

Vannex International Limited Proposed Temporary Battery Recycling Plant and Associated Filling of Land

Sewerage Impact Assessment

Vannex International Limited

Reference: P527783

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2025-11-18

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1 Introduction

1.1 Background

- 1.1.1 Vannex International Limited is seeking planning permission to establish a temporary battery recycling plant for a period of three years at Lot 215 RP (Part) in D.D.78, Ta Kwu Ling, New Territories. The proposed sewerage plan is provided in **Figure 4.1**. The site is currently vacant and is located adjacent to the Northeast New Territories Landfill. The relocation is necessary due to government land resumption at Hung Shui Kiu for the Yuen Long South Development.
- 1.1.2 The facility will operate within an enclosed structure, with working hours restricted to 9:00 a.m. to 6:00 p.m., Monday to Saturday, and no operation on Sundays or public holidays.
- 1.1.3 Aurecon Hong Kong Limited has been appointed to carry out a Sewerage Impact Assessment (SIA) in compliance with the Environmental Protection Department (EPD) requirements. The assessment focuses on estimating the total volume of wastewater generated by the plant per day and proposing a practical solution for its disposal. The proposed arrangement is to discharge the collected wastewater into the to the Flow Chamber FCH1005171 through the underground plastic pipe, subject to EPD approval. Regular monitoring of wastewater quality will be carried out by an independent laboratory to ensure compliance with EPD standards.

1.2 Objective of the Sewerage Impact Assessment

- 1.2.1 The objective of this Sewerage Impact Assessment (SIA) Report is to propose a practical solution to deal with the sewerage generated by the temporary battery recycling plant.
- 1.2.2 This Report is structured as follows:
- Section 1 provides the project background of this Report and describes the project details relevant to the SIA;
 - Section 2 presents the assessment methodology;
 - Section 3 proposes the sewerage disposal arrangement;
 - Section 4 provides the conclusion to the SIA.

1.3 Abbreviations

- 1.3.1 The following table lists out the abbreviations for expressions adopted in this Report:

| Abbreviation | Full Expression |
|--------------|-------------------------------------|
| DI | Departmental Instruction |
| DSD | Drainage Services Department |
| EPD | Environmental Protection Department |
| SIA | Sewerage Impact Assessment |
| WSD | Water Supplies Department |

2 Existing Conditions

2.1 The Proposed Battery Recycling Plant

- 2.1.1 The proposed temporary battery recycling plant is located at Lot 215 RP (Part) in D.D.78, Ta Kwu Ling, adjacent to the Northeast New Territories Landfill, occupying a vacant site of approximately 2,268 m². The recycling plants operates between 09:00hrs and 18:00hrs.
- 2.1.2 The major sources of sewage at the facility mainly come from the staff toilets. There are residual condensation water from the steam boiler and the carbonization furnace which are collected by the floor drainage system. This will also be discharged as sewage. No kitchen nor shower services are provided at the plant.

2.2 Existing Sewerage

- 2.2.1 The existing sewerage system near the proposed site along Wo Keng Shan Road is connected to the NENT Landfill Sewage Pumping Station which features a twin 250mm dia rising mains, and an outgoing 150mm rising main leading to Shek Wu Hui STW.
- 2.2.2 There is no other known public sewerage facility in the vicinity.

3 Assessment Methodology

3.1 Guidelines and Standard

- 3.1.1 The Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF) version 1.0 issued by the Environmental Protection Department (EPD) have been adopted for estimation of the sewerage produced by the battery recycling plant.

3.2 Total Sewerage Discharged

- 3.2.1 To estimate Domestic Sewerage Discharged, the following equation is adopted:
- Estimated Sewerage Discharged = Number of Employees × Unit Flow Factors for Industrial Flows

3.3 Peaking Factor

- 3.3.1 The estimated workforce of the plant is 60.
- 3.3.2 Peaking Factor will be adopted for estimation of peak water flow in line with the EPD Technical Paper Report no. EPD/TP1/05, Table T-5 as follows:
- Peaking Factor = 6 for population <1000 (excluding stormwater allowance) Daily Sewerage Production

3.4 Estimation of Sewerage Discharged

- 3.4.1 The calculation considers wastewater arising from the steam generator, carbonization furnace, and general domestic use within the facility. According to Table 3 – Unit Flow Factors for Industrial Flows in GESF of EPD, the unit flow factor of each manufacturing employee is 0.08 m³/day.

