GCA

Geotechnical Consultants Australia

Krishathi Pty Ltd

Detailed Site Investigation

Proposed Development at:

227 Bungarribee Road

Blacktown NSW 2148

Lot 9 / - / DP26584

E21211-1

28th October 2021

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Report Distribution

Detailed Site Investigation

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Executive Summary

Geotechnical Consultants Australia Pty Ltd (GCA) were appointed by Mr. Prem Krithivasan of Krishathi Pty Ltd (the client) to undertake a Detailed Site Investigation (DSI) for the property located at No. 227 Bungarribee Road Blacktown NSW 2148 (the site).

The proposed development for this site includes:

1) The demolition of the existing on-site structures;
2) Excavation and construction of basement carpark with six (6) car parking spaces;
3) Construction of a two (2) storey boarding house.

The objective of this DSI was to provide a detailed assessment of current and/or historical potentially contaminating activities that may have impacted the site.

The scope of work undertaken includes:

- A site inspection to identify potential sources of contamination;
- Historical investigations relating to the site (if any);
- Historical aerial photographs;
- Local Council records and planning certificates;
- NSW Environment Protection Authority (EPA) environmental contaminated land register;
- Protection of the Environment Operations (POEO) Act public register;
- Dial-Before-You-Dig enquiry for an evaluation into local underground services and assets;
- Review of local geological and hydrogeological information, including an evaluation of the WaterNSW registered groundwater bore database; and
- Acid Sulphate Soils (ASS) data maps.

A site investigation was undertaken on the 15th October 2021 by a qualified environmental consultant. GCA obtained thirteen (13) soil samples from six (6) boreholes (two (2) samples per borehole and one (1) duplicate sample for QA/QC procedures). Samples were submitted to National Association of Testing Authorities, Australia (NATA) accredited laboratory for chemical analysis.

During the site inspection, the structural dwelling did not have any tenants. The rear end of the property was vacant. No aromatic indicators of potential contamination were identified and no obvious features associated with any underground tanks (bowsers, breather pipe, inlet valve and piping) or odour that would indicate the potential for contamination.

Based on the site investigation and analytical results, GCA considers the potential for significant contamination of the underlying natural soils onsite to be low.

Therefore, GCA finds that the site is suitable for the proposed development and land use, providing the recommendations within **Section 16** of this report are undertaken.

1. Introduction

Geotechnical Consultants Australia Pty Ltd (GCA) were appointed by Mr. Prem Krithivasan of Krishathi Pty Ltd (the client) to undertake a Detailed Site Investigation (DSI) for the property located at No. 227 Bungarribee Road Blacktown NSW 2148 (Lot 9 / - / DP26584; approx. area 868.69m^2 of site; current zoning R2 - Low Density Residential).

The proposed development for this site includes:

1) The demolition of the existing on-site structures;
2) Excavation and construction of basement carpark with six (6) car parking spaces;
3) Construction of a two (2) storey boarding house.

Proposed development plans are attached in **Appendix D**.

The objectives of the DSI were to provide a detailed assessment of current and/or historical potentially contaminating activities that may have impacted the site. Additionally, GCA will make recommendations for further investigations based on the identification of data gaps and the overall findings of this DSI if required.

A site inspection was undertaken on the 15th October 2021 by a qualified environmental consultant. Reporting and site photographs were collected on this date (**Appendix A**) with reference to the relevant regulatory criteria (**Section 2, Scope of Work**). Further information obtained during the inspection is described in **Section 4, Site Conditions** of this report.

1.2 Objectives

The objectives of the DSI were to provide a detailed assessment of current and/or historical potentially contaminating activities that may have impacted the site. Additionally, GCA will make recommendations for further investigations based on the identification of data gaps and the overall findings of this DSI if required.

1.3 Trigger for Assessment

This DSI is required as part of a proposed development to ensure that the site does not contain contamination within the soils that pose human health and surrounding environmental risks.

2. Scope of Work

The DSI has been prepared in general accordance with the following regulatory framework:

- National Environmental Protection (Assessment of Site Contamination) Measure – National Environmental Protection Council, 2013;
- National Environment Protection Measures (NEPM), *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater, 2013*;
- National Environment Protection Measures (NEPM), *Schedule B2 – Guideline on Site Characterisation,* 2013;
- National Environmental Protection Measures (NEPM), Schedule B5c – *Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel and Zinc, 2013;*
- National Environment Protection Measures (NEPM), Schedule B7 – *Guideline on Derivation of Health – Based Investigation Levels, 2013;*
- National Environment Protection Measures (NEPM), *Appendix 1 – The Derivation of HILS for Metals and Inorganics, 2013;*
- NSW Environmental Protection Authority (EPA), *Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme,* 2017 (3rd Edition);
- NSW Environmental Protection Authority (EPA), *Waste Classification Guidelines Part 1: Classifying Waste,* 2014;
- NSW Environmental Protection Authority (EPA), *Sampling Design Guidelines*, 1995;
- NSW Environmental Protection Authority (EPA), *Technical Note: Investigation of Service Station Sites,* 2014;
- NSW Department of Environment and Conservation, *Guidelines for the Assessment and Management of Groundwater Contamination,* 2007;
- NSW Environmental Protection Authority, *Guidelines for Consultants Reporting on Contaminated Sites,* 2020;
- Protection of the Environment and Operation Act, 1997;
- Protection of the Environment Operations (Waste) Regulations, 2005;
- The Contaminated Land Management Act, 1997;
- NSW Environmental Protection Authority (EPA), *Guidelines on the Duty to Report Contamination under Contaminated Land Management Act*, 1997;
- State Environment Protection Policy 55 (SEPP 55). *Remediation of Land Under the Environmental Planning and Assessment Act,* 1998;
- Work Health and Safety Act, 2011;
- Work Health and Safety Regulation, 2011; and
- Blacktown Local Environmental Plan, 2015.

The scope of works required to complete the DSI includes:

- A site inspection for evidence of sources of potential contamination onsite and neighbouring properties;
- Historical investigations relating to the site (if any);
- Historical aerial photographs;
- Local Council records and planning certificates;
- NSW EPA environmental contaminated lands register;
- Protection of the Environment Operations (POEO) Act public register;
- Dial-Before-You-Dig enquiry for an evaluation into local underground services and assets;
- Review of local geological and hydrogeological information, including an evaluation of the WaterNSW registered groundwater bore database;
- Acid Sulphate Soils (ASS) data maps;
- Establish whether data gaps may exist within the investigation; and
- Development of a Conceptual Site Model (CSM) to identify the connections between potential sources of contamination, exposure pathways, and human/ecological receptors.

3. Site Details

Table 1. Site Details

Address	227 Bungarribee Road Blacktown NSW 2148
Deposited Plan	Lot 9 / - / DP26584
Zoning	R2 - Low Density Residential
Locality Map	**Figure 1, Appendix A**
Site Plan	**Figure 1, Appendix A**
Area (approx.)	868.69m^2

Table 2. Surrounding Land Use

Direction from Site	Land Use
North	A residential property followed by Paul Street
East	Residential properties
South	Bungarribee Road followed by residential properties
West	Residential properties

4. Site Condition

A qualified environmental consultant inspected the site on the 15th October 2021. Site photographs are provided in **Appendix A**. Observations noted during the inspection are summarised below:

- The site is a rectangularly-shaped lot located within an R2 – Low Density Residential area;
- The site contains a weatherboard and fibro cladded single storey residential building;
- The rear end of the property is a vacant grassed area with only one large tree located in the north – east corner of the site;
- West of the site is a single broken driveway which leads to the rear end of the structural dwelling;
- The driveway is composed of broken concrete with a grass patch located at the centre;
- There is a grass area located at the front of the structural dwelling. The front area also contains healthy shrubbery and trees;
- In front of the site is a large tree followed by a footpath that allows individuals to walk around the neighbourhood;
- The vegetation within the site appears well maintained and healthy;
- There is a small concrete slab located at the rear end of the site (Figure 14);
- There is a decrease in elevation from the front of the site to the rear end of the site;
- There were no aromatic indicators of potential contamination; and
- The closest surface water receptor is Bungarribee Creek, located approximately 1.57km south-west of the site.

5. Site History

5.1 History of the Site and Surrounding Area

A review of the historical aerial photographs indicates how the site and surrounding suburbs have changed over time (**Figures 3-7, Appendix A**).

Table 3. Summary of Historical Aerial Photographs

Year	Description of Image
1943	The site during this period was vacant. The site was devoid of any structural dwelling. The surrounding area was composed of vacant farm/rural lands with some properties containing residential structures.
2000	The site was composed of a rectangular lot that contained a residential dwelling located at the front portion of the site. The dwelling mentioned was a single storey white cladded house. A secondary dwelling was located within the north-west portion of the site. The groundcover of the site was mostly healthy manicured grass. The surrounding area was composed of residential dwellings.
2009	The site and surrounding area were similar to the image taken in the year 2000.
2016	The structural dwelling within the site was still similar to the previous image, however the secondary dwelling had been removed. The surrounding area appeared similar to the image taken in 2009.
2021	The site and surrounding area appear similar to the previous image taken.

5.2 Section 10.7 (2) Planning Certificate

A Section 10.7 Planning Certificate describes how a property may be used and the restrictions on development. The Planning Certificate is issued under Section 149 of the Environmental Planning and Assessment Act 1979. At the time of reporting, GCA could not get access to the Planning Certificate.

5.3 NSW EPA Contaminated Land Register

A search within the NSW EPA contaminated land register was undertaken for the site. No results were found for the site or within 200m of the site.

5.4 Protection of the Environment Operations Act (POEO) Public Register

A search on the POEO public register of licensed and delicensed premises (DECC) was undertaken for the site. No results were found for the site or within 200m of the site.

5.5 SafeWork NSW Hazardous Goods

A search was not undertaken with NSW SafeWork for historical dangerous goods stored onsite. However, based on the historical ownership and historical aerial photographs of the site, no evidence of historical storage of dangerous goods were identified.

5.6 Product Spill and Loss History

The site inspection carried out found no evidence to suggest chemical contamination impact on the site (i.e. chemical staining, unhealthy vegetation).

5.7 Dial Before You Dig

A review of assets and services via Dial-Before-You-Dig request suggests no impact to the site via underground services and assets or act as a portal to transport potential contamination offsite (**Appendix D**). Assets that may be impacted include:

- Jemena Gas
- Endeavour Energy
- NBN Co NSW Act
- Sydney Water
- Telstra NSW Central

6. Environmental Setting

6.1 Geology

Data obtained from the Geological Survey of NSW and the Australian Geoscience Stratigraphic Units Database indicate the site is located within an area characterised by Bringelly Shale, a layer within the Wianamatta Group. This layer is characterised by carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone and rare coal and tuff.

The landscape of the site and surrounding area features gently undulating rises on Wianamatta Group shales. Local relief to 30m, usually >5%. Broad rounded crests and ridges with gently inclined slopes. Cleared Eucalyptus woodlands and tall open – forest (Dry schlerophyll forest). This geologic profile occurs extensively on the Cumberland Lowlands. For example, Black town, Mount Druitt, Glossodia and Leppington.

6.2 Hydrology

A groundwater bore search was conducted on 21st October 2021 and no registered groundwater bores were detected within a 500m radius of the site.

It was beyond the scope of works to study the groundwater flow direction. However, based on topography, surface water is expected to flow south-west towards Bungarribee Creek (~1.57km SW).

6.3. Acid Sulphate Soils

To determine the potential for Acid Sulphate Soils (ASS) to occur at the site, data were reviewed utilising the NSW Department of Planning, Industry and Environment eSPADE map viewer. The ASS maps identify five (5) classes of sulphuric acid on land, with Class 1 being the highest at risk of ASS.

The data obtained indicated that there is no known occurrence of ASS beneath this site (**Appendix D**).

7. Areas of Environmental Concern

Based on the above information, the potential Areas of Environmental Concern (AEC) and their associated Contaminants of Potential Concern (CoPC) for the site were identified and summarised below (**Table 4**).

Table 4. Potential Areas and Contaminants of Concern

Potential Areas of Concern	Potentially Contaminating/ Hazardous Activity	CoPCs	Likelihood of Site Impact	Comments
Entire site	Importation of fill material from unknown origin. Historical onsite operations.	Metals, TPH, BTEX, PAH, OCPs, Asbestos	Low	Based on site observations and location, the presence of imported fill material is likely.
Building structures	Hazardous materials	ACM, SMF, ODS, Lead (paint and/or dust), PCBs	Low	Based on site observations, it cannot be concluded that any of the hazardous materials mentioned here are present at this location. Therefore, we recommend an HMS be carried out to determine the presence or absence of these materials.

Abbreviations: Asbestos Containing Materials (ACM), Hazardous Materials Survey (HMS), Benzene Toluene Ethylbenzene and Xylene (BTEX), Ozone Depleting Substances (ODS), Polychlorinated biphenyls (PCBs), Polycyclic Aromatic Hydrocarbon (PAH), Total Petroleum Hydrocarbons (TPH), Synthetic Mineral Fibres (SMF), Organochlorine Pesticides (OCPs), Organophosphorus Pesticides (OPPs).

8. Conceptual Site Model

A CSM was developed to provide an indication of potential risks associated with contamination source and contamination migration pathways, receptors and exposure mechanisms. The CSM provides a framework for the review of the reliability and useability of the data collected and to identify data gaps in the existing site characterisation (**Table 5**). Here, we consider the connections between the following elements:

- Potential contamination sources and their associated CoPCs;
- Potential human receptors that may be impacted by the site contamination are current and future site users including occupants to the dwelling/infrastructures onsite, site workers and the general public within the immediate vicinity of the site;
- Potential environmental receptors to the site including but not limited to: groundwater and surface water bodies, residual soils at and/or nearby the site;
- Potential exposure pathways; and
- Whether source-pathway-receptor connections are complete based on current and future suite conditions.

Table 5. Conceptual Site Model

Potential Sources	Potential Receptor	Potential Exposure Pathway	Complete Connection	Risk	Justification/Control Measures
Contaminated soil from importation of uncontrolled fill across the site. Historical onsite operations. ACM, lead paint and other metals from fibro cladded residential property and garage, brick residential property and metal sheds.	Occupants, workers, general public	Dermal contact, inhalation/ingestion of particulates	Limited (current)	Moderate	Direct contact with potentially contaminated soils is possible.
			No (future)	Low	If present, impacted soils are required to be disposed of and remediated offsite.
	Bungarribee Creek	Migration of impacted groundwater and surface water run-off.	Limited (current)	Moderate	Due to proximity to site, migration of contaminants through surface waters is considered unlikely.
			Limited (future)	Low	If present, contaminated soils and groundwater are to be remediated.
	Underlying aquifer	Leaching and migration of contaminants through groundwater infiltration.	Unknown (current)	Moderate	Due to unsealed surfaces and suspected shallow bedrock, migration of CoPCs is possible at this location.
			Limited (future)	Low	If present, contaminated soil and/or groundwater would require remediation.

9. Data Gaps

The following data gaps have been identified at the site:

- Extent of potential Asbestos Containing Materials (ACM) or heavy metals within structures.
- Condition of soils beneath the hardstands onsite.

10. Assessment Criteria

The following soil assessment criteria were adopted for the investigation.

