



# Robin Mackenzie Partnership

Excellence in Acoustics

## Residential

# 50



acoustics energy vibration



Quatermile, Edinburgh  
Architect: Foster & Partners/CDA



# 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
- Elmhurst Energy 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 Elmhurst Airtightness Testing Scheme (EAS).

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 residential projects

A quiet environment is at the forefront of most residents expectations for their home. RMP Acoustic Consultants have extensive experience in working on all types of residential projects.

Achieving a high level of sound insulation from the external environment and adjacent properties is very important to residents to ensure the enjoyment of their living space.

We are happy to advise on the refurbishment of existing buildings or new buildings from traditional or modern construction methods.

Acoustic consultancy for residential properties relates to three main areas:

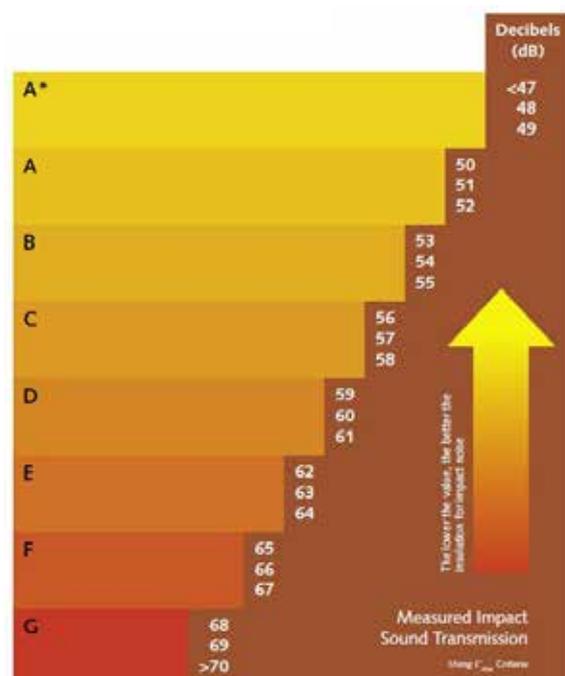
- Undertaking site noise surveys for your planning application and façade designs.
- Providing design advice for party walls, floors and building services.
- Undertaking testing to comply with Building Regulations, BREEAM or client standards.

Our areas of expertise include:

- Strong positive working relationship with the project team
- Advising on appropriate noise levels and reverberation times
- Offering guidance on different criteria and design aspects
- Advising on façade design to provide adequate sound insulation and ventilation
- Offering guidance on the control of plant noise and vibration
- Providing specifications of the acoustic performance of doors, walls and glazing
- Zoning 'quiet' and 'noisy' spaces and separating them where possible by distance and 'buffer' spaces such as corridors
- Undertaking compliance testing measurements of ambient noise levels, sound insulation and reverberation time
- Internal acoustic design utilising some of the latest computer modelling software such as Odeon, CadnaA and Insul

RMP undertake world leading research in housing and sound insulation including:

- Laminate Flooring
- Sound Insulation Standards
- Robust Details
- Open Windows



# Residential Projects



**PROJECT:** Springside Development, Edinburgh  
**CLIENT:** Grosvenor Developments Ltd, AMA, Ogilvie Construction, Miller Homes  
**OUR ROLE:** RMP carried out the noise impact assessment for the Grosvenor masterplan and provided detailed design advice on the residential, student accommodation and hotel blocks.

**PROJECT:** Quatermile, Edinburgh  
**CLIENT:** Gladedale & Quatermile  
**ARCHITECT:** Foster and Partners, CDA Architects

**OUR ROLE:** Since 2003 we have been commissioned to ensure this landmark project achieves the highest level of acoustic performance, from the design phase to site inspections and commissioning testing. We have been providing full acoustic services on all new build sections of the site and the refurbishment of the old hospital wards that comprise part of new luxury apartments.



**PROJECT:** Great Northern Tower, Manchester  
**CLIENT:** Taylor Wimpey City  
**ARCHITECT:** Assael

**OUR ROLE:** Designed by Assael architects for Taylor Wimpey City the 25-storey residential tower providing 260 apartments rises dramatically between the historic Great Northern Warehouse and Manchester G-Mex. We provided the full range of acoustic services. This included an environmental noise impact assessment, designing the external façade, controlling the noise from the surrounding city centre roads, bars and night club, sound insulation design to meet the new Part E regulations and pre-completion testing.

