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OVERSEAS BUILDING CONTROL SYSTEMS AND THEIR RELEVANCE TO THE REVISION OF NEW ZEALAND'S SYSTEM OF BUILDING CONTROLS

P.D. Leslie

BUILDING RESEARCH ASSOCIATION OF NEW ZEALAND

PREFACE

The Building Research Association of New Zealand (BRANZ) publish this report by 1986 BRANZ Study Award Winner, Peter Leslie as part of its ongoing support of research into building controls.

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This report is intended for code writers, local authorities, and members of the building industry who are interested in the revision of New Zealand's system of building controls.

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ABSTRACT

BRANZ Study Award winner Peter Leslie toured parts of the USA, Canada, England, Scotland, France, Norway, Sweden and Denmark to gain an in-depth knowledge of each country's system of building controls.

CONTENTS

INTRODUCTION AND AIMS

The 1986 Building Research Association of New Zealand (BRANZ) Study Award topic "The Study of Overseas Building Control Systems to Assess Their Relevance to the Revision of New Zealand's system of Building Controls" was chosen to assist the then yet to be formed Building Industry Commission (BIC). BIC is charged with the responsibility of undertaking a major review of New Zealand's system of Building Controls. Following the appointment of the Commission members, the BRANZ Award was extended to include specific tasks required by the Commission.

The aim of the study tour was to gain an understanding of the operation of the building control systems of the West Coast of the USA, Canada, England, Scotland, France, Norway, Sweden and Denmark. It was considered important to obtain an in-depth knowledge of each country's system so that strengths and weaknesses could be analysed as they are relevant to the New Zealand situation. This was achieved by having nearly 80 meetings with Architects, Engineers, Contractors, Local Authorities, Fire Services, Code Writing Agencies both Governmental and private enterprise, Standards Associations, Government Departments, Building Research Institutes and Insurance Companies in the various countries visited.

It was considered especially important that as a result of these studies, that BIC was aware of the very latest overseas developments.

Appendix I lists the meetings held. Full meeting notes for most of the meetings are retained at the BIC Library in Wellington.

The following are brief descriptions of those aspects which are considered to have the most relevance to the New Zealand revision. While these are discussed individually, it should be appreciated that in a comprehensive and effective building control system, many are interdependent.

CONCEPTS RELEVANT TO THE REVISION OF NEW ZEALAND'S BUILDING CONTROL SYSTEM

Basic Objectives of Building Controls

The basic objectives of building controls are reasonably uniform in the countries visited.

All countries' building control systems have the objectives of maintaining adequate standards of health and safety.

Most countries' building control regulations also include provision for energy conservation and many also include provisions for access for the disabled. These two provisions are assigned to building control regulations for reasons of convenience rather than as basic objectives of building control.

Some include what might be called commonsense objectives, such as "the measures should be designed to increase productivity in the building industry and to encourage measures that can minimise unnecessary consumption of resources in buildings."

The Norwegians appeared to be the people who adhere most rigidly to the basic aims of their building control system. The example was quoted that

building controls do not concern themselves with the levelness of floors. So long as there is not a problem of health and safety, this is usually considered to be a matter of quality control, and is not the province of building controls and therefore the building official. Although this may seem to be taking rather a narrow view, the Norwegians believe that unless you confine yourself to the basic objectives of building controls, the system will become unmanageable and responsibilities will be poorly defined.

Recent moves in the UK to provide for warranty schemes in conjunction with Building Control is a practical way of overcoming the criticisms of the Norwegian's narrowness. It is also a better use of resources. This is discussed in Section 2.12.

A Philosophy of Maintaining Direction but Encouraging Others to Produce Building Control Documents

There is an increasing trend both overseas and in New Zealand towards a philosophy of minimising the role of Government in people's lives. Wherever possible it is considered the market place should decide and this approach is being carried through to building controls. An important component is the associated reduction in administration costs for Government.

Consistent with this policy, many State-financed Building Control Agencies are developing systems which have a fine balance between maintaining direction so that the basic concepts of health and safety are not compromised, and encouraging industry to do as much of the work as possible. This philosophy also has the advantage that usually industry-developed documents are more likely to be adhered to by the industry than a document which is considered to be imposed by others.

This approach also recognises that the resources available to produce building control documents are limited especially at the State level. Wherever possible industry-based documents or those prepared on a voluntary basis should be encouraged.

This philosophy is being vigorously followed in the UK. The building regulations people have advised that their 1985 system of approved documents is designed to ensure that wherever possible British Standards or similar authoritative documents are referenced. Often information has only been included in the Approved Documents where there is a lack of suitable industry-prepared material.

This approach is not without its difficulties. Negotiations are continuing with the Institution of Structural Engineers to coordinate all structural related building codes. There have also been discussions with the British Standards Institution to develop a style of document that separates basic health and safety issues from other Standards matters such as quality assurance.

BIC needs to be careful to encourage the agencies that have produced building control documents in the past as well as encouraging new sources. The revised system will need a format where this type of information can be formally recognised after suitable scrutinising.

The UK Two-Stage Review of Building Controls

The approach of the United Kingdom to the review of their building regulations may be relevant to New Zealand. With their revision during the period 1980-5, it was decided that a two stage review process would need to be followed to maximise the return on the resources available.

In the first stage of the review, the technical content of the requirements was left substantially the same. The plan was to recast the regulations into their new format first and then review the technical content in stage two. the second stage of the review has been proceeding for the last two years.

Once the size of BIC's task has been established it may be the most effective use of resources to concentrate on recasting the codes into a performance format and putting in place a logical structure that will accommodate future technical change. Overseas experience suggests that other issues such as defining responsibilities and providing appeal procedures, etc., also require addressing at the first stage.

Performance Based Documents for Building Controls

There is general agreement throughout all the countries visited that building codes should be performance based. Interestingly, most countries visited considered they had performance based systems. The Canadians for example state that they have the best of both worlds. Part 9 of the National Building Code of Canada dealing with dwellings is prescriptive, limited in scope, and satisfies a segment of the market. Part 3 "Use and Occupancy" is said to be performance oriented by virtue of its equivalency clauses. This gives scope for tradeoffs and flexibility. However, the performance nature is not consistent with the New Zealand or European ideas of what constitutes a performance based system.

The UK building regulations people in their 1985 Building Regulations have called their performance statements "functional statements" to avoid, as they say, confusion with the use of the word "performance".

In producing the UK Approved Documents, there was considerable discussion as to how to present the information. The opinion was that the NKB (Scandinavian) and ECE five levels system was investigated but found to be too constraining. The format of the Approved Documents with its functional statement and then in effect, mixtures of Level 3, 4 and 5 statements with supporting diagrams was considered most suitable. This format appears to be generally well accepted by the users.

From discussions in Scandinavia, it appears that only Norway attempts to write its code taking account of the NKB five levels system. Denmark and Sweden were vague about the levels, and simply stated their codes are written in performance terms. A copy of the latest Norwegian Code, released in June 1987, was obtained. It is presently being translated and hopefully will be of value to the development of New Zealand's Building Code.

The degree of difficulty that other countries, with greater resources than New Zealand, have had in coming to terms with performance based systems, particularly in trying to define the various levels, should not dissuade

New Zealand from developing a logical performance-based code. However, there appears to be no model that New Zealand can readily copy.

Different Emphasis of Building Control Policies between Commercial and Residential Sectors

While it is a common objective of all countries visited that the primary aim of building controls is to maintain adequate standards of health and safety, in certain countries different policies are being evolved to protect the residential sector compared with the commercial (including industrial) sector.

