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Certification of compliance with public building regulations

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ABSTRACT
In most Western countries, ensuring compliance with public building regulations is traditionally the task of local authorities. In the twentieth century, most countries harmonized the technical requirements for buildings at the national level. In the Netherlands this was realized by means of the *Bouwbesluit* (Building Decree) of 1992. An evaluation of the new regulations showed that their uniformity was undermined by a considerable variation in the way that local authorities checked the building plans for the building permits, and in the manner in which site inspections are conducted. Many other problems concerning the capacity and the quality of local authority building control having been identified, it was then asked how some of the building control tasks could be passed to private parties, subject to effective certification by the duly appointed bodies. This paper presents the results of a research project undertaken on behalf of the Dutch government, in which we explore the possibilities and effects of the certification of public tasks relating to building regulations. An important question concerns the consequences in terms of the responsibilities of the various actors in the building process. The paper also presents a proposed guideline for the certification of design assessments against the requirements of the Dutch Building Decree, and a discussion about the potential of this alternative as a contribution to effective and efficient building control.

Keywords: Building Regulations, Building Control, Certification, Building Permits

1. INTRODUCTION

Developments in society and in the building sector necessitate an alternative approach to the organization of public building control. In Europe, local authorities

operate building and planning permit procedures to assure basic construction quality, and to verify that new buildings are appropriate to the location in which they are to be built. However, the organization of building control varies enormously. In many European countries, private organizations play an important role in conducting building plan checks and site inspections to ensure compliance with public regulations. In the Netherlands, only the traditional local authority building control exists. In recent years, a number of serious incidents have placed local authority building control high on the political agenda. The quality of control is now subject to discussion. In the search for a more effective and efficient organization of building control, a comparison of the approaches adopted by other European countries has proven extremely useful (Meijer *et al.*, 2002).

The Dutch Ministry of Housing, Spatial Planning and the Environment commissioned an exploratory study of ways in which certification can be used as an instrument to support enforcement of building regulations (Visscher *et al.*, 2003). The study devoted specific attention to the likely consequences of the certification of private parties in terms of the division of responsibilities between central government, regional and local authorities, and the private sector. It was prompted by a number of serious incidents involving buildings (in Volendam, Enschede, Tiel, Maastricht and elsewhere) which raised the question of whether the relevant local authorities had fulfilled their responsibilities in terms of building regulation supervision. A policy document issued by the State Secretary of Housing, Spatial Planning and the Environment about the future of building regulations stated that, partly in view of the ongoing process designed to achieve national uniformity in procedural and technical building requirements, efforts in the somewhat longer term would concentrate on the enforcement of technical requirements, whereby it would be appropriate to consider the reassignment of responsibilities between local authorities and the private sector. The document went on to announce a study of ways in which 'accredited certification' (i.e. certification by an independent duly authorized body such as the Dutch Accreditation Council) could be used to support this aim.

Section 2 of this paper briefly describes building control systems in Europe. In Section 3 we analyse the problems presented by the traditional organization of building control in the Netherlands. Section 4 presents the possibilities of certification. In Section 5, we describe a pilot project for a certification scheme for testing planning applications against the public building regulations. A comparison of public building control with certified private building control is then offered in Section 6, followed by the conclusions in Section 7.

2. SYSTEMS OF BUILDING CONTROL IN EUROPE

Relatively little international research has been conducted into building control methods. Two reports – by the Economic Commission for Europe (1985) and the Institute of Building Control (1997) – provide a basic insight into the different systems used by European countries. Sheridan (2001) analyses a broad range of regulations and incentives designed to promote housing quality in selected

European countries. Bowen (1997) provides basic definitions to understand systems of technical requirements, with a focus on performance-based building codes (such as the Dutch Building Decree).