10.1 NEPM Health Investigation Level A (HIL-A)

HILs are scientific, risk-based guidance levels to be used as in the primary stage of assessing soil contamination to evaluate the potential risks to human health from chronic exposure to contaminants. HILs are applicable to a broad range of metals and organic substances, and generally apply to depths up to 3m below the surface for residential use.

Tier 1 HILs are divided into the following sub-criteria:

- HIL A – residential with garden/accessible soils.
- HIL B – residential with minimal opportunities for soil access.
- HIL C – public open space/recreational areas.
- HIL D – commercial/industrial premises.

Table 6. Health Investigation Levels

NEPM Assessment Criteria	NEPM 2013 Residential Soil **HIL-A**, mg/kg
Pesticides	
HCB	**10**
Heptachlor	**6**
Chlordane	**50**
Aldrin & Dieldrin	**6**
Endrin	**10**
DDT+DDE+DDT	**240**
Endosulfan	**270**
Methoxychlor	**300**
Mirex	**10**
Metals	
Arsenic, As	**100**
Cadmium, Cd	**20**
Chromium, Cr	**100**
Copper, Cu	**6,000**
Lead, Pb	**300**

Nickel, Ni	**400**
Zinc, Zn	**7,400**
Mercury, Hg	**40**

10.2 NEPM Health Screening Level A (HSL-A)

HSLs have been developed for selected petroleum compounds and fractions and are used for the assessment of potential risks to human health from chronic inhalation and direct contact pathways of petroleum vapour emanating off petroleum contaminated soils (Vapour Risk). HSLs are guided by land-use scenarios, specific soil physicochemical properties and generally apply to depths below surface to >4m.

Tier 1 HSLs are divided into the following sub-criteria:

- HSL A – residential with garden/accessible soils.
- HSL B – residential with minimal opportunities for soil access.
- HSL C – public open space/recreational areas.
- HSL D – commercial/industrial premises.

Table 7. Health Screening Level

NEPM Assessment Criteria	NEPM 2013 Residential Soil **HSL-A** for Vapour Intrusion, 0-<1m depth, Clay, mg/kg	NEPM 2013 Residential Soil **HSL-A** for direct contact, mg/kg
Benzene	**0.7**	**100**
Toluene	**480**	**14,000**
Ethylbenzene	**NL**	**4,500**
Xylenes	**110**	**12,000**
Naphthalene	**5**	**1,400**
TRH C6-C10		**4,400**
TRH C6-C10 - BTEX (F1)	**50**	
TRH >C10-C16		**3,300**
TRH >C10-C16 - N (F2)	**280**	
TRH >C16-C34 (F3)		**4,500**
TRH >C34-C40 (F4)		**6,300**

10.3 NEPM Ecological Investigation Level (EIL) – Urban Residential and Public Open Space

Ecological investigation levels (EILs) have been developed to assess the risk for the presence of metals and organic substance in a terrestrial ecosystem. EILs are guided by land-use scenarios, specific soil physicochemical properties and generally apply to the top 2m of soil. EILs can be applied for arsenic (As), copper (Cu), chromium III (Cr(III)), dichlorodiphenyltrichloroethane (DDT), naphthalene, nickel (Ni), lead (Pb) and zinc (Zn).

The NEPM Soil Quality Guidelines (SQG) for EILs are calculated using the Added Contamination Limit (ACL) to determine the amount of contamination that had to be added to the soil to cause toxicity, including ambient background concentration (ABC).

Table 8. Generic EIL for Arsenic, DDT and Naphthalene

NEPM Assessment Criteria	NEPM 2013 Soil Generic **EIL** for Urban Residential and Public Open Space, mg/kg
Arsenic, As	**100**
DDT	**180**
Naphthalene	**170**

10.4 NEPM Ecological Screening Level (ESL) – Urban Residential and Public Open Space

ESLs have been developed for selected petroleum hydrocarbons (BTEX, benzo(a)pyrene, TRH F1 and F2) in soil, based on fresh contamination. These parameters are applicable to coarse and fine-grained soil and apply from the surface of the soil to 2m below ground level, which corresponds with the root and habitat zone for many species.

Table 9. ESL for Benzene Toluene Ethylbenzene and Xylene (BTEX), Benzo(a)pyrene and Total Recoverable Hydrocarbon Fractions

NEPM Assessment Criteria	NEPM 2013 Soil **ESL** for Urban, Residential and Public Open Spaces for **fine-grained soil**, mg/kg
Benzene	**65**
Toluene	**105**
Ethylbenzene	**125**
Xylenes	**45**
TRH C6-C10	**180**
TRH >C10-C16	**120**
TRH >C16-C34 (F3)	**1,300**
TRH >C34-C40 (F4)	**2,800**

10.5 NEPM Management Limits – Residential, Parkland and Public Open Space

Management Limits for petroleum have been developed for prevention of explosive vapour accumulation, prevention of the formation of observable Light Non-Aqueous Phase Liquids (LNAPL) and protection against effects on buried infrastructure. Residential, parkland and public open space limits have been adopted based on the proposed land use.

Table 10. Management Limits for Total Recoverable Hydrocarbon Fractions

NEPM Assessment Criteria	NEPM 2013 Management Limits for Residential, Parkland and Public Open Space for **Fine-Grained Soil**, mg/kg
TRH C6-C10	**800**
TRH >C10-C16	**1,000**
TRH >C16-C34 (F3)	**3,500**
TRH >C34-C40 (F4)	**10,000**

10.6 NEPM Guidelines for Asbestos

The assessed soil must not contain Asbestos Containing Materials (ACM) in the excess of 0.01%w/w and surface soil within the site must be free of visible ACM, Asbestos Fines (AF) and Fibrous Asbestos (FA).

11. Sampling and Analysis Plan

11.1 Sampling Rationale

Table 11. Sampling Rationale Criteria

Criteria	Chosen Approach	Justification
Sampling Pattern	Systematic	This pattern was selected due to the area of the site, access to underlying soil and groundwater, the AEC and CoPC as well as the potential heterogeneity of any contamination. GCA employ the consultant's knowledge and experience to sample strategically within this approach.
Sampling Density	13 samples taken from six (6) borehole locations, with six (6) topsoil/fill material samples, six (6) natural material samples and one (1) duplicate sample.	This sampling density was selected based on the extent of the potential contaminated area to be detected, feasibility, the site history, distribution of current and historical uses on site, intended future use of the site, location and condition of structures.
Duplicate Samples (total)	Rate 1:13 samples Duplicate sample: BH4.1	QA/QC sampling was undertaken in general accordance with specifications outlined in Australian Standards (AS) 4482.1-2005, Standard Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil and NEPM 2013 Schedule B2; *Guideline on Site Characterisation*.
Sampling Depths	Fill material/topsoil sample depths: 0.3m – 0.5m Natural soil material sample depths: 0.5m – 0.8m	These depths were selected in compliment with sampling density and to target depths of potential contaminants. Additionally, soil thickness and proximity to the aquifer were considered when determining these depths.

11.2 Field Sampling Methodology

All boreholes were completed with a hand auger to a depth of 0.8m below ground level (bgl). By using a drill auger for the boreholes, the qualified environmental consultant was able to conduct a visual inspection of the soil cross section. Soil was scraped from the freshly cut cross section for sample collection. Hand auger was decontaminated with deionised water between boreholes. Samples were immediately placed in laboratory prepared jars (labelled prior to arriving on site), with the lid securely attached to jar and only removed for the purpose of storing each sample. This sample storage approach allowed the preservation of any potential fill layers as well as natural underlying clay to be stored in stratigraphic layers.

Table 12. Sample Details

Borehole ID	Sample ID	Depth (m)	Soil Type
BH1	BH1.1	0.3	Loam – Fill Material
	BH1.2	0.8	Clay – Natural Material
BH2	BH2.1	0.3	Loam – Fill Material
	BH2.2	0.8	Clay – Natural Material
BH3	BH3.1	0.3	Loam – Fill Material
	BH3.2	0.8	Clay – Natural Material
BH4	BH4.1	0.3	Loam – Fill Material
	BH4.2	0.8	Clay – Natural Material
BH5	BH5.1	0.3	Loam – Fill Material
	BH5.2	0.8	Clay – Natural Material
BH6	BH6.1	0.3	Loam – Fill Material
	BH6.2	0.8	Clay – Natural Material
	D1	Duplicate of BH4.1	

One (1) duplicate sample was collected for quality control and assurance as part of the Sampling and Analysis Plan.

The thirteen (13) soil samples (twelve (12) samples and one (1) duplicate sample) were placed on ice in an esky for transport under Chain of Custody (COC) to a NATA accredited laboratory for the analysis of the CoPC.

11.3 Field Quality Assurance & Quality Control Procedures

The following procedures were undertaken to ensure the data quality for each sample:

- Selection of appropriate sampling methods;
- Decontamination procedures;
- Appropriate containers selected for planned analyses;
- Appropriate preservation and storage measures to minimise contamination or analyte loss;
- Statement of duplicate frequency;
- Sampling devices and equipment;
- Field instrument calibrations.

11.4 Chemical Analysis Methodology

Soil samples were extracted and analysed for Benzene Toluene Ethylbenzene Xylenes (BTEX), Naphthalene, Total Recoverable Hydrocarbons (TRH) and Metals. Soil samples were solvent extracted with methanol and analysed using Gas Chromatography-Mass Spectrometry (GC-MS) Purge and Trap for BTEX, Naphthalene and F1 (C_6-C_9) of TRH. Three (3) different extraction surrogates (Bromofluorobenzene, d4-1,2-dichloroethane and d8-toluene) were spiked with a known concentration into each sample to evaluate extraction efficiency.

Due to the volatility and potential loss of F1 (C_6-C_9) of TRH, this fraction was analysed with GC-MS P&T because this instrument provides a suitable detection limit for these low molecular weight hydrocarbons. The remainder of TRH (F2, F3 and F4) was extracted with Acetone:Dichloromethane (ratio 50:50) and analysed using Gas Chromatography-Flame Ionisation Detection (GC-FID), spiked with the three (3) extraction surrogates used in the previous analysis.

Metals (aside from Mercury (Hg)) were digested with nitric acid to decompose organic matter (OM) and hydrochloric acid to complete digestion of metals, then analysed using Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES), with results reported as dry sample. Hg was analysed by digestion with nitric acid, hydrogen peroxide and hydrochloric acid. Hg ions were reduced via stannous chloride reagent in acidic solution to elemental Hg. The vapour was purged using nitrogen as the carrier gas into a cold cell in an Atomic Absorption Spectrometer (AAS).

Soil moisture % was carried out by placing a known amount of sample in a weighed evaporating basin and drying the soil at either 40°C or 105°C.

11.5 Laboratory Quality Assurance & Quality Control Procedures

The following procedures were undertaken to ensure the data quality for each sample:

- A copy of signed chain-of-custody forms acknowledging receipt date, time and temperature and identity of samples included in shipments;
- Record of holding times;
- Analytical methods used, including any deviations or method detection limit;
- Laboratory accreditation for analytical methods used;
- Laboratory performance for the analytical method using duplicates calculated as Relative Percentage Differences (RPD);
- Surrogates used during extraction process;
- Practical quantification limits (PQL);
- Reference laboratory control sample (LCS) used throughout the full method process from extraction to injection;
- Matrix spikes (MS) indicate percentage of recovery of an expected result, via a known concentration if an analyte spiked in a field sub-sample;
- Laboratory blank results (tabulate);
- Results are within control chart limits; and
- Instrument detection limit.

12. Data Quality Objectives (DQOs)

The DQOs have been developed in accordance with the NEPM Appendix B of Schedule B2 and provide the type, quantity, and quality of data to support decisions regarding the environmental conditions of this site.

Table 13. Data Quality Objectives Steps 1 to 7

Step 1: State the problem	GCA have identified the following risks to human and environmental receptors: - current and/or historical potentially contaminating activities that may have impacted the soils at the site.
Step 2: Identify the decision/goal of the study	GCA considered the site history, the use of this site, and the NEPM Guidelines, when identifying the decisions required for the site to be considered suitable for its continued land use. The questions required to meet these decisions are as follows: - Was the sampling, analysis and quality plan designed appropriate to achieve the aim of the DSI? - If present, is on-site contamination capable of migrating off-site? - Are there any unacceptable risks to the future on site or off-site receptors in the soil or groundwater? - Is the site suitable for its continued land use?
Step 3: Identify the information inputs	GCA has identified issues of potential environmental concern; - Appropriate identification of CoPC; - Soil sampling and analysis programs across the site; - Appropriate quality assurance/quality control to enable an evaluation of the reliability of the analytical data; and - Screening sampler analytical results against appropriate assessment criteria for the intended land use.
Step 4: Define the boundaries of the study	The study boundaries are: - Lateral boundary: The legally defined area of the site; - Vertical boundary: The soil interface to the maximum depth reached during soil sampling; and - Temporal boundary: Constrained to a single visit to the site.
Step 5: Develop the analytical approach	Here, GCA integrates the information from steps 1 – 4 to support and justify our proposed analytical approach. Our aim is to confirm if the site is suitable for the proposed development. If the findings of the SAQP identify; - Any exceedance of the adopted assessment criteria for soil; - Groundwater flow direction confirms contamination likely to be transported offsite; - Professional opinion that further assessment is required; and/or - Adopted RPD for QC data not met. Further assessment may be required to confirm suitability of the site in the form of; Data Gap investigation, Remediation Action Plan and Site Validation.
Step 6: Specify performance or acceptance criteria	For a Systematic soil sampling the data must meet the following qualifiers; - Acceptable recovery on all surrogate spikes used in laboratory analyses; - Acceptable analytical method to ensure detection limit appropriate for all analytes; - If these conditions are not met, then chemical analysis will require re-testing for all samples with fresh aliquot.

Step 7: Optimise the design for obtaining data	Systematic approach on accessible areas across the site, allowing the consultant to determine the suitability of the conditions onsite with a 95% UCL.
The DQOs align with CSM	Yes

13. Analytical Results

The soil analytical results are summarised below. Soil analytical results are presented in the laboratory reports in **Appendix C.**

Results Indicator	
▲	Exceedance of guideline limit for one or more samples.
▼	No exceedance of guideline limit for all samples.

