Appendix 6

MORCON FOUNDATIONS LTD

STRUCTURAL & GROUND ENGINEERING SPECIALISTS

Site Address: ??The Site Address??

Principal Contractor: ??The Principal Contractor??

Vibration Management Programme

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Date of issue: May 15th 2009

Appendix 6
Morcon Foundations
This Work Instruction specifies the requirements of the Vibration Management Programme

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1.0 Introduction

Workers whose hands are regularly exposed to high vibration may suffer from several kinds of injury to the hands and arms, including impaired blood circulation and damage to nerves and muscles.

Collectively, these injuries are known as "Hand Arm Vibration Syndrome" (HAVS). "Vibration White Finger" is one from of HAVS in which impaired blood circulation causes blanching or whitening of the affected fingers.

The main symptoms of HAVS are:

- Tingling and/or numbness of the fingers
- Loss of sensation and manual dexterity
- Finger Blanching
- Aching digits and limbs

HAVS is a notifiable disease under RIDDOR and if a medical practitioner diagnoses an employee as suffering from HAVS caused by his/her work, the necessary notification the HSE must be made.

2.0 Risk Factors

The primary cause of HAVS is work that involves holding vibrating tools and a wide range of tools and processes can give rise to vibration exposure:

High Vibration Risk Equipment

- Road Breaker
- Rotary Hammer
- Hammer Drill/Needle gun
- Scabbler
- Trench compactor
- Plate compactor
- Screed
- Impact wrench
- Chainsaw
- Brushcutter
- Clearing saw
- Angle grinder
- Nibbler
- Hammering or chipping tools not listed elsewhere

High vibration risk equipment could cause vibration injury even when used for a short time each day – this could vary from as short a period as a few minutes to a few hours. Adequate precautions or control is needed if this equipment is regularly used.

Medium Vibration Risk Equipment

- Lawnmower
- Stump grinder
- Hedge trimmer
- Auger
- Cultivator
- Jigsaw
- Sander
- Power Plane

Medium vibration risk equipment could cause vibration injury if used for a significant part of the working day from a few hours to most of the day. Monitor and control the actual usage of this equipment to ensure that operatives are not at risk from using it constantly.

Low Vibration Risk Equipment

Router
Screwdriver
Floor polisher
Circular saw
Drill (no impact or hammer action)
Vacuum cleaner
Pressure washer

Low vibration risk equipment is unlikely to cause vibration injury, even when used constantly throughout an eight hour working day

The damage caused by vibration depends upon the frequency. Low frequency motion from 5-20 Hz is potentially more damaging than higher frequency motion.

Vibration at frequencies below 2 Hz and above 1500 Hz is not thought to cause damage.

To take account of this, a “weighting” system has been developed which adjusts vibration levels according to the frequency known as “weighted values”.

The risk depends on the vibration “dose” received by the tool operator, which is a combination of vibration magnitude and the exposure time, which, to allow comparison, exposures are adjusted to a standard reference period of 8 hours however long the actual exposure is. This adjusted exposure is known as A(8).

The HSE have seta an action level of 2.8 m/s” above which a management action programme should be introduced

The following table indicates the exposure time which would give an A (8) of 2.8 m/s^2 for various measure vibration levels.

Vibration Figures

Vibration Acceleration (m/s^2)	**Exposure Time Minutes of Use**
2.5	614
3	427
4	240
5	154
6	107
7	78
8	60
9	47
10	38
11	32
12	27
13	23
14	20
15	17
16	15
17	13
18	12
19	11
20	10
21	9
22	8
23	7
24	7
25	6
26	6
27	5
28	5
29	5
30	4

3.0 Arrangements

3.1 Hired Plant

The company hires the majority of its tools for use on site and the following table lists the vibration details and recommended usage time for the tools most commonly hired.