The OTB Research Institute for Housing, Urban and Mobility Studies has conducted a number of national and international projects to examine different systems of technical building control. These projects analysed the organization of building control in various European countries (Meijer and Visscher, 1998; Meijer, Visscher and Sheridan, 2002) and have provided input for further studies conducted on behalf of the Dutch government to identify alternative instruments. The international comparative studies have revealed significant differences in the systems for technical building control, the most notable of which (compared to the Dutch situation) is the role played by private organizations in the systems of most other West-European countries. This paper describes selected aspects of the systems in use in Belgium, France, Germany, the United Kingdom, Norway and Sweden[15]. Most of these systems include an important role for private companies in providing adequate quality safeguards, often as a prerequisite for insurance cover, there being stringent third-party liability regulations. Whether, and to what extent, any rigorous inspection takes place depends largely on financial considerations. Consequently, the technical control of individual residential constructions is not comprehensive. In the case of high-rise buildings, French building regulations stipulate mandatory control by private inspection companies. In Germany, the *Prüfingenieure* (certified private building inspection bureaus) play an important part. Local authorities contract out technical building control activities. This system provides high quality control but at relatively high cost. Germany has also introduced the concept of self-control for small buildings (Mönnig, 1993). The British system of 'Approved Inspectors' can be regarded as the certification of individuals (although organizations can also be designated an Approved Inspector). The Approved Inspectors operate in competition with the local building control authorities. The option of 'self-certification' for architects, whereby they would be permitted to verify their own plans, has also been considered (Department for Transport, Local Government and the Regions, 1999; Construction Industry Council, 2001). The most far-reaching form of technical building control privatization is to be found in Norway and Sweden, where technical inspections are no longer the task of the local authorities. Rather, the applicant for a building permit is responsible for arranging adequate control. Design, engineering and construction companies can perform self-control, or may choose to engage an external consultancy. It still falls to the local authority to grant building permits, carry out checks on the location-dependent aspects and to evaluate the proposed 'control plan' (Gustafson, 1995; Grønvold, 1994, Boverket, 1996).

[15] The systems of building control in Europe are described more in detail in paper CIB74: Meijer F and H. Visscher, 'Enforcing building regulations: private versus public responsibilities'.

3. PROBLEMS WITH BUILDING CONTROL IN THE NETHERLANDS

In the Netherlands, the local authority is responsible for ensuring compliance with building regulations. It scrutinizes plans prior to the commencement of construction and will, in principle, grant a building permit only if the plans meet all the stated requirements. The local authority is also supposed to conduct site inspections during the course of construction to ensure that work is being undertaken in accordance with the plans originally submitted. According to several studies (Visscher, 2000; Visscher *et al.*, 2003), the current enforcement system does not function as well as it should. The following problems have been identified:

- Local authorities often lack the manpower to check all building plans and to conduct site inspections in a satisfactory manner. The smaller authorities in particular are unable to cope with fluctuations in the number of applications received.
- The quality of the building inspection departments, particularly among smaller authorities, leaves something to be desired. The small departments have difficulty in achieving the required level of specialization and to provide the necessary ongoing training.
- The local authorities do not apply uniform assessment protocols. Accordingly, not all building applications are subject to the same evaluation methods.
- Local authorities have limited liability for injury, loss or damage due to negligence in the control and inspection procedures. This is to the detriment of the quality and completeness of those procedures.
- There is a risk that local political interests will stand in the way of objective enforcement of the regulations.

Many of these problems can be resolved or alleviated within the existing system. By combining the forces of a local authority's technical departments and increasing capacity, the quality and completeness of controls can be greatly enhanced. There would also be a greater distance between the day-to-day performance of inspection activities and any local political interests, although the local authority officials would, of course, retain full political responsibility. Greater cooperation, including that at national level, would help to achieve a more uniform working method. In fact, none of these problems is new, and neither are the solutions offered here. However, aspects such as cooperation between local authorities have yet to be addressed to any extent. Several authorities are now working on a joint, uniform assessment protocol, primarily intended to establish priorities for the checks and inspections.

Two studies (Visscher, 2000; Visscher *et al.*, 2003) compare the current organization and performance of building inspection with a situation in which some of the relevant activities are carried out by private parties, quality being assured by means of accredited certification. The research reveals that certified alternatives, besides offering a solution to the problems described above, offer

several advantages which are impossible, or at least very difficult, to achieve within the current system of public sector building control. These alternatives are described in greater detail in the following section.

4. POSSIBILITIES FOR CERTIFICATION OF BUILDING CONTROL

Visscher (2000) and Visscher *et al.,* (2003) examine possibilities whereby direct control of building plans further to permit application procedures, as well as site inspections during construction, can be transferred from local authorities to private parties. The quality of the process will then be assured by means of a system of certification. The building requirements themselves will remain the responsibility of government, while the issuance of building permits and any enforcement action required will remain the exclusive right and responsibility of local authorities.

