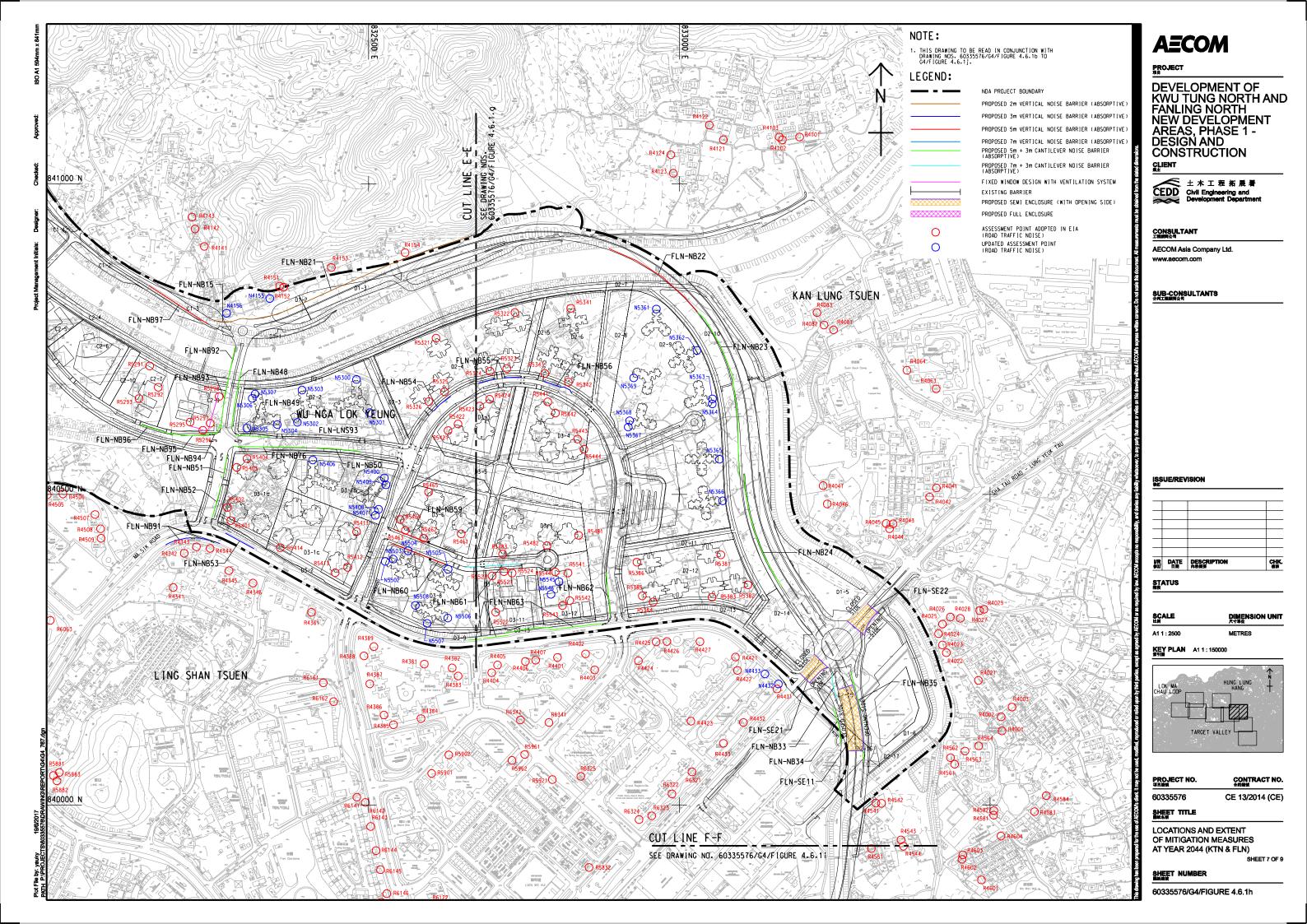


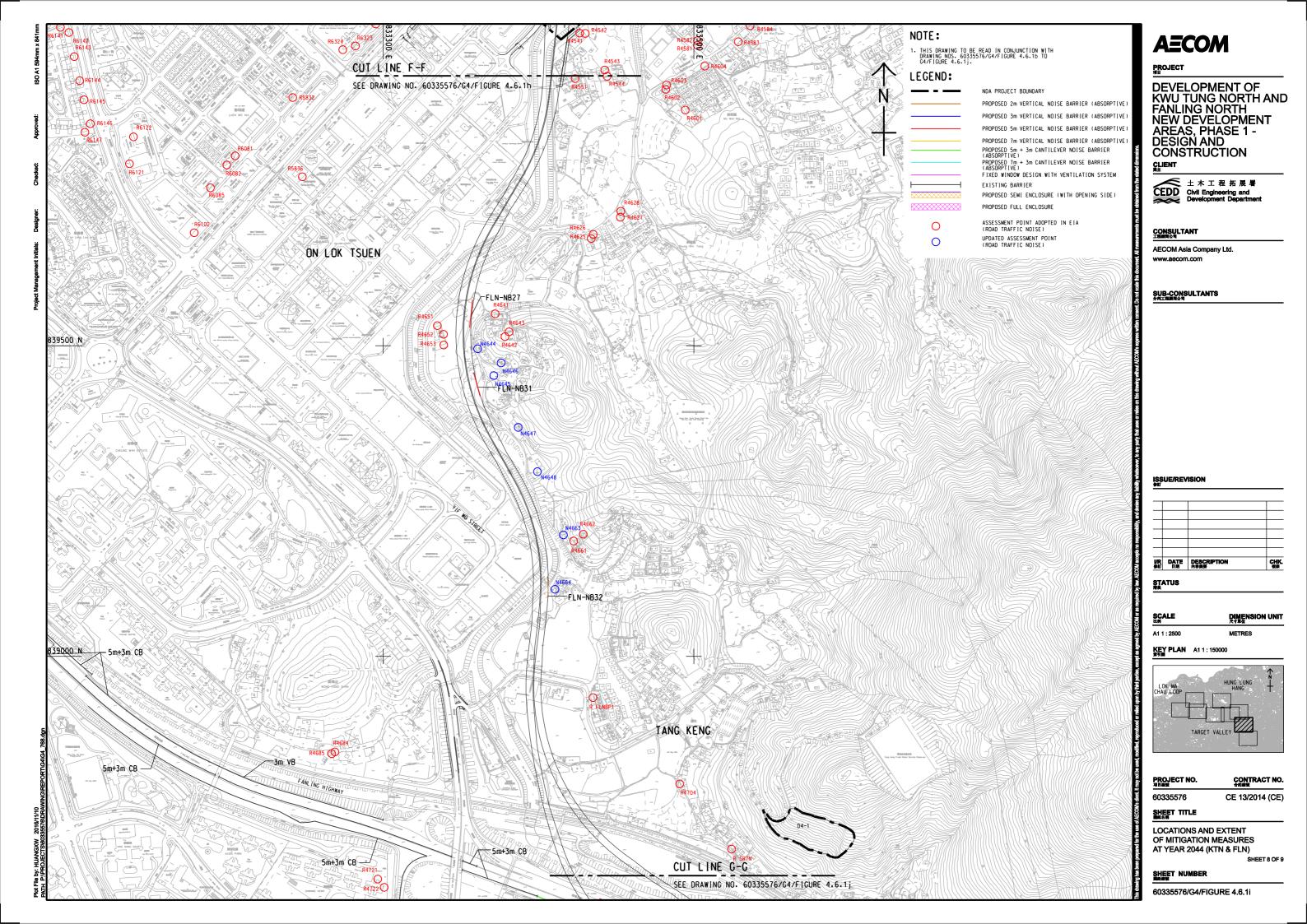












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