PROJECT: Craighouse Development, Edinburgh

CLIENT: Craighouse Ltd

ARCHITECT: Oberlanders Architects

OUR ROLE: RMP were commissioned to undertake pre-conversion sound insulation testing and provide design advice for the redevelopment of existing Bevan, East Craigs and South Craigs buildings into luxury residential properties. The project is looking to attain high levels of acoustic performance, befitting to such a landmark development.



PROJECT: Ropeworks, Manchester

CLIENT: George Wimpey City

OUR ROLE: RMP provided the full range of acoustic consultancy services for this redevelopment in the heart of Manchester.

The Ropeworks development is situated just off Deansgate Locks in the former industrial district of Manchester.

The six storey building has a distinctive gull-wing roof and circular turrets with 300 one and two bedroom apartments and penthouses.

PROJECT: Granton Harbour, Residential Development

CLIENT: Granton Central Developments Ltd

OUR ROLE: RMP were commissioned to undertake the full acoustic design advice and completion testing for the proposed design guidelines.

Funded in partnership with Link, the Scottish Government and the City of Edinburgh Council, the development includes 132 one, two and three bedroom flats and is part of the Granton Harbour Regeneration Plan.





PROJECT: Victoria Road, Govanhill, Glasgow  
CLIENT: Govanhill Housing Association  
ARCHITECT: Collective Architecture  
OUR ROLE: Located on the corner of Butterbiggin and Victoria Road, the development for Govanhill Housing Association will provide 42 new homes for social rent. RMP carried out the noise impact assessment and provided detailed design advice.

PROJECT: Park Quadrant, Park Circus, Glasgow  
CLIENT: Ambassador Residential Ltd  
ARCHITECT: Holmes Miller Architects  
OUR ROLE: Park Quadrant Residences takes the form of an outer ring of accommodation to the north of Park Circus, completing a masterplan concept first devised by architect Charles Wilson in 1851. RMP provided full acoustic design advice and plant noise assessment for the luxury development.



PROJECT: Mann Island, Liverpool  
CLIENT: Countryside Properties, Neptune Developments Ltd  
ARCHITECT: Broadway Malyan  
OUR ROLE: Situated alongside Liverpool's 'Three Graces', the award-winning Mann Island development connects the city centre to the waterfront via a sequence of three new buildings and public spaces. The mixed-use project includes 363 apartments, retail, office and leisure space. RMP were commissioned to undertake the noise impact assessment for the master plan including residential development.

**PROJECT:** Various Properties  
**CLIENT:** McCarthy & Stone  
**OUR ROLE:** RMP have worked with McCarthy and Stone for over 15 years on over 100 developments across the UK. RMP have provided detailed design advice and completion sound and air testing across their developments.



**PROJECT:** Donaldson's College Development  
**CLIENT:** CALA Homes East (New Build)  
**CLIENT:** City and Country Edinburgh (Refurbishment)  
**ARCHITECT:** Richard Murphy Architects Ltd  
**OUR ROLE:** RMP are providing full acoustic design and testing services for the residential redevelopment of the prestigious Playfair building and grounds.

**PROJECT:** Glasgow Harbour Redevelopment  
**ARCHITECT:** Kohn Pederson Fox Associates  
**OUR ROLE:** RMP undertook the noise impact masterplan during the build stages. RMP have provided detailed design advice and testing for a number of the development blocks.





PROJECT: Dundee Waterfront, Dundee  
 CLIENT: Ediston Homes Ltd  
 ARCHITECT: Thomas + Adamson  
 OUR ROLE: Site 6 is a mixed use development and part of the £1 billion transformation of Dundee City Waterfront. The development consists of two residential buildings, 150 bed hotel, office buildings and commercial units. RMP provided review and advice of the proposed acoustic specifications and planning requirements for the residential element of the proposed mixed use development.

