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AN EXPERIENCE IN EXTENSIVE SOUND TESTING AND ENFORCEMENT

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INTRODUCTION

This paper is unashamedly anecdotal. It's aim is to describe the three year experience of "enforcement officers" in the City of Glasgow, Environmental Health Officers and Building Control Officers, and their attempts to utilise the provisions of current legislation to stem the tide of increasing numbers of noise complaints caused by poor sound insulation between dwellings, or between dwellings and business premises in the same building.

The Noise Control Division in the Environmental Health Department of the City of Glasgow District Council was formed in 1979 and during the first two years of its existence it became very noticeable that some complaints, of excessive noise affecting houses and arising from business premises in the same building, were associated with the modernisation or refurbishment of those business premises.

THE TENEMENTAL PROBLEM

The City of Glasgow, like any city, contains many different types of housing but it is well known for it's tenement properties. The Glasgow tenement is typically three or four storeys high, constructed externally of sandstone and internally has timber joist floors.

The bulk of the City's tenements were constructed about, or just after, the turn of the century and frequently contain retail, commercial and even light industrial uses on the ground floor.

In a number of early cases dealt with, the ground floor business premises, during modernisation of their property, would remove the old lath and plaster ceilings and often even remove the ash deafening [pugging] from between the timber joists. In it's place a single layer of plasterboard would be fixed to the underside of the joists.

As this pattern began to emerge we were largely unaware of any problems of poor sound insulation between dwellings although with hindsight it is clear now that problems were arising largely as a consequence of the major programme of rehabilitation being carried throughout the City.

TACKLING THE PROBLEM

In 1981 we approached our colleagues in the Council's Building Control Department who were responsible for enforcing the provisions of the Building Standards [Scotland] [Consolidation] Regulations 1971 and in particular Part H "Resistance to the Transmission of Sound".

This contact allied to research into the problem, news of problems elsewhere in the U.K. and ultimately a detailed examination of our fast increasing numbers of neighbour noise complaints led to discussions on the possibility of a testing programme being initiated.

In one early case, tenement property which had been rehabilitated in the early 1970's was the subject of widespread complaint concerning exceptionally poor vertical sound insulation between flats. The matter was being vigorously pursued by a local community group.

In another case complaint was received concerning a buzzing fluorescent light in the flat below. Yet another problem arose from the location of an electricity sub-station below houses within a block of flats. In each case poor sound insulation was the main problem.

In one classic case a complainer described how she would answer her telephone only to discover that it was her upstairs neighbour's phone that was ringing.

The more we looked at the problem the more examples we encountered where serious noise problems were being caused within houses, not from anti-social or unreasonable behaviour but from abysmally poor sound insulation between flats.

In some of the cases we investigated, we found that the behaviour of residents was not only reasonable but had been grossly modified to minimise the impact of noise on their neighbours. One resident described the situation as like "living in a pressure cooker", knowing that every movement and even quiet conversation could be detected below.

The coming together of these various factors confirmed our suspicion that there was, potentially, a very serious problem to be tackled and this underlined the need for testing as well as action to resolve existing problems.

THE TEST PROGRAM

The first sound insulation test was carried out in newly constructed flats on the 18 May 1982. The second test was carried out in the "problem" rehabilitated tenements referred to above in order to confirm the results of tests carried out by an independant consultant engaged by the residents.

The early tests tended to show that the main problem in the city arose from party floors and that generally party walls did not constitute a major problem. These findings have been confirmed again and again over the past three years.

Having made a commitment to field testing we were faced with the task of looking at the legal aspects of our test procedures.

Our colleagues in the Building Control Department began to inform applicants for Building Warrants that sound insulation testing may be required before the issue of any Certificate of Completion at the end of the project.

We, in turn, looked for methods of reducing the time taken for each test in order that more tests could be carried out.

The first decision taken was to initially test only one pair of apartments, since it was believed that the responsibility for satisfying the Building Control Officer lay with the developer not The Building Control Officer and hence any dispute could involve either additional tests by us, or indeed by consultants engaged by the developer. The Regulations, of course, require that a minimum of four pairs of apartments be tested.

A question then arose as to which version of British Standard 2750 should be

used as a guide to the method of test.

The Regulations cited British Standard 2750: 1956 as the appropriate guide to technique, however the British Standards Institution had already withdrawn this Standard and replaced it with British Standard 2750: 1980.

Legal opinion was sought and suggested that the 1956 version should be used since the use of the later version implied that the British Standards Institution had the power to amend the Building Regulations,which clearly they do not.

CRITERIA

In the field of "new build" the Building Control Department requested that tests be carried out under Part H and under this general requirement the specified performance standard viz 23 A.A.D. was the objective.

Where a "deemed to satisfy" specification was used tests were required under Part B [workmanship and materials]. In this case a level appropriate to that type of specification was aimed for and any significant shortfall in performance was regarded as an indicator of poor workmanship etc.

