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UDC 69.001.3 : 69.009.182

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THE ROLE OF THE BUILDING RESEARCH ASSOCIATION IN BUILDING CONTROLS

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BUILDING RESEARCH ASSOCIATION OF NEW ZEALAND

THE ROLE OF THE BUILDING RESEARCH ASSOCIATION IN BUILDING CONTROLS

Conference Paper 1

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Reference:

Foster, P.K. 1982. The role of the Building Research Association in building controls. Building Research Association of New Zealand Conference Paper 1. Judgeford

Keywords:

Building regulations; Building Research Association of New Zealand; Bylaws; Certification; Codes of practice; Law; New Zealand; Standards; 1982.

Abstract:

This paper describes the Association's interest in building controls, considering advisory and information application aspects. It discusses BRANZ interaction with building controls, such as statutes and standards and sets out the aims and objects of Appraisal Certificates, and the effect of Building Information Bulletins. The paper concludes by describing the factors influencing BRANZ effectiveness. Appendix 1 gives the objects for which BRANZ is established and Appendix 2 the consolidated proceedings of a discussion on building controls.

THE ROLE OF THE BUILDING RESEARCH ASSOCIATION IN BUILDING CONTROLS

The objective of this paper is to provide, for the Building Control Forum, 10-11 February 1982, a background summary of those present activities of the Building Research Association of New Zealand (BRANZ) relevant to the present building control situation.

The broad functions of the Association have been give as:

"To provide the interface between the building industry and the knowledge it needs to better meet its clients' needs".

This broad scope is spelt out in more detail under "Objects" in the Association's Rules; this clause is reproduced as Appendix I to this paper.

BRANZ INTEREST IN BUILDING CONTROLS

This stems from activities in two directions:

1. Within our proportionately large advisory function to the industry, we are continually asked for advice in the technical aspects of building controls.

2. The best means of application of much of the information we generate is by incorporation in building controls.

Our involvement with, and input into, the vast number of Regulations derived from Statutes, and promulgated by Government Departments, has been comparatively slight. Our principal involvement has been with Standards Association of New Zealand (SANZ) committees, and with the application of the Model Building Bylaw and related documents. Most of this paper, accordingly, is concerned with these latter components of building controls.

In November 1980, BRANZ held a meeting of an invited cross-section of the building industry to identify factors which provide obstacles to the application of technology in the industry, and thus limit our effectiveness. The consolidated proceedings of the discussion are given here as Appendix 2, in the form of hypotheses advanced for discussion, together with the principal comments that were generated.

BRANZ INTERACTION WITH BUILDING CONTROLS

1. Regulations

As noted earlier there is comparatively little interaction with Regulations deriving from Statutes. We have formal representation on the Advisory Committee on the Drainage and Plumbing Regulations, and consult and are consulted by relevant Departments from time to time - e.g. Ministry of Energy in respect of thermal insulation.

2. SANZ

The great majority of our work relevant to building controls is connected with SANZ Committees and with the application of their documents by the industry.

The two organisations have quite distinct functions. BRANZ has the job of producing useful information. Where a consensus is needed (e.g. on a national level of performance) SANZ has the job of assembling the appropriate cross-section of interests (of which we are often part) to reach consensus on what should be done using all available information (of which ours is often part).

In general it is true to say that our involvement in contributing our expertise to SANZ functions in these terms is as considerable as it can be. One can argue that the confusion in the industry as to the respective BRANZ and SANZ roles is a direct measure of the closeness and effectiveness of our contribution.

The sub-divisions of our work which interact with SANZ are as follows:

1. Work on and for SANZ Committees. Some of this is undertaken to meet SANZ priorities rather than ours. However, most of our SANZ Committee work is inseparably involved both in meeting SANZ's requirements for information and expertise from us, and in our requirement for getting our knowledge into a Code or Standard as an effective means of implementation of our work. It is right, proper and understandable that much of our research is related to work at SANZ. The industry's needs include the need for requirements which are increasingly updated (NOTE: not necessarily increased) as knowledge and experience increases. In carrying out their respective functions, it would be wrong if SANZ and BRANZ were not involved in the same areas of work, because it would mean that the industry's needs were not being reflected in the work of both organisations.

2. Work Direct for Industry Much of our day-to-day activity interacts or is complementary to SANZ work.

   2.1 In our information and advisory role we are constantly involved with SANZ publications. For established documents there is constant application and interpretation. For new documents, we have in addition a responsibility to achieve as uniform an understanding and implementation as possible. Our very considerable efforts in respect of both thermal insulation and light timber frame are examples. For BRANZ to act otherwise would be to deny our expertise to the industry.

