

WSP GLOBAL – ACOUSTIC, NOISE AND VIBRATION SERVICES

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Abstract

With over 150 specialist acousticians, WSP Global owns one of the largest dedicated acoustics consultancies. Our acoustic specialists are based in the major cities around the world ensuring we can quickly mobilise local teams whilst leveraging global best practice and experience. Our scale also enables us to have technical experts across a diverse range of very specific areas of acoustics meaning we can look at all aspects of a project. We have the expertise to provide concept-to-commissioning solutions, ranging from impact and constraint assessments during the planning phase, to detailed acoustical services design, through to noise monitoring and mitigation during construction, operation and decommissioning. Outstanding technical excellence in our solutions is our fundamental, but we have a reputation for challenging the status quo and delivering creative, pragmatic, sustainable and commercially focussed designs.

Keywords: Acoustic, Noise, Vibration

1 Integrated Service

Having worked on some of the most reputed projects around the world, we are delighted in establishing ourselves as a core member of all multi-firm and multi-disciplinary project teams. We regularly work with notable companies such as Rio Tinto, Husky Energy, Alstom Power, Canadian Malartic General Partnership, Hydro-Québec, Montoni Group, Reliance, MTQ, Canadien Pacifique, etc.

In addition, Parsons Brinckerhoff recently joined WSP Global allowing us to be a 32,000 strong design, engineering and environmental consultancy. It enables us to provide you with seamless integrated expertise through working with in-house specialists ranging from M&E engineers, structural and civil engineers, fire engineers, environmental planning experts, transportation specialists and many more - an approach proven on various projects.

2 Expertise

2.1 Industrial Noise

Large industrial sites can be very complex. There are often a multitude of noise sources contributing to the overall noise environment. WSP Acoustics are able to undertake detailed 3D computer modelling of industrial noise sources to determine likely causes of noise complaints, and develop suitable and cost effective remedial measures. At complex industrial sites, and where noise sources are inaccessible, we use 'acoustic cameras' to visualise the dominant sources of noise. Another example of WSP's knowhow in the industrial domain is led by the WSP UK team: we have developed a transient finite element method to model and improve any industrial ventilation fan without reducing flow or increasing pressure drop. The technique has been proven able to gain more than 10 dBA (Figure 1).

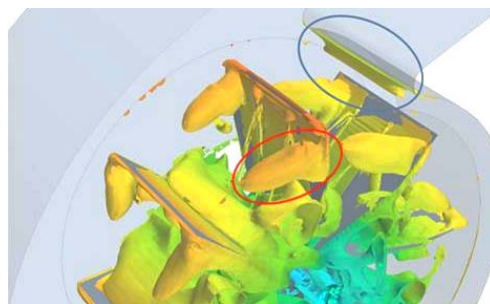


Figure 1: CFD simulation of ventilation fan noise.

Through our Norwegian affiliate Multi-consult, we have extensive expertise in the special noise and vibration requirements for oil and gas projects, including engineering, quality control and verification of Public Alarm Systems, both offshore and onshore.

2.2 Quarries and mines

Extraction projects such as quarries or mining operations have to develop at the resource position. This implicates that some ore projects have to be executed close to sensitive areas or in some cases in urban areas. Under these conditions, enormous efforts are necessary in each phase of the project to reduce noise and vibration (design, construction, overburden/sterile handling, drilling/blasting, transportation and resource extraction).

WSP Canada inc. has developed through numerous mining projects an international expertise in mining acoustics and vibration (Royal Nickel Corporation – Dumont Project in Canada, Orzone – Bomboré project in Burkina Faso, Nordgold – Montagne d'Or project in French Guiana). In each of these projects, WSP has been a key partner for federal/provincial approval and social acceptance. Noise and vibration studies were conducted for mining infrastructure construction planning, blasting and extraction acoustical optimization, characterization of specific noise source and implementation of optimal mitigation measures to achieve regulatory compliance.