Table 14. Total Recoverable Hydrocarbons (TRH) and Benzene Toluene Ethylbenzene Xylene (BTEX) Analytical Results

Total Recoverable Hydrocarbons (TRH) and Benzene Toluene, Ethylbenzene and Xylene (BTEX)	**NEPM 2013 HSL-A for Vapour Intrusion, 0-<1m Depth, Clay, mg/kg**	**NEPM 2013 HSL-A for Vapour Intrusion, 1-<2m Depth, Clay, mg/kg**	**NEPM 2013 HSL-A for Direct Contact, mg/kg**	**NEPM 2013 ESL for Urban, Residential and Public Open Spaces, Fine-Grained Soil, mg/kg**	**NEPM 2013 Management Limits for Residential, Parkland and Public Open Space, Fine-Grained Soil, mg/kg**
Benzene	▼	Not Analysed	▼	▼	
Toluene	▼	Not Analysed	▼	▼	
Ethylbenzene	NL	Not Analysed	▼	▼	
Xylenes	▼	Not Analysed	▼	▼	
TRH C6-C10			▼	▼	▼
TRH C6-C10 - BTEX (F1)	▼	Not Analysed			
TRH >C10-C16			▼	▼	▼
TRH >C10-C16 - N (F2)	▼	Not Analysed			
TRH >C16-C34 (F3)			▼	▼	▼
TRH >C34-C40 (F4)			▼	▼	▼

Table 15. Analytical Results for Polycyclic Aromatic Hydrocarbons (PAH)

Polycyclic Aromatic Hydrocarbons (PAH)	NEPM 2013 HSL-A for Vapour Intrusion, 0-<1m Depth, Clay, mg/kg	NEPM 2013 HSL-A for Vapour Intrusion, 1-<2m Depth, Clay, mg/kg	NEPM 2013 HSL-A for Direct Contact, mg/kg	NEPM 2013 HIL-A, mg/kg	NEPM 2013 Soil ESL for Urban, Residential and Public Open Spaces for Fine-Grained Soil, mg/kg	NEPM 2013 Generic EIL for Urban Residential and Public Open Space, mg/kg
Naphthalene	▼	Not Analysed	▼			▼

Table 16. Analytical Results for Pesticides

Pesticides	NEPM 2013 HIL-A, mg/kg	NEPM 2013 Generic EIL for Urban Residential and Public Open Space, mg/kg
HCB	▼	
Heptachlor	▼	
Chlordane	▼	
Aldrin & Dieldrin	▼	
Endrin	▼	
DDT		▼
DDT+DDE+DDT	▼	
Endosulfan	▼	
Methoxychlor	▼	
Mirex	▼	

Table 17. Analytical Results for Heavy Metals

Metals	NEPM 2013 HIL-A, mg/kg	NEPM 2013 Generic EIL for Urban Residential and Public Open Space, mg/kg
Arsenic, As	▼	▼
Cadmium, Cd	▼	
Chromium, Cr	▼	
Copper, Cu	▼	
Lead, Pb	▼	
Nickel, Ni	▼	
Zinc, Zn	▼	
Mercury, Hg	▼	

Table 18. Analytical Results for Asbestos

Chemical	BH1.1	BH2.1	BH3.1	BH4.1	BH5.1	BH6.1
Asbestos Detected	No	No	No	No	No	No

14. Data Quality Indicators (DQIs)

Table 19. Field Data Quality Indicators

Completeness	The DSI ensured that all critical locations for soil were sampled, and samples were collected within the Systematic formation at the appropriate depths during a single visit to the site. This plan also aligns with Standard Operating Practices (SOP), to produce valid and reproducible data. GCA's qualified environmental consultants are experience and ensure compliance and completion of all sample recording, labelling and COC procedures.
Comparability	The DSI aligns with SOP to produce qualitative data. GCA's qualified environmental consultants sampled uniformly to ensure that each individual sample collection contained sufficient soil (g) to produce a dataset that is reflective of the environmental conditions of the site at time of collection. All samples were handled and stored in a manner that maximised the preservation of all potential CoPC within the soil samples. Climatic and physical conditions at the time of sample collection were considered and recorded.
Representativeness	The DSI aligns with SOP to produce a qualitative dataset that is representative of soil on site. GCA's qualified environmental consultants ensured sample collection, handling, storage and transfer was appropriate for soil. Additionally, samples reflect environmental conditions at time of collection and samples are homogenised to maximise detection during laboratory analysis.
Precision	The DSI aligns with SOP to produce qualitative data that measures the variability of results. The primary technique for evaluating field precision is by collection of duplicate samples, to measure the difference in response between two (2) different samples from the sample location. GCA's qualified environmental consultants collected one (1) duplicate sample along with the 13 samples collected for this site.
Accuracy	The DSI aligns with SOP to produce qualitative data that measures bias within the results. GCA's qualified environmental consultants ensured all COC procedures were carried out appropriately to minimise incidents of cross contamination or incorrect handling and storage of samples.

Table 20. Laboratory Data Quality Indicators

Completeness	The allocated NATA accredited laboratory produce reliable and thorough datasets. All samples were analysed for CoPC using an appropriate and standardised extraction method and analytical instrument. Samples were received, extracted and injected within specified holding times. The laboratory qualified environmental organic chemists ensured completion of COC procedures, wet chemistry, data integration and calculation.
Comparability	Analytical procedures within the NATA accredited laboratory were specialised and standardised for soil samples. The qualified environmental organic chemists determined the appropriate extraction methods and analytical instruments used based on response factor and ability to target CoPC. Spikes and surrogates were chosen based on appropriateness to avoid coelution with contaminants indigenous to the samples and across varying retention times to map response factor. The chosen spikes and surrogates were used for all samples and analysis was completed within the same batch to account for analytical instrument calibration (in addition system blanks support instrument calibration baseline results).
Representativeness	The NATA accredited laboratory procedures ensured the data is representative of the site by using appropriate extraction and analytical instrument methods. The qualified environmental organic chemists followed COC procedures; ensured that extraction methods were specialised for each potential contaminant and standardised across all samples; and used analytical instruments suitable for the sample type, targeted CoPC, extraction method, instrument sensitivity, response factor and detection limit.
Precision	Quantitative measures undertaken by the NATA accredited laboratory include field and laboratory duplicates. The qualified environmental organic chemists produced a field duplicate analysis that measured the precision of field sampling and maps the potential heterogeneity of contamination across a field sampling location. The laboratory duplicate procedure included two (2) laboratory sub-samples for extraction and analysis from the one (1) field sample in the collection container (250mL jar). The two (2) laboratory sub-samples map the potential heterogeneity of contamination that can occur within the one (1) field samples collection.
Accuracy	Quantitative measures undertaken by the NATA accredited laboratory's qualified environmental organic chemists include the analysis of field, rinsate and method blanks; spike and surrogate analysis to measure response factor and retention time; laboratory control samples; appropriateness of analytical method; and timing and completion of analysis.

15. Conclusion

Based on the site investigation and analytical results, GCA considers the potential for significant contamination to be low.

Therefore, GCA finds that the site is suitable for the proposed development and land use, providing the recommendations within **Section 16** of this report are undertaken.

16. Recommendations

Based on the information collected and available during this investigation, the following recommendations have been made:

- All structures onsite should have a Hazardous Materials Survey (HMS) conducted by a qualified occupational hygienist and/or environmental consultant for the site prior to any demolition or renovation works in accordance with relevant Australian Standards, SafeWork NSW codes of practice and any other applicable requirements;
- An Asbestos Clearance Certificate is required to be completed once all existing buildings and structures have been demolished;
- Any soils requiring removal from the site, as part of future site works, should be classified in accordance with the "Waste Classification Guidelines, Part 1: Classifying Waste" NSW EPA (2014);
- The demolition of any structures and excavation activity on site be undertaken in accordance with relevant Australian Standards, SafeWork NSW codes of practice and any other applicable requirements; and
- A site specific 'Unexpected Finds Protocol' is to be made available for reference for all occupants and/or site workers in the event unanticipated contamination is discovered, including asbestos.

References

- National Environmental Protection (Assessment of Site Contamination) Measure – National Environmental Protection Council, 2013;
- National Environment Protection Measures (NEPM), *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater, 2013*;
- National Environment Protection Measures (NEPM), *Schedule B2 – Guideline on Site Characterisation,* 2013;
- National Environmental Protection Measures (NEPM), Schedule B5c – *Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel and Zinc, 2013;*
- National Environment Protection Measures (NEPM), Schedule B7 – *Guideline on Derivation of Health – Based Investigation Levels, 2013;*
- National Environment Protection Measures (NEPM), *Appendix 1 – The Derivation of HILS for Metals and Inorganics, 2013;*
- NSW Environmental Protection Authority (EPA), *Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme,* 2017 (3rd Edition);
- NSW Environmental Protection Authority (EPA), *Waste Classification Guidelines Part 1: Classifying Waste,* 2014;
- NSW Environmental Protection Authority (EPA), *Sampling Design Guidelines*, 1995;
- NSW Environmental Protection Authority (EPA), *Technical Note: Investigation of Service Station Sites,* 2014;
- NSW Department of Environment and Conservation, *Guidelines for the Assessment and Management of Groundwater Contamination,* 2007;
- NSW Environmental Protection Authority, *Guidelines for Consultants Reporting on Contaminated Sites,* 2020;
- Protection of the Environment and Operation Act, 1997;
- Protection of the Environment Operations (Waste) Regulations, 2005;
- The Contaminated Land Management Act, 1997;
- NSW Environmental Protection Authority (EPA), *Guidelines on the Duty to Report Contamination under Contaminated Land Management Act*, 1997;
- State Environment Protection Policy 55 (SEPP 55). *Remediation of Land Under the Environmental Planning and Assessment Act,* 1998;
- Work Health and Safety Act, 2011;
- Work Health and Safety Regulation, 2011;
- Blacktown Local Environmental Plan, 2015;

- Protection of the Environment Operations Act (POEO) Public Register, https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers, accessed on 21st October 2021.
- NSW EPA- Contaminated land register, https://apps.epa.nsw.gov.au/prclmapp/sitedetails.aspx, accessed on 21st October 2021.
- Topography – map.com, https://en-au.topographic-map.com/, accessed on 21st October 2021.
- WaterNSW, https://realtimedata.waternsw.com.au/, accessed on 21st October 2021.

Limitations

The findings of this report are based on the scope of work outlined in Section 2. GCA performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental consulting profession. No warranties, express or implied are made.

The results of this assessment are based upon the information documented and presented in this report. All conclusions and recommendations regarding the site are the professional opinions of GCA personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, GCA assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of GCA, or developments resulting from situations outside the scope of this project.

The results of this assessment are based on the site conditions identified at the time of the site inspection and validation sampling. GCA will not be liable to revise the report to account for any changes in site characteristics, regulatory requirements, assessment criteria or the availability of additional information, subsequent to the issue date of this report.

GCA is not engaged in environmental consulting and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes.

Geotechnical Consultants Australia Pty Ltd (GCA)

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APPENDIX A

Figures and Site Photographic Log

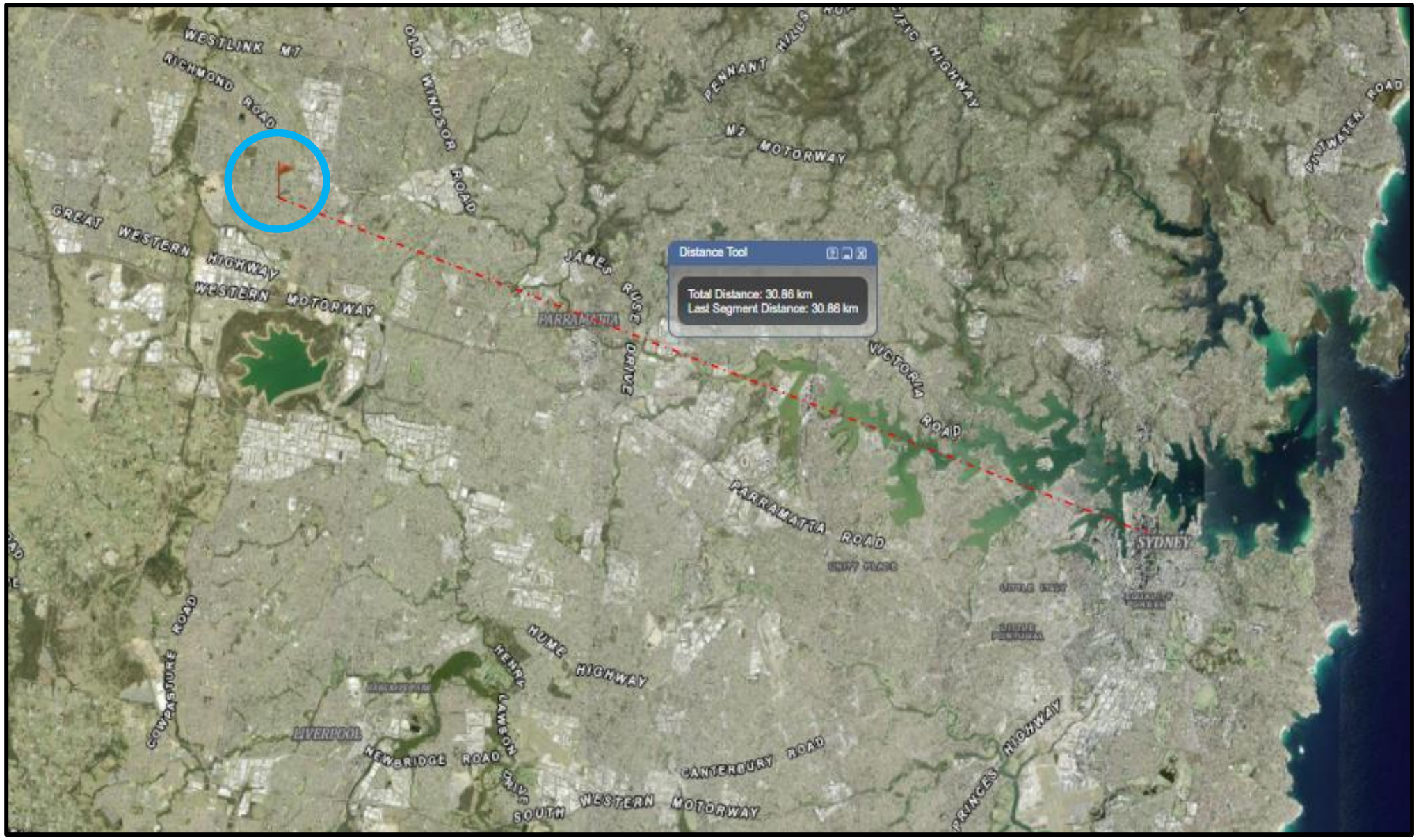

Figure 1. The site is located approximately 30.66km to the north-west of Sydney's CBD.

Site location

Source: Six Maps 2021

Figure 1	Locality Map
Project	227 Bungarribee Road, Blacktown, NSW, 2148

Figure 2. Thirteen (13) samples were collected from six (6) boreholes. Twelve (12) primary samples and one (1) duplicate for QA/QC procedures.

Sample Name	Approximate Sample Depth (m)	Sample Name	Approximate Sample Depth (m)
BH1.1	0.3m	BH4.1	0.3m
BH1.2	0.8m	BH4.2	0.8m
BH2.1	0.3m	BH5.1	0.3m
BH2.2	0.8m	BH5.2	0.8m
BH3.1	0.3m	BH6.1	0.3m
BH3.2	0.8m	BH6.2	0.8m
		D1 – duplicate of BH4.1	0.3m

⊗ Borehole Locations

Source: Nearmap 2021

Figure 2	Site Area
Project	227 Bungarribee Road, Blacktown, NSW, 2148

N

Figure 3. Aerial image of the site and surrounding area in 1943. The site is a vacant lot during this period. The surrounding area is composed of residential properties within farm/rural lands.

Figure 3	Aerial Image 1943
Project	227 Bungarribee Road, Blacktown, NSW, 2148

Source: Metromap 2021

N

Figure 4. Aerial image of the site and surrounding area in 2000. The site is composed of a rectangular lot that contains a single storey residential property. The dwelling is located within the front portion of the lot, while the rear end is vacant. There is a secondary dwelling (or shed) located within the site. The surrounding area is zoned as R2 – Low Density Residential.