In the UK, the private homeowner is considered to require greater protection than the commercial sector. This is to some extent reflected in recent case law. The reason is that usually it is assumed the commercial sector will have the skills or the resources to purchase skills to protect itself.

It is generally recognised that the private home buyer will often not have the resources to employ lawyers and other professionals in the event of a problem. Recent moves with the National House Building Council in the UK, providing what is in effect compulsory insurance for anybody requiring a Building Society mortgage to build a dwelling, shows the emphasis on protecting the residential sector. This is discussed further in Section 2.12.

In France there is concern that the present technical control system operated by the Bureaux de Controle is not able to give the needed emphasis to the residential sector. A fixed percentage fee structure is in operation. Because most private dwellings are worth relatively little in comparison with commercial projects, there is not a sufficient component of the fee available to adequately supervise private dwellings according to Socotech. Socotech is the largest technical control agency in France having 50% of the market.

It may be appropriate to provide a package of measures, consistent with the overall objectives, that has certain features for the residential sector. This would be consistent with developing a system of building controls which reflects the expectations of New Zealand society.

Code for Residential Buildings

There is a trend overseas to produce simple concise codes for residential buildings. These documents are written with the view of being complete in themselves. They are specifically designed to provide a solution for this relatively unsophisticated but very important sector of the building control market.

These codes tend to be rather more prescriptive than performance oriented. They recognise that this sector of the market is generally only interested in how to get the job completed rather than understanding performance characteristics.

The introduction of such codes does not detract from the emphasis to performance oriented codes. It is also not suggesting that the concrete design code, for example, should be written in a form suitable for small

buildings. It utilises a marketing approach to building controls in recognising that generally people involved in residential buildings have different skills and requirements to the engineers and architects involved in using such codes as the concrete design code.

The Danish Small Buildings Code 1985 is a good example of a simple concise code for the residential sector.

The fire code is another example of a code that could be written in a rather prescriptive format by limiting its scope to "small" buildings. Such a decision should be dependent on who would ultimately use the document. However, any control system must also provide an alternative performance based document for fire that will provide scope for encouraging innovation and flexibility.

Exemptions from Building Control Requirements for Small Buildings

There is a trend in overseas codes to extend the exemptions from building permit requirements for small buildings. In parts of Scandinavia this has been pursued to a point where it is not necessary to take out a building permit even when completing structural alterations in one's own home.

It would be prudent for BIC to have a policy to provide the greatest possible number of exemptions from building control requirements for small buildings. These exemptions would apply to building controls rather than planning controls which are a separate issue.

"Binding the Crown"

The binding of the Crown is commonly accepted in most countries. There does not appear to be any particular problems. Most countries have exemptions for the Crown only for top secret military installations and the like.

Relationship of Planning and Building Controls

It was generally recognised that planning and building controls have separate but complementary roles. The statements made by Mr Bill Williams in "District Planning in New Zealand" and other BIC statements are consistent with the mainstream of overseas opinion.

In Scandinavia it was considered important to have Planning and Building Control functions under the one Ministry. This does not happen presently in Norway and causes some problems with coordination according to the National Office of Building Technology and Administration. This is the body charged with the responsibility of producing Norway's National Building Code.

There was criticism of planners in the USA and Canada who were considered to make requirements that were beyond the Planning Ordinances. Developers apparently were reluctant to argue for fear of repercussions in the future.

There was a feeling in all countries visited, that Building Controls suffered much unwarranted criticism due to delays in the planning process. However, there was also general agreement that the delays in the planning

process were not usually excessive. They were necessary for the democratic planning process to function.

Role of Local Authorities

The role of local authorities appeared to depend on the law, resources available and their degree of competence. Although there are wide disparities in their mode of operation both within and between countries, the local authorities remain the core of the building control business in all countries visited except France.

In the USA and Canada, local authorities are generally considered helpful, and particularly in the larger cities, competent. Contractors, architects and professional engineers visited were strongly of the opinion that local authorities should continue with their existing role. They were most surprised at suggestions that self-certification schemes were a viable alternative.

In the UK, local authorities are held in low regard compared to North America. Building Control personnel are relatively lowly paid and this function is often low on the priorities of Local Government. Matters are not helped by the Central Government/Local Government arguments in many local authorities. A relatively large proportion of the population is under Labour controlled authorities whereas Central Government is Conservative. The local authorities obtain much more funding from Central Government than in New Zealand.

At the time the UK Building Regulations were being formulated it was debated whether the Building Control function should be removed altogether from local authorities and given to private enterprise. After much discussion, it was considered necessary to retain local authorities as a backstop for reasons of concern regarding the longevity of private enterprise, and insurance problems.

In France, local authorities have no role in building control. They do have a role in planning. The building control role is undertaken by the Bureaux de Controle and the insurance companies. This tends to be expensive and there is concern about the effectiveness of this system in the residential sector.

In Scandinavia, the local authorities have a major role in building control, but the law has made this an "all care, no responsibility" function.

From this overseas experience, New Zealand would be out of step if it were to remove local authorities from the building control function. The problem of course is what to put in the place of the local authorities. Much of the criticisms of local authorities would be overcome by ensuring uniform codes throughout the country, providing adequate appeal procedures, and clearly defining responsibilities. The competition from "Approved Inspectors" in the UK has also improved the performance of local authorities to the benefit of the building control market.

Alternative Building Control Authorities

The role of building control authority has traditionally been undertaken in most countries by local authorities. With increasing concern about liability and sometimes decreasing resources, local authorities have not always been able to maintain an adequate building control service. With the resulting dissatisfaction some countries have taken measures to improve the situation. The UK Approved Inspector scheme, the City of Vancouver, British Columbia, Canada Certified Professional Scheme and the French Bureaux de Controle Technical Control alternatives are described.

UK Approved Inspector Scheme

A major thrust of the 1985 revision of the UK Building Regulations was to provide for greater flexibility, innovation and self-certification by developers, builders and owners.

Because of dissatisfaction with the local authorities performance in building controls, it was debated whether this function could be transferred completely to the private sector. This would also have been consistent with the Conservative Government's policy of privatisation. In the end, mainly for reasons of liability and insurance, and the perceived temporary nature of some private enterprise agencies compared with local authorities, it was decided that the best solution would be to retain local authorities, but to make provision for competition.

The private enterprise competition was provided for in the legislation by permitting "Approved Inspectors". Approved Inspectors would be able to compete with local authorities. Local authorities would provide a backstop in the event of a failure by the Approved Inspectors.

The specification for being an "Approved Inspector" was advertised by the Institution of Structural Engineers and Institution of Civil Engineers and is included in Appendix II.

To date there has been only one "Approved Inspector" authorised. The problem is that Government was seeking a 15 year professional indemnity insurance cover for all Approved Inspectors whereas in practice only one year's cover is able to be obtained.

The sole Approved Inspector is the National House Building Council (NHBC). This organisation was able to gain the necessary approval because it has its own insurance company associated with the NHBC ten year warranty scheme. Under the warranty scheme the NHBC is already covering building control matters for 10 years. For matters of litigation in tort beyond 10 years, the NHBC will be in the same situation as local authorities.

The NHBC building control scheme is confined to the new home residential sector. All dwellings up to and including four storeys or three storeys plus a basement are covered. The service includes preliminary advice to intending users, the checking and approval of plans, and a full on-site inspection service. Additions and alterations are not included at this stage. It presently has 25% of this market; this is causing local authorities concern.

