Project Unique ID	**8681**
Site Name	**St Giles Circus**

Zone 3 - St Giles Circus

Environmental Monitoring

Ref: **8681-MM-04**

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1. Environmental Monitoring - Vibration

A vibration monitoring unit is to be installed at ground level in the Book Mews courtyard. The approximate location of the unit is shown on the sketch. It should ideally be placed as close as possible to a close neighbour, so as to gauge the most likely conditions they would be experiencing.

The vibration unit consists of a vibration monitoring logger component housed in a lockable weatherproof casing, which is coupled to an external geophone.

The geophone will be attached to a fixed part of a structure through either a mounting bracket, a small tripod mount or through a ground-spike if installed on lose ground.

An 110V or 240V power supply to the monitoring units will need to be provided by the client.

Vibration levels affecting the structure will be recorded by the geophone at their specified frequency by the data logging unit housed within the protective case.

Example of Vibration Monitoring Unit in Weatherproof case and external geophone

Single Screw Mounting bracket

Geophone on bracket

Geophone on small tripod base

Example of Vibration Unit installation on wall

2. Environmental Monitoring - *Noise*

A Sound level meter will be installed at the approximate location noted on the sketch below. The unit will consist of a lockable weatherproof casing, which will contain the sound level meter, modem, power supply and backup battery. An external microphone will also be attached. If required, the system may also contain an alarm module.

Mains power will be required in the form of a 110V or 240V supply.

Each unit contains a sim card allowing for remote data retrieval. There will be no requirement to access the unit other than routine maintenance.

The microphone is able to be detached from the logging unit, which allows for the unit to be located in a discreet location.

Example of Sound Meter within Weatherproof case and External Microphone

3. Environmental Monitoring - *Dust*

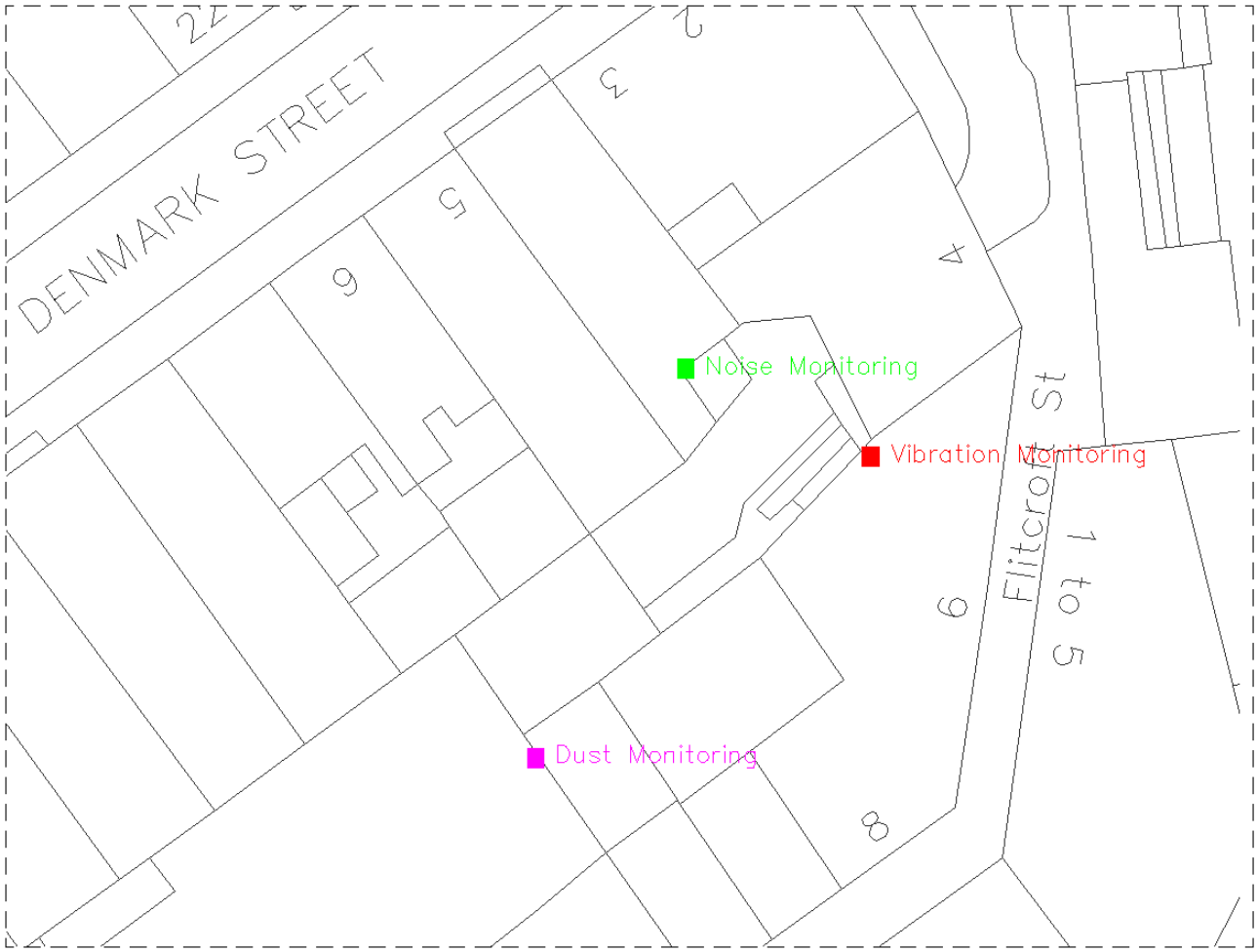
A Dust monitoring unit is to be located at a convenient location on site to sample the dust generated by the demolition and construction activities. An example position is marked on the sketch below.