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Some of these projects required a real-time noise monitoring program on which controls the mining production rate based on climatic conditions (wind direction and thermal inversions can greatly increase a mine's noise contribution in habited areas). WSP is also capable of executing underwater noise studies for naval infrastructures or dredging operations which is sometime required for specific mining projects (Sharq project – Qatar, McInnis Cement plant – Canada).

2.3 Environmental and Transportation Services

Noise is very often a primary factor in determining the acceptability of a new residential or commercial development, with associated transportation development, within an environmentally sensitive area. WSP undertake environmental noise impact assessments in line with National Standards, Approved Codes of Practice, Planning Policy Guidance, and Building Bulletins. In addition to generating appropriate noise and vibration evidence to support planning applications, we are able to provide expert witnesses at planning inquiries to support our Environmental Statements.

Noise free or 'tranquil' areas are increasingly hard to find and is a notable environmental factor. WSP has undertaken both city and rural noise mapping projects in response to environmental noise directive. These studies have included the provision of guidance to clients on what steps need to be taken to satisfy the noise directive requirements. Noise mapping studies are also often included within our Environmental Impact Assessments to aid the understanding of how noise disperses around a new development. We have a selection of noise prediction software to generate easy-to-read and understandable colour presentations and noise maps (figure 2).

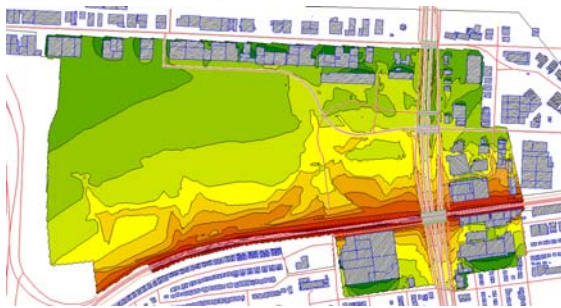


Figure 2: Noise mapping.

2.4 Architectural and Room Acoustics

We assist signature developers, architects, and contractors through:

- Advising on building layout to minimise the need for expensive acoustic countermeasures.
- Building façade acoustics design that minimises excessive road noise break-in
- Sound insulation design between private spaces
- Designs that optimise reverberation to enable high levels of speech intelligibility or audibility.

We pride ourselves on technical accuracy and depth to ensure your projects have cost-effective designs that deliver superior comfortable internal acoustics environments. We also undertake inspections and acoustic measurements within existing buildings. These include electro-acoustic system performance, airborne sound insulation, impact sound transmission, building services noise, etc.

2.5 Equipment Noise and Vibration Control

Our Acoustics team can assess mechanical and electrical building services plant with respect to both internal and external noise breakout and vibration transmission. Our team will ensure that noise and vibration specifications and advice are tailored to a client's requirement. This means that the level of quality and performance from noise control hardware is actually what a client needs, rather than what a particular hardware supplier would like to sell. We help to specify to the M&E plant and systems selected, evaluating their noise and vibration qualities. We design in extra measures to protect user comfort (noise barriers, vibration isolators, etc.).

3 Relevant Canadian past projects

- Osisko Mining Corp., Noise management of mining operations, Canadian Malartic gold mine, 2008-2014
- Graymont, Acoustic barrier for the Marbleton factory, Community noise monitoring and new sound sources contribution assessment, 2000-2014
- Rio Tinto Fer & Titane inc., Noise assessment program for the Sorel-Tracy industrial complex, 2002-2015
- Canadian Pacific Railway, Noise and vibrations impact assessment study for a new marshalling yard in Les Cèdres, 2012
- KPH Turcot, Ministère des Transports du Québec, Traffic noise study of the Turcot project and noise management program, 2015
- SM Group International, Acoustic impact assessment of east-west highway in Algeria, 2008-2009
- Husky Energy Inc., Noise survey and control for fans, ductworks, and mechanical equipment of the oil tanker Sea Rose, 2012
- La Presse, Acoustic study and optimization of the future open-space office on three levels in the former printing press room, 2014
- Pandev Inc. KF Architect, Globale acoustic and vibration study of the residential project Tom Condos, 2012-2014
- City of Montreal, Interior acoustic study of the former Montreal's library converted in an art venue, Gaston Miron Building, 2010