The costs associated with the NHBC, which are set out in Figure 1, are very similar to those charged by local authorities. Local authority building permit fees are fixed nationally in the UK unlike New Zealand where each local authority is permitted to set its own fee level.

The present fee structure of the NHBC building control of, for example, 135 pounds for an average home costing 50,000 pounds or 0.27% is a very small additional cost. However, NHBC Building Control Service Ltd which is a subsidiary of the NHBC does not break even.

For local authorities, studies have shown that, on average, the income from building permit receipts is only covering about 50% of the total costs of building control. With the Government's policy to have full cost recovery, it is expected that building control fees will be progressively increased. The NHBC is eagerly awaiting these moves so it can increase its own fee structure to the break-even point.

The introduction of the NHBC into the building control market appears to be having beneficial effects. The initial outcry, particularly by local authorities, has abated somewhat and many local authorities have joined in initiating procedures to ensure they remain competitive.

The procedures to remain competitive have included introducing local authority national "house type" approval schemes. This service is already provided by the NHBC. It means that a builder/developer has to obtain approval only once for a standard house plan after which the approval will be accepted in all other areas covered by local authorities that belong to the scheme. The approval applies to the part of the house above the foundations. Foundations and drainage, which are often site dependent, require separate approvals for each site.

Local authorities have found they have had to have a more flexible approach to standards to remain competitive. The NHBC has in certain cases relaxed the requirements set down in British Standards Institute publications. Local authorities have been reluctant to do this but are now setting up procedures offering similar savings. This is only in those situations where health and safety are not compromised and the standards can be proven to be excessive.

The present major concern to local authorities is their inability to be able to offer a complete Building Control/ten year warranty package in competition with the NHBC. The proposals to remedy this, introduce interesting philosophical issues for the role of local authorities.

In association with the Municipal Mutual Insurance Company (MMI) the local authorities have developed a warranty package called Muniguard. The MMI is the English equivalent of the NZMCIC. Muniguard as proposed would be very similar to the NHBC ten year warranty. In addition to building control matters of structural integrity, it will cover such non-building-control matters as quality assurance, what happens if the builder goes bankrupt or does not complete construction, etc. These aspects are generally accepted as being essential components of warranty schemes.

The dilemma is that for local authorities to be competitive, they consider it essential that they can offer the full package of the NHBC. However, Government has replied that this goes beyond the traditional role of local

authorities. Government maintains that local authorities should be involved only in health and safety matters and should not extend their services to cover other matters such as quality assurance. The outcome of this continuing debate will be interesting.

Certified Professional Schemes

A Certified Professional (CP) scheme has operated in British Columbia since 1983. It is organised essentially by the City of Vancouver and the University of British Columbia.

The aim of the CP scheme is to provide a fast track procedure for obtaining a building permit. There is less local authority checking compared to the traditional procedure. The reduced involvement of the local authorities is extended to the supervision phase. The CP must certify at various intervals during construction and at completion that the project has been built in accordance with the contract documents. There is in effect a fair degree of self-certification associated with this procedure.

To become a CP it is necessary to be a qualified engineer or architect, to undertake a study course at the University of British Columbia and to obtain an 80% mark to pass the exam. Presently only 50% of those people undertaking the course pass the exam.

The CP course concentrates on the fire and use and occupancy sections of the code. According to Roger Hebert of Vancouver City, one of the instigators of the scheme, the CP scheme was able to be introduced because of a recognition that architects and engineers had a poor performance record in these two sections of the code. As a consequence local authorities were often left to sort out the problems.

The CP scheme is used only on a relatively small number of commercial projects. It is not seen as a successor to the traditional process but rather as giving the industry a choice.

The advantages of the CP scheme are:

(i) the training required to become a Certified Professional generally upgrades the work of the design professions and improves the quality of submissions even under the traditional building permit approval process;

(ii) it reduces the time required to obtain a building permit;

(iii) there is a reduction in the building permit fee (reflects the lesser work by Local Authorities);

(iv) responsibility and therefore liability is more clearly established;

(v) certified professionals should be able to obtain reduced insurance premiums in recognition of their increased competence;

(vi) it has increased the awareness of each other's problems for designers and local authority building officials.

The Director of the Ontario (Canada State Government Building Control) Branch is also seeking to introduce a Certified Professional Programme. He is meeting resistance, particularly from designers who consider the scheme is elitist. Many professional engineers consider it is totally wrong to allow only those people who have passed an examination to operate as Certified Professionals. They say it is not necessary as a professional will not act beyond his competence. It will be interesting to learn of the final outcome in Ontario.

French Building Control Authorities - Bureaux de Controle

In France local authorities are not involved in technical control. They are only responsible for town planning matters which include land use and bulk and local requirements.

Technical control is the responsibility of Bureaux de Controle in France. The degree of checking by these organisations is considerably more than in New Zealand. The largest Bureau de Controle in France, Socotech, which presently has 50% of the total market was visited.

By law in France technical control is required for 3 categories of structures:

(i) public buildings;

(ii) high buildings (higher than 28m);

(iii) structurally complex buildings, e.g., long span structures.

Although these buildings, for which technical control is compulsory, comprise only about 10% of the value of structures, because of insurance reasons the actual percentage under technical control is about 90%.

The technical controller is directly employed by the owner. The technical controller requires approval by a Government sponsored committee. This approval can be restricted in the type of work permitted to be controlled by the technical controller and can be for a limited period. Presently Socotech has approval in all building fields for 5 years.

The technical controller can not be involved in any other activity except technical control.

According to the Law of 1978 (Article 8) - "The Technical Controller's task is to contribute to the prevention of the different technical risks likely to be encountered in the realisation of works".

The technical controller must give advice to the owner who in turn passes this on to the insurer of the completed works. This means the technical controller must be involved at all stages of the works; i.e.,

- General concept and design checking.
- Detailed specification and working drawing checking.
- Checking construction on site.

The scope of the works to be covered by the technical controller depends on the services required by the owner and may include checking the following:

(i) strength of foundations and structures, watertightness, elements that are inter-connected with the structure, roads and service mains;

(ii) safety of persons, e.g., fire, safety of lifts;

(iii) correct functioning of equipment, e.g., air conditioning, heating, ventilation, electricity, plumbing, lifts, etc;

(iv) thermal insulation;

(v) sound insulation.

Where technical control is compulsory as specified by the law, items (i) and (ii) must be checked.

It should be emphasised that the process of technical control in France is fundamentally to "normalise the risks" for insurers. The "normalisation of risks" is not to perform systematic checking of the compliance with regulations, but to obtain a level of failures which are statistically and economically acceptable.

The approach of technical control in France may be summarised by two words:

- Pathology.
- Methodology.

Pathology means failures are classified according to their cost, degree of repetition, etc.

The exploitation of this pathology involves -

Methodology which includes

(i) the preparation of control procedures and methods which aim to reduce the most expensive failures, either in value or frequency;

(ii) The establishment of technical recommendations that cover problems which are not specified in the regulations, or which require special attention from the technical controllers.

The technical control agencies like Socotech maintain that through their network of nationwide offices a high degree of uniformity is maintained. The cost of technical control is about 1%. This is considered totally inadequate for single or double family dwellings. This means there is a real problem in this area which has not been solved at the present time.

Insurance aspects

Because of legal problems associated with settling claims the law was changed in 1978 which established obligatory insurance of two types.

(i) "Defects insurance" or "Dommages Ouvrage" which must be taken out by the owner or his/her representative. The idea is that a rapid settlement can be achieved in the event of a problem. In turn the Insurer may try to claim on the insurance company of the "builders" (contractor, architect, or engineer).