   2.2 Means of Compliance This is dealt with in most detail here, as it is a more recent source of confusion as to BRANZ and SANZ roles. There are no new principles involved - rather the degree has changed, particularly since Appraisals have developed, but also because we have produced more information that can be applied within existing by-law requirements.

   A description of the BRANZ Appraisal Scheme is appropriate at this point.

   Appraisal Certificates are formal technically-based favourable opinions published in co-operation with the manufacturer of the product covered. They concern innovations intended primarily for use in the building industry and are produced at the request of any enterprise which needs one to assist with the market acceptance of a new product.

   As the Certificates concern new ideas only, they have a limited life, initially three years, sometimes renewed for a further three years.

   Certificates are primarily used by their initiators - the manufacturers of building products - to market their innovations. Local Authorities also use them to facilitate their Building Permit decisions and this can save manufacturers some of the large costs involved in individual presentations to

each Local Authority. All Certificates are widely circulated according to their expected use by Architects or other industry groups.

Our pracice of formal advice to industry via means of compliance documents fits within the hierarchy of:-

1. By-laws
2. Performance levels
3. Means of Compliance

An informal illustration of the hierarchy would be:-

1. "It has to stand up to wind."
2. "It has to resist winds of 50m per sec."
3. "100 x 50 studs spaced and braced as follows will resist winds of 50m per sec."

Where we are members of the appropriate SANZ Committee we contribute to the decision on the performance level to be adopted. Where we are giving technical advice direct to the industry we are working at the third level. In doing this we apply the performance levels of the second level that have been set by consensus, by SANZ Committees. The only exception to not using a consensus performance level is where a consensus performance level does not exist. In such a case we would state our assumption, and draw to SANZ attention the need to establish a consensus level.

The best and most formal example we have of our operation in this context is the Appraisal Scheme, but many Bulletins, some of our other publications, and much of our individual advice and correspondence fulfill this function.

The reason behind this approach:-

1. The SANZ "Means of Compliance Policy" was introduced in 1969 specially to permit both flexibility of adapting to technological change, and ready adoption of alternative means of achieving acceptable levels of performance.

2. The industry regularly seeks our advice on means of compliance, and we are obliged to give advice and opinions on matters within our expertise.

3. We follow the consensus levels of performance where they exist because to do otherwise would be to set ourselves above formally constituted SANZ groups with much wider representation - and bring us into conflict with a system which we are part of.

4. We have a duty to report non-confidential outcomes of our work to the industry to which we are accountable.

5. Formal reporting provides opportunity to the individual staff involved, to demonstrate their worth.

6. Formal reporting to the industry at large is a method of getting our knowledge applied.

7. Publishing means of compliance on general ways of doing things is identical in principle with the more than 70 Appraisal Certificates issued - already proved to be a useful mechanism.

FACTORS INFLUENCING BRANZ EFFECTIVENESS

There are three characteristics of any building control system which are essential to the effective application of technology to the building process:

For BRANZ, and other technical organisations, to play their full part in whatever system may be developed, we require:

1. The ready adoption of new information.

2. Effective means of technical input to interpretation procedures.

3. Acceptance of independently produced means of compliance with required performance levels.

APPENDIX I

"OBJECTS

The following are the objects for which the Association is established:-

a) To promote and conduct research and scientific work in connection with the building industry and all matters concerned with or relating thereto.

b) To establish, form, equip and maintain laboratories for any such research and testing as aforesaid, including the testing of materials.

c) To provide for research and scientific work whether in such laboratories or elsewhere, and whether carried out by or on behalf of the Association or of any other body.

d) to establish and maintain a library.

e) to encourage the study and understanding of building research matters relating directly or indirectly thereto by such means as may seem proper to the Board, and in particular by awarding fellowships, scholarships and bursaries, by conducting discussions, seminars or conferences and by any other appropriate methods.

f) To publish in any form and to disseminate as widely as possible and by any means information concerning research in connection with the building industry and whether relating to or arising from the activities of the Association or otherwise.

g) to collaborate with any institution, group or person engaged in substantially the like purposes as those hereinbefore set out, whether in New Zealand or elsewhere.

h) Generally to do such things as in the opinion of the Board may be considered conducive to the attainment of the above objects and such other things as may conveniently or advantageously be carried on in connection with such objects.

i) To conduct its activities at all times in an impartial and independent manner free from bias and any sectional interests."

