

## **NOISE TESTING in SCOTLAND**

### **1. REQUEST FROM SCOTTISH BUILDING STANDARDS DIVISION**

This paper has been written in response to the request from Scottish Building Standards Division for comments on the guidance that is required to support the 2010 Technical handbooks. Its content is advised by the Association of Noise Consultants (ANC) having instituted, developed and administered their scheme for pre-completion testing in England and Wales.

The Association of Noise Consultants (ANC) is the representative body for noise consultants in the UK. Membership has grown steadily over the last few years and there are now 113 member companies, with nearly 200 offices around the UK employing over eight hundred consultants.

The requirement in paragraph 5.1.9 of Section 5 sets out the competence required to undertake testing in Scotland, "Testing should be carried out by persons who can demonstrate relevant recognised expertise in acoustics for sound insulation testing. This should include membership of a professional organisation which accredits its members as competent to both test and confirm the results".

The ANC considers that the Registration Scheme which has been developed for sound insulation testing in residential properties in England and Wales meets the requirements of paragraph 5.1.9 and could be readily adapted to fulfil the full requirements of Section 5.

In this response we set out background to the Scheme and some of the advantages which we believe the Scheme would offer to the Building Standards Division and local authorities.

The ANC is already well represented in Scotland. Of the 55 members of the IOA (Institute of Acoustics) currently undertaking building acoustic consulting in Scotland, 18 are already registered testers and a further 17 work for ANC member companies and could therefore quickly become registered testers. All of the large acoustic consultancies located in Scotland are members of the ANC, e.g., AECOM, Arup, Bureau Veritas, New Acoustics, Robin Mackenzie Partnership, Sandy Brown Associates, and URS/Scott Wilson. When the Scheme started in England and Wales there were relatively few registered testers, but this changed rapidly once the requirement for testing and its benefits became recognised. We believe there will be a similar growth and benefits through introduction of the Scheme in Scotland.

### **2. ANC SCHEME**

- 2.1 In response to the revision of Approved Document E (2003 Edition)<sup>1</sup> which included a new requirement to carry out pre-completion sound insulation tests in a number of situations, the ANC Registration Scheme for pre-completion testing was established.
- 2.2 The Scheme secured approval from CLG (formerly ODPM), and is referred to in the 2004 amendments to the Approved Document. It also provides significant assistance to the building industry in authorising a considerable number of testers, who would otherwise have no form of registration, to carry out these tests.
- 2.3 There are currently 78 companies registered with the Scheme. In all, they employ 330 individual testers. Membership of the Scheme has grown every year since its creation.
- 2.4 The Scheme is a sub set of the ANC membership covering 70% of companies. A separate application process must be completed by companies wishing to join the Scheme.
- 2.5 The ANC scheme is the only one that requires every tester to be at least a technician grade member of the Institute of Acoustics and 50% of all acoustic staff to be full members of the IOA.

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<sup>1</sup> Resistance to the Passage of Sound, the Building Regulations of England and Wales, 2000

- 2.6 The Scheme currently applies only to sound insulation tests as specified in the Building Regulations of England and Wales. The Registration Scheme applies only to testing and the reporting of tests, not to advice on remedial works.
- 2.7 A Scheme Handbook is available and sets out the detailed requirements and operation of the Scheme. A Good Practice Guide is provided to Scheme Members to encourage a consistent approach to testing. The Good Practice Guide is constantly being developed as part of our commitment to improve the reproducibility of test results. We consider reproducibility of results essential for the effective administration of Building Regulations.

### 3 OPERATION

- 3.1 Companies applying to join the Scheme are required to submit details of their sound insulation test procedures, qualifications and experience of proposed Testers, and instrumentation details including calibration certificates.
- 3.2 Individual Testers are assessed on the basis of sound insulation reports from tests previously carried out, and other training requirements. A sound insulation training course is available to ANC members, offered by a Training Provider. An undertaking is made by all authorised Testers to keep up their training in the field, and they may be subjected to random witnessing of tests at any time.
- 3.3 The Scheme is intended to ensure that all tests are carried out in full accordance with ISO140-4:1998, ISO 140-7:1998 and ADE (including arithmetic averaging of the 1/3 octave band level differences for all source positions – a requirement introduced in ADE).
- 3.4 Test results are always submitted in full, regardless of the test outcome, with certification provided centrally from the ADvANCE database. Fees are charged by the ANC to the Scheme Member on a 'per test' basis, providing a variable overhead which suits the diverse range of Scheme Members involved.
- 3.5 The ANC will request specific documentation from each Scheme Member on an annual basis. All documents submitted to the ANC will be treated as commercial and confidential. The documents will be independently audited against a checklist by an Examiner. If the documentation fulfils the requirements shown in the checklist, this will be noted, and an acknowledgement sent that the Company is confirmed on the Scheme.
- 3.6 An Examiner can observe a test by any Scheme Member at any time. In any case, Scheme Members should expect to have a test witnessed at least every three years.
- 3.7 Examiners are appointed and paid by the Scheme and are experienced acoustics engineers.

