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Enforcing building regulations: Private versus public responsibilities

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ABSTRACT
Building regulations should guarantee that newly built buildings are safe and healthy for the users and visitors. Many countries make additional demands concerning comfort, accessibility, energy efficiency and sustainability. The building regulatory system consists in general of a set of technical requirements and a set of administrative regulations. The latter determines the building permit and control procedures. In Europe traditionally governmental bodies play a central role in formulating and enforcing the regulations. However in a growing number of European countries private parties within the building sector take over some of these enforcement tasks. The reasons for this development differ. In the Netherlands alternatives for local authority building control are sought because doubts have arisen about the effectiveness and efficiency of the control. In some other countries however the changes are motivated by more positive reasons. This paper addresses on the public versus private responsibilities for inspection and control of the building regulations. The paper is based on the results of a research project in which the system of building control of eight European countries (Belgium, Denmark, England, France, Germany, the Netherlands, Norway and Sweden) were compared. The material has been updated and extended with an investigation of the Australian building control system. Central question is what are the preconditions and ingredients for an effective and efficient building control system?

Keywords: Building regulations, building control, deregulation, certification, private responsibility

1. INTRODUCTION

There is a growing number of international oriented research in the field of technical building regulations and building control procedures. Studies of the Institute of Building Control (1997) provide basic insight in the different systems in the European countries. Sheridan (2001) analyzes technical building regulations in some European countries with a broad range of regulations and incentives that promote housing quality. Bowen (1997) provides basic definitions to understand systems of technical requirements, with a focus on performance-based building codes (like the Dutch Building Decree). The Task group Performance Based Regulatory Systems of the CIB (international Council for Research and Innovation in Building and Construction) has developed a performance systems model for the technical requirements systems (e.g. Beller, D. et al. 2001, Meacham, B. et al. 2002). The final report was presented at the CIB-world conference in Toronto (Tubbs, B., 2004)

Within this field the OTB Research Institute for Housing, Urban and Mobility Studies has focused in a range of national and international projects on the different systems of technical building control. Some of these studies supported the Dutch government in the search of alternative instruments (e.g. the development of an Assessment Guideline with requirements for the certification of private companies for inspecting construction work). Other research projects analyse the organization of building control in various European countries (Meijer, F. & Visscher, H., 1998). Recently we have finished an international project into building regulations in eight European countries: the Netherlands, England, France, Germany, Sweden, Norway, Belgium and Denmark (Meijer, F. et al. 2002; Sheridan, L. et al. 2003). Slowly but surely these international oriented comparative studies lead to a framework, in which the building regulatory systems can be analyzed in a coherent way. This paper focuses mainly on a part of the regulatory system, namely the inspection and enforcement aspects of the building regulatory systems. Traditionally the role of public authorities is large but in a growing number of countries, private parties within the building industry are playing a more important role. The focus on this subject is inspired by the fact that public versus private inspection is a topical subject in the Netherlands. The paper is largely based on the European comparison mentioned before and is supplemented with the system in Australia. We start with our classification of the building control systems studied on the basis of how the responsibility for the technical control of the building plans and the site inspections is allocated. In the sections 3 through 8 different systems in various countries are reviewed. In section 9 conclusions are drawn.

2. CHECKS AND INSPECTION: PRIVATE VERSUS PUBLIC RESPONSIBILITY

The general point of departure of our research is the wish to establish a more effective and more efficient building control system in the Netherlands. In this paper the emphasis particularly lies on the system of plan checks and site inspections. In past international comparative research projects we have classified

the building control systems in the countries studied on the basis of how the responsibility for exercising technical control of the building plans and the site inspections is allocated (see table 1). The aesthetic and planning control are left out of consideration. We have distinguished three categories:

- Local authorities are responsible for plan checks and site inspections.
- Private organizations are responsible for plan checks and site inspections.
- Private organizations are responsible for granting the building permit.

Table 1: Responsibility for building control

Public responsibility for control	Private responsibility for control	Private responsibility for granting permits
A. Local authority carries out control (Netherlands, Denmark)	C. Local authority contracts out, private organization is responsible (Germany)	G. Recognised private organisations are qualified to issue building permits (England & Wales)
B. Local authority contracts out but remains responsible (Netherlands, Denmark)	D. Legal liability for private control based on building regulations (France) E. Inspection by private organizations because of liability and insurance requirements (Belgium, France) F. Developer/applicant has full responsibility for control (self inspection or contracting out) (Norway, Sweden, Germany)	

A fourth possible category – local authorities grant the permits – is left out in the table. In all European countries studied local or regional authorities are in charge of the building permit procedure, i.e. they formally grant the permits. In Table 1 the eight European countries studied are placed in our 'model'. Compared with a few years back the situation has not changed substantially. In most countries public as well as private organizations can be responsible for technical plan checks and site inspections. Only in England and Wales does an alternative exist in which private organizations may grant a building permit which only covers the technical aspects (and not the planning aspects). Both private and public organizations can be responsible for the check of the design application and the site inspection of building activities. When private parties are responsible for these tasks local authority building control in most cases stays in charge to supervise the control of these private organizations.