3.4.2 The following tables summarized the sewerage produced by the plant:

Table 3.1 Calculations of Average Dry Weather Flow for Toilet

| Employee Population | Unit Flow Factor (m ³ /day) | Average Dry Weather Flow (m ³ /d) |
|---------------------|--|--|
| 60 | 0.08 | 4.80 |

Table 3.2 Calculation of Total Average Dry Weather Flow

| Source of Wastewater | Descriptions | Estimated Volume (m ³ /day) |
|----------------------------------|--|--|
| Steam Boiler Residual Water | Filtered water produced during steam generation, based on installation of four carbonization furnaces. | 0.2 |
| Carbonization Furnace | Excess steam discharge (non-contaminated) by four carbonization furnaces. | 0.1 |
| Foul water from employee toilets | ADWF | 4.80 |
| Total | Combined ADWF | 5.10 |

Table 3.3 Calculation of Peak Flow

| Combined ADWF (m ³ /day) | Peaking Factor | Operating Hours* | Peak Flow (L/s) |
|-------------------------------------|----------------|------------------|-----------------|
| 5.10 | 6 | 9 | 0.157 |

Note:

3.4.3 The average dry weather flow (ADWF) from the proposed battery recycling plant is 5.10m³/day. Given the operating hours of the battery plant is 9 hours daily, with a peaking factor of 6, the estimated peak flow will be 0.157L/s.

4 Proposed Sewerage

4.1 Proposed Sewerage Connection

4.1.1 It is proposed that a 150mm dia PE sewer be constructed to convey the sewage from the recycling plant for discharge to the wetwell of the nearby NENT Landfill Leochate SPS, for onward conveyance to the Shek Wu Hui STW.

4.1.2 The quantity of the discharge of 0.157L/s is expected to be insignificant compared to the capacity of the existing SPS, and therefore no adverse impact to the SPS is expected.