### 4 VOLUME OF TESTS

- 4.1 Since the start of the Scheme in 2004 there have been nearly 250,000 tests.
- 4.2 At its peak over 4000 tests per month were being registered. In 2010 the average number of tests per month has been approximately 2200.

### 5 ADVANTAGES OF THE SCHEME

#### 5.1 Data Analysis

- 5.1.1 Data from all the tests is securely held by an independent contractor who also produces detailed statistical analysis on the sound insulation performance of construction types. This analysis could be provided for use by the Building Standards Division to demonstrate the effect of changes in the Regulations. The ANC Scheme is uniquely placed to provide this service as no other organisation involved in sound insulation testing has either the quantity of data, familiarity with analysing it or the experience of resolving the issues identified. Information based on the experience of testing in England and Wales could be shared with the BSD if requested.
- 5.1.2 Test data has been analysed under the following headings:

- Purpose built houses and flats, Walls, Airborne.
- Houses and flats formed by material change of use, Walls, Airborne.
- Purpose built rooms for residential purposes, Walls, Airborne.
- Rooms for residential purposes formed by material change of use, Walls, Airborne.
- Purpose built houses and flats, Floors, Airborne.
- Houses and flats formed by material change of use, Floors, Airborne.
- Purpose built rooms for residential purposes, Floors, Airborne.
- Rooms for residential purposes formed by material change of use, Floors, Airborne.
- Purpose built houses and flats, Floors, Impact.
- Houses and flats formed by material change of use, Floors, Impact.
- Purpose built rooms for residential purposes, Floors, Impact.
- Rooms for residential purposes formed by material change of use, Floors, Impact.

## 5.2 Security and Online Verification

- 5.2.1 Until the end of 2009 the ANC Registration Scheme provided hard copy certificates for each test undertaken. Following instances of attempted fraud through the use of counterfeit certificates it was decided to move to an on-line system of test verification from January 2010. This is known as the ADvANCE system.
- 5.2.2 ADvANCE improves access to and confidence in certification and test results as it provides an on-line system that BCOs can interrogate and it has reduced fraud.
- 5.2.3 In order to register sound insulation tests with the ANC Scheme and to obtain access to the ADvANCE online verification system various details of each test are required to be provided to the ANC by the Scheme Member using an online form. Each Scheme Member is assigned a unique Member Number with a username and password to access the online form.
- 5.2.4 The Scheme Member is provided with a unique Task Reference Number for each measurement contract that they wish to register with the ANC. This number is assigned via the online form and may be obtained prior to undertaking the measurements. Once the measurements have been made, details regarding the test(s) are entered into the database via the online form.
- 5.2.5 The information entered onto the database will include reference to the Scheme Member, Tester, test location details, limited construction details (where available) and source/receive room information. In addition, the 1/3 octave band data of DnT and L'nT will be entered with the associated single figure numbers and appropriate spectrum adaptation terms calculated automatically. An email is sent to the Tester once the relevant information has been entered and verified. This confirms the data submitted and provides access codes to the ADvANCE system.
- 5.2.6 The online verification (certification) system means that Building Control Bodies can verify the results quoted in the relevant test report by going to the ANC website and entering the task number and password. They will then see a summary list of results of all the Tests undertaken to date for this project (task) as held on the secure primary server and can print this table for their records.
- 5.2.7 ANC has encountered three instances of attempts to produce fraudulent reports and test results or to doctor the results. In each case a genuine report had been amended by a third party with the aim of showing that a building had achieved a satisfactory result. Trading Standards Officers have successfully prosecuted the developer in one of these cases and another is being actively pursued. The use of the online ADvANCE system has removed much of the scope for abuse and enables local authority building control officers to easily check that the information they have been given is correct.