In Australia the situation is somewhat different. In Australia private building certifiers may issue building permits and occupancy permits. Individuals who are employed by local government agencies may also carry out designed certification and inspectorial functions. In both cases stringent demands are made on

qualifications and experience (ABCB 2003). In this respect the situation is quite distinct from those in many European countries.

Category 'A' local authority building control forms the basis in all the countries studied. Denmark and the Netherlands are however the only ones where it is the only form of building control. In the Netherlands there is a move towards giving private organizations a more important role in scrutinizing technical requirements, but as this has not yet taken effect, the Netherlands is still classified under A/B (see the following section). The Dutch experiences show it is the question whether this 'local authority building control model' produces optimum quality of inspection. In the first place, the local building control authorities in the Netherlands can hardly be held responsible for the quality of the inspections. The execution of the control activities as to frequency and profundity varies from one local authority to another (and even within a particular authority) and the inspection work is not always in proportion to what is actually needed. The size and quality of local authority building control differs widely in the Netherlands. Small municipalities in particular have problems keeping their knowledge and skills up to date. Applicants have to prove in advance, by means of substantial plans and other documentation, that the regulations are going to be complied with, resulting in a rather heavy administrative burden on applicants. This is quite different from a system in which self inspection plays an important role, and where only a control plan has to be drawn up. Norway and Sweden are examples where such control systems exist. In Norway and Sweden the applicant is responsible for all controls and inspections. The local authority building control scrutinizes the control plan, in which the applicant indicates how all the necessary checks and inspections—during design and on-site—are provided for to ensure that the structure meets the requirements under the building regulations. The authority decides when it is satisfied with a self inspection system carried out by the firms involved (designers, construction specialists and contractors) and when to insist on independent inspection by a specialized inspection body. The next sections elaborate on the systems in the countries analysed.

3. THE NETHERLANDS AND DENMARK

Denmark and the Netherlands are the only countries in which local authority building control is the only existing form of building control. In the Netherlands there are developments towards a more important role of private organizations by the check on the technical requirements. As has been stated before this search for an alternative is driven by the fact that the traditional approach in which all municipalities (big and small) operate their own department of building control, does not function well because of the lack of non-uniform control procedures and limited a certificate for testing building permit applications in compliance with the requirements capacities. A draft assessment guideline (AGL) indicating the requirements for processing of the Building Decree have been completed in the summer of 2002. The system is not yet implemented in practice. The idea is that engineering companies and architect's firms can be certified for the checks on the integral Building Decree, but certification for one ore more parts of the Building

Decree is also possible. The following scopes have been specified: General subjects, (no specific calculations required) and co-ordination; (A), Structural safety (B); Fire safety.(C); Building physics (D), Installations.(E) and Environment (F). The quality of the certified test procedure is assured by a series of requirements. There are some general requirements to the certificate holder (a company) that controls its independence and there are requirements on the qualifications of the responsible controllers. These are specified for every scope and make demands on general (technical) education and additional specific courses. All specialists have to follow professional developments and courses if these are required by the change in regulations and building techniques. The AGL further contains requirements for the quality system of the certified organizations. They have to work out their system in a quality book. Most important are the checking procedures, which must be described in detail. The AGL contains requirements for a series of about twenty specific checking procedures. There is a general checking procedure for subjects which can be checked on drawing (presence of functions and dimensions). Other procedures relate to specific calculations (structure, building physics). Another important feature of the AGL is a format for a detailed test report for every individual building plan in which all the requirements of the Building Decree are listed. An experimental project with the certified Building Decree Test, in which about 20 engineering and architect's firms participate, is currently being carried out. This project will have to prove if this concept works in the building practice. In 2005 the new system could be implemented in the building regulations.