4.1.3 The Proposed Sewerage Plan is presented in **Figure 4.1**.

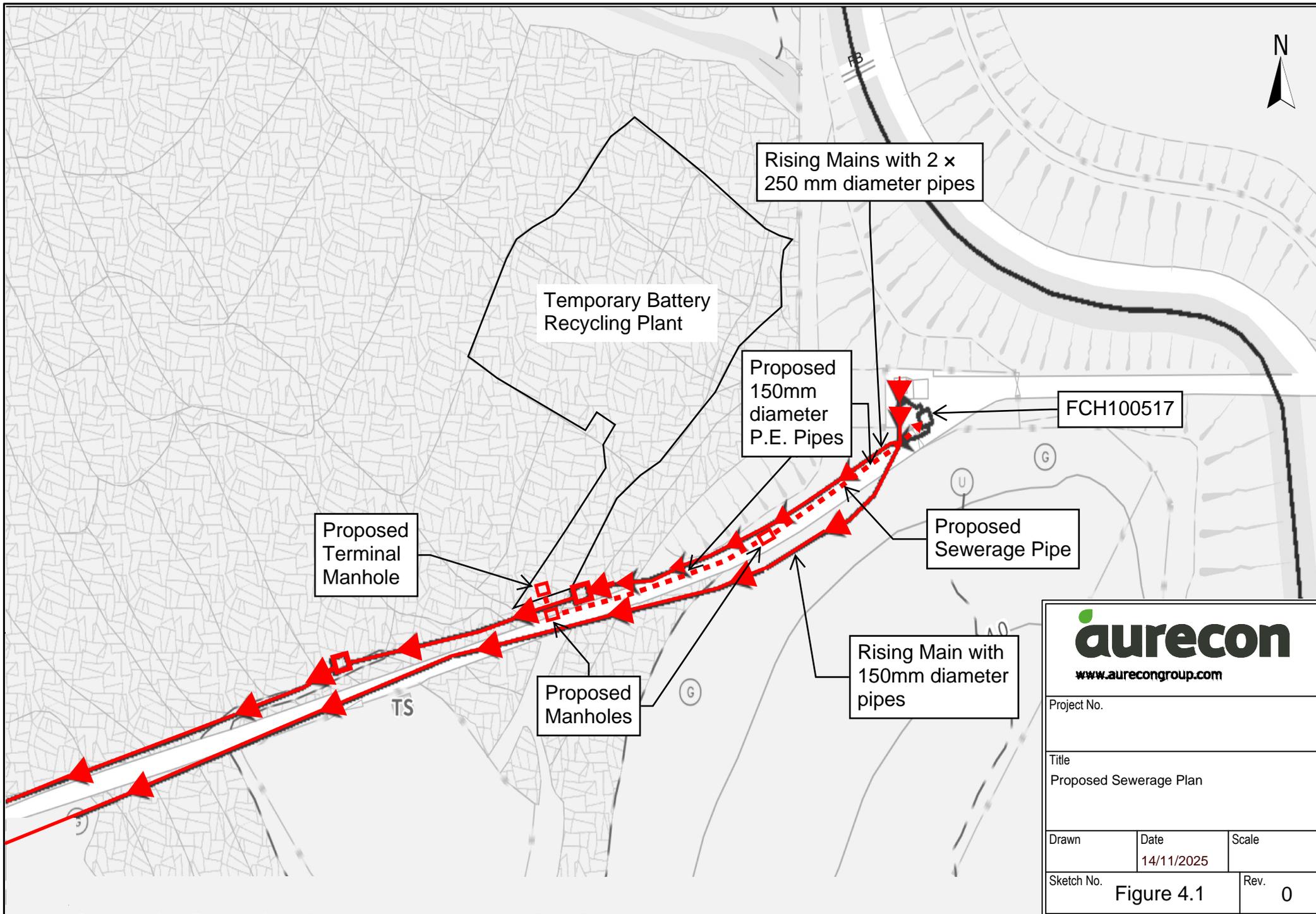
5 Conclusion

5.1 Conclusion

5.1.1 The existing sewerage system near the project site has been reviewed.

- 5.1.2 The estimated sewage flow from the temporary battery recycling plant has been calculated based on the Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF) version 1.0 issued by the Environmental Protection Department (EPD).
- 5.1.3 The collected sewage from the proposed development is proposed to be conveyed to NENT Leochate SPS.
- 5.1.4 It can be concluded that there will be no adverse impact on the existing sewerage infrastructure, and the proposal complies with EPD requirements.

Figure 4.1
Proposed Sewerage Plan



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|---|--------------------|--------|
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| Sketch No. | Figure 4.1 | Rev. 0 |

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Explanation of the chimney issue at the proposed battery plant

1. Hong Kong Planning Standards and Guidelines (Chapter 9: Environment)

Table 3.1 Open Space Use Guidelines

| pollution sources | specification | Separation distance | Permitted Use |
|--------------------------|---|----------------------------|---|
| Roads and highways | Road category Main roads and main roads | >20 meters | Dynamic and static recreational uses |
| | | 3-20 meters | Passive recreational use |
| | | <3 meters | Beautify urban areas |
| | Regional trunk roads | >10 meters | Dynamic and static recreational uses |
| | | <10 meters | Passive recreational use |
| | Main roads in the area | >5 meters | Dynamic and static recreational uses |
| Under the overpass | <5 meters | Passive recreational use | |
| Industrial Zone | Height difference between industrial chimney outlet and construction site | <20 meters | >200 meters Dynamic and static recreational uses |
| | | 20m-30m(*) | 5-200 meters Passive recreational use |
| | | >100 meters | Dynamic and passive recreational uses |
| | | 5-100 meters | |

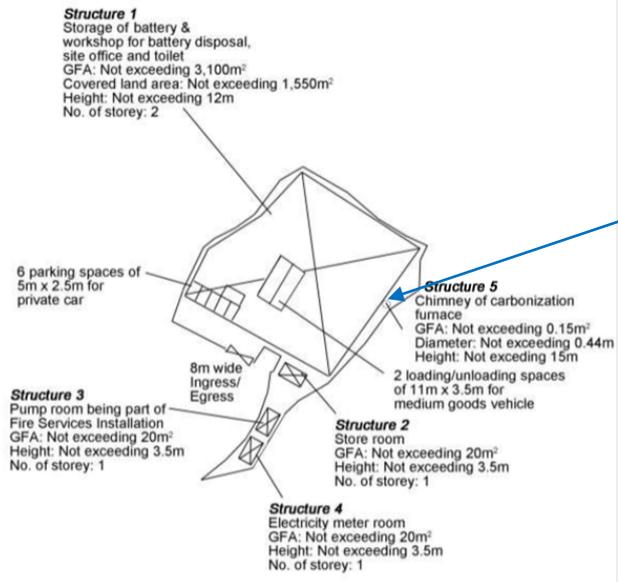
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|---|--------------|---------------------------|--|
| | 30-40 meters | >50 meters | Passive recreational use Dynamic and static recreational uses |
| | >40 meters | 5-50 meters >10 meters | Passive recreational use Dynamic and static recreational uses |
| Construction and earthmoving activities | | <50 meters >50 meters | Dynamic and static recreational uses Passive recreational use |

Remark:

- (a) If you are not sure about the chimney height, you can use the model-marked guidelines for preliminary planning and make adjustments after you have more information.
- (b) Separation distance refers to the shortest horizontal distance between the boundary of an industrial lot, the location of an existing chimney or the roadside and the boundary of an open space.
- (c) The guidelines generally apply to major industrial areas, but not to individual large industrial establishments that are likely to be major sources of air pollution. The Environmental Protection Department should be consulted when planning open space adjacent to such establishments .
- (d) Amenity use is permitted in all circumstances.