In proposed rehabilitation projects a test was carried out before rehabilitation and a further test carried out after the works.

The objective in this case was to ensure that the situation was "no worse than before".

Where the initial test results were very poor,it became normal practice to advise the developer of the likelihood of problems and the advisability of additional remedial works although enforcement was not legally possible.

In converted property and sub divided property new party walls and floors were required to meet the new build standard as were existing internal walls and floors which were now to be defined as party walls or floors.

The action taken since 1982 has only been challenged in the courts once in the case of Scottish Special Housing Association -v- City of Glasgow District Council.

A "deemed to satisfy" specification was used in new flats. When tested, figures around 60DB[AAD] were obtained. Similar specifications generally gave figures that were significantly lower.

A Certificate of Completion was not issued and this refusal was appealed to the Sheriff Court by the developer.

The appellants lost their case on the grounds that the Director of Building Control was entitled, on the basis of the evidence before him, not to be satisfied. Had the appellants led evidence to the effect that workmanship was satisfactory,the Sheriff indicated that he would have been required to consider it. The Sheriff took no exception to the test procedures or the use of a said insulation test to assess workmanship/materials.

NUMBER OF TESTS

Since 1982 more than 1,000 tests have been carried out.

A rough estimate of the breakdown of the figures into the three main categories

is:

New Build	-	29%
Converted or Sub-Divided Property	-	13%
Rehabilitation Projects (before and after)	-	58%

[nb wall and floor tests are combined]

CONCLUSIONS FROM THE TEST PROGRAM

A number of significant conclusions may be drawn from our experience of testing.

The three main reasons for failure were;

a] Lack of technical input early in a project.

b] Severe financial constraints imposed on the architect.

c] Poor workmanship or errors during construction.

[a] There is no doubt what so ever that the text book specifications do work in the overwhelming number of cases. However the availability of technical skills to solve a sound insulation problem has, in my opinion, never been in doubt. It is the belated application of the "expert" to the problem to "bail out" an unsuccessful construction that poses additional difficulties, and often crippling additional costs.

I know of several organisations in the Glasgow Area who took technical advice soon after becoming aware of air test program and by applying that advice those organisations have never had a failure.

[b] In some cases funding is perceived to be a problem and in these cases some "gambler's compromise" if a specification is used.

When it fails, as it usually does, the "expert" is brought into retrieve the situation.

The cost of remedial works in this kind of situation, added to the cost of the original specification will usually exceed the cost of a considered specification produced long before works commence.

[c] Quality control on site is also of major importance since, for example, the presence of two 9" diameter holes in the concrete floor beam, provided to run a 1/4" telephone cable, may just influence the performance of the floor.

The final conclusion from the City's test program is that, if the acoustician is involved at the drawing board stage of a project, if the architect is permitted the considered specification, if site control is reasonable, there should be no widespread occurrence of poor sound insulation in new, converted or rehabilitated property, especially if a test program forces the industry to consider all three as being very necessary.

DEALING WITH PROBLEMS IN EXISTING OCCUPIED PROPERTY

In recent years, the number of neighbour noise complaints has spiraled upwards. Where poor sound insulation has been considered as the prime cause of complaint some alarming trends have emerged which suggest that significant numbers of houses built since World War II have very severe sound insulation problems. These problems are common to both public and private sector.

The question of how to deal with existing problems arose and after a great deal of discussion it was decided that action by the Local Authority via the Environmental Health Department was not only feasable but a legal requirement.

The method finally chosen was by use of Section 58 of the Control of Pollution Act, 1974.

Where noise nuisance existed and my investigating officer was satisfied that a deficiency in said insulation was responsible, the structure would be tested. If the insulation is very poor consideration is given to the service of a Notice requiring that the nuisance be abated.

A handful of Notices have been issued and the initial impression given is that remedial works will be carried out by the recipient of the Notice, normally the Owner.

The City wide implications of such action is considerable however it was felt that the existance of a problem arising from same deficiency in the structure could not be ignored.

Thus for the bulk of the problems encountered have arisen either in Council owned property or in property recently rehabilitated or converted by the City's numerous Housing Associations. The Associations tend to be community based and this has effectively contained the problem however this situation cannot prevail for much longer.

The financial implications to the public sector, including Housing Associations in the event of widespread complaints, are enormous.

A number of enlightened Housing Associations in the city are now actively pursuing a policy of improving sound insulation in property that has already been subjected to major rehabilitation works within the past five years.

Several recent cases of individuals either using the Local Authority Ombudsman or the procedures in Section 59 of the Control of Pollution Act, 1974 to pursue complaints against local authorities will I believe begin to open the floodgates which could show poor sound insulation to be a major problem in existing housing.

I would conclude by saying that in Glasgow we estimate the new build failure rate to be less than 10%,much lower than the often quoted B.R.E. estimated failure rate. Our involvement in the field has I believe concentrated a few minds on what is a very real problem for a large number of people.

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