(ii) Liability insurance (Decennial insurance) of "builders".

Typical costs for insurance are for the owner under category (i)

- 3-4% without technical control
- less than 3% with technical control

In general it is cheaper for the owner to employ a technical controller whose services usually costs less than 1%. This is the reason why 90% of buildings are subject to technical control.

Under category (i) insurance, the owner receives the following guarantees:

(a) complete guarantee (1 year)

(b) maintenance guarantee on fitments (2 years)

(c) decennial liability ("builders") (10 years)

This insurance based system is considered expensive and the insurers have reservations because of the high costs. The weaknesses are considered to be due to the following:

- There is no"excess" on category (i) insurance. This means even very small claims must be processed with resulting high administrative costs.
- The insurers do not know inflation rates and need to be conservative in estimating 10 years into the future.
- There is no upper limit to the insurer's liability.

The average costs of category (ii) insurance are

Engineers	10% of fees
Architects	0.6% - 1% of works
Contractors	0.2% - 9% of turnover

Excesses for contractors can be very high. This provides a degree of control over the people in the industry through the insurance basis.

In addition all builders must be registered. However, apparently in France "anyone wishing to do anything" must be registered, and according to the people visited this system of registration is neither especially restrictive or exercises much control.

National House Building Council (UK) Warranty Scheme

One of the major criticisms of building control systems in many countries are the problems involved in putting things right when there is a failure associated with a building.

People, particularly residential home owners, can suffer considerable hardship both emotional and economic. Under previous systems it was often necessary to go before the courts to obtain any compensation. The settlements usually do not fully recompense for the economic hardship let alone the emotional strain.

To overcome these problems, several countries have introduced building warranty schemes. One of the most well known is that operated by the National House Building Council (NHBC) in the United Kingdom. This has been used as a model by other countries including the USA, Canada and Australia.

To understand how the NHBC warranty scheme has developed it is useful to have some knowledge of the history of the NHBC.

The NHBC was formed in 1936 amid widespread allegations of "jerry building". It was founded as the Housing Improvement Association, a voluntary registration body to control building design, workmanship and materials in private sector housing. In these early days the members gave a two-year warranty. The war years prevented further development until the 1950s. In 1951, 4% of private sector housing was covered and the scheme included 653 registered builders. By 1963, 26% of private sector housing was covered and there were 1700 registered builders.

During 1965/66 there were several major parliamentary debates. There was all party support for the NHBC as a voluntary registration body. The parliamentary debate was as a result of problems with failures in the housing industry.

In 1965 the 10 year warranty scheme was first introduced by the NHBC. As a consequence, in 1966 the Building Society movement put their support behind the NHBC. The involvement of the Building Societies meant that all people obtaining a mortgage from a Building Society were required, as a condition of the mortgage, to have an NHBC warranty scheme.

Today 25,000 builders belong to NHBC. Membership is essential since new homes cannot normally be mortgaged without the 10 year warranty. As a result over 99.9% of new homes are covered by the scheme. Three million households have received the protection since it was introduced in 1965.

Another significant date for the NHBC was the decision in 1978 for NHBC to be approved as an insurance company. This allowed for greater control over the warranty scheme.

In 1985 as a result of the new building regulations, the NHBC was given the status of Approved Inspector. NHBC Building Control Services Limited was set up as a wholly owned subsidiary and is able to compete with local authorities in the residential sector.

The main features of the NHBC 10 year warranty scheme are set out in Figure 2.

The NHBC has advanced considerably since its origins in 1936. To take account of its widening role of protecting both builders and homeowners, the governing council now represents all people interested in maintaining standards of private sector house building. Of its members, two-thirds represent the Building Societies, Consumers, Architects, Surveyors, Town Planners and the Unions; one-third are house builders.

The NHBC undertakes its warranty scheme in the following ways:

- It vets applicant builders to ensure their competence. It encourages good builders by offering no-claims discounts on membership fees and disciplines bad builders by withdrawing their membership.

- It improves standards by obtaining feedback from its inspectors and analysing claims. Both these aspects are undertaken on a national basis.

- It encourages quality because its warranty scheme goes further than basic health and safety.

- It informs builders and carries out on-site inspection.

The cost of the NHBC warranty scheme is about 0.4% of the house price. 70% of this cost is accounted for by the insurance premium and 30% is involved with administration, inspections and building up reserves.

Status of Building Code Writing Agencies

The status and role of building code writing agencies depends on the regulatory framework in which they operate and the extent of their activities.

In the USA the three main code writing agencies are private enterprise and to some extent are controlled by the local authorities. The International Conference of Building Officials (ICBO), for example, produces a model code which has no legal status until it is adopted by the local authority. For reasons of uniformity, some States are now legislating to ensure the same codes are used by all authorities.

The National Building Code of Canada (NBC), National Fire Code (NFC) and associated documents are developed and maintained by the Associate Committee of the National Building Code (ACNBC) and the complementary ACNFC (Fire Code) with input from 16 subordinate technical committees and a varying number of mission-oriented task groups, plus an inter-provincial building code advisory committee established by the provinces.

The ACNBC is made up of some 28 individuals representing all facets of the building industry. It includes engineers, architects, enforcement officials, fire fighters, builders and materials suppliers. The ACNFC comprises some 25 individuals broadly knowledgeable in fire safety matters. Two-thirds of the voting membership of the Associate Committees is from the private sector. The Associate Committees formally report to and are responsible to the National Research Council's Council.

The ACNBC and ACNFC appoint technical committees, called Standing Committees, each of which is specialized in a particular area of building technology or fire safety and to which is delegated the task of developing the technical requirements. Again, over two-thirds of the voting membership is selected from the private sector. These technical committees may in turn appoint task groups to study specific issues. In total, some 350 National Code volunteers freely provide more than one million dollars per year in contributed time and expertise to the development of the National Code documents.

The National Research Council, through its Institute for Research in Construction (IRC), provides the secretariat for the code committees, as well as technical and research assistance. Maintaining the National Codes as progressive and up-to-date documents requires ongoing technical service to the committees. IRC also arranges for the publication and distribution of the National Codes and associated code documents.

The Staff of the IRC considered the arrangements to be the best available for producing Building Codes. Apparently with the status of the NRC in the Canadian system of Government, the NRC can operate independent of political interference.

There was considerable criticism of the NRC and IRC by other sectors involved in building controls particularly in other provinces. The NRC and IRC were considered to be too research dominated and out of touch with commercial realities.

The United Kingdom system for writing building regulations and codes involves the Building Regulations section of the Department of the Environment. This section, comprising 26 people, drafts the documents in relative isolation. The checks and balances are provided by the Building Regulations Advisory Committee (BRAC). BRAC consists of 16 people who are widely representative of the industry served by building controls. However, they are chosen primarily for their individual expertise rather than representing any sector of the industry.

The UK system is considered by many to be written by people who are too Government oriented although the checks and balances of BRAC are recognised. The building regulations people in turn maintain that protecting health and safety is a Government function which cannot be satisfactorily performed in a consensus or similar system subject to the usual industry pressures.

The Norwegian, Swedish, and Danish Building Regulations/Codes are written by Divisions of Government Agencies in a similar manner to the UK. The Norwegians made special efforts to distance the building regulation and code writing agency from Government by setting up the National Office of Building Technology and Administration in January 1985. This office acts as a link between the Royal Ministry of Local Government and Labour and those involved in the building industry. It has its own budget and is designed to be in contact with, but at arms length from Government. Its success or otherwise will be able to be assessed shortly with the very recent, June 1987, release of the latest Norwegian Building Code.