2. Originally planned chimney height and distance from the house

At the time of application, the original planned design for the chimney height was 15m (3m higher than the building height), the horizontal distance between the chimney and the house was 90m, and the closest distance between the factory boundary and the house was 27m, as shown in the figure.



煙囪位置

3. Proposed adjustment measures

According to the Hong Kong Planning Standards and Guidelines for Open Space Use, Dynamic and passive recreational uses are permitted when the height difference between an industrial chimney outlet and the construction site is 20-30 metres and the separation distance is greater than 100 metres. Dynamic recreational activities and residential areas are both classified as areas prone to disturbances.

By changing the height of the proposed chimney, the original planned

height of 15 meters was adjusted to between 20 and 30 meters;
The chimney position was also changed so that the horizontal distance between the chimney and the house was adjusted from the originally planned 90 meters to 103 meters, as shown in the figure, so that the distance meets the distance requirements for dynamic recreational activities.



Question1: the fuel of carbonization furnace

During operation, the carbonization furnace is primarily powered by the combustion of combustible gases generated by the pyrolysis of lithium batteries. Low-sulfur diesel fuel (hereinafter referred to as "diesel") that meets EU standards is used as an auxiliary fuel only during the first two hours of operation to power the furnace. Based on the carbonization furnace's equipment specifications and the manufacturer's experience, each furnace consumes 60-70 liters of diesel fuel per day, for a total of 240-280 liters of diesel per day for all four furnaces. Ignition of the carbonization furnace is automatically controlled by an electric ignition starter.

Diesel storage uses four custom-made diesel tanks with a capacity of 100L (with 100L of diesel reserved as a backup), which does not exceed the general exemption quantity of 500 litres stipulated in the Dangerous Goods Ordinance and does not require a dangerous goods storage licence .

The diesel tank is stored in the position shown in the figure.

