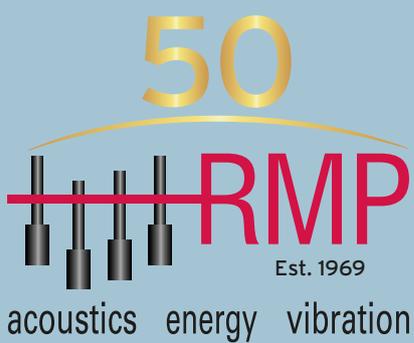




# Robin Mackenzie Partnership

Excellence in Acoustics

Gyms





# Robin Mackenzie Partnership

## Company Brochure

Having celebrated our 50th anniversary in 2019, the Robin Mackenzie Partnership is one of the UK's largest acoustic consultancies and a leader in its field. Here at RMP we consistently deliver innovative acoustic solutions which our clients value as both robust and cost effective.

We are very proud to have received the Queen's Anniversary Prize 2009 for our work developing the Robust Details constructions used in over 75% of new attached housing in the UK, and of our close association to the Queen's Anniversary Prize 2015 awarded to Edinburgh Napier University for its internationally acclaimed work in timber engineering, sustainable construction and wood science.

Our company brochure gives an insight into the practice and presents examples of developments on which we are proud to have provided the acoustic design.

- Building acoustic design
- Environmental and industrial noise control
- ANC accredited sound insulation testing
- iATS accredited air tightness testing
- Infra-red thermography
- Noise mapping
- Vibration control
- CPD training
- Product development
- Design animation
- Acoustic research



Our dedicated team delivers a high quality client-focused service at a reasonable cost. All RMP consultants are full members of the Institute of Acoustics while our directors hold fellowship status. RMP test engineers are accredited by the Association of Noise Consultants and The Independent Airtightness Testing Scheme (iATS).

The practice has a very low turnover of staff which ensures consistency throughout major long-term projects.

RMP operates from offices throughout the United Kingdom undertaking projects of all sizes, many of national significance. Our research work is internationally recognised and has helped formulate national building regulations. Our client database includes the UK's leading construction companies, architects, product manufacturers, trade bodies and public sector bodies.

# Acoustic design of gym projects

RMP have extensive experience with gym noise and vibration impact assessments, including a dedicated team of gym specialists. We are happy to advise on gym projects in existing or new buildings; and for all types of traditional, modern, lightweight or concrete-framed constructions.

Equally, we have extensive experience and can assist you with remediating noise complaints from prevailing gyms / their activities; having worked on these projects for gym operators, local authorities and complainants alike.

We understand the variables that arise between diverse gyms and their associated individual operational activities. Notwithstanding the unique inherent acoustic weaknesses of differing building types, constructions and their settings; gyms brought into or adjacent to buildings containing noise sensitive residential dwelling flats, office units, retail units and/or shopping centres.

RMP are represented on the ANC working group, providing guidance on best practice on the acoustic assessment of noise and vibration from gyms.

Gyms occurring in close proximity to the above noise sensitive receptors produce noise and vibration mitigation challenges that need careful, bespoke, experienced and qualified assessments to be undertaken. We consequently approach every gym project anew and tailored to the specific needs of the site and/or associated noise complaints; whilst always drawing on our considerable experience of former projects.

It is important to contact us at the earliest stages of a gym project, as adverse airborne and impact noise (including associated vibrations), could stem from (but are not limited to) any of the below listed typical gym activities. It is often the case that mitigation/remediation measures for any one of the below activities have a significant or unforeseen cost impact on the project.

## Airborne Noise:

- Spin studios: high levels of amplified music, often with a loud bass content and shouting from instructor(s).
- Exercise/workout/aerobic studios: high levels of amplified music (with or without significant bass content), shouting from instructor(s)/gym members
- Background amplified music throughout main areas of a gym and set at relatively loud volumes

## Impact/Vibration:

- Free weight areas: free weights (dumbbells and barbells 10 kg - 150+ kg) being dropped onto flooring from any height. Including loading and unloading of disc weights
- Cross-Training classes: group high intensity classes using repetitive and relatively heavy weights; often with barbells outstretched above head-level.
- Slam-ball zones: medicine balls ranging in weights from 4 kg to 30+ kg thrown onto the floor with force and often from above head-height.
- Battle ropes: the repetitive and rhythmic undulations of two thick-gauge ropes, which consistently beat the floor with each oscillation (wave).
- Exercise/workout/aerobic studios – rhythmic jumping/running of groups; with or without the use dumbbells/bar bells etc.
- Pin-loaded weight machines: stacks of heavy weights allowed to drop onto the machine/ non-isolated stacks/floors etc.
- Running machines: rhythmic running from several gym-members in parallel.