The nature of BIC's successor will to a considerable extent depend on the activities, if any, undertaken. The Norwegian model is attractive if the circumstances are similar.

The Need for "Openness" in Developing Building Controls

Most code writing agencies were very aware of the need to have fair, democratic, and open to the public, code writing procedures. The National Fire Protection Association (NFPA), ICBO and Canadian Standards Association all have highly developed consensus based systems where everybody has an opportunity to have a say. The time for consensus has precise limits after which votes are taken and decisions made.

The ACNBC (Canada) has only recently been forced to "open up" their code revision meetings. Many organisations and individuals in Canada had been very critical of the secretive manner in which code revisions were previously undertaken. As a result there was considerable mistrust and many amendments were made by some provinces who considered that their ideas were largely being ignored. This is one of the reasons why Ontario is investigating writing a completely new building code.

In the UK and Europe there is not the same openness at the level where Government agencies draft the documents. However the UK building regulations people prepare discussion papers on which the industry can comment. The Building Regulations Advisory Committee is meant to reflect public and industry opinion. The Norwegians have also taken measures to ensure their code writers are accountable to all sectors of their market.

The lesson for New Zealand is that BIC must ensure that it develops systems to communicate with all sectors of its market. These systems must provide for two way communication.

Procedures for Appeals, Interpretations, Relaxations, Dispensations and Disputes

It is commonsense that Building Acts/Codes should make provisions for appeals. The various countries have different methods of handling appeals. For the purpose of this discussion, appeals shall also include interpretations, relaxations, dispensations and disputes.

In the ICBO areas of the USA, the local authorities are the ultimate appeal authorities and there are various ways by which these authorities process appeals. The ICBO also provides an interpretation service but only at the request of the local authority.

In Canada there are a variety of appeal procedures depending on the provincial rules. These include appeal to the local authority, Building Code Commissions and Provincial Building Code Officials.

The United Kingdom situation has recently been revised so that the final authority, apart from the courts, appears in most cases to be the local authority. The local authority is empowered to relax or dispense with a requirement where there are special circumstances. Previously the Department of Environment (DOE) Building Regulations Division gave relaxations and dispensations in conjunction with the local authority. Now the DOE is only involved in terminations. A determination can be requested

by a person applying for the permit where the local authority or Approved Inspector refuses a request for a dispensation or relaxation. The DOE will determine the issue based on the information supplied by the appellant and other information it considers necessary.

The above process is seen as a backward step by several of the people interviewed. It is considered preferable to have a central agency that has sufficient expertise to discuss the often complex proposals which will require dispensation and which are often beyond the level of expertise of most local authorities. However it is obviously preferable to resolve these matters at the local authority level wherever possible.

The Scandinavian building control agencies are also involved in interpretations and relaxations to varying degrees. Although the local authorities have the ultimate power to make rulings, the building regulation authorities give assistance in complex matters. Documents are also produced to give assistance where the codes are considered unclear.

Unless some other national organisation becomes responsible for building permit approval, BIC will need to consider very carefully whether it or its successor should have a role as an appeal authority. This could include approving complex buildings where dispensations or relaxations are appropriate. It may also give interpretations so that uniformity throughout the country is maintained. This procedure would also recognise that it would be a waste of resources to have every local authority with sufficient expertise to approve sophisticated structures.

An effective appeal system requires suitable technical expertise with the ability to act quickly. This may be a role for BIC or its successor.

Role of Fire Service in Building Controls

It is generally accepted in the countries visited that the Fire Service has a role in building controls. The mainstream of opinion is that the Fire Service should be consulted for major buildings at the permit stage but the final say should remain with the building control authority.

In the countries visited the Fire Service is generally more involved after construction has been completed and the building occupied. They carry out ongoing inspections. In the UK there is a statutory bar to prevent the Fire Authorities asking for more than that which was required as a condition of the building permit.

In Canada the National Fire Code (NFC) is a separate document from the National Building Code (NBC). Care is taken to ensure the two codes are consistent. The fire code people are involved with the NFC. The NFC is primarily a maintenance document used after the building has been completed.

In Canada all firemen take part in building inspections. As part of their routine duties and while waiting for call-outs, an appliance will be sent to a city area where routine inspections of buildings can be made. This appears to be a good use of resources.

The need for appeal provisions against fire as well as general building provisions is important.

Consolidation of Legislation

It is a sound objective to consolidate all matters that relate to buildings into a single Act and/or Building Code. However from the English experience there is a word of caution.

An example was given of an Agricultural Act which had a building requirement that holes in floors should be protected so that people didn't fall through. In this case it was considered the requirement was more likely to be complied with if it was left in the agricultural legislation rather than cluttering the building legislation.

The above comments are not intended to dissuade a fundamental review of all building related legislation. They are intended to sound a word of caution over taking a very purist view of consolidating every single piece of building legislation which may be of little or no benefit.

Building Management Implications for Building Controls

It was emphasised by the UK building regulations people that if advantage is to be taken of the advances in technology. Then building management or maintenance aspects of building controls must be included.

The example was given of the savings that can be made by utilising "active" compared with the traditional "passive" fire protection systems. The problem is that "active" systems require regular maintenance and this contradicts the view that building controls should not extend beyond the point of building completion. Another example from the UK is the need to maintain air conditioning systems because of the problems of legionnaires disease.

The opinion of the UK people is that these building management aspects should come within the jurisdiction of building controls but should be the responsibility of the building owner.

Building management implications, in principle, should not be a problem for New Zealand. Some are already covered under the existing system by various licensing provisions set out in the Local Government Act. The insurance companies require regular inspections of sprinkler installations. Whether these aspects can all be made the responsibility of the owner is debatable.

Defining Responsibilities in the Building Control Process

It is most important that all participants in the building control process including owners, architects, engineers, local authorities, fire authorities, contractors, subcontractors, insurers, etc., have their responsibilities clearly defined.

Compared with overseas countries New Zealand's present system is poor in the area of defining responsibilities especially for on-site supervision aspects. The Certified Professional Scheme of Vancouver, Canada and the rules for the operation of "Approved Inspectors" within the revised UK regulations show considerable evidence of efforts to define responsibilities more clearly.

The clear definition of responsibilities is an important part of the review of New Zealand's Building Control System. This will eliminate much of the uncertainty and duplication with the associated frustration and cost implications that are part of the present system.

CONCLUSIONS

The review of New Zealand's building control system can derive much benefit from the study of overseas building controls. Many factors are common and relevant in New Zealand. The main conclusions are:

1. It is important to define basic objectives and to adhere to them wherever practical.

2. There is an emphasis overseas on having the industry produce as much of the building control documentation as possible. The Building Control System must have formal structures to accommodate and develop this information consistent with the overall objectives.

3. Overseas experience shows that considerably greater resources are required to revise and develop building control systems than expected at the commencement. The scope and the resources required should be continuously reviewed and adjustments made as necessary. The UK decided it was preferable to have a two-stage review procedure to provide earlier returns.

4. Building codes should generally be performance based. There is no overseas model that can be simply transferred for use in the New Zealand revision.

5. An appreciation of the building control market suggests that a different emphasis for building control policies are applicable between the residential and commercial sectors. These differences must still be consistent with the basic objectives of the building control system.

6. There is a trend overseas to producing simple, concise and complete codes for the "small buildings" of the residential sector.

7. Consistent with overseas trends, it should be an objective to maximise the number of small buildings or parts thereof which are exempt from building control procedures.