Figure 4	Aerial Image 2000
Project	227 Bungarribee Road, Blacktown, NSW, 2148

Source: Metromap 2021

Figure 5. Aerial image of the site and surrounding area in 2009. The site and surrounding area is similar to the previous image taken in the year 2000.

Source: Nearmap 2021

Figure 5	Aerial Image 2009
Project	227 Bungarribee Road, Blacktown, NSW, 2148

Figure 6: Aerial image of the site and surrounding area in 2016. The site does not contain the secondary dwelling. The surrounding area is similar to the previous image taken in 2000 and 2009.

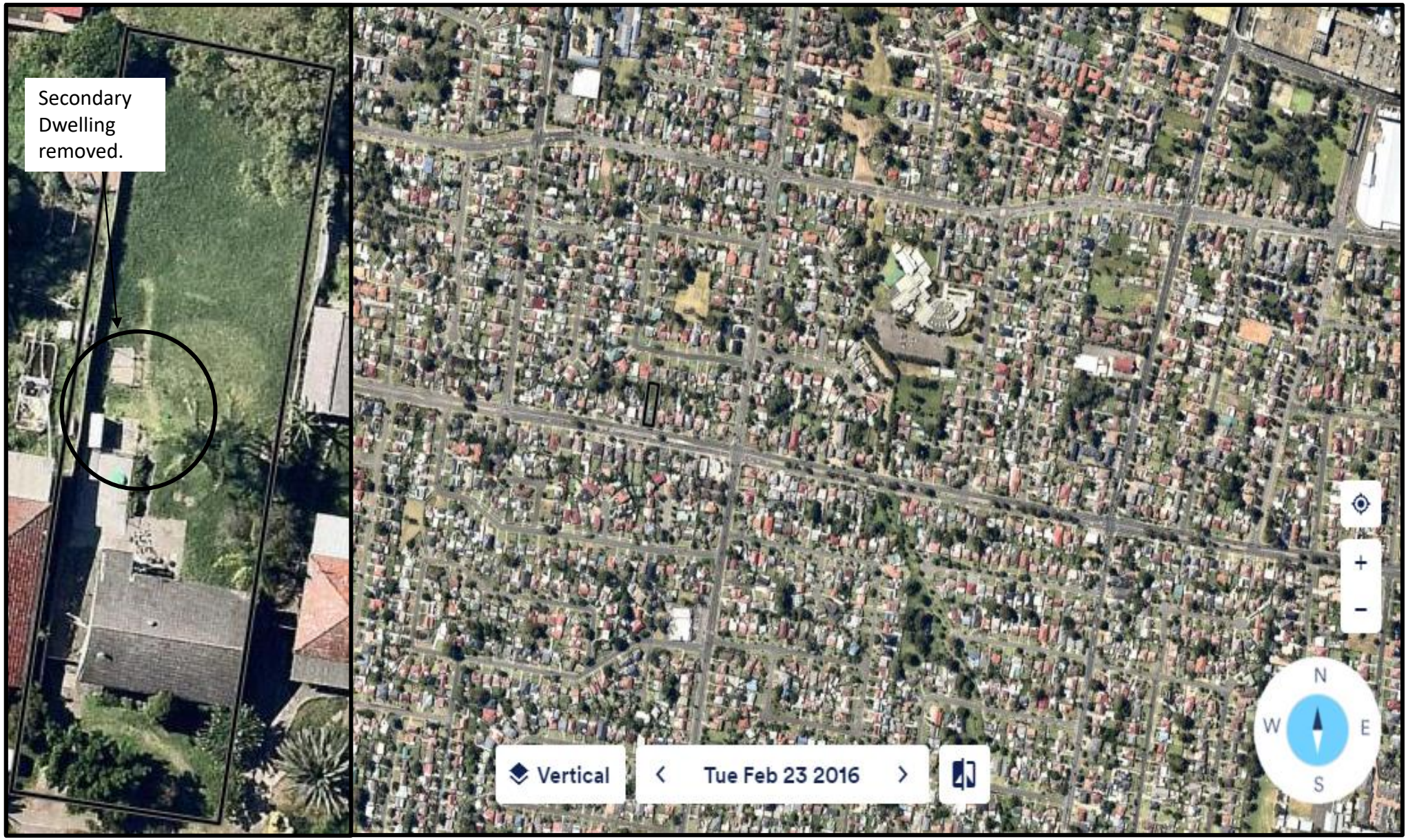

Figure 6	Aerial Image 2016
Project	227 Bungarribee Road, Blacktown, NSW, 2148

Source: Nearmap 2021

N

Figure 7: Aerial image of the site and surrounding area in 2021. The site and surrounding area is similar to the previous image taken in 2000, 2009 and 2016.

Source: Nearmap 2021

Figure 7	Aerial Images: 2021
Project	227 Bungarribee Road, Blacktown, NSW, 2148

Figure 8. Depicts the front of the site. The site contains a white single storey cladded residential dwelling. In front of the site is a grassed area, trees and shrubbery.

Figure 9. A broken paved driveway is located west of the site. There is a dirt grassed area located within the centre of the driveway. There is a decrease in elevation from the front of the site to the rear end of the lot.

Figure 10. The driveway leads to the rear end of the site. There is a black metal fence to avoid any vehicles from continuing further down the site. The groundcover is concrete.

Figure 11. Depicts the rear end of the site. The groundcover is mostly healthy manicured grass. The image also depicts the location of the clothes line, concrete pavement and metal shed.

Figure 12. A close up image of the rear end of the structural dwelling. There is a bricked staircase which leads to the back door of the dwelling.

Figure 13. Depicts a concrete footpath in front of the site to allow individuals to walk around the neighbourhood.

Figure 14. A concrete slab is located within the rear end of the property. The slab is located between the rear end of the structural dwelling to the rear end of the site.

Figure 15. Depicts the soil profile of BH2. The soil is natural clay.

Figure 16. Depicts the soil profile of BH4. The dominant soil type is a natural clay.

Figure 17. Depicts the soil profile of BH5. The soil is natural clay.

APPENDIX B

Laboratory Summary Table

Table 21. Analytical results for TRH, BTEX and Naphthalene. Values are presented as mg/kg. NL = Not Limiting. F1 = subtract the sum of BTEX concentrations from the C_6-C_{10} aliphatic hydrocarbon fraction. F2 = subtract Naphthalene from the> C_{10}-C_{16} aliphatic hydrocarbon fraction.

NEPM Assessment Criteria		Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	TRH C6-C10	TRH C6-C10 - BTEX (F1)	TRH >C10-C16	TRH >C10-C16 - N (F2)	TRH >C16-C34 (F3)	TRH >C34-C40 (F4)
NEPM 2013 Residential A Soil **HSL-A** for Vapour Intrusion, 0-<1m depth, **Clay**, mg/kg		**0.7**	**480**	**NL**	**110**	**NL**		**50**		**280**		
NEPM 2013 Residential A Soil **HSL-A** for direct contact, mg/kg		**100**	**14,000**	**4,500**	**12,000**	**1,400**	**4,400**		**3,300**		**4,500**	**6,300**
NEPM 2013 Soil **ESL** for Urban, Residential and Public Open Spaces for **fine-grained soil**, mg/kg		**50**	**85**	**70**	**105**		**180**		**120**		**300**	**2,800**
NEPM 2013 **Management Limits** for Residential, Parkland and Public Open Space for **fine-grained soil**, mg/kg							**800**		**1,000**		**3,500**	**10,000**
NEPM 2013 Soil Generic **EIL** for Urban Residential and Public Open Space, mg/kg						**170**						
Sample	Depth (m)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1.1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH1.2	0.8	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH2.1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH2.2	0.8	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH3.1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH3.2	0.8	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH4.1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH4.2	0.8	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH5.1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH5.2	0.8	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH6.1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
BH6.2	0.8	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120
D1	0.3	<0.1	<0.1	<0.1	<0.3	<0.1	<25	<25	<25	<25	<90	<120

Table 22. Analytical results for Heavy Metals. Values are presented as mg/kg.

NEPM Assessment Criteria		Arsenic, As	Cadmium, Cd	Chromium, Cr	Copper, Cu	Lead, Pb	Nickel, Ni	Zinc, Zn	Mercury, Hg
NEPM 2013 Residential Soil **HIL-A**, mg/kg		**100**	**20**	**100**	**6000**	**300**	**400**	**7400**	**40**
NEPM 2013 Soil Generic **EIL** for Urban Residential and Public Open Space, mg/kg		**100**			**240**		**200**	**430**	
Sample	Depth (m)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1.1	0.3	**5**	<0.3	**15**	**20**	**17**	**5.5**	**39**	<0.05
BH1.2	0.8	**5**	<0.3	**15**	**19**	**17**	**5.5**	**52**	<0.05
BH2.1	0.3	**5**	**0.7**	**14**	**62**	**60**	**8.1**	**340**	<0.05
BH2.2	0.8	**5**	<0.3	**14**	**19**	**12**	**4.2**	**26**	<0.05
BH3.1	0.3	**5**	<0.3	**14**	**22**	**20**	**8.6**	**86**	<0.05
BH3.2	0.8	**5**	<0.3	**14**	**19**	**13**	**5.2**	**38**	<0.05
BH4.1	0.3	**5**	<0.3	**13**	**21**	**16**	**7.9**	**31**	<0.05
BH4.2	0.8	**6**	<0.3	**12**	**17**	**12**	**3.9**	**21**	<0.05
BH5.1	0.3	**5**	<0.3	**14**	**25**	**18**	**6.1**	**42**	<0.05
BH5.2	0.8	**5**	<0.3	**13**	**170**	**20**	**6.9**	**60**	<0.05
BH6.1	0.3	**4**	<0.3	**12**	**19**	**27**	**9.9**	**68**	<0.05
BH6.2	0.8	**4**	<0.3	**13**	**22**	**21**	**9.8**	**44**	<0.05
D1	0.3	**6**	<0.3	**14**	**17**	**13**	**4.0**	**22**	<0.05

Table 23. Analytical results for Pesticides. Values are presented as mg/kg.

NEPM Assessment Criteria		HCB	Heptachlor	Chlordane	Aldrin & Dieldrin	Endrin	DDT	DDT+DDE +DDT	Endosulfan	Methoxychlor	Mirex	Total CLP OC Pesticides	Total OP Pesticides
NEPM 2013 Residential Soil **HIL-A**, mg/kg		**10**	**6**	**50**	**6**	**10**		**240**	**270**	**300**	**10**		
NEPM 2013 Soil Generic **EIL** for Urban Residential and Public Open Space, mg/kg							**180**						
Sample	Sample Depth (m)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1.1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH1.2	0.8	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH2.1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH2.2	0.8	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH3.1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH3.2	0.8	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH4.1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH4.2	0.8	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH5.1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH5.2	0.8	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH6.1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
BH6.2	0.8	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7
D1	0.3	<0.1	<0.2	<0.2	<0.3	<0.2	<0.2	<0.6	<0.5	<0.1	<0.1	<1	<1.7

Table 24. Asbestos values within each tested soil sample. Values are presented as mg/kg.

Sample	Sample Depth (m)	Detected
BH1.1	0.3	No Asbestos Detected
BH2.1	0.3	No Asbestos Detected
BH3.1	0.3	No Asbestos Detected
BH4.1	0.3	No Asbestos Detected
BH5.1	0.3	No Asbestos Detected
BH6.1	0.3	No Asbestos Detected

APPENDIX C

Laboratory Report and Chain of Custody

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: NEO Consulting Pty Ltd
Address: 186 Riverstone Parade, Riverstone, NSW, 2765
Contact Name: Nick Catubiano, Luke Brevu

Project Name/No: N5191
Purchase Order No:
Results Required By: Next day / 3 days / (Standard) (Single one)
Telephone: Nick's mobile: 0416 680 375 Luke's mobile: 0455 485 502
Facsimile:
Email Results: [Read Comment section]

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH	BTEX	Heavy Metals	OCP/OPP	Asbestos
BH1.1	15.10.21	1		✓		2	✓	✓	✓	✓	✓
BH1.2	"	2		✓		1	✓	✓	✓	✓	
BH2.1	"	3		✓		2	✓	✓	✓	✓	✓
BH2.2	"	4		✓		1	✓	✓	✓	✓	
BH3.1	"	5		✓		2	✓	✓	✓	✓	✓
BH3.2	"	6		✓		1	✓	✓	✓	✓	
BH4.1	"	7		✓		2	✓	✓	✓	✓	✓
BH4.2	"	8		✓		1	✓	✓	✓	✓	
BH5.1	"	9		✓		2	✓	✓	✓	✓	✓

SGS EHS Sydney COC
SE224700

Relinquished By:	Date/Time:	Received By: George Zhi	Date/Time: 15/10/21 @ 3:25pm
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: (Yes) / No	Temperature: Ambient / (Chilled)	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:

Comments: Email Reports and Invoices to all emails =>
① Nick@neoconsulting.com.au
② Luke@neoconsulting.com.au
③ admin@neoconsulting.com.au
④ Oskar@neoconsulting.com.au
⑤ sarah@neoconsulting.com.au
⑥ Ehsan@neoconsulting.com.au

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 2 of 2

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: NEO Consulting Pty Ltd
Address: 186 Riverstone Parade, Riverstone, NSW, 2765
Contact Name: Nick Caltabiano, Luke Brevu

Project Name/No: N5191
Purchase Order No:
Results Required By: Next day / 3 days / Standard (Circle One)
Telephone: Nick's mobile: 0416 680 375 Luke's mobile: 0455 485 502
Facsimile:
Email Results: [Read Comment section]

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH	BTEX	Heavy Metals	OCP/OPP	Asbestos
BH5.2	15-10-21	10		✓		1	✓	✓	✓	✓	
BH6.1	"	11		✓		2	✓	✓	✓	✓	✓
BH6.2	"	12		✓		1	✓	✓	✓	✓	
D1	"	13		✓		1	✓	✓	✓	✓	

Relinquished By:	Date/Time:	Received By: George Zhi	Date/Time 15/10/21 @ 3.25pm
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: (Yes) No	Temperature: Ambient / (Chilled)	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments: Email Reports and Invoices to all emails => ① Nick@neoconsulting.com.au ② Luke@neoconsulting.com.au ③ admin@neoconsulting.com.au ④ Oskar@neoconsulting.com.au ⑤ sarah@neoconsulting.com.au ⑥ Ehsan@neoconsulting.com.au		

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Admin
Client	NEO CONSULTING PTY LTD
Address	PO BOX 279 RIVERSTONE NSW 2765
Telephone	0416 680 375
Facsimile	(Not specified)
Email	admin@neoconsulting.com.au
Project	**N5191**
Order Number	**N5191**
Samples	13

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE224700 R0**
Date Received	15/10/2021
Date Reported	22/10/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Bennet LO
Senior Chemist

Kamrul AHSAN
Senior Chemist

Ly Kim HA
Organic Section Head

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

Shane MCDERMOTT
Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 18/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 18/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 18/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

OC Pesticides in Soil [AN420] Tested: 18/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 18/10/2021 (continued)