- 5.2.8 ANC can demonstrate the operation of the ADvANCE system to the Building Standards Division. A version has already been developed to enable the different requirements of the Scottish Regulations to be entered.

### 5.3 Reduced Failure Rates

- 5.3.1 The ANC Scheme has been operating in England and Wales for seven years during which time the failure rate for new build walls has fallen from 40% to around 3%.
- 5.3.2 In the small number of cases where a test fails, ANC member companies are able to offer diagnosis advice and suggest mitigation. A test failure should trigger additional works (which fall outside the Scheme) and additional tests to confirm that measures taken have addressed the problems.
- 5.3.3 Testers in England & Wales report that failed sound insulation tests result in a number of outcomes, some of which are more consistent with the ADE requirement than others.
- i- Test result accepted anyway, as relatively close to required standard
  - ii- Remedial work of some kind required, no re-test
  - iii- Remedial work, and re-test required to the failed plot(s) only
  - iv- Intensification of testing to establish extent of problem, some remedial work and re-testing required
  - v- Test all plots on site, remediate until they all pass.
- 5.3.4 Perhaps the fairest conclusion to draw from this is simply that this requirement could be more clearly worded to encourage more uniform implementation, a lesson from which Scotland may be able to learn.

### 5.4 Professionally qualified testers

- 5.4.1 Testers working within the Scheme are experienced, professionally qualified acousticians, not simply testing staff with no understanding of the underlying issues or motivated by a desire to obtain a result which will satisfy the client.
- 5.4.2 The Scheme has identified issues of “presumed competence” with individuals who have previously conducted tests but are now operating within the guidelines of the Scheme. This has resulted in improved standards and adoption of a common approach to testing throughout the membership.
- 5.4.3 The ANC Scheme offers an in built peer review of test methods and reports as part of the annual company audit and regular witnessed testing process. This can be particularly valuable for smaller consultancy practices such as sole traders who make up approximately 25% of the membership.

## 6 WHAT GUIDANCE SHOULD BSD PROVIDE

- 6.1 Introduction of a recognised scheme for noise testing will assist in producing a standard system which all testers follow. It will provide reassurance to Building Control Officers who will know that tests completed under the scheme have been undertaken by qualified personnel, whose procedures, reports and equipment have been independently checked and are subject to regular monitoring.
- 6.2 ANC welcomes the ratio of testing proposed in Section 5. We note that in England & Wales the testing of 2 walls in 10% of attached houses and 2 walls, 2 floors in flats has proven to be successful. It would be helpful for the guide to provide a table that indicates the number of tests required for any given number of attached plots of the same construction on a development.
- 6.3 Where failures are recorded, Section 5.1.10, indicates that additional testing may be required. We believe BSD should provide additional guidance to Building Control bodies on this issue.

It is the ANC member's experience that where a system has failed, only limited additional testing may be required to confirm a consistent failure. However where variable workmanship is responsible, full testing of all plots may be required to ensure that the requirements of Section 5.1 are achieved.

- 6.4 The ANC support the recommendation in Section 5.1.5 that Pre-conversion sound testing be carried out in conversions. We would recommend that the guide to local authorities highlights this advice.
- 6.5 We consider that tests should be carried out by a body of testers whose procedures and reporting follows standard systems that have been checked by external examiners. To improve compliance and confidence in Building standards, testers should be professional, qualified acoustics engineers who follow an industry wide agreed methodology derived from the building regulations and relevant ISO standards.
- 6.6 All testers should follow agreed guidance on site conditions, such as those already agreed as part of the ANC Scheme Handbook.
- 6.7 Where a test fails, the database helps identify robust solutions and successful remediation. If required ANC members can offer diagnostic support and advise although this falls outside the Scheme.
- 6.8 All these key points set out in the request from BSD will be covered by adoption of the ANC Registration Scheme. In addition BSD will have access to data and analysis not only of test results in Scotland but also to the lessons learned from testing in England and Wales. Resources such as the Good Practice Guide can be made available and specific sections to deal with testing in Scotland will be developed as required.
- 6.9 No other organisation already has in place a Scheme which can be made available almost immediately to fit the requirements of the Technical Handbooks. ANC would be pleased to discuss any aspect of the Scheme further with the BSD.

## 7 FURTHER INFORMATION

Requests for any further information should be directed to:

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