4. GERMANY

In Germany local building control contracts out many checking and inspection activities to specialized and recognized engineering firms. In general this is the structural check and the site inspection. These engineering firms are responsible for their control. The engineers involved are specialized, recognized, have to comply with heavy demands to qualify and are liable for the quality they deliver. The check engineer (*Prüfingenieure*) is an independent, freelance, fully qualified, consulting engineer having knowledge of static and structural problems. Other requirements include - design experience of more than 10 years, knowledge of materials, economical and ecological problems, building management and building legislation, more than one year's experience as a site engineer and be within the age range of 35 - 60 years. When mistakes occur in building parts or functions of the building that are inspected which should have been detected, the engineers are legally liable for damages. Germany has also introduced the concept of self-control for small buildings: residential buildings with a maximum height of one storey and a maximum floor area of 200m^2.

5. BELGIUM AND FRANCE

In Belgium and France private companies play an important role in the provision of adequate quality safeguards as the foundation for insurances because of strong liability regulations. Whether, and to what extent, checking takes place depends mainly on financial considerations. In France the applicant for certain construction

types (e.g. constructions with a high 'fire-risk' like big buildings) is legally obliged to hire a private engineering or control firm. This system is basically the same as described by Germany. The main difference is that the national law and not the local authority decide in what cases this control firm has to be brought in. The technical inspector is subject to the same presumption of liability as the architect and contractor, must be completely independent of any design, construction or advisory activity relating to the structure and approved by the Council of State. The role and function of the technical inspection body are now defined under the Spinetta Law. For 50 years the profession of technical inspection, especially the issuing of decennial insurance policies, developed without legal obligation. The Spinetta Law, together with supplementary regulations, gave the profession official status and defined its new legal framework. In particular the following has been specified:

- The role of the technical inspection body: intervening on behalf of the owner, with a view to contributing to the prevention of technical hazards, i.e. the risks of errors made by all professionals involved in a project.
- The main subjects of control that should be covered: structural stability and peoples' general safety being the main concerns.
- The conditions of practice of the technical inspection profession.

In France and Belgium extensive checks and site-inspections by private organizations commissioned by the contractor are in some cases necessary because of the strict liability system and the sometimes obligatory insurance system. Because of the important role of private organizations, local building control authorities in France hardly execute any preventive inspections anymore. This means that there is a category of construction works (where there is no control by private organizations) that are not controlled at all.

6. ENGLAND & WALES

Before 1997 building control was carried out either by local authorities, or since 1985, by NHBC Building Control Services Ltd., the first organisation to be appointed as an Approved Inspector. Since January 1997, more Approved Inspectors, both corporate and individual, have been appointed, but only NHBC Building Control Services Ltd. has the necessary insurance to undertake building control of new-build houses and flats. A mutually agreed set of Performance Standards for both public and private sector Building Control Bodies (BCBs) was published in 1999. There are four stages to qualification as an Approved Inspector:

- Application: an application form and a detailed 'knowledge base' must be completed. The knowledge base, which is similar to an open exam, addresses six key areas of knowledge: Building Regulations and statutory control; Law; Construction technology and materials; Fire studies; Foundation and structural engineering; Building service and environmental engineering. It uses the formulation "Please demonstrate, using particular examples from your experience, how you feel you are equipped with a comprehensive knowledge of / an understanding of / an appreciation of…" depending on the topic. Applicants must also submit an operational business plan.

- Pre-qualification verification: the registrar checks the knowledge base responses for gaps in experience or qualification that may disqualify the applicant or cause delays at later stages.
- Admissions panel: the papers are assessed by experts nominated by members of the Construction Industry Council and qualified Approved Inspectors. They decide whether the candidate merits a professional interview.
- Professional interview: three assessors assisted by the **Construction Industry Council Approved Inspectors Register I**nterview the candidate**.**

Successful completion of the four stages results in an invitation to register as an Approved Inspector. Approval is valid for five years. New Approved Inspectors are issued with the CICAIR Code of Conduct and Disciplinary Procedures. The Approved Inspector checks if the design and execution meets the technical demands and is authorized to submit a building permit. The applicant may choose between local authority building control or an Approved Inspector. An Approved Inspector does not have the same competences as a local building control authority. When conflicts arise about whether the regulations are being met (especially during the construction phase), the Approved Inspector has to call in whether local building control authority to take action. The system of building control may change again in the next few years. In addition to self-certification schemes for the installation of specified equipment and for replacement windows, which were introduced in 2002, the government is considering the development of self-certification of buildings by enterprises or individuals deemed to be 'competent' by accrediting bodies.