THIS TABLE IS FOR GUIDANCE ONLY AND NEEDS TO BE BOTH CHECKED WITH THE TOOL HIRER AND A SPECIFIC RISK ASSESSMENT CARRIED OUT

Description	Vibration Level	Maximum Recommended usage time
Breakers (Pneumatic)		
CP1230 (Heavy Duty)	12 m/s^2	16 minutes
CP1210 (Medium Duty)	16 m/s^2	14 minutes
Sulair SK 10A (Light Duty)	17.83 m/s^2	11 minutes
Breakers (Petrol)		
Wacker BH23 breaker (Petrol)	12.8 m/s^2	22 minutes
Hydraulic Power packs (Petrol)		
Stanley BR48 (Std Mode)	11.4 m/s^2	28 minutes
Stanley BR48 (Vibro Damped)	6.3 m/s^2	94 minutes
Vibrating Rollers		
Bomag BW55E (22" Petrol)	3.9 m/s^2	247 minutes
Benford B1-57 (23" Petrol)	5.4 m/s^2	128 minutes
Vibrating Plates and Rammers		
Wacker PVP75A (18" Petrol) 75kg – 100 – kg	9.8 m/s^2	39 minutes
Wacker VAP1740 (16" petrol) 75kg – 100 kg	17.0 m/s^2	12 minutes
Wacker VPY750 (20" Petrol) 100kd – 125 kg	17.0 m/s^2	12 minutes
Wacker DPU2440 (for/Rev) up to 150 kg	3.8 m/s^2	260 minutes
Wacker DPU2440F (for/Rev) 150 kg – 200 kg	8.8 m/s^2	48 minutes
Wacker DPU4045 (for/Rev) 140kg – 400 kg	6.0 m/s^2	104 minutes
Wacker BPS1135A (12" Trench plate)	7.5 m/s^2	66 minutes
Rammers		
BS45Y (up to 70kg)	6.0 m/s^2	104 minutes
BS52Y (up to 70kg)	6.0 m/s^2	104 minutes
BS60Y (up to 70kg)	9.0 m/s^2	46 minutes
Vibrating Pokers		
Wacker FWP 40/40 (40mm)	7.5 m/s^2	66 minutes
0.5m from head	Under 2.8 m/s^2	N/A
Wacker FWP 57/57 (57mm)		
0.5m from head	7.8 m/s^2	61 minutes
3.0m from head	Under 2.8m/s^2	N/A
Vibrating Pokers (Pneumatic)		
Air Poker Benford FPM55 (50mm)	4.5m/s^2	185 minutes
Air Poker Benford FPM75 (75mm)	Under 2.8m/s^2	N/A

Floor saws/Hand Held Abrasive Saws

Floor saws (14/18")		
DB FS350 (petrol)	Under 2.8m/s^2	N/A
Clipper CS1 (petrol)	No load under 2.8m/s^2	N/A
	Cutting Asphalt 4.6m/s^2	177 minutes
	Cutting concrete 4.2m/s^2	213 minutes
Petrol Disc Cutters (12")		
Sachs Dolman/Makita	Top handle 7.3 m/s^2	70 minutes
	Rear handle 8.0 m/s^2	58 minutes
Partner K560	Top handle 3.8m/s^2	260 minutes
	Rear handle 8.9 m/s^2	47 minutes
Pneumatic Tools		
Macdonald 1UF pole scabbler	23.9m/s^2	6 minutes
Macdonald triple headed scabbler	15.6 m/s^2	15 minutes
Power Tools		
Large Duty Electric Breaker		
Bosch USH27	13.0 m/s^2	22 minutes
Medium Duty Electric Breaker/Drill		
Bosch 865 DCE	13.0 m/s^2	22 minutes
Electric Drill		
Bosch GBH 2/24	11.0 m/s^2	31 minutes
Electric Drill (Standard)		
Bosch GSS28	3.5 m/s^2	307 minutes
Angle Grinder 5" (125mm)		
Bosch GWS 9-125	5.0 m/s^2	150 minutes
Belt Orbital Sanders		
Bosch GBS100A & GSS280A	Under 2.8 m/s^2	N/A
Breaker		
Wacker EHB/110	7.7 m/s^2	63 minutes

3.2 Company Plant

Tools owned by the Company will be included in the routine maintenance procedures and include assessment of vibration, risk and monitoring of vibration levels in use. Replacement tools will be purchased in accordance with the Tool Purchasing Policy.

4.0 Managing Tool Use

Having selected the most suitable tool for the work, its safe use requires management by:

- Making sure the most appropriate tool is used for each job
- Minimise the time individuals use the equipment (e.g. job rotation). As a rule of thumb, ensure that the above tools are not used for longer than 20 minutes without taking a break.
- Break up periods of continuous equipment use by individuals (introduce other tasks).
- Avoid poor posture and provide training on safe use.
- Setting up maintenance and replacement programmes for tools and their consumables (e.g. chisels)
- Monitor and review these actions on a regular basis.