The dust monitoring equipment is housed in a steel enclosure, which will then need to be attached a stable mounting surface. This is normally on the back of a hoarding, wall, scaffold tube, etc.

A 110V or 240V power supply to the unit will be required.

The sampling of the data will be conducted using specialist air-quality monitoring equipment capable of recording data at up to 1 minute intervals, although a period of no greater than 15 minutes is advised.

Examples of a Dust Monitoring Unit and Placement on Site



4. Monitoring Data

All data will be transmitted remotely back to head office where it will be processed.

4.1 The vibration measuring geophone measures PPV (Peak Particle Velocity) values which is stored on the attached datalogger in units of millimetres per second ($mm.s^{-1}$) at pre-set time intervals. Measurements are recorded in the 3 dimension planes, X Y and Z.

4.2 **T**he sound units are normally set to collect LAeq values in units of decibels (dB) at pre-defined time intervals.

4.3 The dust unit will measure particle types PM1, PM2.5 and PM10.

For the alarm modules, if the pre-determined trigger limits are reached, a text or email alarm can be generated.

All data can be sent to a dedicated website, or compiled into a PDF report, which will be issued on a regular basis.

5. Frequency of Readings

For environmental monitoring, the units are normally set to record data every 15 minutes, but this is customisable to the client's needs.

A clear instruction (in writing) will need to be provided by the client for SES to commence the installation, regular monitoring or change of frequency.

