17 June 2016

Ref: 9100-SPC-005

Kidderpore Avenue
Engineering Requirements for Limiting Vibration

1.0 Introduction

1.1 Mount Anvil have prepared a Construction Management Plan (CMP) which outlines procedures for monitoring vibration will be controlled. This is in accordance with the London Good Practice Guide "Noise and Vibration Control for Demolition and Construction".

1.2 The CMP states: Building occupants can be disturbed by vibration at levels appreciably less than that which would result in building damage. Therefore, in the absence of any other restrictions, to minimise disruption to building occupants, the following upper vibration guidance levels, as measured at the worst-affected floor of the relevant property, are recommended:

- 1 mm/s Peak Particle Velocity (PPV) for occupied residential and educational buildings
- 3 mm/s PPV for occupied commercial premises where work is not of an especially vibration sensitive nature or for potentially vulnerable unoccupied buildings
- 5 mm/s PPV for other unoccupied buildings

2.0 Structural Engineering Preamble

2.1 In engineering terms, vibration levels need to be controlled such that they do not cause damage to structures. This needs to take account of existing buildings that are to be retained on the site and 'Neighbouring Properties' surrounding the site.

2.2 The engineering assessment of the Neighbouring Properties shows that generally they are in a good state of repair and are of sound construction.

2.3 Structural appraisals of the existing buildings to be retained on the site have also been carried out. These relate to Kidderpore Hall, Bay House, Skeel Library, Dudin Brown the Maynard Wing and the Chapel. With the exception of the Chapel these buildings are in an average or reasonable condition structurally.

2.4 The Chapel is in a poorer condition due to the effects of differential settlement caused by tree root activity below the existing foundations. There are cracks within the main elevations as a result of this which has undermined the structural integrity of the existing structure. Structural repairs are necessary to re-introduce this structural integrity and to make the structure robust.

2.5 Construction works need to reflect the condition of these building structures. Where construction activities are to be carried out prior to the Chapel being repaired to improve the robustness of the building, the vibration limits will be stricter.

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3.0 Structural Engineering Requirements for Limiting Vibration

3.1 The following vibration levels are considered conservative level thresholds for minor non-structural damage to structures arising from ground borne vibrations:

	Vibration level threshold PPV (mm/s)	
	Transient Vibration	Continuous vibration
To the Chapel		
Prior to repair works being carried out	5	2.5
Following repair works being carried out	10	5
For all other buildings	10	5

3.2 For each vibration level the following trigger levels are proposed:

	Vibration level threshold PPV (mm/s)					
	Transient Vibration			Continuous Vibration		
	G	A	R	G	A	R
To the Chapel						
Prior to repair works being carried out	<3	3	5	<3	3	2.5
Following repair works being carried out	<3	3	10	<3	3	5
For all other buildings	<3	3	10	<3	3	5

3.3 Where amber levels are triggers, the monitoring shall be repeated to check the results. Once checked and if proven correct, Tully De'Ath are to be notified immediately.

3.4 If amber level is reached, the contractor shall assess their method of working, and the plant being used and revise this accordingly. Work will be allowed to continue however with monitoring carried out daily until movements are shown to be below the amber level.

3.5 If red levels are reached, all works are to stop immediately and Tully De'Ath will visit site to assess the existing buildings potentially affected. An inspection will also be carried out of neighbouring properties as necessary to assess what, if any, damage has occurred which will rectified as outlined in the party wall awards. The contractor's method of work will need to be revised. Once a revised method of working has been agreed with the Engineer, works can continue. The frequency of monitoring associated with this new regime shall also be agreed