# Gym Projects



PROJECT: Fitness Park Gyms, France

CLIENT: SAS Mov'in

OUR ROLE: Fitness Park is developing a network of franchised fitness clubs under the brand which belongs to the Moving Group, the French leader in the field.

RMP provided acoustic advice to mitigate airborne and impact noise to adjoining homes/commercial premises. Other Fitness Park franchises RMP provided advice for include:

Batignolles, France

Théâtre, Paris

Choissy, Paris

Cergy les Trois Fontaines, France

Aix-en-Provence

PROJECT: PureGym, Aberdeen

CLIENT: PureGym Ltd

OUR ROLE: With Gym and Fitness Classes running 24 hours a day 365 days a year and more than a million members, PureGym is one the largest gym and fitness operators in Europe.

RMP undertook free-weight impact tests for noise breakout from PureGym to surrounding commercial/office units and provided impartial acoustic advice.



PROJECT: Fitness Centre, Rouen, France

CLIENT: SARL PREST IG

OUR ROLE: RMP were commissioned to carry out noise impact assessments and provide advice on the conversion from commercial space to Fitness Park situated in the Saint-Marc Shopping Centre, Rouen, France.

PROJECT: Anytime Fitness

CLIENT: Various

OUR ROLE: Anytime Fitness is a franchise of 24 hour health and fitness clubs which operates in over 4000 franchised locations in 50 countries. RMP were commissioned to carry out noise impact assessments and if necessary provide advice for suitable mitigation measures to be incorporated in the fit out design.

Anytime Fitness Franchise RMP have provided advice for include:

Bexleyheath, London  
Stockton Heath, Warrington  
Manchester  
Edinburgh Quay  
Macclesfield



PROJECT: F45 Gym, Edinburgh

CLIENT: GSS Development/ HB1 Fitness

OUR ROLE: With over 1750 studios in 45 countries and one of the fastest growing fitness franchises, F45 Training, an American franchiser and operator of fitness centres based in California, launched in 2011.

RMP provided acoustic advice to specification for noise mitigation measures to control the anticipated gym music levels such that it should not cause disturbance to the offices above.

F45 Franchise RMP have provided advice for include:

Bermondsey, London  
Clapham Junction, London  
Vinicombe Street, Glasgow  
Winchester, Hampshire  
Newbury, Berkshire

PROJECT: Westgrove, Melrose

CLIENT: Camerons Architects Ltd

OUR ROLE: gymGO provides a virtual training, coaching, and business management solution, giving fitness professionals the ability to host live private and public 1-to-1 and group-training sessions, as well as create a library of videos on-demand.

RMP were instructed to undertake a noise impact assessment in relation to the proposed change of use for West Grove Office.



# Consulting services

The acoustics market has grown, particularly since the 1990s, due to increasing regulation, population density and expectations of improved building standards. Since the millennium, global warming and energy cost concerns have created a greater awareness of the environmental impact of buildings which has led to tighter regulation. We have embraced this environmental challenge through low carbon impact design solutions and by introducing thermography and air tightness testing services to our portfolio.

We now provide a wide range of acoustic and environment consultancy services, using state of the art measuring equipment and computer software. Our highly qualified consultants guarantee a service of exceptional quality.

## Building Acoustics

Acoustic design of auditoria and theatres has always been one of our main services. This is because the necessity of delivering good acoustics inside such buildings has long been recognised.

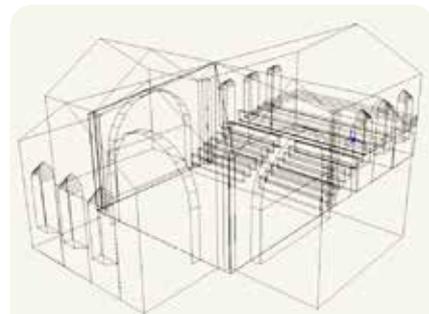
With the introduction of new technical guidance documents relating to schools, hospitals, offices and commercial premises (BB93, HTMo8-01, BCO, BREEAM etc) the need for good internal acoustics is now an issue for most architectural developments.