7. NORWAY AND SWEDEN

In Norway and Sweden the applicant is always responsible for the execution of the plan checks and site inspections. Local building control authority checks the control plan in which the applicant indicates how all the necessary inspections – during design and on-site – are provided for to ensure that the construction meets the demands of the building regulations. The local authority decides when they are satisfied with a self-control system carried out by the firms involved (designers, construction specialists and contractors) and when they insist on an independent inspection by a specialized inspection body. The qualification system for architects, building companies knows various classes and levels. The basis for the class levels are complexity of the construction work and risk for damage on health, environment and safety damage. There can, however, be a mix of classes within one project, if a fire solution requires special attention, that part of the project can be put in a certain class, while the rest may be categorized in another class. On the basis of this, the construction work is divided in some hundred categories. Besides the three 'complexity/risk' levels, three roles are distinguished: responsible for design, responsible on site and responsible for the complete co-ordination. Most companies apply for approval for the complete set of 'risk and role levels'.

The qualification and experience demands are limited to the professional staff. The administrative staff and the workers are not included. There are four levels of education, from technical school to university degrees. The demands depend on the class. The building regulation contains a table for the demands for education and length of experience for each function in each class. The demand on experience depends also on the class, and varies from two to eight years. Co-ordination responsibility requires longer experience than ordinary performing responsibility in design or construction, and there is also a demand for 'relevant' experience. Contrary to the demands for education and length of experience, which are related to the professional leadership of the company, the so-called (quality) system requirements (or demands) are related to the company as such. There are four formal demands:

- Organisation plan (or rather two organisation plans, one showing how the company is organised, and one showing how the company organises its projects).
- A system for identification of official demands (often just shown in the control plans).
- A system for the handling of documents.
- A system for handling of deviations.

In addition, there is a general demand for knowledge of the building regulations. As a part of the permit application the building and construction companies have to show qualifications in order to be given responsibility. The national qualification body provides the proof or certificate for this qualification. This certificate has recently been given a duration of three years (formerly two years). If the company does not have a national certificate, in can nevertheless apply for a local issue, but it must renew its application in each new case. The demands are initially the same as for the national certificate, but the municipality also has a possibility to issue responsibility to persons. On the national level, certificate is only issued to companies. Until now, it is estimated that about 1/3 of all the Norwegian building and construction companies (= 30 to 35.000) have obtained certificate from the National qualification body, and it is also estimated that this figure (which still is increasing) will stop at about 50 %. This is about the double of what was estimated in 1997.

8. AUSTRALIA

In Australia a nationwide uniform system of competency standards for building surveyors has recently been approved by all States and Territories (ABCB 2003). This Framework seeks national harmonization of educational qualifications, experience and work scope for professionals who are involved in building certification. In essence the framework adopts 2 levels of building certifiers, namely:

- Building Certifier, Level 1 (who has an unrestricted work scope) and who must hold a tertiary level degree and have a minimum of 3 years relevant and practical experience; and

- Building Certifier, Level 2 who is able to certify the design and construction of buildings up to 3 storeys and with a maximum floor area of 2,000 m2. These professionals must hold an advanced diploma and have at least 2 years relevant and practical experience.

Individuals who are employed by local government authorities may carry out designated certification and inspectorial functions in respect of structures (including residential buildings) that are no more than 2 storeys in rise, with a maximum floor area of 500 m2. Such personnel would require to hold at minimum a diploma in building surveying and have at least one year relevant experience. The Framework was developed in consultation with industry, State and Territory Governments and other relevant stakeholders, and was in its final form adopted by the Australian Building Codes Board. The National Accreditation Framework requires practitioners to have attained competencies in both education and practical experience. Graduates of an accredited course or program are deemed to have attained the educational competencies of the Framework without further assessment. Attainment of the practical competence requires a period of practical experience within industry under the guidance of experienced professional Building Certifiers practicing at the relevant level. A further guideline document is developed which details how the experience competencies should be assessed. The rationale for developing these guidelines is that across the building and construction industry, changes are occurring at an unprecedented rate. The role of building certification profession has changed quite significantly over recent years and now embodies work in building regulatory consultancy, building approval or enforcement (both in private practice and Local Government) and construction or asset management. The rapid change in the role of building certifiers has been influenced by industry changes such as the introduction of private certification, adoption of the performance based Building Code of Australia, and through rationalization of Local Government in most States and Territories. These factors have increased industry and community expectations for building certification profession to be multi-skilled in various facets of the construction industry. To this end, courses for professional building certifiers need to give rise to attributes that will enable this level of multi-skilling to occur.