'Certification' may here be defined as the sum of all activities whereby an independent, expert institute provides a written statement to the effect that a product, process, system or person meets all the predetermined standards or legislative requirements. Clearly, certification can be used as an instrument to support public sector building control: this much is evident from its use in several other policy areas in the Netherlands, all of which are in some way connected with health and safety. They include Health & Safety at Work legislation and food safety requirements. In fact, an 'accredited quality declaration' for building products has been in existence since 1992, and is recognized in public law. However, only when the system of certification itself meets a number of conditions can there be an adequate guarantee that it will contribute to the process of ensuring that all the technical requirements of the Building Decree have been met. These requirements have been formulated in a sufficiently concrete and objectified manner to allow them to be applied without further administrative operationalization or discussion, and therefore provide a clear framework for building control activities.

A first step in the development of certification schemes is to prepare an assessment guideline (AGL), indicating the requirements for a Process Certificate for evaluating building permit applications according to the requirements of the Building Decree. The researchers also conclude that a number of specific applications should be further developed: building control for small projects, site inspections during construction, periodic inspections of existing buildings (to include fire safety aspects) and the aesthetics control.

5. CERTIFICATION OF THE BUILDING DECREE TEST

A draft version of the assessment guideline (AGL) for a Process Certificate for the Building Decree Test has been produced (Visscher *et al.* 2002). It was commissioned by the Ministry of Housing, Spatial Planning and the Environment, and developed by the OTB Research Institute for Housing, Urban and Mobility Studies in collaboration with SWK Certification. The project involved a working group of fourteen experts on the Building Decree and building control, being representatives of major organizations in the construction sector (architects,

technical advisors, contractors, local building control, the Ministry of Housing, standardization and certification institutions). The group held several meetings over a long period to discuss proposals before agreeing on the final draft of the AGL. A further forty or fifty representatives of the stakeholders in the construction sector have been asked to comment on several versions of the draft AGL. The AGL should function in accordance to public requirements and its functionality can only be regarded reliable if it enjoys broad public acceptance.

Any organization or individual meeting with the requirements of the AGL could acquire the certificate. In practice, these are likely to be engineering companies, architects or construction firms which produce their own construction plans. Local building control authorities would also be eligible for certification. The AGL controls and ensures that the requirements of the Building Decree are met by every conceivable building. For open-ended cases, the certified plan tester should return to the local building control authorities to ask for a decision. Companies can be certified for the entire Building Decree, but certification for one or more parts of the Decree is also possible. The following areas have been identified as separate or combinable components:

A. General aspects (no specific calculations required) and coordination
B. Structural safety
C. Fire safety
D. Building physics
E. Installations
F. Environmental aspects.

Coordination relates to the contact between the various parties involved, (including the local authority for the permit application procedure) as well as verification that all aspects are covered and controlled on the basis of the same building plan specifications.

The quality of the certified test procedure is assured by a series of requirements. Firstly, a number of general requirements apply to the certificate holder (a company) with regard to its impartiality. Secondly there are requirements with regard to the competence and qualifications of the responsible inspectors. These are specified for each area listed above, to include general (technical) training and additional specific courses. All specialists will be required to follow developments within their respective professional areas and to attend any courses prompted by changes to regulations or building technologies. The AGL also includes requirements for the certified organizations' quality management systems, which must be presented in the form of a 'quality book'. Most important are the checking procedures which have to be described in detail. The AGL specifies requirements for a series of some twenty procedures. There is a general checking procedure for aspects which can be checked from the drawings (presence and dimensions). Other procedures relate to specific calculations (structure, building physics). Another important feature of the AGL is a template for a detailed test report for every individual building plan, listing all the requirements of the Building Decree.

Certified controllers must indicate the following points in their reports: which requirements are relevant to the project? To which building components will the requirements be applied? How does the design address these requirements? Which drawings and calculations have been used? What checking procedure has been used? Which specialist carried out the check, when, and what were the results of the check? Where appropriate, any additional remarks for specific attention during the site inspection will also be included.

If organizations wish to be certified, they must first demonstrate eligibility. During the admission procedure, the certification institute will assess the 'quality book' according to the requirements of the AGL. Finally, the candidate organizations will have to take a form of 'entry examination' which will involve controlling a construction plan. Other (certified) organizations will referee this quality control process.