APPENDIX 2

Consolidated Proceedings of Discussion on Building Controls

1. Objectives of Codes etc.

"Objectives" can include health, safety, conservation of national resources; protection of neighbours; protection of subsequent purchasers; protection of lay clients by centralising skilled authorities.

Hypotheses:

Competition between these occurs.

Lack of clear orders of precedence make the use of information relevant to codes, and their subsequent interpretation more difficult.

Comment:

Many problems arise from the lack of clear statements of objectives, and of purposes behind requirements. The problems can include multiple interpretations, (arising from multiple guesses at the objectives); unwise dispensations (because the reason for the requirement is not understood); uncertain results where there are competing requirements (such as life safety vs. building preservation, or acoustic separation vs. structural integrity), and no order of priority is given.

It was noted that the trend towards performance requirements is dependent for effectiveness on clearly available technology for means of meeting those requirements.

2. Interpretation

Hypotheses:

Many requirements, particularly loosely-worded requirements, lead to multiple interpretations of a single clause in a single document.

Obtaining interpretation when there are matters of doubt or conflict is a problem.

Comment:

Much weight was given by most present to the problem of multiple interpretations. The problem can arise from the degree of ambiguity which often appears to be necessary in codes etc., for parties to reach consensus. It was also seen as arising from the factors which influence individual interpretation decisions. For example, local community standards; the personal background - and perhaps limited experience - of the Authority employee can cause variations in the personal judgements made in interpreting requirements. It was noted that there was no mechanism by which interpretations, variations, and dispensations could be recorded and available centrally.

Perhaps the biggest single area of concern under this heading was the absence of any referring or appeal mechanism which could be turned to in cases of dispute, but this appears an inevitable consequence of Central Government's delegation to Local Government of the power and duty to set bylaw requirements.

It was also noted that there was no established means by which uniform judgements could be obtained when circumstances arose which the code etc. could not handle because the circumstances were not, or could not have been, foreseen by the code authors.

3. Risk Levels

Hypotheses:

These levels are unstated or insufficiently clearly stated, so that there are problems:

If, as a result of improved understanding, a new requirement is introduced, or an old requirement modified, the setting of an appropriate minimum level is inhibited by ignorance of acceptable performance or risk levels.

Levels are set anyway, whether implicitly or deliberately. They thereby predetermine performance or risk. There is inconsistency with other performance levels set implicitly by other variables.

When one standard is set for a wide variety of circumstances, to be satisfactory for the most stringent conditions, the standard is automatically excessive for less demanding conditions.

Comment:

It was seen as potentially valuable for there to be a general source of decision for minimum levels of risk, but the setting of risk levels was considered a political, not a technical, decision. Concern was expressed on the extent to which the seeking of virtually absolute or complete safety could lead to large costs and to code complexity.

4. Legal Aspects

4.1 Local versus Central Government control of building standards

The consensus and voluntary local adoption process of standards has, in principle, certain advantages:

Local responsibility allows local opportunity for interested parties to make special cases - in principle a more democratic process.

A community can set its own standards, and take account of special local conditions.

On the other hand, there seem to be considerable disadvantages:

Hypotheses:

Variation between Local Authorities in the application of the same requirement causes cost and confusion.

Variation between Local Authorities in rates of adoption and updating of requirements in line with the latest standards and amendments causes cost and confusion. (There is some evidence that even an Act's provisions are not being required by those Local Authorities who do not believe it is necessary).

Local Authorities vary in their attitudes to the relative meaning and status of the categories of documents such as bylaws, means of compliance; related standards; MP101 of SANZ; code commentaries. This causes uneven application of technology.

Comment:

There were few advantages seen for national regulations as against the present position whereby the greater part of building control exists through the adoption of the Model Building Bylaw by Local Authorities. The main ones seen were that they could incorporate requirements now imposed from other directions than by bylaw: they presented an opportunity for clarifying questions attaching to negligence and limiting the present apparent "open-ended" possibilities of suing: all affected industry groups could be notified automatically when amendments were made.

On the other hand, regulations were not necessarily any more effective, and would not cure differences between local interpretations.

There was discussion at length on the administrative consequences of delegation by Central Government to Local Government of the power to make building bylaws. Concern was expressed on:

The length of time it takes to update a bylaw leading to difficulties in the inter-regnum.

The variability between Authorities in timing of incorporation of amendments, leading to differences between Authorities.

Absence of obligation for Authorities to notify any central organisation, leading to no record of what standards are required where.

