



GALCROSS ENGINEERING LTD  
1-3 Ferdinand Place - Air Monitoring proposal

# 1-3 Ferdinand Place

Air monitoring proposal

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Rev D

Client





## 1. INTRODUCTION

The purpose of this proposal is to put forward a monitoring system that will measure Dust and air quality levels both pre construction and during demolition and construction works

The monitoring will consist of the following items:

- Air quality Monitoring

The monitoring regime of the above systems is to be outlined in this document and be site specific for 1-3 Ferdinand Place – Firmitas Design And Build

First monitor installed on 18<sup>th</sup> January 2022 it was assumed that due to the nature of the site and the local proximity for back round readings one monitor would suffice, this decision was taken due to the small nature of the site and the site being on a small Cul De Sac restricting traffic flow to one lane, after collection of the data was established once demo/construction was due to start 2 no monitors was the intended process moving forward however as of the week commencing 18<sup>th</sup> April 2022 we have installed two no monitors both of which so far are collecting similar data readings

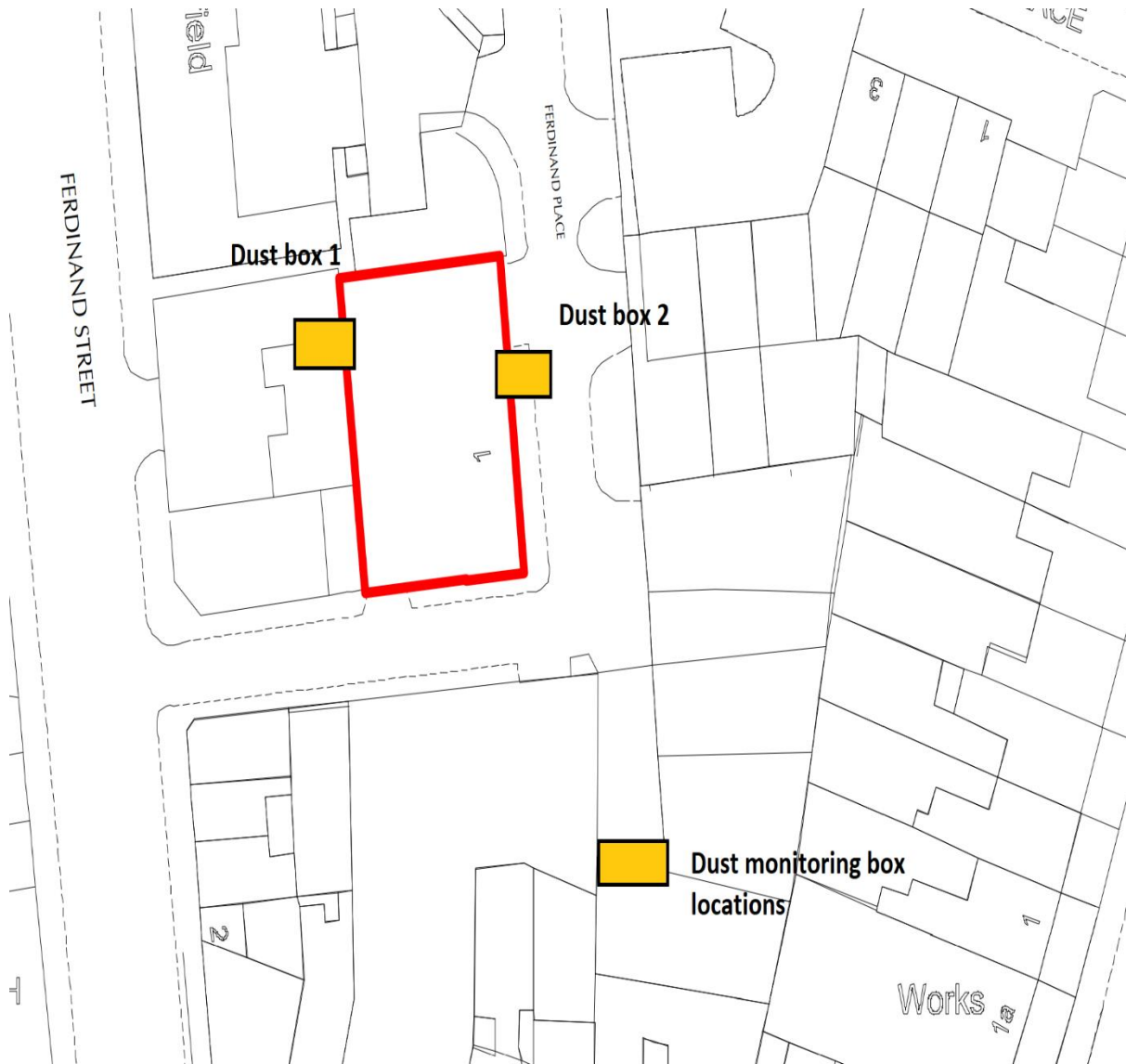


## 2. INSTALLATION

### 2.1 Control

DUST control units will be installed at locations shown

Figure1. to show pre construction dust monitoring system location

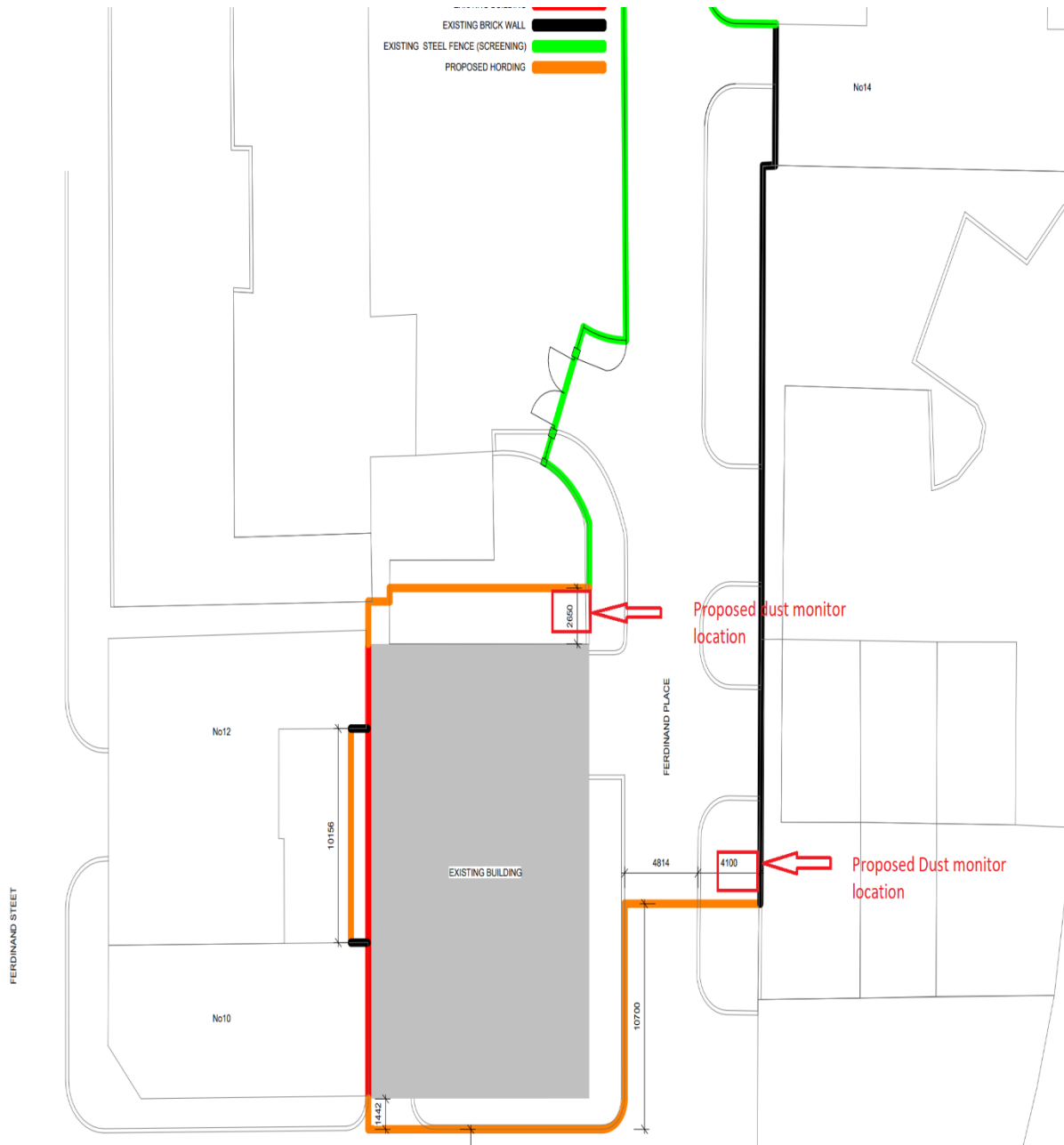




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Figure 2 to show moving the current two units during construction works