In the case of certified building control, the applicant for a building permit submits an application in outline. The local authority then makes a decision on the basis of a check against the local area development plan and the architectural appearance (aesthetics), subject to subsequent certified control with regard to Building Decree requirements. The certified controller will then submit a final declaration that the control has been successfully completed. The local authorities have to accept the certified Building Decree test. The final report has to be submitted to the local authority since it may also contain remarks for specific attention during the site inspection.

The Ministry of Housing, Spatial Planning and the Environment started an experiment with this draft AGL in 2003. The first phase of the experiment is nearing completion and the Ministry is now considering a second phase in which some outstanding questions will be addressed. Implementation is scheduled for 2007.

6. COMPARISON OF PUBLIC SECTOR BUILDING CONTROL WITH THE CERTIFIED PRIVATE PARTY SYSTEM

6.1 Quality

The quality of local authority control procedures is not optimum. Some problems can be resolved, but the certified private party system offers a number of additional opportunities. In these certified alternatives, the controllers must perform their assessments according to uniform protocols, and the completeness of the assessment of each project can, in principle, be assured (provided the certification system itself functions properly). The draft AGL for the assessment of construction plans against the Building Decree contains a number of very specific requirements designed to ensure a complete assessment of appropriate quality. These requirements relate to such areas as: the training and qualifications of the controllers, test assessment as part of the certification process, the production of a 'quality book' describing all aspects of the specific assessment protocols further to the Building Decree, and a comprehensive report of each control conducted.

6.2 Division of responsibilities

The plan owner (project principal) is responsible for ensuring that his building plans or ongoing project comply with all the requirements of public law. In realizing his wishes, the plan owner will retain the services of architects, consultants and contractors who will then assume responsibility for designing and building the project in accordance with government regulations. Before construction can commence, or if the function of an existing building is to be changed, the plan owner must apply for a permit from the local authority. Under the provisions of the *Woningwet* (Housing Act), the local authority has the task of supervising and controlling construction and usage of all buildings within its area, both residential and non-residential. It must therefore conduct various checks and controls to establish that the plan complies with all requirements and that the building is realized according to the stipulations of the building permit granted. However, the depth and breadth of these checks and inspections are not defined. While local authorities are, in principle, expected to examine all submitted plans thoroughly, it is common knowledge that this does not always happen in practice. Some of the staff involved contend that it is not possible to do so with the manpower and resources available.

Local authorities have only limited liability for loss or damage caused due to negligence during the performance of the controls and inspections. The issuance of a permit means that the authority *has not found* any indication that the plan does not comply with the requirements. This offers the holder only limited assurance that the requirements have been met in full. A certified Building Decree Assessment would provide an express statement that all the relevant requirements of the decree have been met. It may be assumed that the certified controller would be accountable (in law) for the quality of his or her assessment. The control function would therefore carry greater liability, and there would be more opportunities for redress, than in the current system of local authority control. If a certified Building Decree controller is involved in a construction project, the local authority will not longer be required to evaluate the plans against the requirements of the Building Decree. Other aspects will still have to be examined, but for those falling within the terms of the Building Decree, a check to ensure that the appropriate certification is held will be enough. At least, that is currently the envisaged purpose of the certification system.

6.3 The effectiveness and efficiency of the construction process

Traditional local authority controls are conducted when the design plans are already completed. Subsequent modifications to a design are often extremely difficult to make and may not lead to the best possible solution. During construction, any errors or omissions can be extremely difficult (and costly) to put right. The certified controls will take place during the primary process. The advantage is that knowledge about the specific project, the relevant technologies and the legal requirements is available at the time, whereupon the controls can steer and influence the design process itself. This will result in a more effective and efficient construction process. Any necessary modifications can be quickly and

easily implemented, and there is a greater likelihood that doing so will not be at the cost of other qualities (such as the architect's basic design principles). Besides enhancing the quality of individual projects, this approach will also lead to a general improvement of quality on the part of the certificate holders. The development can therefore provide a significant boost to innovation in construction processes.

6.4 Costs

It is difficult to make any absolute comparison of the costs of public sector supervision versus those of the certified private party alternative. However, some general indications can be given. In general, it may be stated that the introduction and implementation of the certification system will represent additional costs, as will the performance of complete and thorough controls on each construction project. However, there will also be cost savings due to the enhanced effectiveness and efficiency of the construction processes. Some investment will be required, particularly in the preliminary phase. The savings will then become apparent in the course of time.