RMP has a wealth of experience in sound insulation, reverberant noise control and control of services noise. Our clients rely upon us to provide robust and cost effective design solutions which consistently achieve the design standards.

We have the experience to meet every architectural acoustic challenge – from the design of atria, school halls, court rooms and multipurpose spaces through to concert halls, exhibition centres and special needs schools. We achieve the very best results through a combination of experience, the latest computer modelling techniques (AutoCad, Odeon and CadnaA) and a full suite of on-site testing services.

### Areas of expertise:

- Offices, hotels, commercial - BS8223, BCO guide
- Enhanced Housing Performance Code for Sustainable Homes, BRE Environmental Assessment Method (BREEAM), Robust Details
- Schools - BB93
- Hospitals - HTMo8-01
- Calculation of sound insulation  
BS EN ISO 717, BS EN ISO 12354
- Design to Part E England and Wales
- Design to Section 5 and 7 Scotland
- Technical Booklet G/G1 Northern Ireland
- Public house and night club noise assessment
- Cinemas and leisure complexes
- Theatres and concert venues
- Museums and visitor attractions



Odeon wireframe acoustic model

## Sound Insulation - Testing and Diagnostics

RMP were one of the first companies in the UK to undertake sound insulation testing back in the late 1960's. Over the years we have built up an unrivalled wealth of experience in sound insulation and building acoustic design. We draw upon this experience when providing acoustical services for the refurbishment of existing buildings or the design of new buildings. As a result, our expertise in this area is now internationally recognised. Our staff have provided research guidance and technical support to government institutions and organisations from the UK to New Zealand.

RMP is registered on the Association of Noise Consultants Acoustic Tester scheme. This accredits RMP to undertake sound insulation testing for Part E, Section 5, Code for Sustainable Homes, BRE Environmental Assessment Method (BREEAM) rated developments for new build residential. We also regularly undertake sound insulation testing in schools, hospitals and office developments.

Our work ranges from small developer buildings and flat refurbishments through to multi- million pound residential flagship developments such as Quatermile in Edinburgh and the Great Northern Tower in Manchester.

The practice also specialises in the assessment of acoustic defects, providing invaluable advice to clients who require to remedy complex acoustic insulation problems which can occur in new build developments, refurbishment projects or in response to resident complaints.

We consider the provision of good, economical and practical design advice to be our business. This is why we provide technical guidance and recommendations, when needed, as part of our core service.

### Areas of expertise:

- Offices, hotels, commercial - BS8223, BCO guide
- Enhanced Housing Performance Code for Sustainable Homes, BREEAM, Robust Details
- Schools - BB93
- Hospitals - HTMo8-01, HBN 12-01 Sup C
- Sound insulation testing on site (airborne and impact) - BS EN ISO 140, ANC registered, Robust Details inspectors, IOA Good Practice
- Reverberation time measurements - BS EN ISO 3382
- BS5363 – auditoria reverberation measurements
- Testing to Part E England and Wales
- Testing to Section 5 Scotland
- Public house and night club noise assessments
- Cinemas



Spot the scaffolding clamp!

# Environmental Noise

Environmental noise covers a wide range of sources however, this is predominantly unwanted noise from transportation, construction and industrial activities. Increasingly governed by a variety of regulations, most new and existing noise sources now require assessment and mitigation. Requirements for assessment are diverse, but typically result in the assessment of the existing noise environment and the impact on the environment of constructing a new road, factory or wind farm etc.

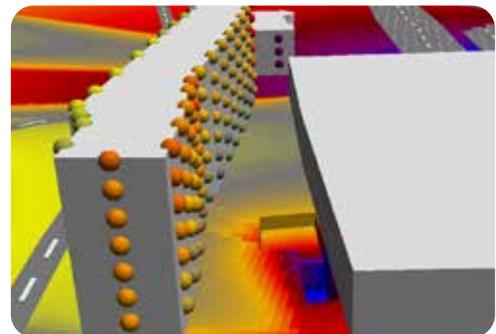
RMP assesses environmental noise sources against the specific criteria provided by local authorities, including the stringent inaudibility criteria. We carry out environmental impact noise assessments in support of planning applications and in response to noise abatement notices. We combine our extensive environmental impact experience with the latest calculation and mapping software to produce innovative and cost effective mitigation solutions for the most complex of projects.



