

## Lessons Learned- Noise & Vibration Borough Market

### Contract

Thameslink Programme  
Borough Viaduct

### Contract No

312521

### Location

Borough Market Area,  
South East London

### Date of Activity

March 2010

### Date of Report

April 2010

### Activities

- Demolition of the industrial roof in Three Crown Square Market and behind Bedale Street properties
- Demolition of the basement concrete slabs in Three Crown Square
- The above demolition activities are required to make room for construction of new railway viaduct.
- Equipment used: Floor saw, various sized excavators trialled with hydraulic breaker and pulveriser attachments.
- This activity undertaken throughout the week. Impact on third parties is greater on market days (Thursday – Saturday)

### Description

- A saw cut undertaken in advance order to reduce vibration transmission
- Structure-borne noise and vibration experienced by businesses surrounding Three Crown Square/Borough Market
- Several noise and vibration related enquiries generated.
- Borough Market remains open for the duration of the project. There are busy public interfaces within a busy urban area in South East London which is challenging.

### The Problem

- Bedale Wine Bar is particularly sensitive due to the nature of the business and because there is a gap in the existing hoarding line behind the property.
- The gap in the Bedale Hoarding a goodwill gesture in order to minimize landtake. The open area to the rear is an important access for customers and increases trade. However, the gap allows noise to reverberate in the outdoor premises adjoining the property.
- Managing stakeholder expectations.
- Managing subcontractor behaviour
- Co-ordination of internal communications with regard to enquiries and complaints and recording conversations with third parties.
- The noise generated by traditional breaking out methods generated unacceptable noise and vibration levels.

### Photographs/Drawings



Left busy Friday lunchtime trading period at Borough Market, right Rentavent baffling during saw cut attempted to reduce vibration transmission.

### **Lessons Learned**

- Give advance notification to affected businesses and residents at least 14 days in advance
- Understand reasons for complaints and sensitive/critical business times. Programme noisy works around business critical times.
- Thursday, Friday and Saturday are key trading periods in the Borough Market Area
- Ensure agreements in place are communicated effectively and commitments are honoured in order to manage expectations of the stakeholders.
- Following vibration experienced vibrations limits have been set in a third party wall agreement and additional vibration monitoring required. There are associated cost and time implications
- Skanska Technology has an excellent section 61 application process in place and a good relation with London Borough of Southwark. It is important to maintain good relations with the wider community and regulator to avoid unnecessary delays.
- The saw cut did not successfully reduce the transmission of vibration, subsequently alternative construction techniques investigated.
- Stakeholders need greater visibility of the works programme and longer term overview in order to understand some of the short term disruption.
- We conducted a trial using pulverising and monitored the noise levels. This reduced noise levels by 12dB, to acceptable limits. Traditional breaking out duration is 4 days. Pulverising takes longer (8 days) but is compliant and more acceptable to stakeholders. Remember to discuss any alternatives with the Project Manager and Commercial Team as there may be programme implications.
- The Rentavent solutions are most effective for high frequency noise and provide approx 5dB reductions depending on site specific circumstances. The solutions are good in scenarios where small reductions are required but in this case a 10 dB reduction was required and the most effective solution was to change the construction technique.

### **The Solution**

The site activity reviewed considering programming, trialling different construction techniques, BMP and implementing a procedure to improve operational control. The following procedure implemented for noisy works to ensure that the works have been programmed to minimise noise and vibration and ensure BPM is in place prior to work commencing

- Prior to commencing any noisy works Black Hat supervisor is to notify SCE Engineer of intended works
- Supervisor is to prepare worksite using BPM's (eg. Acoustic screens, baffling, insulation etc). Supervisor to complete & sign attached Permit and contact SCE Engineer
- SCE Engineer to inspect area and sign permit allowing works to commence
- SCE Engineer to ensure that noise monitoring at nearest receptor is carried out periodically and stop works immediately if there is an exceedance and notify Environmental Manager.
- Permits to be handed back to SCE Engineer.
- Weekly meeting and update bulletin about the upcoming works sent out to affected parties  
Different construction techniques trialled and noise monitoring undertaken to assess potential for noise reduction.

### **Best Practical Means**

- BPM technical solutions used in the Borough Market Area includes baffles for high level industrial roof demolition. Acoustic screens are used around large plant and for small scale plant Rentavent acoustic enclosures are used.
- There are a number of agreements in place with local businesses to avoid busy or business sensitive times.
- Different methods have been trialled after agreeing appropriate times with local residents. A pulverisation technique using a 5 tonne vehicle reduced the noise levels by approximately 12 dB.
- Procedure in place for noise sensitive works in the Three Crown Square/Borough Market Area.

### **Contact details of person(s) involved**

- **Nad Rajwani 07770596788/ Tom Morgan 07977203402**
- **Rentavent 08708900063**

# Construction Noise Permit

Activity & location:	
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To be completed by the supervisor before commencing any noisy works in sensitive areas:

	Site Supervisor	SCE Supervisor
Name		
Signature		
Date		

- Screening between the source and the receiver of noise is effective? Check the direct line of sight between the two is obscured.
- Positioning of the acoustic screen is effective? The higher a screen is, the more effective it is. A screen that is placed near to either the noise source or the receptor is more effective than one placed halfway between the two.
- Is electrically powered plant selected? Electrically powered plant is quieter than diesel- or petrol-driven plant.
- Plant and equipment operated to reduce noise? Shut down plant when it is not in use, no over revving and throttle down to minimum.
- Is plant/equipment correctly maintained? Check equipment adequately lubricated to reduce squeaks and minimise rattles from loose fittings are part of routine maintenance
- Are doors and hoods of vehicles and machinery closed?
- When operating plant, noise-control equipment such as jackets on pneumatic drills, covers on compressors used?
- Hoods and doors on compressors and cranes etc should not only be closed but also be tightly fitting and well sealed? A partly closed door is of little use.
- Have residents been notified 7 days in advance about particularly noisy works?
- Has noisy assembly been avoided? Can assembly/fabrication take place off site?
- Are effective silencers or mufflers for plant, eg pneumatic percussive tools used and in accordance with manufacturers' instructions?
- Are there restricted hours for activities in place? Please describe restrictions in place

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- Is Noisy plant and equipment situated as far away as possible from sensitive receptors?
- Please record any defective items of plant and do not use (log details in HSF 37)

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Notes:

Normal working hours are Monday-Friday 08.00-18.00 (excluding bank holidays)

Saturday 08.00-13.00

There is a start up and shut down period between 07.00-08.00 and between 18.00-19.00 Monday to Friday and 13.00-14.00 on Saturday. Arrival/departure of the workforce, refuelling, inspections and clean up are the only activities permitted. No shouting or swearing permitted at all times.

Emergency overrun- You must advise Jon Eames and John Rooney of expected overrun timescales and keep updated. London Borough of Southwark will be advised by Jon Eames.