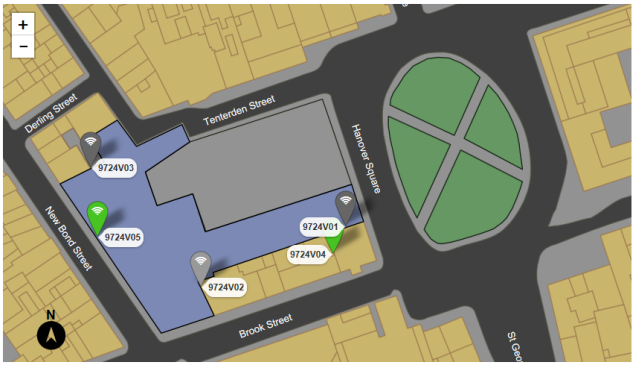
6. Trigger Values

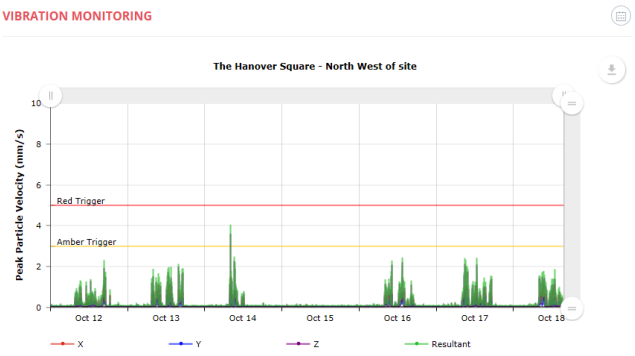
Trigger levels are yet to be defined.

7. Reporting

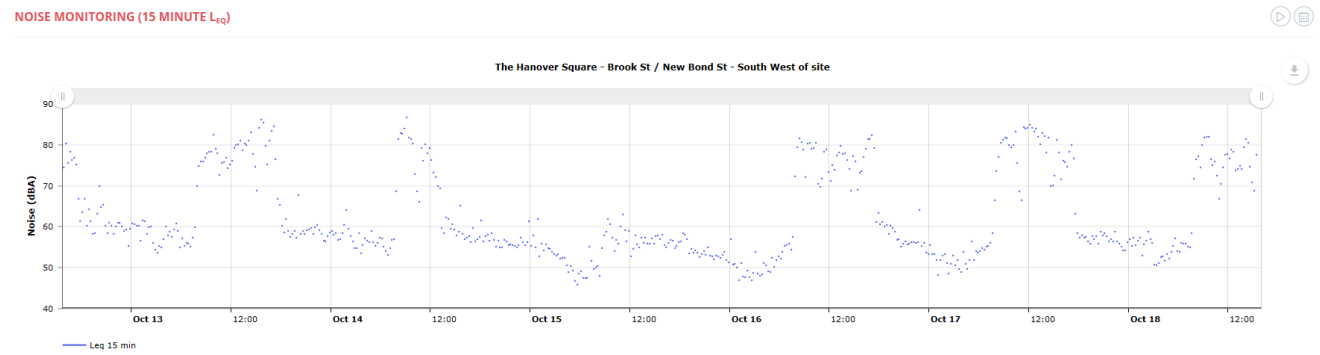
Example plots from recent websites;

Vibration

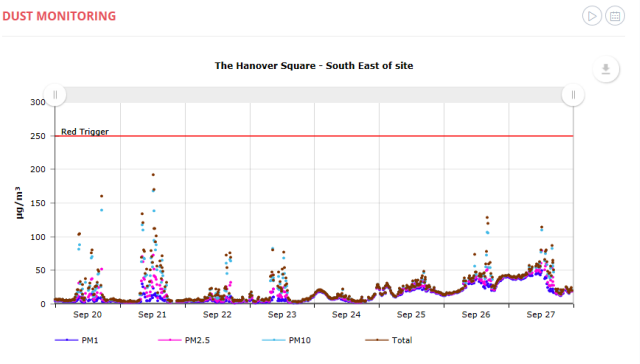




Noise



Dust



8. Instrumentation

Vibration Monitoring Unit

Vibra + (or similar)	**Seismograph**
Geophone	**Tri-axial (X, Y, Z)**
Velocity range	**0.1-200mm/s**

Noise Monitoring Unit

Rion NL31	**Type 1 Sound Level Meter**
Measurement Range	**A weighting: 28-138 dB**
Frequency Range	**20-12500 Hz**
Sample Rate	**20.8 µs (Leq, Lmax, Lmin, LE)**

Dust Monitoring Unit

Air Quality Monitors	**DM11 / DM1 Pro**
Detector	**laser nephelometer**
Measurements	**TSP, PM10, PM2.5, PM1.0**
Detection limit	**0.01 micrograms per cubic metre**
Particle size range	**0.5 to 20 micro diameter**
Flow rate	**600cc per minute**