Absence of any requirement for a minimum qualification for building inspectors.

4.2 Legal status and format of documents

This is concerned with the differences between Bylaw (or Regulation); Means of Compliance; standards incorporated by reference in the Bylaw or the Means of Compliance; MP101; code commentaries.

Hypotheses:

Legal liability for negligence is unaltered by where information is placed, in that a "careful" expert would be aware of it anyway.

'BRANZ' effectiveness is different according to where its work is placed in the above categories.

BRANZ work which appears in a voluntary standard potentially suffers from one or more of four factors acting against adoption:

The market is not aware that there is something worth demanding.

The market does not check that what it ordered was in fact supplied.

There is not testing equipment or skills available for the checking to be possible.

The market is aware but does not consider adoption to be worthwhile.

More teeth in Government regulations, and/or more regulations rather than voluntary local adoption would make the application of technology better.

Comment:

As far as the format of documents is concerned, it was emphasised that the requirement for bylaws to be legal documents often made them unsatisfactory as technical ones. The difficulty of site staff appreciating and following detailed cross-referencing systems was also quoted.

Discussion on the effect of status of documents emphasised the importance of there being no comprehensive description extant of the present system. It was therefore not possible to be sure one was aware of all requirements.

4.3 Legal liability

Hypotheses:

The increasing threat of litigation for negligence increases reluctance to deviate from approved means of compliance.

The lower and less specific the minimum standards required by bylaw are made, the less there is to be negligent about.

Comment:

Legal liability for negligence was seen as a matter of developing importance for all. The design professions as well as Local Authorities are becoming increasingly concerned and constrained by precedents such as the Anns-Merton case.

5. Conflicts between requirements

Buildings are controlled by:

Local Authority bylaws

Quasi - and non-Government organisations (e.g. Fire Service; Insurance Council)

Government regulation from as many as eight departments:

Ministry of Works and Development	Internal Affairs
Housing Corporation of New Zealand	Labour
Health	Welfare
Energy	Earthquake & War Damage

On any one project many diverse controls may be exerted.

Hypotheses:

There are several matters of relevance under this heading:

It is difficult to be aware of all requirements - they are widely dispersed.

There are conflicting requirements between different sources of authority.

Documents given by reference in a specification are incomplete for their intended purpose.

The dispersion of authority and documents results in the omission, from related or interdependent documents, of amendments necessitated by a change in another requirement.

Comment:

Several examples of conflict between requirements were given, stemming from an earlier point, that there is no overall description of the present system so that conflict can be checked and avoided.

A particular difficulty in respect of large contracts was noted: namely, that the requirements during the construction phase can be significantly different from those that existed during the design phase.

6. Use of information

Hypotheses:

Availability of information is inadequate.

The training of appropriate industry sectors to read, analyse and apply written information is inadequate.

Loan limits, inflation, taxation and interest rates combine to provide an incentive towards minimum capital cost in building design. BRANZ work suffers when it leads to higher capital cost, although the overall capital plus operating cost constitutes reductions over the life of the building which are in the national interest.

Comment:

It was pointed out that the vast quantity of general information disseminated these days created serious problems of competition for attention, for technical information.

The cost of technological developments was seen as important. The view was held that those leading to increases in capital cost, although economic in the long run, would need a legal (compulsory) backing to overcome the pressures on the builder to minimize capital costs.

7. Education and training

Hypotheses:

The level of resources required of Local Authorities to fulfil their duty of care under the law, is higher than those for which ratepayers are prepared to provide. Local Authorities are prevented from providing the service necessary for BRANZ' effectiveness.

There is an increase in performance (as opposed to prescriptive) specifications. The greater choice this offers, also offers a greater opportunity to make mistakes - at all stages of design, construction and inspection to the detriment of BRANZ' efforts.

It is a significant constraint on retraining and awareness of new developments that industry sectors are under pressures of time (e.g. a consultant to charge out the maximum possible hours). Further study would then be only at the expense of income. This is a disincentive detrimental to BRANZ.

Comment:

The main thrust of comment under this heading was the need for more, and continual, educational efforts - especially education by BRANZ. Technical Institutes and Local Authority officers were seen as the main targets for such goals as improved uniformity of inspection and site practice.

Advantages were seen in "further education" in some form being made a requirement of maintaining rights of membership of trade and professional organisations.

The registration of trades in which it is currently not required met with conflicting responses. Those who propounded the greater entry standard that could be enforced by registration were countered by those with concerns about the effects of a "closed shop" used to serve its members' interests rather than their clients'.