In order to determine the vibration dose, it will be necessary to measure the duration of the exposure i.e. the "trigger time" on the tool. Experience shows that individual estimates of "trigger time" can be wildly inaccurate and the actual duration should be determined. If operatives use several different vibrating tools during the working day, the overall vibration exposure needs to be determined.

Encourage operatives to monitor their use of vibrating tools by completing the "Tool Trigger Card" on a regular basis. Check the card and adjust work patterns accordingly if necessary.

5.0 Information for Operatives

Employees need to know about the hazard and what they should do to reduce the risk – for example:

- Potential sources of hand arm vibration
- The health risks of hand arm vibration
- The risk factors (e.g. high levels of vibration, daily exposure and regularity of exposure
- How to recognise and report signs of injury
- Ways to minimise the risk including:-
    - changes to working practices to reduce exposure
    - correct selection, use and maintenance of equipment
    - how to use tools to reduce grip force, strain etc
    - Maintenance of good blood circulation at work e.g. by keeping warm, exercising fingers and not smoking.

Refer operatives to their copy of our Health and Safety for Employees and Sub Contractors booklet.

Provide a Tool box talk on HAVS (see Toolbox Talks Manual)

Request employees to complete the Vibration White Finger Surveillance Questionnaire (Doc Ref: VWFSQ)

Issue HAVS Guidance Card for Employees

6.0 Health Surveillance

Even when we have taken precautionary measure, some employees may still be at risk. In cases where regular exposure to vibration continues or employees are reporting symptoms the need for regular health checks becomes necessary.

This should mean that harm from vibration is detected early and will allow us to:

- Arrange for a medical assessment and for medical advice to be given to the employee
- Take steps to avoid serious injury of the employee
- Take action to reduce exposure of injured people to avoid worsening their symptoms

EXAMPLE ONLY:-

- Checking tools before use to make sure they have been properly maintained to avoid vibration caused by wear and tear
- Making sure cutting tools are kept sharp
- Reducing the amount of time you use the tool in one go – do other jobs in between
- Share work tasks with colleagues when using such tools
- Avoid gripping or forcing the tool more than necessary
- Ensure tools have rubber grips or wear gloves to avoid contact with cold handles

What else can I do?

Encourage a blood flow by:-

- Keeping warm and dry – wear gloves, hats and waterproofs
- Giving up or cutting down smoking will help with blood flow
- Massage and exercise your fingers during work breaks
- Reporting any symptoms to your Site Manager
- Reporting any symptoms to your Doctor
- Using the control measure provided by the Site Manager
- Co operating with site management by completing the "Tool Trigger Card" when requested to do so

You or your Doctor can get further information from the Employment Medical Advising service or at any office of the Health and Safety executive.

Guidance Card for Employees
HAVS
Hand Arm Vibration Syndrome

Hand Arm Vibration Syndrome (HAVS) is

- A disorder which affects the blood vessels, nerves, muscles and joints of the hand, wrist and arm
- Is severely disabling if ignored and
- Its best known form is vibration white finger

Symptoms:-

- Can be triggered by cold or wet weather, causing severe pain in the affected fingers
- Tingling and numbness in the fingers
- In cold and weather the fingers go white then blue, red and painful
- Make picking up small objects such as nails and screws difficult
- Pain, tingling or numbness in hands, wrists and arms which may affect you sleeping
- Loss of strength in hands making you unable to lift or hold heavy objects

Symptoms will probably get worse if you continue to use high vibration tools a lot

What causes HAVS?

The regular and prolonged use of hand held power tools such as

- Concrete breakers, jigger picks, hammers
- Vibrating pokers
- Sanders and angle grinders
- Vibrating compactors
- Hammer drills, jigsaws
- Scabblers and needle guns

How can it be prevented?

We will play its part in reducing the hazard by implementing a tools vibration policy and will look to buy or hire new tools that have the lowest vibration rating.

In addition, a policy of measuring existing company owned tools will be put into practice during maintenance inspections

Your co operation is required by:

- As a rule of thumb, you should not operate tools for longer than 20 minutes without taking a break
- Seeking to do the job in a different way without using vibrating tools
- Using low vibration tools
- Using the right tool for the job