## Ambient air quality Monitoring

The Galcross Praxis/Urban unit offers an out-of-the-box solution for urban air quality monitoring. The Praxis answers both the challenge of capturing accurate data in variable climate conditions and the need for fine-grained air quality monitoring networks.

The Praxis/Urban offers ultra-low noise sensing for gasses (CO, H<sub>2</sub>S, NO, NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, CO<sub>2</sub>) and particulates (PM<sub>1</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>). The device supports multiple analysis techniques including any sampling rate and real-time access to comply with local authority regulations

Consistent device function is possible within a broad climate range (T/rH) with a casing rated for hostile environments. This includes continuous operation for up to 2 hours in the event of external power loss.

Use Praxis to build a high-density air quality network using low-cost, individually baselined devices that use open-source device firmware for highly customisable sensing, data delivery and analysis.





### **3. FREQUENCY AND DURATION OF READINGS**

The monitoring frequency is set to:

Hourly readings which will give the reports

- Daily – during preconstruction / background data of existing air quality levels
- Daily – during demolition and construction activities
- Monthly – after completion of the works and construction



#### 4. Trigger levels

##### Dust

##### Magnitude of Dust Emissions Demolition

The existing ground building will predominantly comprises brickwork and timber. The total building volume is less than 20,000 m<sup>3</sup> with the demolition activities being carried out at ground level and within the construction site. Therefore, site is considered to have a 'Medium' dust emission magnitude for demolition. Earthworks  