PROJECT: Dyson Student Village, Nigg Energy Park  
 CLIENT: Carbon Dynamics  
 ARCHITECT: Wilkinson Eyre  
 OUR ROLE: The series of stacked cross-laminated timber aluminium-clad pods are designed to accommodate up to 50 students in total, plus visiting Dyson staff. The unique 26m<sup>2</sup> pods are centred around a new two-storey 'roundhouse' hub building, accommodating social and teaching spaces including a restaurant, bar, lecture-cum-screening room and study space. RMP provided sound insulation testing between 3 of the vertically stacked prototype CLT flats.



PROJECT: Broadford Works, Aberdeen  
 CLIENT: Ferness Investment Holdings  
 ARCHITECT: Seppard Robson  
 OUR ROLE: The mixed use development will create an urban village on the site of Aberdeen's textile industry which operated from 1808 to 2004. The redevelopment includes restoration and conservation of the majority of remaining listed buildings and construction of new buildings. RMP have been commissioned to undertake full acoustic services from planning stage to completion testing.

# Robust Details

Robust Details provide an alternative to pre-completion testing for demonstrating compliance with the performance standards of Part E for new build dwellings (England and Wales), Part G Northern Ireland and Section 5 Scotland.

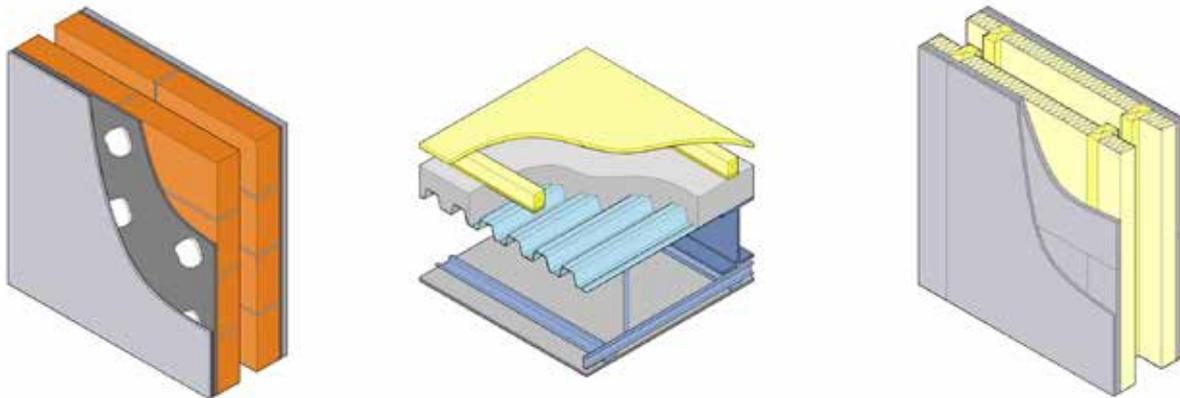
In order to use Robust Details for this purpose, at design stage the site plots are registered with Robust Details Ltd for a small fee per plot. Designers should refer to the Robust Details Handbook in order to enter the relevant construction required.

The house builder is then exempt from the requirement of post completion testing. As part of their registration they can be subject to spot inspections and testing carried out by the Robust Details Inspectorate.

There are several benefits to using the RD Scheme, these include: pre-completion sound testing is not required; risk and uncertainty of remedial action is minimised; potential delays in completing the development are avoided; the increase in material cost associated with RD is an – investment in the fabric of the building for lifetime, rather than one-off test fee.

RDL monitors the performance of current Robust Details through feedback from third parties such as building control bodies and new home warranty providers, together with independent spot checks. The spot checks on site are undertaken by the Robust Details Inspectorate drawn from a large number of acoustic consultancies from across the UK.

RMP Acoustic Consultants currently provide 10% of the total number of registered inspectors under the Robust Details Scheme from our existing staff. We also serve external technical advisors on the RD Standards Committee, and the RD Inspectorate Committee.



# CLT (cross laminated timber)

Construction is one of the largest producers of solid waste in the world. How can we change this situation if most of the materials we use are not renewable, and therefore, finite?

Popularized in Europe and gradually gaining attention in the rest of the world, Cross Laminated Timber (CLT) stands out for its strength, appearance, versatility and sustainability.