8. Binding of the Crown is commonly accepted in most overseas countries.

9. Planning and Building Controls have separate but complementary roles.

10. In the countries visited, with the exception of France, local authorities remain the core of the building control system at the local level.

11. Alternative building control authorities have been developed in the UK and Canada. These effectively provide competition for the local authorities.

12. The National House Building Warranty Scheme is a good example of a ten year warranty scheme that may be relevant in New Zealand. It includes both building control and quality assurance aspects.

13. The status and role of Building Code Writing Agencies depends on the regulatory framework in which they operate and the extent of their activities. There are a range of options which New Zealand could use as a model.

14. There is a need for "openness" in developing building control systems and associated documentation. Systems need to be developed which provide for adequate two-way communication.

15. A system of building controls must include procedures for the rapid and fair processing of appeals, interpretations, etc. These may be heard at several levels to obtain the best use of resources.

16. Overseas the Fire Services generally have a role in building control systems. Usually there is an emphasis on maintenance aspects although many countries do have rules requiring consultation with the fire agencies before the building permit is issued.

17. The consolidation of building-related legislation into one Act is practised in most countries.

18. It is necessary for building management or maintenance implications to be included in building controls to take advantage of technological advances.

19. It is important to clearly define the responsibilities of all parties involved at all stages of the building control procedure.

Figure 1

Fees (including VAT) charged by NHBC Building Control Services Limited from February 1st 1987

A	Builders building more than 1000 dwellings per year	£95 flat fee per dwelling irrespective of size
B	201 - 1000 dwellings	£109 flat fee per dwelling irrespective of size
C	51 - 200 dwellings	£121 flat fee per dwelling irrespective of size
D	50 or less per year	Based on number of dwellings registered (fees paid) on a site at one time:

No. of dwellings	Dwellings over 64 metres	Dwellings under 64 metres
5 or less	£173	£153
6 to 10	£150	£130
11 to 20	£135	£115
21 and over	£123	£103

Comparison with fees charged by local authorities (including VAT and rounded to nearest £):

No. of dwellings	Dwellings over 64 metres	Dwellings under 64 metres
5 or less	190	138
10	164	129
20	134	116
30	118	106

FIGURE 2

National House Building Council UK - Ten Year New Homes Warranty Scheme

Covered	Extent of Cover
1. BEFORE COMPLETION	
(a) Builder still in business - Unfinished items - All defects arising from a failure to comply with NHBC technical requirements.	10,000 pounds
(b) Builder bankrupt or in liquidation - Lost deposit - Additional cost of completing the dwelling to NHBC standards - Where the building is substantially complete: all defects arising from not complying with NHBC's technical requirements.	10,000 pounds
2. YEARS 1 & 2	
(a) Builder still in business - All defects arising from failure to comply with NHBC technical requirements.	Purchase price of dwelling (up to three times national average) increased in line with building cost index to a maximum of 12% p.a. (Present max 124,000 pounds).
(b) Builder bankrupt or in liquidation - Unfinished items - All defects arising from a failure to comply with NHBC technical requirements.	
3. YEARS 3 - 10	
Major damage caused by defect in the structure or by subsidence or by heave e.g. - settlement, foundation, failure etc. - serious distortion or collapse of joists, roof structures etc. - chemical failure of materials affecting load bearing structures - dry rot.	As above 124,000 pounds

APPENDIX I

SCHEDULE OF MEETINGS OF P.D. LESLIE OVERSEAS STUDY TOUR 4 APRIL - 3 SEPTEMBER 1987

Mtg No.	Date	Description	Profession	Function
		U.S.A.		
	4/ 4/87	Travel Wellington - Los Angeles		
1	5-10/ 4/87	Earthquake Conference Los Angeles		
	6/ 4/87	My presentation/Interview on CBS News television		
2	6/ 4/87	Earl Schwartz, Head, Department of Building Safety, Los Angeles City	PE	CE
	6/ 4/87	Michio Noma, Director, The Association for Prevention of Building Disaster, Japan, Tokyo	PE	
3	8/ 4/87	Jim Bihr, President, ICBO, Whittier, California	PE	CW
	8/ 4/87	Floyd McLellan, Manager, Development Services, Environmental Management Agency, Orange County, Calif.	PE	CE/Des
4	10/ 4/87	Richard (Rick) M. Okawa, Staff Engineer Codes ICBO	PE	CW
5	10/ 4/87	Bob D. Heinrich, Information Systems Manager ICBO	PE	
6	13/ 4/87	Dave Scott, Director, Dept of Building Safety, Tempe City	PE	CE
7	14/ 4/87	Robert (Bob) Fronske, Robert D. Fronske & Associates, Ltd Architects, Tempe	Arch	Des
8	14/ 4/87	Bob Edwards, Fire Chief, City of Scottsdale and Director Rural Metro Corporation (Private Enterprise Fire Organisation) Scottsdale, Arizona	Admin	Fire

PE - Professional Engineer, CE - Code Enforcer, CW - Code Writer, Ins - Insurance, Arch - Architect,
BS - Building Surveyor, B/I - Building Inspector, Admin - Administration/Management,
Des - Designer, Pdt Ev - Product Evaluation

Mtg No.	Date	Description	Profession	Function
	14/ 4/87	Frank Hodges, Assistant to Fire Chief Scottsdale, Rurual Metro Corporation, Scottsdale		
9	15/ 4/87	A.W. Arcaro & Co. Inc., Building Contractors, Scottsdale		Constrn
10	16/ 4/87	Joanie Mead, Development Services Records Manager, Scottsdale City Council	Admin	
11	16/ 4/87	John Smetana, Project Review Manager/Anthony Floyd, Checking Engineer, Community Development Dept., Scottsdale City Council	PE	CE
12	16/ 4/87	John Chase, Director, Development Services, Don Logan Assistant Director, Ed Peaser, Building Inspector Manager, Scottsdale City Council	PE	CE
13	16/ 4/87	James (Jim) Schrum, Community and Economic Development Manager (special responsibilities for Fire Service)	Admin	
		CANADA		
15	22/ 4/87	Roger V. Herbert, Director, Permits and Licenses Dept, Vancouver City Council	PE	CE
16	23/ 4/87	Neil Tennant, Dominion Construction, Vancouver	PE	Constrn
17	23/ 4/87	Brian Palmquist, Director, The Hubert Group Architects Vancouver	Arch	Des
18	23/ 4/87	Barry Thorsen, Thorsen & Thorsen, Consulting Engineers	PE	Des

Mtg No.	Date	Description	Profession	Function
19	23/ 4/87	Garry McLean, Project Manager, Dominion Construction, Vancouver	PE	Constrn
20	27/ 4/87	Arnold Rasmussen, Chief Building Inspector, Kamloops City	B/I	CE
	30/ 4/87	Omkar Nath Chanan, President WOBO, Calgary (telephone)		
21	4/ 5/87	Robert (Bob) Hewitt, Principal Secretary, National Codes Secretariat, Institute for Research and Construction (Canada National Building Code), Ottawa	PE	CW
22	4/ 5/87	Alistair Aikman, National Building Code of Canada		CW
23	4/ 5/87	D.(Dan) E.R. Anderson, Canada Mortgage and Housing Corporation, Ottawa	PE	Pdt Ev
24	7/ 5/87	David Hodgson, Director, Ontario Ministry of Housing, Toronto	Admin	CW, CE
25	7/ 5/87	Salvador Salvosa, Director of Administration and, Systems, City of North York, Toronto / Heather Adams, Administrator	PE	CE
26	8/ 5/87	Zain Shah, Director, Standards Programs, Standards Division, CSA, Toronto	PE	CW
27	11/ 5/87	Paul Kuppe, Building Commissioner, Hamilton City, Ontario	PE	CE
28	11/ 5/87	Mayor Robert Morrow, Lou Sage, Chief Executive Hamilton City	Admin	
29	11/ 5/87	Acting Fire Chief John Fitzpatrick, K.K. Kiernan, Chief Fire Prevention Officer; D.P. Peters, Assistant CFPO, Fire Prevention Division, City of Hamilton	Fire	CE