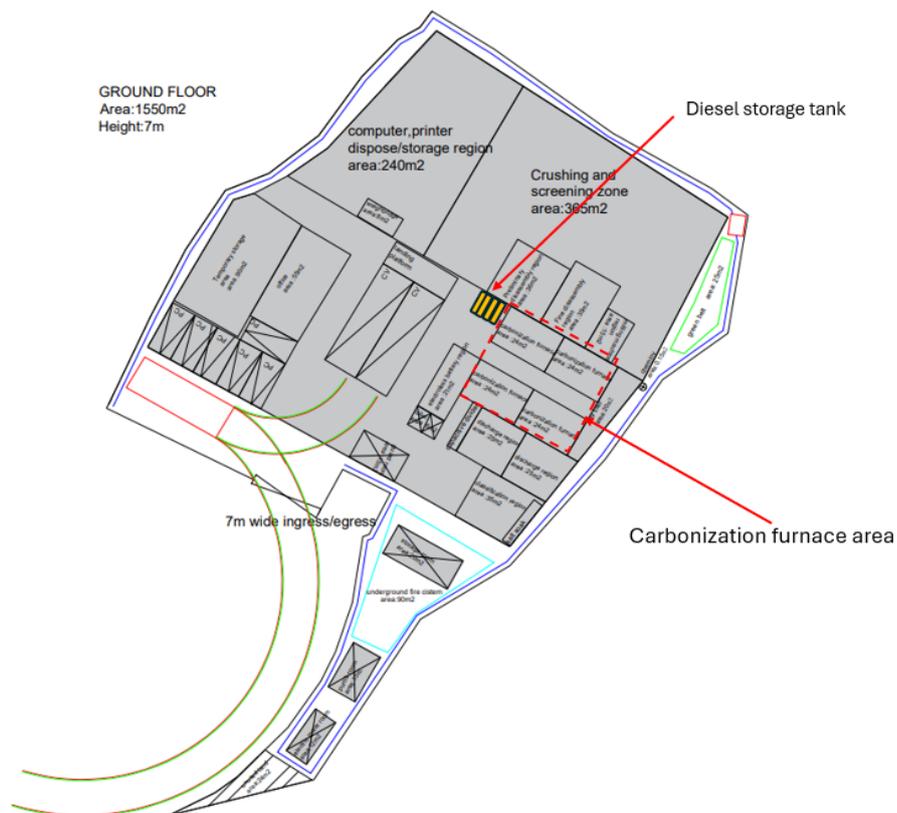
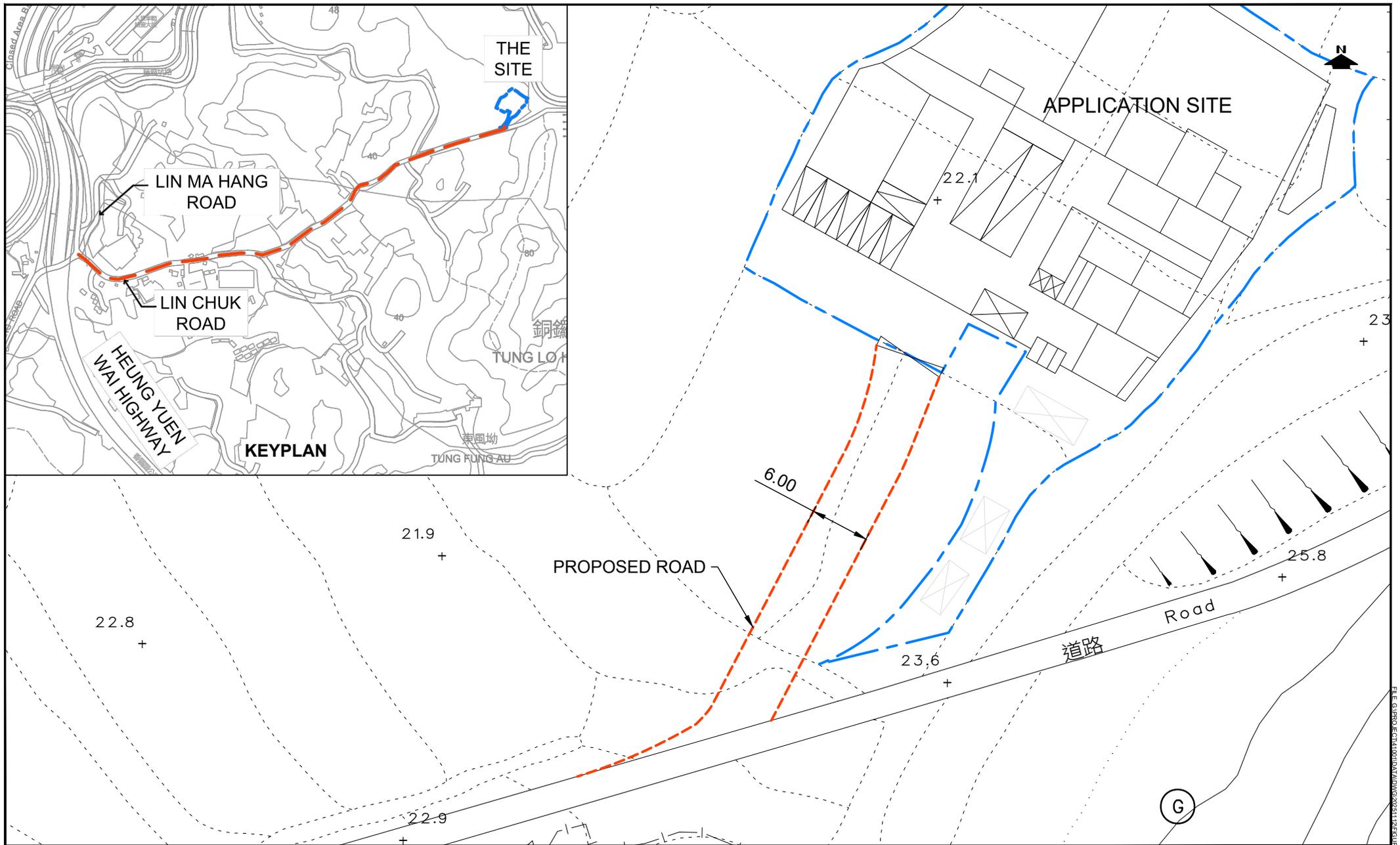