Our directors and senior consultants frequently provide expert advice to Planning Inquiries and Parliamentary Inquiries such as The Edinburgh Tram inquiry. We are also frequently consulted on amendments to environmental noise planning guidelines.

## Areas of Expertise:

- Environmental Measurements - BS 7445, WHO Guidance
- Planning and Noise - PAN 1/2011, NPPF
- Noise and Vibration from Mining - PAN 50
- Construction Noise and Vibration - BS 5228
- Motor Sports Code of Practice on Noise from Organised Off-Road Motorcycle Sport 1994, Auto Cycle Union (ACU) Maximum Permitted Sound Levels
- Shooting Ranges/Galleries - BS EN ISO 172001
- Sports Grounds
- Road Traffic Noise, existing and new roads - CRTN, NISR, DMRB, PAN 56, PPG 24
- Rail Noise - CRN, BS 6427, BS 14837, BS 8041, PAN 56, PPG 24
- Aircraft Noise - BS8233, WHO, Noise Contours (civil and military)
- Industrial Noise - BS 4142
- IPPC Assessments
- Workplace Noise Assessments - HSE
- Low noise work environments - BS 11690
- Wind farm - ETSU R 97, IOA GPG
- Concert noise, noise council code of practice



CadnaA plant noise predictions on a residential façade

## Vibration



RMP provides expert advice on vibration measurement and analysis. Our comprehensive engineering advice on problem resolution takes into account the long-term structural integrity and enhanced engineering performance. Our consultants are members of the Institute of Acoustics and The British Institute of Non Destructive Testing and are experienced in planning, collection, analysis, and interpretation of ground-borne vibration data.

We undertake vibration measurement and analysis on new residential developments – at railway track-sides, alongside highways (both urban and rural), in tunnels (both road and rail), on piled foundation construction sites, and across a broad spectrum of commercial and retail developments. We regularly act as expert witnesses in planning inquiries and insurance claim resolutions. The latter includes site vibration assessment, data synthesis and analysis to assist dispute and claim resolution.

We strongly recommend that vibration testing be carried out on development sites at an early stage, before it becomes an expensive post-completion problem. This allows our expert team to provide tailored advice which can significantly reduce the risk of failure following completion. It can also reduce the level of material and remedial measures necessary to meet vibration isolation guidelines.

### Areas of expertise:

- Offices, hotels, commercial & retail developments
- Housing, mixed-use residential/retail/commercial, schools & colleges, vibration isolated laboratories & plant/machine rooms
- In situ vibration testing (air- and ground-borne): rail, road, bridge, and tunnel sites
- Piled foundation installation vibration assessment
- PPV, VDV, and rms acceleration measurements: time and frequency domain analysis
- Assessment to BS 6472 Guide to the evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)
- Assessment to BS 7385 Evaluation and measurement for vibration in buildings
- Assessment to BS 5228 Noise and vibration control on construction and open sites
- Compliance checking to The Control of Vibration at Work Regulations 2005
- Blast induced and other sources BS 6427
- Ground Borne Vibration from Rail BS 14837
- Human Response BS 8041
- Hand arm vibration assessment
- Whole body vibration assessment

## Air Tightness Testing

Air tightness testing is increasingly being requested by private developers, housing associations and social landlords, as a means of checking the energy performance and workmanship of dwellings. Unwanted air infiltration can account for up to 20% of a building's heat loss and reduces occupant comfort via draughts.

RMP provides a 'one-stop' consultancy service for both sound insulation and air tightness, simplifying the design and completion phases of a project.

We carry out air tightness testing for the domestic market using Independent Airtightness Testing Scheme (iATS) accredited testers required for Part L1 England and Wales Building Regulations compliance testing. We also undertake commercial air tightness testing (volume dependant) and provide consultancy advice on design and detailing. The tests are conducted to the Air Tightness Testing Measurement Association's Technical Standard 1 (ATTMA TS1).