In the traditional system, the costs to the building permit applicant consist of the services of the architect and consultant who must demonstrate that the plans do indeed conform with the requirements of the Building Decree. (They must consult the requirements, norms and standards, and must prepare calculations to establish compliance). There is also an administration fee for the building permit itself. For its part, the local authority must have technical specialists on its payroll to conduct the necessary checks and controls. This cost is offset by the revenue from the administration fees. The extent to which Building Decree controls are actually covered by administration fee income is not known. However, it is known that the fees for small projects rarely cover the cost of the work involved, while those for larger projects may result in a surplus. In the certified alternative, the certificate holders must make some initial investment to acquire certification. Later, they should be paid for maintaining the certificate and for conducting ongoing inspection activities. The certificate holders may be able to recoup their initial investment by means of more effective business processes (with fewer project failure costs), a better competitive position, and possibly additional charges to be passed on to clients.

In the case of specific construction projects, we must consider the costs to the project principal. If an architect who is himself a certified controller is retained, this would seem to represent a cost saving. It is possible that the certified architect will be more expensive than his uncertified colleague, but the design process will be subject to effective management on the basis of quality, which will in itself lead to cost reductions in the primary process. Since the local authority no longer has to conduct any checks or inspections further to the Building Decree, a reduction in the administration fees would seem to be in order. If the architect is not certified, it will still be possible to retain the services of a certified consultancy. This consultancy would conduct not only the final Building Decree assessment, but also

the calculations required to demonstrate compliance, thereby relieving the architect of part of the work. The additional costs of the consultancy's services would then be offset, at least in part, by a reduction in the costs of the architect. Here too, a reduction in the local authority's administration fees would seem appropriate.
There may be further indirect cost savings if the use of the certified control system were to attract reduced insurance premiums, as is already the case in France.

7. CONCLUSIONS

The introduction of certified building control as an alternative to local authority building control in the Netherlands could have effects in terms of completion time, quality and costs. Completion time is likely to be shortened. Certified control can take place close to the design process so that any discrepancies can be addressed promptly. Quality is also likely to be enhanced. Certified control offers every opportunity for quality that is systematic, complete and good. However, quality can come under pressure because of cost and time factors. A more serious role for the certification institutions is therefore essential. The change of system is also likely to place greater pressure on the building sector to develop effective quality systems. The effect on costs is difficult to predict, particularly with regard to municipal administration fees. What discount can applicants who submit a certified control expect, and how would it relate to the costs of the control? Certified control should be carried out more thoroughly than the usual local authority control. On the other hand, there are also advantages of scale to be gained by the specialist bureaus. Self-control will also lead to cost reductions, even though certification has to be paid for.

The consequences for designers, consultants and construction companies are also difficult to predict. They are likely to be most marked if a system of self-control is adopted. The advantages of scale for the larger companies will provide greater opportunity to develop new working methods and to cover the development costs. On the other hand, there are also opportunities for smaller companies to develop low threshold and less costly certificates for straightforward building projects. It may prove necessary to support the smaller building companies in developing tailor-made instruments. These organizations perceive the current developments not as deregulation, but as privatization and re-regulation: the transfer of government tasks to the private sector.

The building control departments of local authorities will also feel some effects. Some of their technical control activities will be discontinued, which might be expected to lead to better performance of the remaining tasks. However, this could be over optimistic, since the restructuring of tasks would also affect the budgets and staffing capacity. In the short term, it could become even more difficult to maintain the current quality level. Technical control is already often contracted out to private companies. This trend is likely to persist if the certified test acquires a reasonable market share. It could well be that local authority building control departments will contract out further control activities to certified organizations.

Given the public law significance, close government involvement in these forms of certification is desirable. This involvement may entail determining the form and content of certification schemes (including the official accreditation of certificate holders), or an ongoing responsibility in terms of safeguarding quality. In the most extreme case, the government could itself issue the certificates. In the United Kingdom, private control agencies were accredited directly by government when the system was first introduced. In effect, this would mean abandoning the existing certification infrastructure. This would not be a desirable development in the long term, but could be a viable option in the early stages.

It is difficult to state how – and indeed whether – the preconditions for a thorough and successful certification system can be met. The assessment criteria must be determined in advance by the many stakeholders, and there must be general acceptance of those criteria. The current experiment is intended to provide some indication of whether the intended effects will materialize in practice, and whether this approach does indeed offer a solution to the problems of building control which are currently experienced.

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