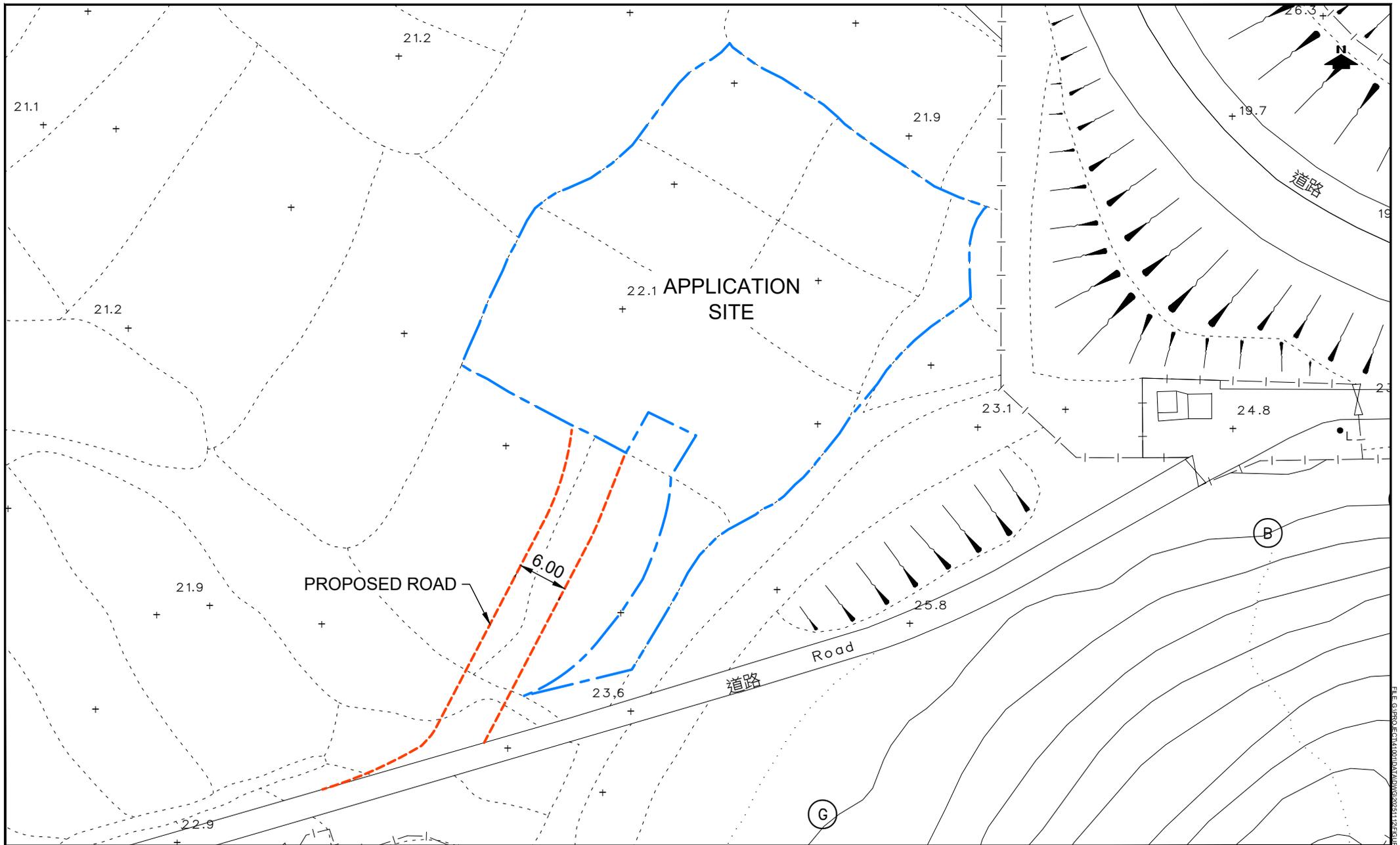
Figure 1 The location of diesel storage tank



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| PROJECT TITLE | PROPOSED TEMPORARY BATTERY RECYCLING PLANT AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS AT LOT 215 RP (PART) IN D.D. 78, TA KWU LING NORTH, NEW TERRITORIES | |
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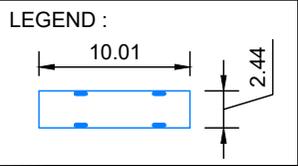
| | | |
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| DRAWING NO. | FIGURE 1 | |
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| DRAWING TITLE | SITE PLAN | |

| | | |
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SWEPT PATH ANALYSIS - 10m MGV

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