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 18/10/2021 (continued)

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1	<1

OP Pesticides in Soil [AN420] Tested: 18/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 21/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
Arsenic, As	mg/kg	1	5	5	5	5	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.7	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	15	15	14	14	14
Copper, Cu	mg/kg	0.5	20	19	62	19	22
Lead, Pb	mg/kg	1	17	17	60	12	20
Nickel, Ni	mg/kg	0.5	5.5	5.5	8.1	4.2	8.6
Zinc, Zn	mg/kg	2	39	52	340	26	86

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
Arsenic, As	mg/kg	1	5	5	6	5	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	14	13	12	14	13
Copper, Cu	mg/kg	0.5	19	21	17	25	170
Lead, Pb	mg/kg	1	13	16	12	18	20
Nickel, Ni	mg/kg	0.5	5.2	7.9	3.9	6.1	6.9
Zinc, Zn	mg/kg	2	38	31	21	42	60

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
Arsenic, As	mg/kg	1	4	4	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	12	13	14
Copper, Cu	mg/kg	0.5	19	22	17
Lead, Pb	mg/kg	1	27	21	13
Nickel, Ni	mg/kg	0.5	9.9	9.8	4.0
Zinc, Zn	mg/kg	2	68	44	22

Mercury in Soil [AN312] Tested: 21/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 18/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH1.2 SOIL - 15/10/2021 SE224700.002	BH2.1 SOIL - 15/10/2021 SE224700.003	BH2.2 SOIL - 15/10/2021 SE224700.004	BH3.1 SOIL - 15/10/2021 SE224700.005
% Moisture	%w/w	1	13.2	14.3	26.5	21.1	22.4

PARAMETER	UOM	LOR	BH3.2 SOIL - 15/10/2021 SE224700.006	BH4.1 SOIL - 15/10/2021 SE224700.007	BH4.2 SOIL - 15/10/2021 SE224700.008	BH5.1 SOIL - 15/10/2021 SE224700.009	BH5.2 SOIL - 15/10/2021 SE224700.010
% Moisture	%w/w	1	20.1	21.3	19.4	18.3	19.7

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011	BH6.2 SOIL - 15/10/2021 SE224700.012	D1 SOIL - 15/10/2021 SE224700.013
% Moisture	%w/w	1	12.6	12.8	20.3

Fibre Identification in soil [AN602] Tested: 21/10/2021

PARAMETER	UOM	LOR	BH1.1 SOIL - 15/10/2021 SE224700.001	BH2.1 SOIL - 15/10/2021 SE224700.003	BH3.1 SOIL - 15/10/2021 SE224700.005	BH4.1 SOIL - 15/10/2021 SE224700.007	BH5.1 SOIL - 15/10/2021 SE224700.009
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH6.1 SOIL - 15/10/2021 SE224700.011
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection/reporting limit (RL) of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit (RL) of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

APPENDIX D

Proposed Plans and Relevant Site Data

Proposed 12 Rooms Boarding House
at 227 Bungarribee Rd Blacktown NSW

Gus Fares Architects PL

ACN 112691237
Tel: 02 9160 9250
email: gus@gfares.com

Notes:
1. Do not scale the drawings, read all dimensions shown.
2. The contractor shall check and verify all dimensions before commencing new work, and shall ask if in doubt.
3. The contractor shall comply with all relevant Australian Standards (AS) and the Building Code of Australia (BCA).
4. This document is for the purpose of Development Application approval only. They cannot be used as construction documents, tender documents,contract administration drawings, nor workshop drawings.
5. All sheets should be read as one document. For any discrepancy, the project manager should inform the architect immediately.
6. Note that ground levels may vary due to site conditions.

Issue	Description	Date
A	DA Lodgement	02/2021
B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Cover Page

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL/GF

Printed 9/09/2021 5:01:11 PM

Checked by GF

A000

Scale

Drawing : DA

Issue D

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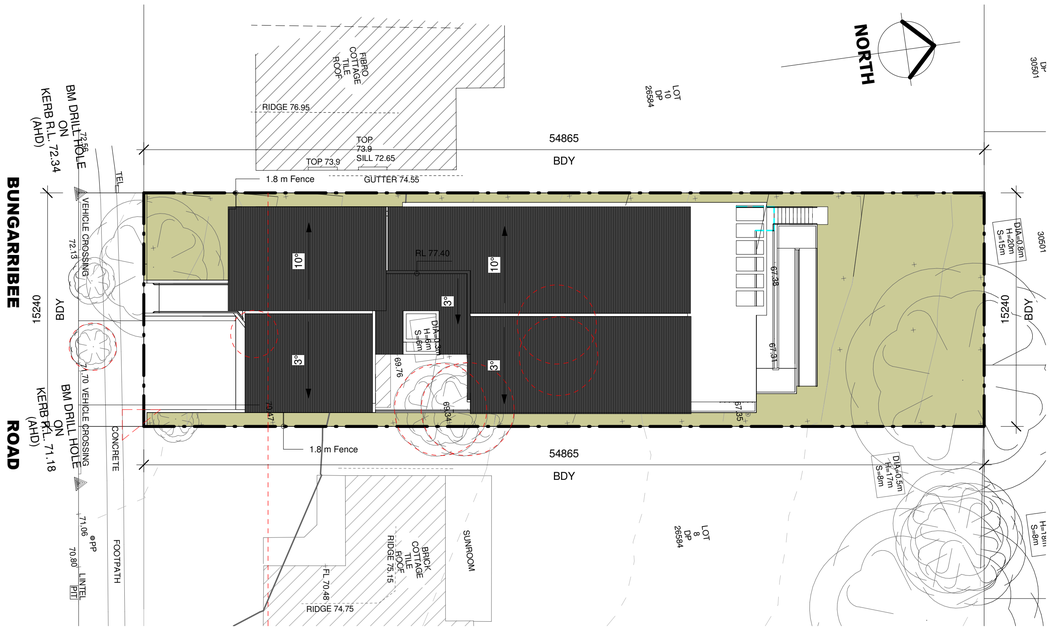
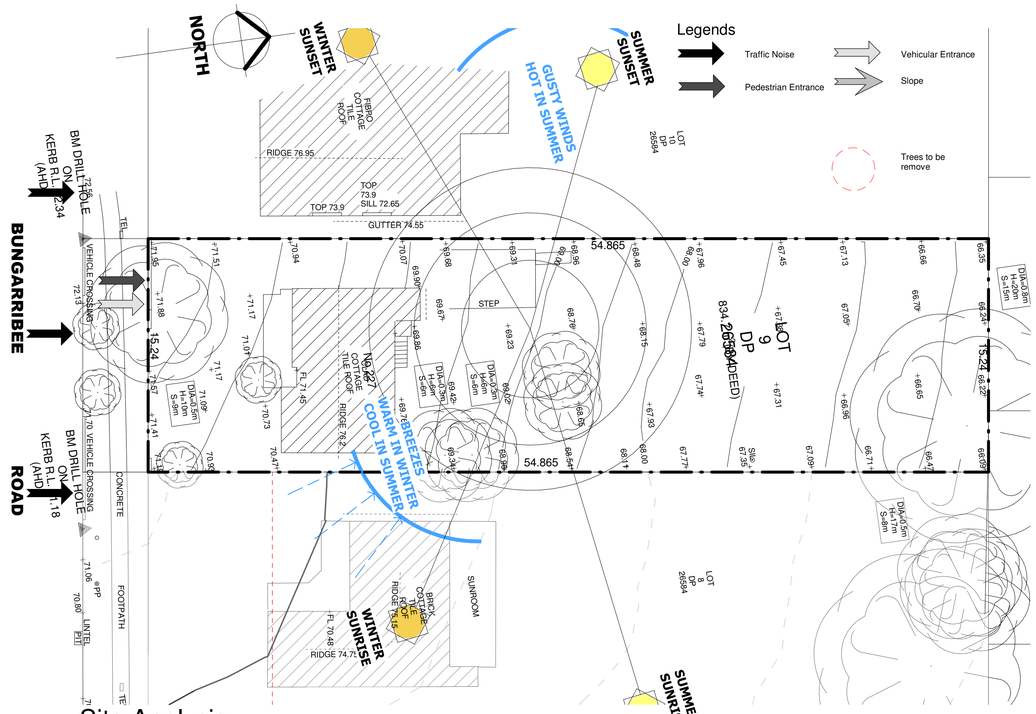
EEC
EVERGREEN ENERGY CONSULTANTS

9/09/2021 5:01:11 PM



1 Site Plan
1 : 200



2 Site Analysis
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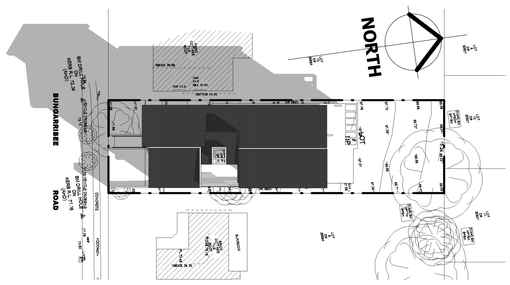
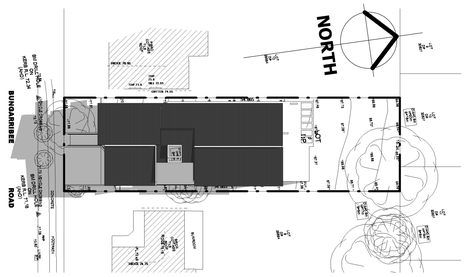
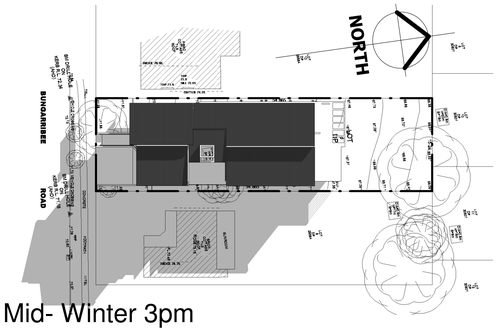


7 Mid- Winter 9am
1 : 500



6 Mid- Winter 12pm
1 : 500



5 Mid- Winter 3pm
1 : 500

General Information	
Council	Blacktown City Council
Project Address	227 Bungarribee Road, Blacktown
Site area	834.7 m²
Maximum allowable FSR	No FSR Control
Maximum allowable GFA	Maximum allowable GFA
Heritage	Not Applicable
HOB	9 m
Zoning	R2 - Low Density Residential
Site Frontage	15.24 m
Deep Soil	No Deep Soil Control
Landscaping	No Landscaping Control
Communal Open Space	20 m²

Proposal

	Manager	Double Lodger	Total	
Room Numbers	1	11	12 (24 Persons)	Rooms (incl. accessible rooms)
Accessible Rooms	2		2	Rooms
Proposed GFA			528.2	m²
Proposed FSR			No FSR Control	
Carpark (Residential)	0.5 parking space/room		6	Residential Car Spaces
			6	Total Car Spaces
Carpark (Shared area)	1		1	Shared area
Motorcycle	0.2 space/room		3	Motorcycle Spaces
Bycicle carpark	0.2 space/room		3	Bicycle Spaces
Deep Soil			234	m²
Landscape			234	m²
Communal Open Space			220	m²

227 Bungarribee Road, Blacktown
SUMMARY OF BASIX COMMITMENTS
This is a summary of the BASIX Commitments as detailed in the BASIX Certificate.
Refer to the CURRENT BASIX Certificate for Complete details.

WATER COMMITMENTS					
Fixtures					
Alternative Water – None					
Fixtures					
4 Star Shower Heads	4 Star Toilet	4 Star Kitchen Taps	4 Star Basin Taps		
THERMAL COMFORT COMMITMENTS - Refer to TPA Specification on plans					
ENERGY COMMITMENTS					
Hot Water	Gas instantaneous 3 star				
Cooling System	Living	None			
	Bedrooms	None			
Heating System	Living	None			
	Bedrooms	None			
Ventilation	Bathrooms	Fan ducted to roof/facade	Manual on/off		
	Kitchen	Fan ducted to roof/facade	Manual on/off		
	Laundry	Not Applicable			
Natural Lighting	Window/Skylight in Kitchen		As Drawn		
	Window/Skylight in Bathrooms/Toilets		As Drawn		
Artificial Lighting (Primarily lit by fluoro or LED)	Number of bedrooms	1	Dedicated	No	
	Number of Living/Dining rooms	1	Dedicated	No	
	Kitchen	Yes	Dedicated	No	
	All Bathrooms/Toilets	Yes	Dedicated	No	
	Laundry	Yes	Dedicated	No	
	All Hallways	Yes	Dedicated	No	
OTHER COMMITMENTS					
Outdoor clothes line	No	Indoor or sheltered clothes drying line	No		
Stove/Oven	Electric cooktop, electric oven				
Other	Central photovoltaic system to generate minimum 10 kW of electricity				

Glazing Reccomendation from the Acoustic Report prepared by Far West Consulting Engineers

Ground Level -
- **Facade to Road - Bedroom** - 8.38 mm VLam with Acoustic seals and min. R_w or STC Rating of 34
- **West Elevation - Bedroom & Kitchen** - 8.38 mm VLam with Acoustic seals and min. R_w or STC Rating of 34
- **East & West Elevation - Bedroom & all glazing** - 6.38 mm VLam with Acoustic seals and min. R_w or STC Rating of 32

First Level -
- Facade to Road - Bedroom - 8.38 mm VLam with Acoustic seals and min. R_w or STC Rating of 34
- **East & West Elevation - Bedroom & Kitchen** - 8.38 mm VLam with Acoustic seals and min. R_w or STC Rating of 34
- **East & West Elevation - Bedroom & all Kitchen** - 6.38 mm VLam with Acoustic seals and min. R_w or STC Rating of 32

CERTIFIED BY
EEC EVERGREEN ENERGY CONSULTANTS

Gus Fares Architects PL
ACN 112691237
Tel: 02 9160 9250
email: gus@gfares.com

Notes:
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B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021
	Calculation revised to reflect amendments	