Mtg No.	Date	Description	Profession	Function
		U.S.A.		
30	15/ 5/87	Kenneth E.H. Backman, Director, External Affairs; Grey Kyte, Life Safety Specialist, Engineering Services Division, NFPA, Boston, Mass	Admin Fire	CW
31	20/ 5/87	Ross H. Hoff, Assistant Director ICMA, Washington DC	Admin	
32	20/ 5/87	Mike Dowling, LINUS (Computer Aided Information Service) ICMA, Washington DC	Comp Science	
33	20/ 5/87	David Harris, Vice President for Technology; Don Hill, Director of Public Relations, National Institute of Building Sciences, Washington DC	Arch	
34	20/ 5/87	Wiley Williams (ex ICMA Director of Member Services, now Deputy Director of Works, Washington DC City) Telephone	Admin	
		UNITED KINGDOM		
35	1/ 6/87	J.(Jim) J. Cunningham, Chief Building Surveyor, London Borough of Haringey	B/S	CE
36	2/ 6/87	Anthony Cooper, Deputy Director-General, National House Building Council, Amersham		CE/Ins
37	9/ 6/87	Bill McEwen, Chief Building Control Officer; Muir Somerville, Building Control Officer, Edinburgh City Council, Scotland	B/I	CE
38	9/ 6/87	Humphrey Sharpe, Scottish Development Dept, Edinburgh	Arch	CW
39	11/ 6/87	Dawson Lillywhite, Chief Building Control Officer, Northampton Borough Council	B/S	CE

Mtg No.	Date	Description	Profession	Function
40	11/ 6/87	Peter Curran, Consultant Building Surveyor, Gayton, England	B/S	
41	12/ 6/87	John Payne, Municipal Mutual Insurance, London		Ins
42	15/ 6/87	Stephen McQuillin, Head, Building Regs Div, DOE, London	Admin	CW
43	15/ 6/87	Oliver Palmer, Building Regs Division, DOE, London	Arch	CW
		FRANCE		
44	22-26/ 6/87	United Nations, Economic Commission for Europe (ECE) Conference-Seminar on Regulations and Technologies for Construction and Land Development, Paris		
45	23/ 6/87	Serge Inglevert, Area Manager; Paul Dedieu, General Manager Socotech, Bureau de Controle, Montigny-le-Bretonneux, near Paris	PE	CE
46	24/ 6/87	Allan Wallin, Statens Planverk, Ms Weiss-Lindencrona, National Board of Physical Planning and Building, Sweden		CW
47	24/ 6/87	Alain Saint-Dizier, Thierry Le Bourg, Engineers, Dept. Risques Techniques, Societe Commerciale de Reassurance (SCOR), Paris	PE	Ins
48	26/ 6/87	Jacques de L'Hermite, Centre Scientifique et Technique du Batiment (CSTB), Paris		CW
49	29/ 6/87	Paul A.L. Bernard, Ingenieur General, Ministere de l'Equipment, du logenent, de l'amenagement du territoire, et des transport (also Conference Organiser), Paris	PE	CW
50	30/ 6/87	Direction des Journaux Officiels, Paris		

Mtg No.	Date	Description	Profession	Function
		DENMARK		
51	6/ 7/87	Hans Larsen, Director Danish Building Institute (SBI) Horsholm (near Copenhagen), Denmark	PE	
52	7/ 7/87	Ib Brusendorff, Head, Building Regulations Division, Danish Ministry of Housing and Building, Copenhagen	Arch	CW
		SWEDEN		
53	16/ 7/87	Borje Hoglander, The Swedish Institute of Building Documentation (Byggdok), Stockholm	PE	
54	17/ 7/87	Swedish Building Centre, Svensk Byggtjanst, Stockholm		
55	17/ 7/87	Lars Frykfeldt, Building Inspector, Stockholm City	B/I	CE
		NORWAY		
56	20/ 7/87	Odd Lyng, Director, Norwegian Council for Building Standardisation, Oslo		CW
57	20/ 7/87	Olav O Berge, Director; Gustav Pillgram Larsen Assistant Director, The National Office of Building Technology and Administration, Oslo	PE Lawyer	CW
58	22/ 7/87	H.P. Sundh, Head of Planning, Norwegian Building Research Institute, Oslo	PE	
		UNITED KINGDOM		
59	28/ 7/87	Randolph Bott, Head, Scottish Building Regulations Division, Scottish Development Dept, Edinburgh	Arch	CW

Mtg No.	Date	Description	Profession	Function
60	4/ 8/87	Bernard Godfrey ex Constrado, St Albans	PE	CW/Des
61	7/ 8/87	T.(Tom) P.R. Lant, Director, British Board of Agrement (BBA), Garston		Pdt.Ev.
62	10/ 8/87	Alan C. Parnell, Architect and Fire Engineer, President Institution of Fire Engineers, London	Arch	Fire/Des
63	11/ 8/87	Dave Andrew, Consulting Engineer, Considere & Partners, Windsor	PE	Des
64	13/ 8/87	Dr R.G. Watson, Director; Mr N.O. Milbank, Assistant Director and Head of Environmental and Energy Division; Dr D.F.A. Moore, Head of Structural Integrity Division; Mr R.B. Bonshor, Head of Advisory Service; Mr G.M.E. Cooke, Head of Fire and Materials Division, Fire Research Station; Mr V.H.V. Crisp, Head of Environmental Systems Division; Mr D.D. Ward, Building Energy Efficiency Division; Dr P.R. Warren, Environmental Physics Division; Dr G.J. Raw, Environmental Physics Division, Building Research Establishment, Garston		
65	18/ 8/87	Mark Lawson, Research Manager-Buildings, The Steel Construction Institute, Ascot	PE	
66	20/ 8/87	John Veal, Practice Secretary, RIBA, London	Arch	
67	20/ 8/87	Philip A. Kilshaw, HM Inspector of Fire Services, Home Office, London		Fire
68	21/ 8/87	G.M.E.(Graham) Cooke, Head, Fire and Materials Division; K.N. Palmer, Head of Fire Research Station; W.A. Morris, Special Studies, Fire Research Station, Borehamwood	PE	
69	24/ 8/87	HMSO/BRE Publications		

Mtg No.	Date	Description	Profession	Function
70	25/ 8/87	Brian Fuller, Chief; John Shopland, Asst. Chief Officer Fire Prevention, West Midlands Fire Service, Birmingham		Fire
71	25/ 8/87	Frank N. David, Deputy Commandant, Fire Service College Moreton-in-Marsh		Fire
72	27/ 8/87	Nigel Thompson, Director Ove Arup & Partners, Consulting Engineers, London (Telephone)	PE	Des
74	31/ 8/87	J.J. Cunningham, Borough Surveyor, London Borough of Haringey (Telephone)		
75	1/ 9/87	P.J. Cresswell, Consulting Engineer, Asoct	PE	Des
76	2/ 9/87	Bernard Godfrey ex Constrado	PE	Des
77	3/ 9/87	Anthony Cooper, Deputy Director General, National House Building Council, Amersham		Tns
	3/ 9/87	Travel London - Wellington		

APPENDIX II

Specification for Approved Inspectors (as advertised by Institution of Structural Engineers and Institution of Civil Engineers

Functions:

Certification of design and site work for all aspects covered by the building regulations, taking on all the responsibilities now carried by local authorities

Proposed designated bodies to approve inspectors:

RIBA, CIOB, IStructE, ICE, RICS, FAS, IAAS, and IBCO.