The site covers less than 2,500 m<sup>2</sup> and the total material moved is anticipated to be less than 20,000 tonnes. London Clay Formation (clay, silt and sand) and the Gravel Member (sand and gravel) [10] with a high potential for dust release. It is estimated there will be less than 5 heavy earth moving vehicles active at any one time. Spoil will be stored on-site and then transferred via an overhead conveyor and chuted into a waiting tipper lorry within the suspended on-street loading bay at the front of the property. The conveyor will be hoarded over the footway. The site is considered to have a 'Medium' dust emission magnitude for earthworks. Construction

For the formation of the new building, were required it is assumed concrete will be delivered to site ready-mixed and pumped over the hoarding and on to site. For smaller pours, the concrete may be mixed on site. Brickwork and timber will be used to construct and finish the construction. The site is considered to have a "Medium" dust emission magnitude for construction.

The number of heavy-duty vehicles (HDV) outward is predicted to be less than 10 per day and vehicles will remain on paved roads along Ferdinand Place and Ferdinand road, as there will be no on-site haul route. In light of this, the site is considered to have a 'Small' dust emission magnitude for track out.

The dust emission magnitudes for all activities is summarised in Table. Activity Dust Emission



Activity	Dust Emission Magnitude
Demolition	Medium
Earthworks	Medium
Construction	Medium
Trackout	Small

Nearby receptors are predominantly residential properties, which have a high sensitivity to dust soiling and health effects.