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Site Information

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL/GF

Printed 9/09/2021 5:01:17 PM

Checked by GF

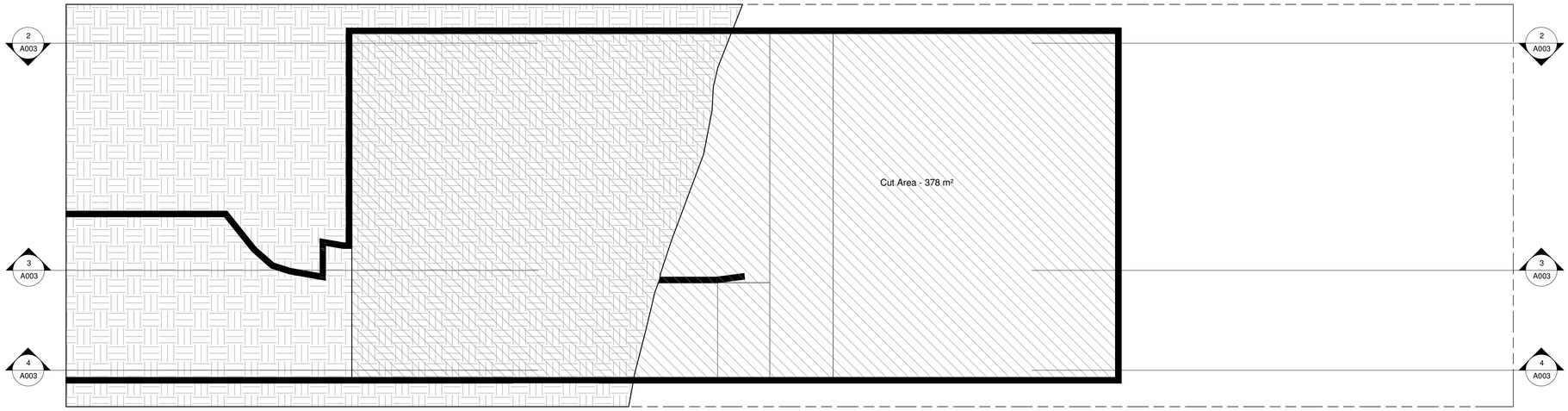
A001

Scale As indicated

Drawing : DA

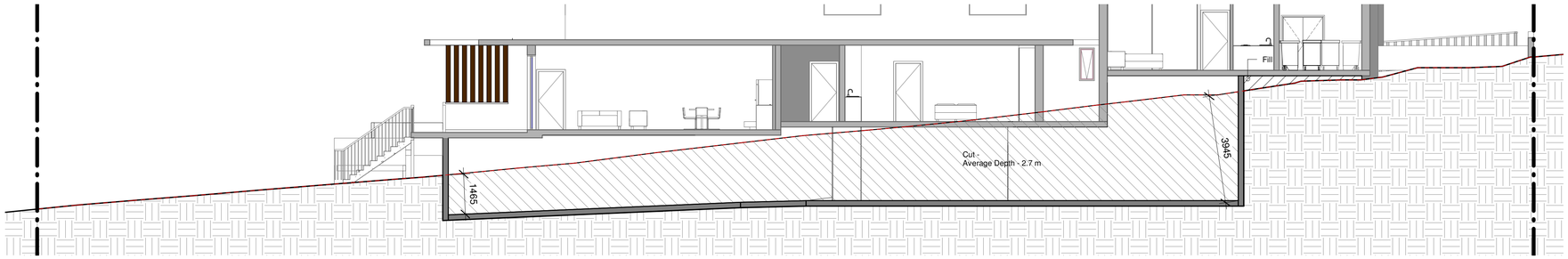
Issue D

9/09/2021 5:01:17 PM



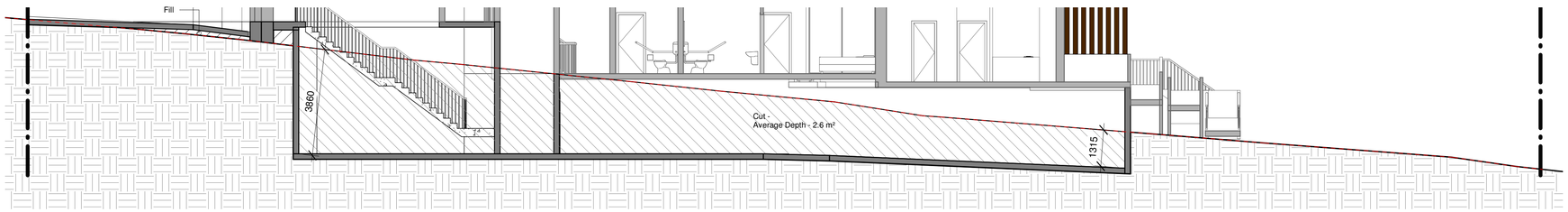
1 Level B1 Plan

1 : 100



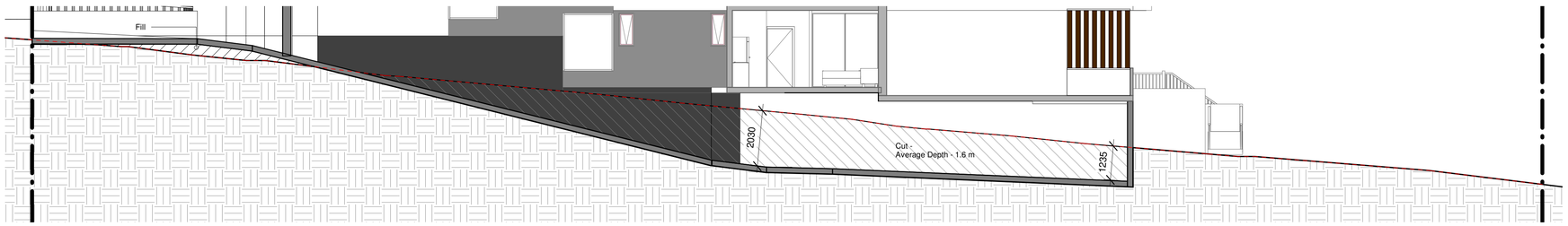
2 Cut & Fill - AA

1 : 100



3 Cut & Fill - BB

1 : 100



4 Cut & Fill - CC

1 : 100

Gus Fares Architects PL

ACN 112691237
Tel: 02 9160 9250
email: gus@gfares.com

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Issue	Description	Date
A	DA Lodgement	02/2021
B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Cut & Fill

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL

Printed 9/09/2021 5:01:18 PM

Checked by GF

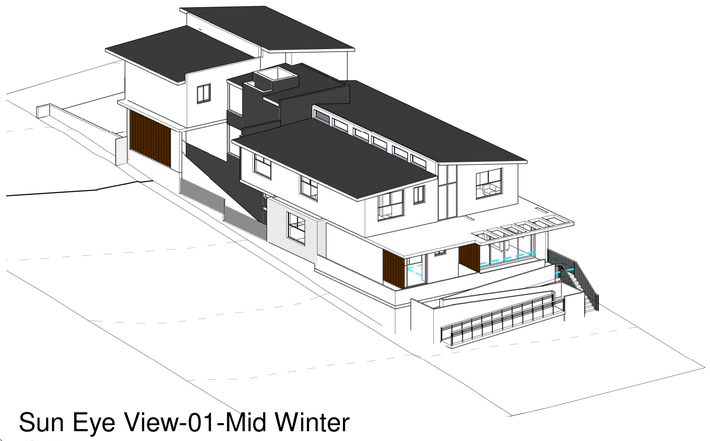
A003

Scale 1 : 100

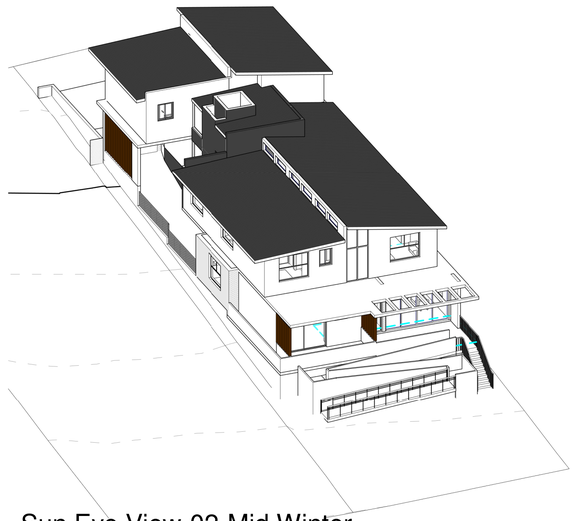
Drawing : DA

Issue D

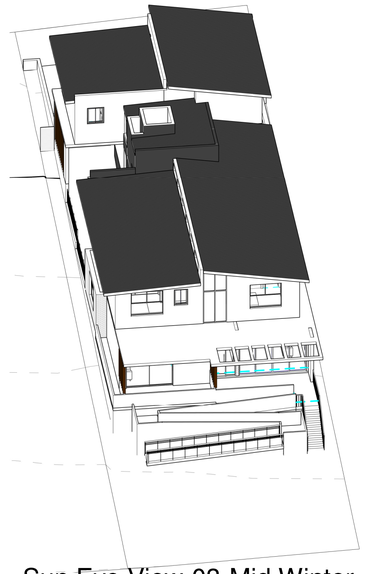
9/09/2021 5:01:18 PM



1 Sun Eye View-01-Mid Winter
@ 9 am

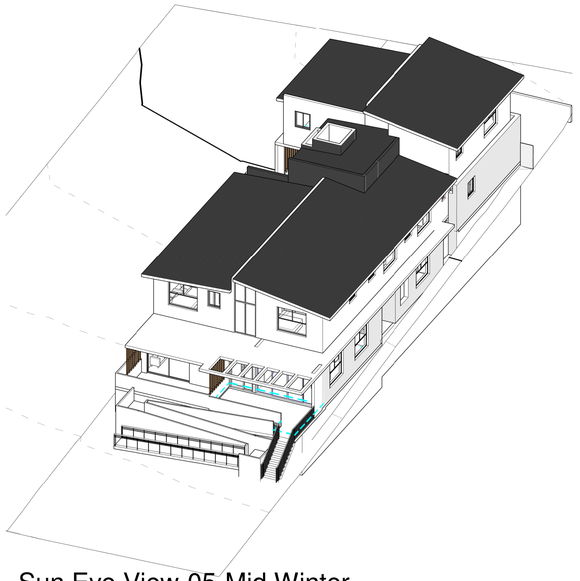


2 Sun Eye View-02-Mid Winter
@ 10 am

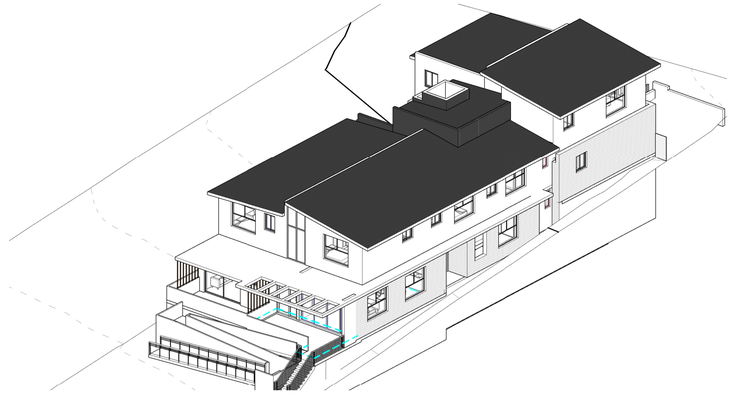


3 Sun Eye View-03-Mid Winter
@ 11 am

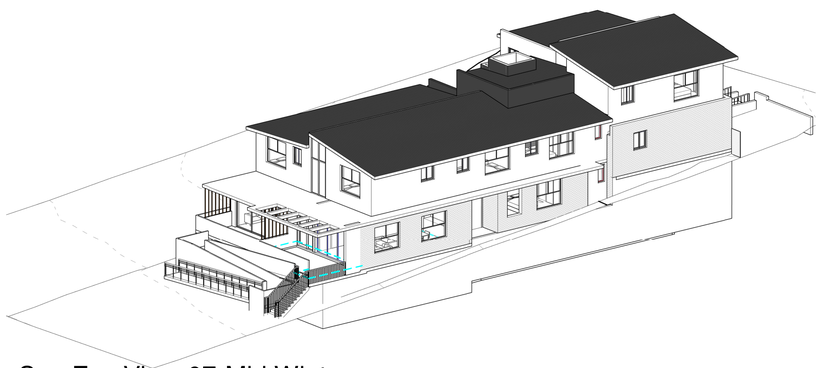
4 Sun Eye View-04-Mid Winter
@ 12 pm



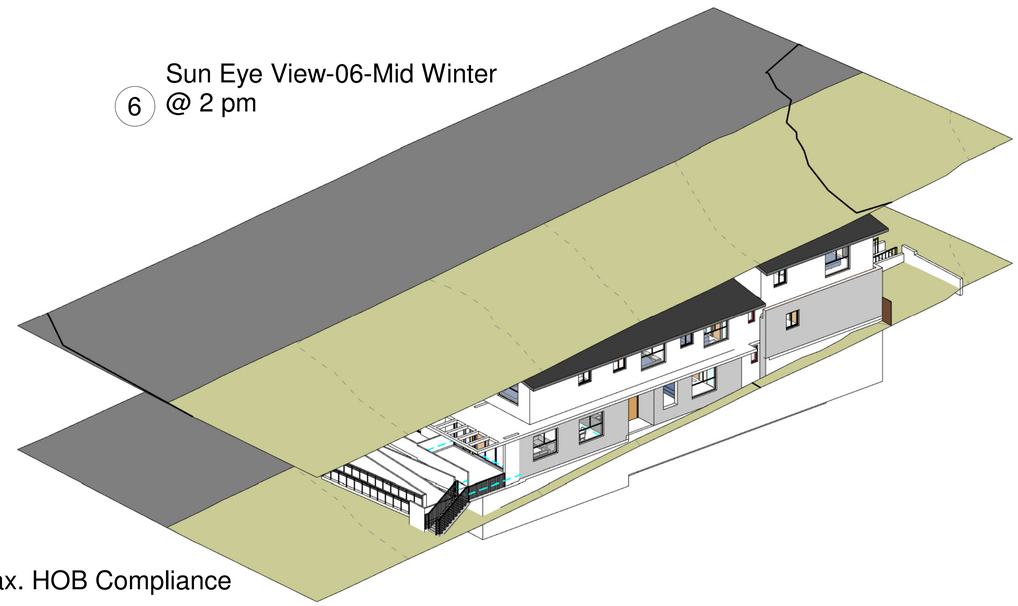
5 Sun Eye View-05-Mid Winter
@ 1 pm



6 Sun Eye View-06-Mid Winter
@ 2 pm



7 Sun Eye View-07-Mid Winter
@ 3 pm



8 9 m max. HOB Compliance
1 : 1

Gus Fares Architects PL

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email: gus@gfares.com

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B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021
	9 m max. HOB compliance 3D perspective provided	

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Sun Eye Views/ HOB Compliance