### Areas of expertise:

- iATS accredited domestic air tightness testing to ATTMA TS1 requirements
- Part L complaint testing for the England and Wales Building Regulations
- Section 6, Energy, complaint testing for the Scottish Domestic Technical Standards
- Commercial air tightness testing
- Building fabric systems in relation to air tightness
- Design, detailing and construction consultancy services for air tightness
- Pressure loss diagnosis using building smoke testing and thermography



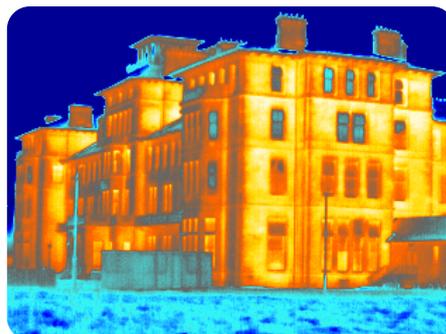
## Infra-red thermography

Thermal imaging (or infra-red imaging) captures thousands of surface temperature measurements and converts them into an image. The service can identify air leakages, badly insulated areas and other construction problems. Therefore, it is often complimentary to air tightness testing. Thermal imaging has a wide range of applications in the building industry.

RMP operates a range of thermal imaging infra-red cameras to support our professional diagnostic services, software and detailed reporting. Our experience spans a wide range of activities.

### Areas of expertise:

- Infra-red imaging of domestic dwelling
- Complex detailing of building envelope
- Evaluation of process energy system
- Diagnosis of building envelope defects
- Diagnosis of building pathology
- Assessments of energy heat loss



# Directors

## Professor Robin Mackenzie

BSc (Hons), MSc, PhD,  
CEng, FIOA, FRSA



Professor Robin Mackenzie was educated at Heriot-Watt University, the University of Edinburgh and the Massachusetts Institute of Technology. He is a fellow and past member of the Council of the Institute of Acoustics and the American National Science Foundation. Winner of The Institute of Acoustics Tyndall Medal in 1980, Robin was awarded the Royal Society Industrial Fellowship in 1992.

Robin has lectured extensively throughout the world on the subject of sound insulation and auditorium acoustics. He has been acoustic consultant for the Royal Scottish Academy of Music and Drama in Glasgow, the Edinburgh Conference Centre in Riccarton, The National Library of Scotland and The Queen's Hall in Edinburgh. He has also offered his expert advice on the lecture facilities at five of Scotland's universities.

His previous roles have included Dean of the Faculty of Engineering & Computing, and Vice Principal for Knowledge Transfer at Edinburgh Napier University.

## Richard Mackenzie BSc, FIOA, MInstSCE



Educated in Building Engineering at Edinburgh Napier University and Applied Acoustics at Sheffield-Hallam University, Richard joined RMP in 1993. Richard has extensive experience in major building acoustics projects. These include the 2001 Stirling Prize winning Magna Project in Rotherham, the 2008 RIBA Prize winning Scottish Storytelling Centre in Edinburgh, Great Northern Tower in Manchester and Great Glen House in Inverness – Sustainable Building of the Year 2006.

Richard is adept at offering expert evidence during planning enquiries relating to environmental noise impact. He recently gave evidence at the Scottish Government Parliamentary enquiry for the Edinburgh Trams project.

RMP's principal consultant and business manager, Richard has significant experience of project management, particularly large scale contracts. He was Joint Project Manager on the House Builders Federation Robust Standards Details Project and is co-author of 'Housing and Sound Insulation'. One of RMP's three Robust Detail inspectors, Richard is an examiner on the Association of Noise Consultants (ANC) Members Registration Scheme and sits on the ANC board. In 2008 he was awarded Fellowship of the Institute of Acoustics and sits on the IOA council.

RMP works in partnership with Edinburgh Napier University's Institute for Sustainable Construction bringing together a wide range of specialist expertise in construction innovation.



**Institute  
for  
Sustainable  
Construction**

**Construction technologies  
for tomorrow's communities**

Our primary research and innovation support centres include:

Building Performance Centre  
Centre for Geotechnics  
Centre for Offsite Construction and Innovative Structures  
Robin Mackenzie Partnership  
Scottish Energy Centre  
Centre for Sustainable Communities

[www.napier.ac.uk/isc](http://www.napier.ac.uk/isc)

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