The sensitivity of the area to dust soiling for demolition, earthworks, construction and track out activities is assessed as 'High' and the sensitivity of the area to human health impacts from on-site and track out activities is assessed as 'High' due to the number and proximity of sensitive receptors and a background annual mean PM10 concentration of between 28 and 32  $\mu\text{g}\cdot\text{m}^{-3}$  in the vicinity of the site

Sensitivity of the Area	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	High	High	High	High

**TABLE 5.2: SENSITIVITY OF THE AREA ASSESSMENT**

### Dust Risk

The likely risk of dust effects, based on the contents of Table 5.1 and 5.2, at nearby sensitive receptors without mitigation in place is summarised in Table 5.3. There is a 'Medium' risk from demolition, earthworks and construction activities and a 'Low' risk from track out activities causing dust soiling effects at local receptors. There is a 'Medium' risk of health effects from demolition, earthworks and construction activities and a 'Low' risk from track out activities

Summary	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Medium Risk	Medium Risk	Low Risk
Human Health	Medium Risk	Medium Risk	Medium Risk	Low Risk

**TABLE 5.3: SUMMARY DUST RISK CATEGORY**





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From the above quick summary of potential works and risk to this site

The Praxis/Urban unit for air quality monitoring is recommended

The trigger level Guidance suggests that  $250 \mu\text{g m}^{-3}$  is set as a 15-minute mean for concentrations of PM10 close to construction sites as also stated in local authority guidelines



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## 5. REPORTS

The measurements are to be taken as per the proposed frequency at regular intervals and the results will be issued to the main contractor every week. They will also be issued to anyone on the site distribution list

The readings are to be put into a table format with graphical data; In addition to monthly reports, monitoring data will be remotely accessible to enable on-demand interrogation; however, this will only be possible if the site conditions allow a suitable signal to be achieved. Furthermore, instant email alerts will be sent to relevant site personnel when Site Action Levels are exceeded. System checks will be completed on the first working day of the week to ensure the monitors are functioning correctly and logging data.



## Dust

### Monitoring Dust

The dust units have been configured to record Particulate Matter (PM) size data continuously at given intervals (see installation details) with a flow rate of 1 litre per minute. The graph contains data of the PM<sub>10</sub>  $\mu\text{g}/\text{m}^3$  values, where  $\mu\text{g}/\text{m}^3$  is the micrograms per cubic meter, which is a measure of particle size. The PM<sub>10</sub> values depict the dust level in  $\mu\text{g}/\text{m}^3$  over pre-set time period.

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometres in diameter pose the greatest problems, because they can affect the lungs and heart. Larger particles are of less concern, although they can irritate the eyes, nose, and throat.

- **Fine particles (PM<sub>2.5</sub>).** Particles less than 2.5 micrometres in diameter are called "fine" particles. Sources of fine particles include all types of combustion, also motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. PM<sub>2.5</sub> contains more toxic heavy metals and hazardous organic pollutants and can go directly to the lungs. It is more easily attached to bacteria and viruses in the environment, so the particles have greater impact on ecology and human health.
- **Coarse dust particles.** Particles between 2.5 and 10 micrometres in diameter are referred to as "coarse." Sources of coarse particles include crushing or grinding operations, and dust stirred up by vehicles traveling on roads.

### How can particles affect your health?

Long-term exposure, is associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death.

Short-term exposure to particles (hours or days) can aggravate lung disease, cause asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposure is linked to heart attacks and arrhythmias. Healthy children and adults may experience temporary minor irritation when particle levels are elevated.

Dust 250 particles ( $\mu\text{g}/\text{m}^3$ )



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## Machine specifications



## Air mite

A unique sampling system.

This system provides real time monitoring for dust (pm10, pm2.5) and gases (choose from NO2, NO, O3, SO2, H2S, CO and CO2 by NDIR or VOC's by pid).

The system can support up to 4 cells and CO2 or 3 cell with a VOC detector plus CO2.

Data logging. This unit can sample at any frequency down to one sample per second. Data can be obtained remotely or data log locally.

Connectivity Wired (Ethernet) or wireless attachment

Power powered options 90 to 240v AC or 7- 24v DC ask about external power options- back up battery provides 2hours of power

Weight less than 1.5kg

Power for the site in question is 110 constant power required