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL

Printed 9/09/2021 5:01:24 PM

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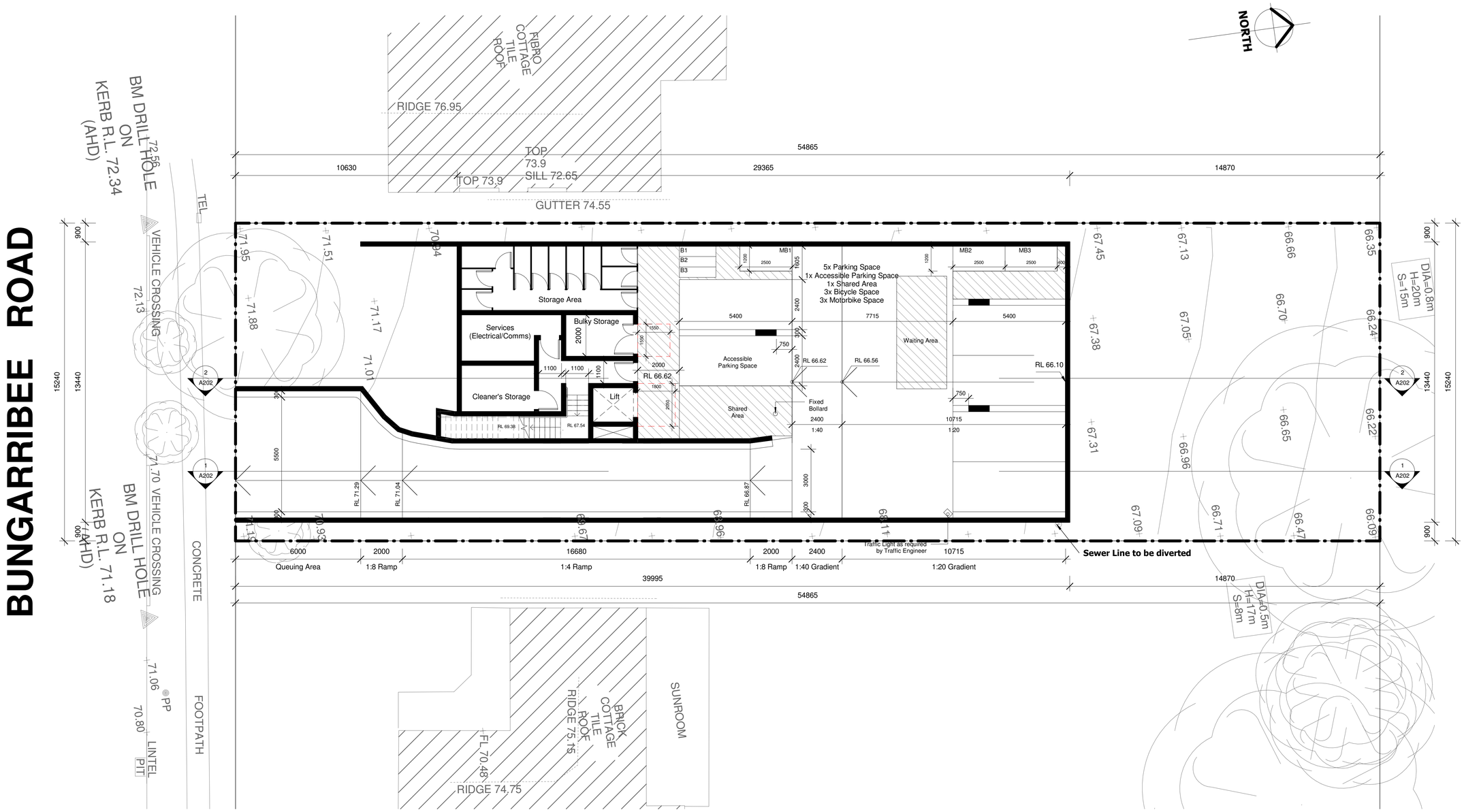
A004

Scale 1 : 1

Drawing : DA

Issue D

9/09/2021 5:01:24 PM



1 Basement Level Plan

1 : 100

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Gus Fares Architects PL

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Issue	Description	Date
A	DA Lodgement	02/2021
B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021

Client: Krishathi Pty Ltd

Project: Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Basement Plans

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL/GF

Printed 9/09/2021 5:01:25 PM

Checked by GF

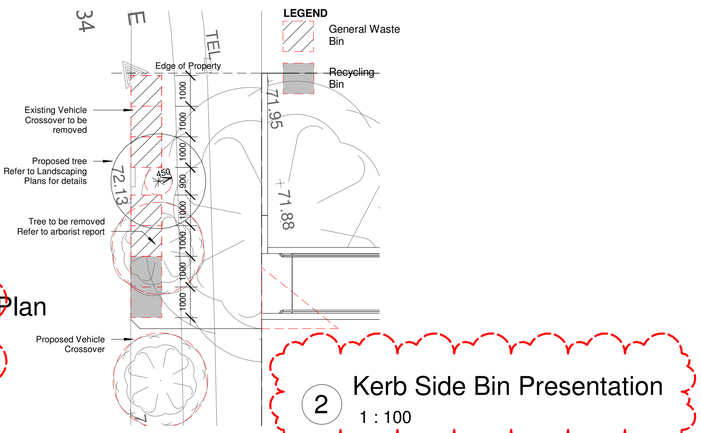
A101

Scale 1 : 100

Drawing : DA

Issue D

9/09/2021 5:01:25 PM



1 Ground Floor Plan
1 : 100

2 Kerb Side Bin Presentation
1 : 100

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ACN 112691237
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Issue	Description	Date
A	DA Lodgement	02/2021
B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021
	Manager's room provided	
	Door width to bin storage room increased to 1500 mm	
	Bin presentation along kerb	

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Ground Level Plan

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL/GF

Printed 9/09/2021 5:01:26 PM

Checked by GF

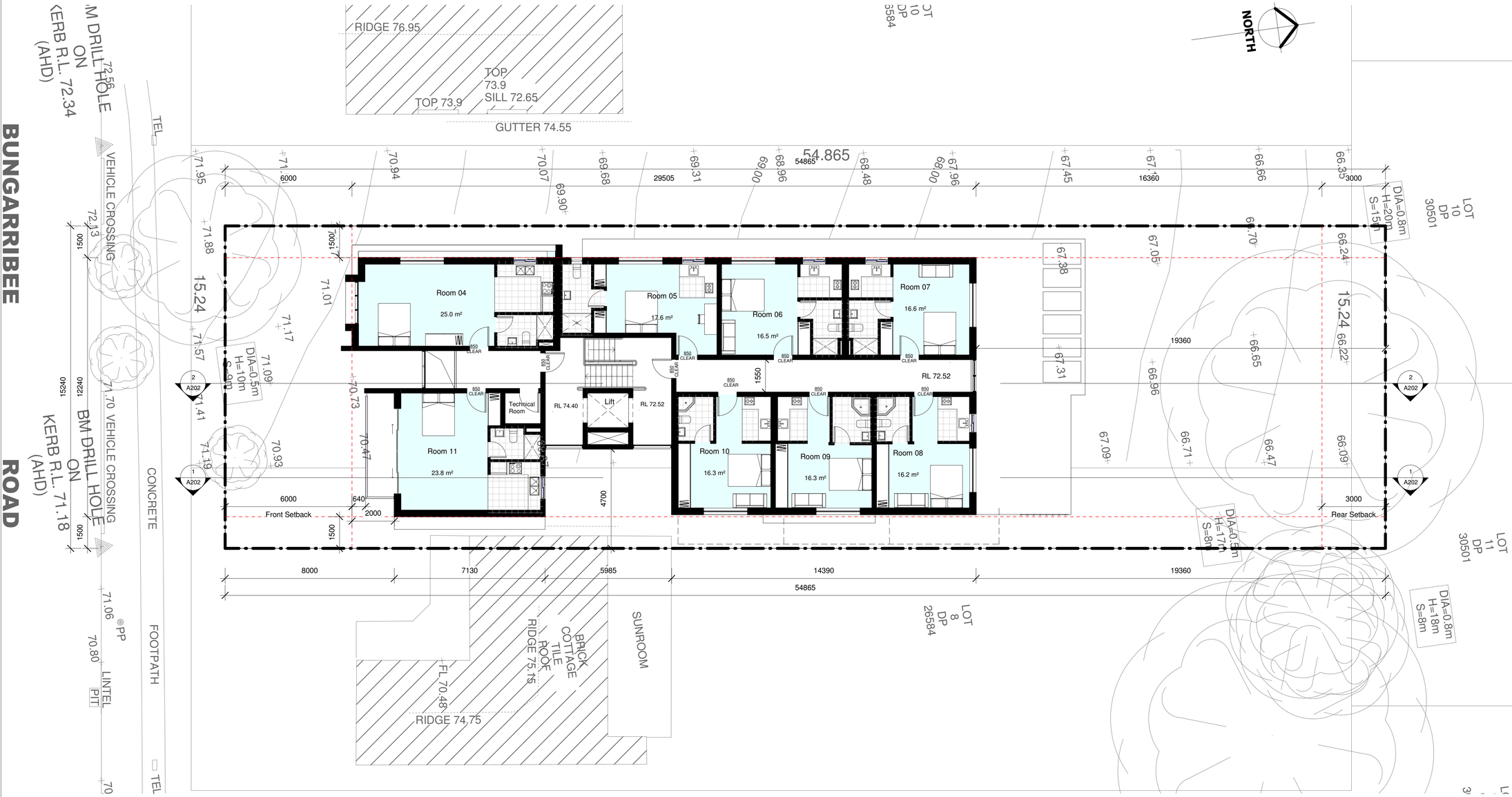
A102

Scale 1 : 100

Drawing : DA

Issue D

9/09/2021 5:01:26 PM



1 First Floor Plan
1 : 100

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ACN 112691237
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Issue	Description	Date
A	DA Lodgement	02/2021
B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021
	Room area for all single rooms increased to be > 16 m²	

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

First Floor Plan

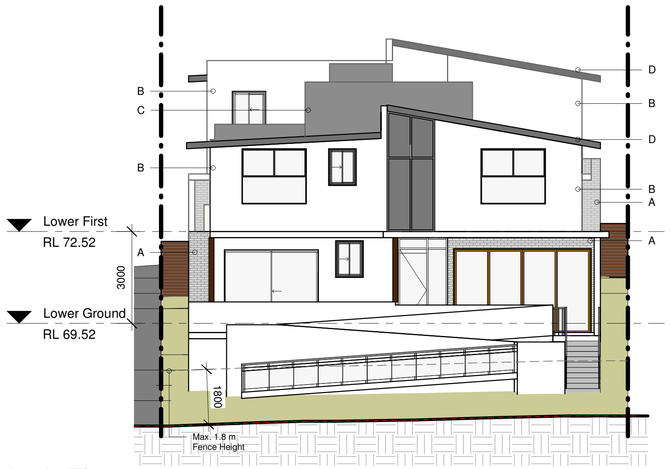
FOR DA ONLY

Project number	2020-19
Date	Feb-2021
Drawn by	SL/GF
Printed	9/09/2021 5:01:27 PM
Checked by	GF

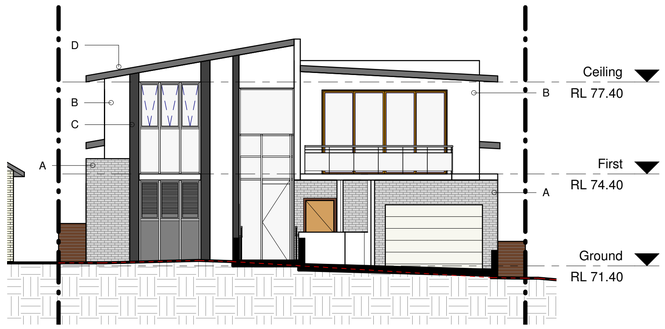
A103

Scale	Drawing :	Issue
1 : 100	DA	D

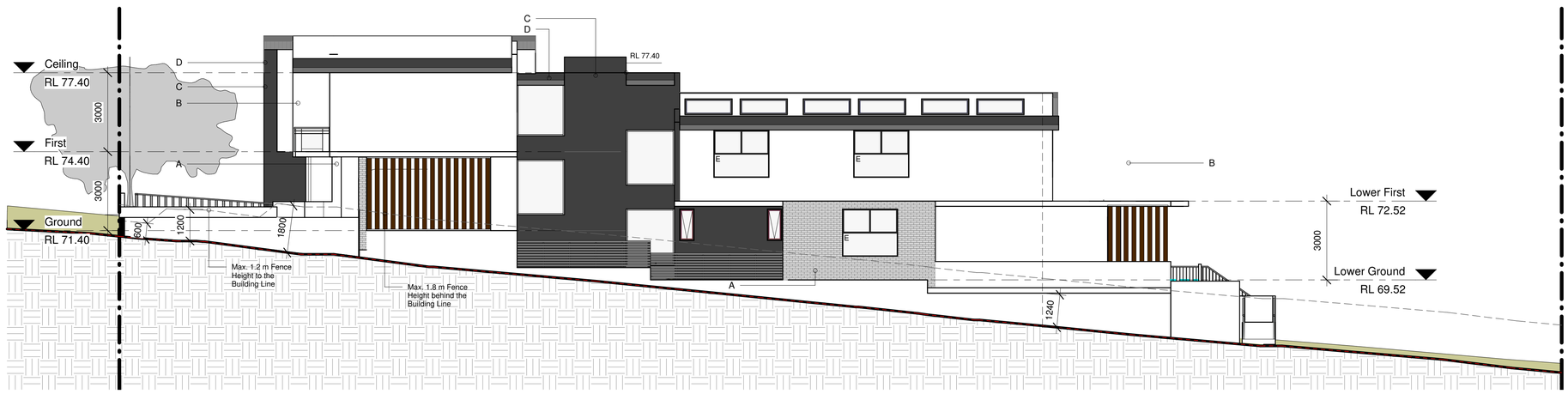
9/09/2021 5:01:27 PM



1 North Elevation
1 : 100



2 South Elevation
1 : 100



3 East Elevation
1 : 100

4 West Elevation
1 : 100

Schedule of Finishes

A.	Face Brick - Bowral Bricks Bowral Dry Pressed - Brahman Granite or Similar
B.	Render & Paint Dulux - Vivid White or Similar
C.	Render & Paint Dulux - Domino or Similar
D.	Metal Roof Colorbond - Basalt or Similar
E.	Frosted Glass

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Issue	Description	Date
A	DA Lodgement	02/2021
B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021
	Elevations revised to reflect amendments	

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Elevations

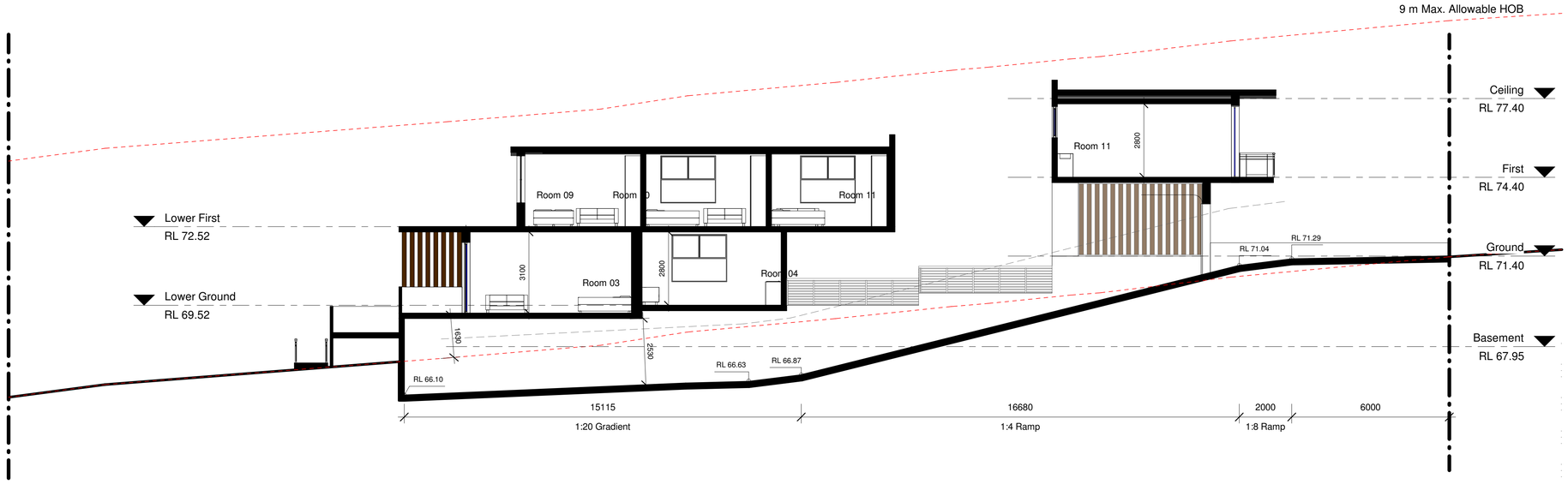
FOR DA ONLY

Project number	2020-19
Date	Feb-2021
Drawn by	SL/GF
Printed	9/09/2021 5:01:30 PM
Checked by	GF