The material consists of planks (or lamellas) of sawn, glued, and layered wood, where each layer is oriented perpendicular to the previous. By joining layers of wood at perpendicular angles, structural rigidity for the panel is obtained in both directions, similar to plywood but with thicker components. In this way, the panel has great tensile and compressive strength.

## Scotland's Tallest Timber Building

Scotland's tallest timber building has become a physical showcase for the benefits of cross laminated timber (CLT) construction.

Glasgow-based CCG earlier worked with the Edinburgh Napier University via its Centre for Offsite Construction + Innovative Structures to determine the technical viability and market feasibility of utilising CLT, within a Scottish context.

This work contributed to the University winning the 2015 Queen's Anniversary Prize for its work in wood science and technology. The research assistant David Crawford moved on to CCG following this research and became project lead at Yoker, Glasgow.

The latest chapter in the story of the partnership between the company and the University, supported by the Construction Scotland Innovation Centre, will also call on Edinburgh Napier's expertise in acoustics, energy performance and sustainability.

**RMP provided advice on architectural acoustic design, sound insulation testing and industrial noise reduction.**

Meanwhile, the university's Scottish Energy Centre will offer expertise in energy monitoring, thermal performance assessment, systems design and building performance evaluation.



# 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.

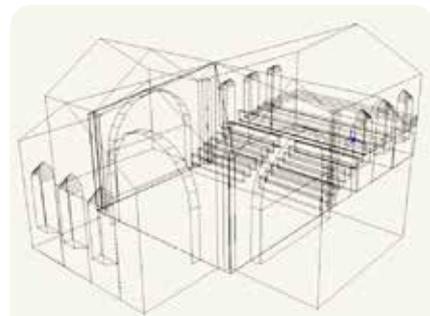
With the introduction of new technical guidance documents relating to schools, hospitals, offices and commercial premises (BB93, HTMo8-01, BCO, BREEAM etc) the need for good internal acoustics is now an issue for most architectural developments.

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.

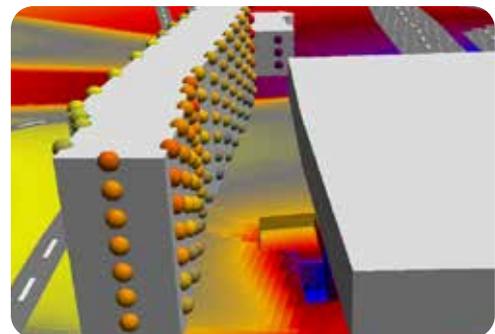
RMP assesses environmental noise sources against the specific criteria provided by local authorities, including the stringent inaudibility criteria. We carry out environmental impact noise assessments in support of planning applications and in response to noise abatement notices. We combine our extensive 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 Elmhurst Airtightness Testing Scheme (EAS) 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:

- EAS 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



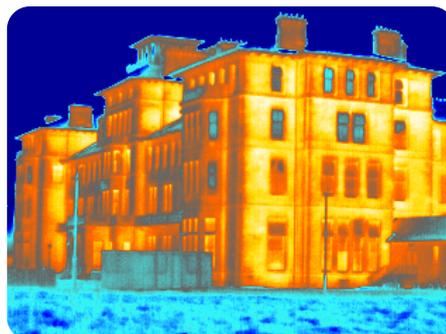
## Infra-red thermography

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)

## OFFICES

### Head Office Edinburgh

Unit 1, 7Hills Business Park  
37 Bankhead Crossway South  
Edinburgh  
EH11 4EP

**0345 062 0000**

South West  
17 Bishops Close  
Torquay  
Devon  
TQ1 2PL  
07908 144954

South East  
The Officer's Mess  
Royston Road  
Duxford  
Cambridge  
CB22 4QH  
07592 104564

[rmp@napier.ac.uk](mailto:rmp@napier.ac.uk)

[www.rmp.biz](http://www.rmp.biz)

 [@RMPsoundtesting](https://twitter.com/RMPsoundtesting)

### Disclaimer

In the preparation of this collection of work we have, where possible, credited photographic copyright.