An integral part of the framework is the recently nationally endorsed competency standards and higher education benchmark for building surveyors. The competency standards are the building blocks used by TAFE–Institutes (Technical and Further Education) to develop courses. These have been specifically designed to match the core functions of level 2 of the framework. The Benchmarks similarly align with the functions described at level 1 and universities will structure their undergraduate courses accordingly. These two sets of standards mean that irrespective of where a student gains their building surveying qualification, they will graduate with the same skills, knowledge and understanding in the identified core areas, Moreover much care has been taken to ensure that there is a seamless transition between the two sets of education standards, People with a TAFE qualification in building surveying may progress through to the University degree.

9. CONCLUSION AND DISCUSSION

In this paper the emphasis particularly lies on the system of plan checks and site inspections. The need to improve the quality of the plan checking and site inspections (skills, competences, behaviour) is clear. Theoretical the optimum situation would be architects and engineers being certified to check their own work: process control in stead of end control. In this would have a maximum impact on the quality (effective) and the speed of process (efficient). However, such a shift of responsibilities from local authorities to certifiers raises many questions about the liability of the system. For the coming years, the solution lies not only in the introduction of private inspection to replace local authority building control. Apart from the fact that this will lead to unforeseeable effects, local authority building control still has basic qualities and skills based on many years of experiences. The aim should be to develop a system in which private and public building control (eventually) work side by side. A framework has to be established that guarantees the competences of both public as private inspectors. The introduction of private control could be used as a catalyst for improvement of building control all along the line. The demands on both inspectors (private or public) should be identical and both public and private inspector should be accredited for the same skills, capabilities and experiences.

Almost every European country used to have a 'traditional' control system, in which local authority building control played a key role. This system has undergone major changes and the role of private organizations within the permit procedure has grown considerably. Due to liability reasons this has been the case in Belgium and France for a long time. In Germany the responsibility of the check engineer to enlarge the security that buildings are built according to the rules also goes back a long time: to the early 1920s. In the other countries however the developments are from a more recent date. In England Approved Inspectors have been able to take over the role of local authority building control since the mid 1980s. At the moment the English are considering enlarging the role of private organizations further by introducing a form of self-certification for architects. This could mean that inspection and control could be integrated in the design and draft phase of building projects. The same idea is behind recent propositions in the Netherlands to certify architects, building advisory organizations, construction companies, etc. to check whether the plan meets the technical requirements of the Building Decree. In Norway and Sweden the decision has been made to move away completely from the traditional role of local authority building control. The applicant is responsible to take care of the necessary inspections. Local authority building control checks the control plan. In Denmark local authority building control can contract out inspections to private organizations, but they stay responsible for the inspection. To our knowledge there are no developments in Denmark comparable with those described for the other countries. In Australia in 2003 a nationwide uniform system of competency standards for building surveyors has been approved by all States and Territories. Both private and public building surveyors fall inside the scope of the framework.

With the exception of Belgium and France (where financial and liability reasons play an important role) the main motives for other countries to adapt their system is to enlarge the quality of the building control and to diminish the administrative burden for applicants. The systems in Belgium and France are not an inspiring example. Apart from the fact that these systems there are the result of historical factors, the disadvantages seem great. Main disadvantage is that this option creates a dependency of the building regulatory system on the insurance market. In France we see furthermore that, because of the important role of private organizations (including insurance companies), local building control authorities hardly execute any preventive inspections anymore. This means that there is a category of construction works (where there is no control by private organizations) that are not controlled at all. The experiences in the other countries support our conclusion that the Netherlands should develop a system in which private and public building control work side by side. A certification/accreditation framework both for public and private inspectors in which educational standards and the demands on the building practitioners are linked, offers the optimum chance for effective and efficient actual control and inspection.

The question how the quality, skills and competence of inspectors can be guaranteed is of course of great importance, but there are more preconditions and ingredients for an effective and efficient building control system. The technical requirements should be clear and nationally wide uniform. The most obvious solution is that an organization (with representatives from governmental organizations and the building industry) defines the regulations at a national level. The performance approach as used among others in the Netherlands provides a good basis. In the future determination methods are uniform in Europe if the Euro Codes are implemented in all the countries. All countries can set their own limit values that can vary because of regional reasons (like climate and geophysical factors). It is important that the systems are the same and that a set of approved documents (with acceptable solutions) and alternative solutions is kept up to date. The procedures should be transparent, effective and efficient. It must be possible that an applicant can get information about the feasibility of the planned construction work as early as possible. This could be realized in various ways, for instance by making a distinction between a permit for location dependent aspects (e.g. planning permit) and a permit for location independent aspects (e.g. building permit) of construction works. Other ingredients that can contribute to this goal are the introduction of an obligatory pre consultation meeting, a phased procedure and fixed permit handling times.

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