A201

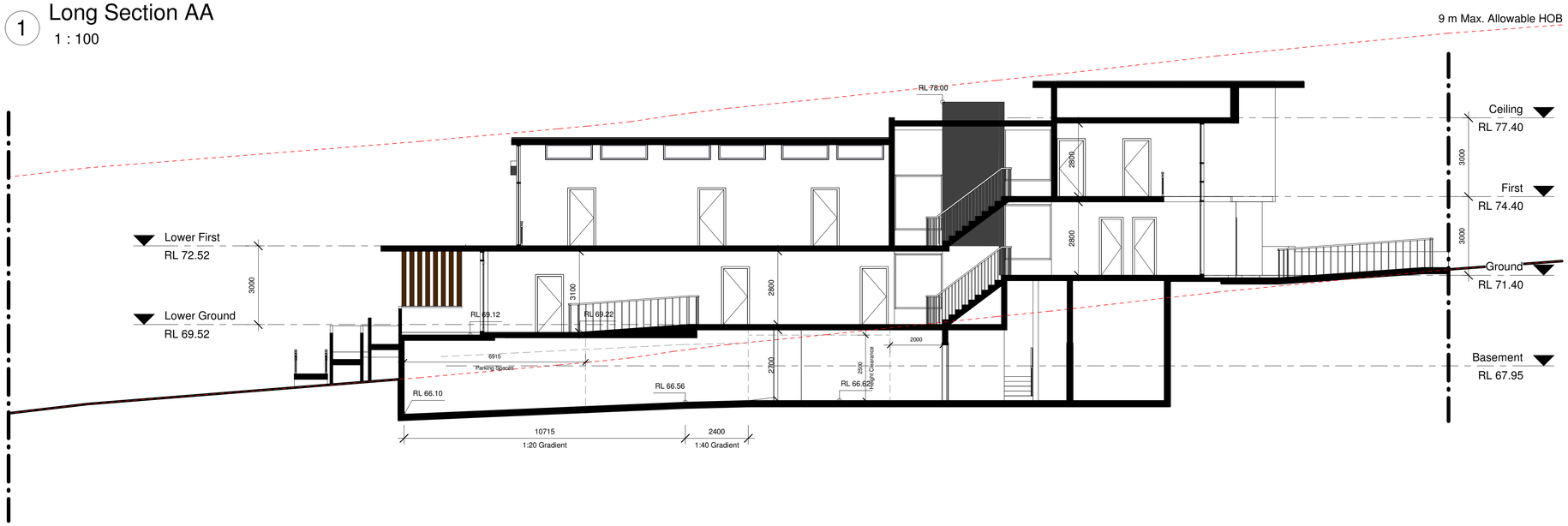
Scale	Drawing :	Issue
1 : 100	DA	D

9/09/2021 5:01:30 PM



1 Long Section AA

1 : 100



2 Long Section BB

1 : 100

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B	DA Amendments	03/2021
C	LEC Amendments	08/2021
D	LEC Amendments	08/2021
	Sections revised to reflect amendments	

Client
Krishathi Pty Ltd

Project
Proposed Boarding House Development at 227 Bungarribee Road Blacktown Pursuant to ARHSEPP 2009

Sections

FOR DA ONLY

Project number 2020-19

Date Feb-2021

Drawn by SL/GF

Printed 9/09/2021 5:01:30 PM

Checked by GF

A202

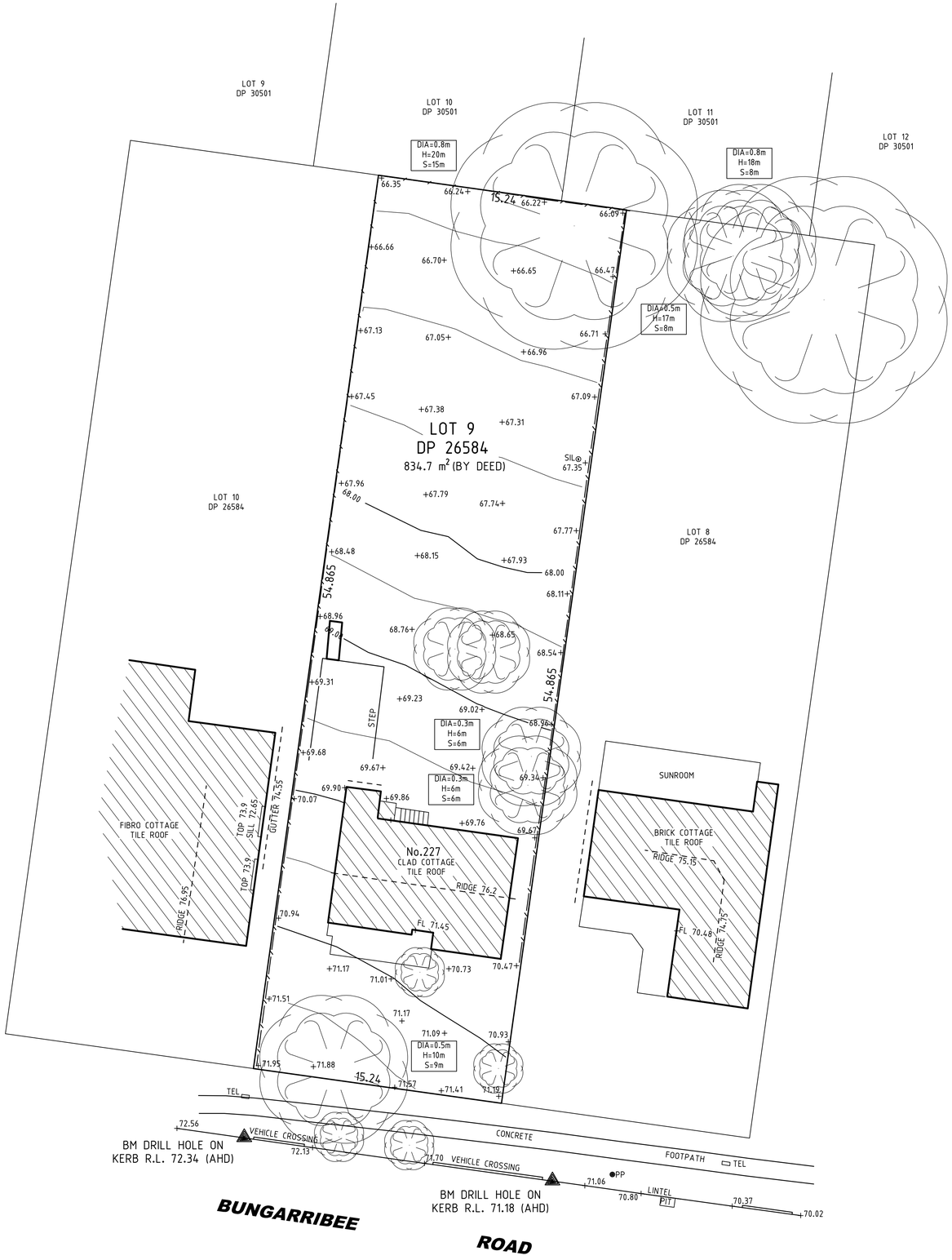
Scale 1 : 100

Drawing : DA

Issue D

9/09/2021 5:01:30 PM

WARNING
THIS PLAN IS NOT AN IDENTIFICATION SURVEY AND MUST NOT BE USED AS SUCH.
THE BOUNDARIES HAVE NOT BEEN INVESTIGATED NOR MARKED.
SCALING (DIGITALLY OR OTHERWISE) IS UNACCEPTABLE - ASK IF IN DOUBT.
THE DIGITAL PDF VERSION CONSTITUTES THE ORIGINAL DOCUMENT.
NO RE-ISSUE OF DELIVERABLES WILL BE MADE - UNLESS UNDER REVISION BY ABD



DIAL BEFORE YOU DIG
www.1100.com.au

IMPORTANT NOTES:

a) The cadastral overlay shown on this plan has not been established by survey and is shown in approximate positions only. If any structure is to be erected upon the land then the boundary corners MUST be marked.
b) Underground services have not been surveyed and, if shown, are in approximate positions only. End users are warned to establish line and depth of buried assets prior to any excavation works. A "dial before you dig" search MUST be made before any construction works can commence.
c) Windows, doors, roof profiles and elevated structures are surveyed by remote measurement and are shown in indicative positions only. All detail (including levels) shown on this plan MUST NOT be used for accurate design purposes unless verified on-site before hand.
d) All spot levels shown are based on Australian Height Datum (origin SSM 2900 RL 75.014)
e) Contours show indicative relief patterns only and are not to be used for level interpolation.
f) Contour interval = 0.5

I, ROSS ALBERT ROBINSON, hereby certify that the land comprised in this plan was surveyed under my supervision and in accordance with Part 2 Division 1 Clause 9(1) of the Surveying & Spatial Information Regulation, 2017 and was completed on: 02/12/2020

Registered Land Surveyor
BOSSI ID: SU001922
Date 20/12/2020

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE
SCALE: 1:50
3 1.5 0 3 6 9 12 15

AB DIMENSIONS

AB DIMENSIONS PTY LTD
Engineering Surveyors
Sydney Office: 115 Waminda Avenue, Campbelltown 2560
Email: abdimensions@hotmail.com Contact: 0426262332

A.B.	A.B.	R.R.	ISSUED FOR INFORMATION PURPOSES ONLY			02/12/20	A
SURVEY	DRAWN	CHKD	AMENDMENTS	EXAMD	APPD	DATE	No.

CLIENT: GUS FARES ARCHITECTS

TITLE: DETAIL SURVEY OF LAND AT 227 BUNGARRIBEE ROAD, BLACKTOWN NSW 2148

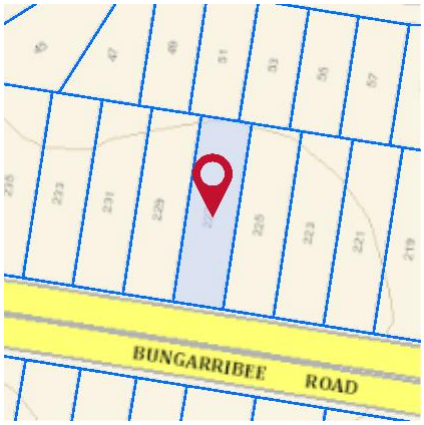
SCALE: 1 : 150

DRAWING No.: A1-20204-1-A

SHEET: 1 of 1 | A1

Property Report

227 BUNGARRIBEE ROAD BLACKTOWN 2148



Property Details

Address:	227 BUNGARRIBEE ROAD BLACKTOWN 2148
Lot/Section /Plan No:	9/-/DP26584
Council:	BLACKTOWN CITY COUNCIL

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Blacktown Local Environmental Plan 2015 (pub. 26-5-2015)
Land Zoning	R2 - Low Density Residential: (pub. 26-5-2015)
Height Of Building	9 m
Floor Space Ratio	NA
Minimum Lot Size	450 m²
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA
Local Provisions	30 km

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

- State Environmental Planning Policy (Affordable Rental Housing) 2009: Land Application (pub. 31-7-2009)
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application (pub. 25-6-2004)
- State Environmental Planning Policy (Concurrences and Consents) 2018: Land Application (pub. 21-12-2018)

- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017: Land Application (pub. 1-9-2017)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004: Land Application (pub. 31-3-2004)
- State Environmental Planning Policy (Infrastructure) 2007: Land Application (pub. 21-12-2007)
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007: Land Application (pub. 16-2-2007)
- State Environmental Planning Policy (Primary Production and Rural Development) 2019: Land Application (pub. 28-2-2019)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Excluded (pub. 17-9-2021)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land (pub. 25-8-2017)
- State Environmental Planning Policy No 19—Bushland in Urban Areas: Land Application (pub. 24-10-1986)
- State Environmental Planning Policy No 21—Caravan Parks: Land Application (pub. 24-4-1992)
- State Environmental Planning Policy No 33—Hazardous and Offensive Development: Land Application (pub. 13-3-1992)
- State Environmental Planning Policy No 36—Manufactured Home Estates: Land Application (pub. 16-7-1993)
- State Environmental Planning Policy No 50—Canal Estate Development: Land Application (pub. 10-11-1997)
- State Environmental Planning Policy No 55—Remediation of Land: Land Application (pub. 28-8-1998)
- State Environmental Planning Policy No 64—Advertising and Signage: Land Application (pub. 16-3-2001)
- State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development: Land Application (pub. 26-7-2002)
- State Environmental Planning Policy No 70—Affordable Housing (Revised Schemes): Land Application (pub. 31-5-2002)
- Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997): Land Application (pub. 7-11-1997)
- Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997): Sub Catchment Boundaries (pub. 7-11-1997)

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

1.5 m Buffer around Classified Roads	Classified Road Adjacent
Local Aboriginal Land Council	DEERUBBIN
Regional Plan Boundary	Greater Sydney

Job No 30694249

Phone: 1100
www.1100.com.au

Caller Details

Contact:	Nick Caltabiano	**Caller Id:**	3063293	**Phone:**	0423 834 874
Company:	Neo Consulting				
Address:	186 Riverstone Parade Riverstone NSW 2765	**Email:**	neo.searches.dbyd@gmail.com		

Dig Site and Enquiry Details

WARNING: The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

User Reference: Blacktown
Working on Behalf of: Private

Enquiry Date:	**Start Date:**	**End Date:**
13/10/2021	15/10/2021	29/10/2021

Address:
227 Bungarribee Road
Blacktown NSW 2148

Job Purpose:	**Onsite Activities:**
Excavation	Vertical Boring
Location of Workplace:	**Location in Road:**
Private	

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Notes/Description of Works:
Not supplied

Your Responsibilities and Duty of Care

- The lodgement of an enquiry does not authorise the project to commence. You must obtain all necessary information from any and all likely impacted asset owners prior to excavation.
- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at **www.1100.com.au**
- **For more information on safe excavation practices, visit www.1100.com.au**

Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days.
Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Dial Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.
** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.
# Asset owners highlighted with a hash # require that you call them to discuss your enquiry or to obtain plans.

Seq. No.	Authority Name	Phone	Status
204057000	Endeavour Energy	(02) 9853 4161	NOTIFIED
204057001	Jemena Gas West	1300 880 906	NOTIFIED
204056998	NBN Co NswAct	1800 687 626	NOTIFIED
204057002	Sydney Water	13 20 92	NOTIFIED
204056999	Telstra NSW Central	1800 653 935	NOTIFIED

END OF UTILITIES LIST