Qualifications and experience:

Minimum of 10 years' relevant experience after qualifying as a corporate member

Age:

A minimum age may be specified.

Background:

Wide experience in building practice, together with knowledge of building regulations, of approved documents and of law relating to building

Period of approval:

5-year periods likely (renewable)

Fee (to either institution) for approval:

More than for approved persons

APPENDIX III

RELATED DOCUMENTS

1. CANADA. ONTARIO GOVERNMENT

Plumbing Code under Ontario Water Resources Act. Ontario Regulation 815/84 as amended by O.Reg 675/85 15 March 1986. Ontario, Ministry of Housing 1986.

2. ECONOMIC COMMISSION FOR EUROPE

Building regulations in ECE countries. 2nd Report United Nations, 1985. ECE/HBP/52

3. ECONOMIC COMMISSION FOR EUROPE

International harmonization of building regulations in the ECE region. United Nations 1987. ECE/HBP/62

4. GREAT BRITIAN, DEPARTMENT OF TRADE

Standards, quality and international competitiveness presented to Parliament .... July 1982. Command Paper. Cmnd 8621.

5. GREAT BRITIAN - HOME OFFICE/SCOTTISH HOME & HEALTH DEPARTMENT

Guides to the Fire Precautions Act 1971,
1 Hotels and boarding houses.
Pt I General guide to the Act
Pt II The Act as it applies to hotels and boarding houses
HMSO 1972

6. GREAT BRITIAN - HOME OFFICE/SCOTTISH HOME & HEALTH DEPARTMENT

Guides to the Fire Precautions Act 1971,
2 Factories
Pt I Guide to the Act as it applies to factories
Pt II Guide to Fire precautions in factories
HMSO 1977

7. GREAT BRITIAN - HOME OFFICE/SCOTTISH HOME AND HEALTH DEPARTMENT

Guides to the Fire Precautions Act 1971,
3 Offices, shops and railway premises
Pt I Guide to the Act as it applies to offices, shops and railway premises
Pt II Guide to fire precautions in offices, shops and railway premises
HMSO 1977

8. GREAT BRITIAN - HOME OFFICE/SCOTTISH OFFICE

Guide to safety at sports grounds. HMSO new edition 1986.

9. GREAT BRITIAN - LAWS AND STATUTES

Building Act 1984 Chapter 55 reprinted 1986. HMSO

10. GREAT BRITIAN - LAWS AND STATUTES

Latent Damage Act 1986 Chapter 37. HMSO

11. GREAT BRITIAN - DEPARTMENT OF THE ENVIRONMENT & WELSH OFFICE

The Building Regulations 1985

Box contains:

1.	Manual to the Building Regulations 1985 which includes the Regulations	
2.	Approved Documents	A1/2 Loading and ground movement A3 Disproportionate collapse
3.		B1 Mandatory rules for means of escape in case of fire.
4.	" "	B2/3/4 Fire Spread
5.	" "	C1/2/3 Site preparation and contaminants. C4 Resistance to weather and ground moisture.
6.	" "	D1 Cavity insulation
7.	" "	E1/2/3 Airborne and impact sound
8.	" "	F1 Means of ventilation F2 Condensation
9.	" "	G Food storage G2 Bathrooms G3 Hot water storage G4 Sanitary conveniences
10.	" "	H1 Sanitary pipework and drainage H2 Cesspools and tanks H3 Rainwater drainage H4 Solid waste storage

11. " " J1/2/3 Heat producing appliances

12. " " K1 Stairways and ramps
K2/3 Pedestrian and vehicle barriers.

13. L2/3 Resistance to the passage of heat
L4 Heating system controls
L5 Insulation of heating services

14. Approved Documents to support Regulation 7 - Materials and Workmanship

12. INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS

a) Accumulative supplement to the Uniform Building Code U.B.C. Standards, Uniform Mechanical Code, Uniform Administrative Code, Uniform Housing Code, Uniform Code for the Abadement of Dangerous Buildings, Uniform Code for Solar Energy Installations, Uniform Fire Code, Uniform Fire Code Standards. ICBO, 1987.

b) Analysis of revisions to the Uniform Building Code and Uniform Mechanical Code, Uniform Fire Codes, Uniform Administrative Code, Uniform Housing Code, Uniform Code for the Abatement of Dangerous Buildings, Uniform Sign Code, Uniform Building Security Code, U.B.C. Standards, ICBO, 1985.

c) CABO one and two family dwelling code. Council of Amercian Building Officials 1986 edition. BOCA, SBCCI, ICBO.

d) Concrete Manual by Joseph J. Waddell, ICBO, 1984.

e) Dwelling construction under the Uniform Building Code 1985 edition, ICBO, 1985.

f) Field Inspection Manual, ICBO, 1983.

g) Illustrated Mechanical Manual. Illustrations and commentary for the user of the Uniform Mechanical Code, ICBO 1985.

h) Legal aspects of code administration prepared by BOCA, ICBO and SBCCI, primary author George Dean, ICBO, 1981.

i) Model Energy code. Council of American Building Officials assisted by BOCA, ICBO, NCSBCS, SBCCI 1986 edition, CABO 1986.

j) National Electrical Code 1987. National Fire Protection Association, 1986 includes Uniform administrative code provisions, ICBO.

k) Plan Review Manual. Refers to the Uniform Building Code

1985 edition, ICBO, 1986.

l) Recommended provisions and commentary for existing high-rise buildings, ICBO 1981.

m) Uniform Administrative Code 1985 edition. Promulgated by ICBO, IAPMO, IAEI, PCEA, NEMA. Purpose to provide for the administration and enforcement of the technical codes, ICBO 1985.

n) Uniform Building Code 1985 edition, ICBO 1985.

o) Uniform Building Code; application/interpretation manual, applies to the 1985 edition. ICBO 1986

p) Uniform Building Code Standards 1985 edition, ICBO 1985.

q) Uniform Building Security Code, 1985 edition, ICBO 1985.

r) Uniform Code for Solar Energy Installations 1986. International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials, 1986.

s) Uniform Code for the Abatement of Dangerous Buildings, 1985 edition. Code sets forth orderly procedures for remedying dangerous buildings, ICBO 1985.

t) Uniform disaster mitigation plan, ICBO 1979.

u) Uniform Fire Code, 1985 edition. Western Fire Chiefs Association, ICBO 1985.

v) Uniform Fire Code Standards, 1985 edition. Western Fire Chiefs Association, ICBO 1985.

w) Uniform Housing Code, 1985 edition. Provides requirements affecting conservation and rehabilitation of housing, including appeals procedures, ICBO 1985.

x) Uniform Mechanical Code, 1985 edition. International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials, 1985.

y) Uniform Plumbing Code, 1985 edition. International Association of Plumbing and Mechanical Officials, adopted at the 54th Annual Conference, September 1983. 1985. Endorsed by ICBO as a companion document to ICBO's model codes.

z) Uniform Sign Code, 1985 edition, ICBO 1985.

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