EFFECTIVE AND EFFICIENT BUILDING CONTROL

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Abstract

Building regulations provide a solid base for safe, healthy, energy efficient, environment friendly and comfortable buildings. To be sure that the requirements are met in designs and in construction, an appropriate system of building control is indispensable. In the Netherlands some recent striking accidents with buildings have put the importance of the quality of building control high on the agenda. The task of technical checks and inspection lies traditionally in the hands of the local authorities. Several investigations into the performance of local building control have shown that the quality is beyond acceptable. Besides the effectiveness of the control system, also the efficiency of permit procedures and actions of plan checking and site inspection has been an important drive to search for alternative policies. A comparative study of building regulations and systems of building control in eight European countries has shown a broad variety of organization models with a severe role for the private parties. Self-control by architects and technical advisors is about to be introduced in the Netherlands. This paper presents an assessment guideline for the certification of this process and discusses the chances of this alternative as a contribution to effective and efficient building control.

Keywords: Building Control, Building Regulations, Certification, Self-control

1. Introduction

Developments in the society and in the building sector necessitate an alternative approach to the organisation of public building control. In Europe, local authorities operate building and planning permit procedures to assure basic qualities of buildings and to verify that they are suitable for the location where they will be built. The organisation of building control however varies enormously within Europe. This paper focuses on the checks and inspections on compliance with the technical requirements. In many countries private organisations play an important role in the control. In the Netherlands only the traditional local

authority building control exists. Recent striking incidents have put local authority building control high on the political agenda. The quality of control is subject of discussion in the Netherlands. In the search for more effective and efficient organisation the comparison of the approaches in other European countries has been very fruitful.

International orientated research on the field of technical building regulations and building control is quite scarce. Economic Commission for Europe (1985) and Institute of Building Control (1997) provide basic insight in the different systems in the European countries. Sheridan (2001) analysis a broad range of regulations and incentives that promote housing quality of some European countries. Bowen (1997) provides basic definitions to understand systems of technical requirements, with a focus on performance-based building codes (like the Dutch Building Decree). 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. These projects analyzed the organization of building control in various European countries (Meijer and Visscher, 1998; Meijer, Visscher and Sheridan, 2002) and supported studies for the Dutch government in the search of alternative instruments. One of the results is the development of an Assessment Guideline with requirements for the certification of private companies for testing building plans on conformity with public technical building requirements. It is the intention of the government to recognize this instrument as an alternative for public building control.

2. Systems of building control in Europe

International comparative research (Institute of building control (1997), Visscher & Meijer (1997), Visscher & Meijer (1998), Meijer, et. al (2002) has shown a broad variety in systems for technical building control. Most remarkable difference to the Dutch system is the role that private organizations play in the systems of most of the other West-European countries. This section describes the systems of Belgium, France, Germany, England, Norway and Sweden. Belgium and France show an important role for private companies 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. Consequently, the technical control on individual residential constructions is lacking. For tall buildings the French building regulations directly require building control by private inspection companies. In Germany recognized private building control bureau's (Prüfingenieure) play an important role. The municipalities contract out the technical building control. This system can be characterized by high quality control for relatively high costs. Germany has also introduced the concept of self-control for small buildings (Mönnig, 1993). The English system of the Approved Inspectors can be seen as certification of persons (although also whole organizations can also be designated as an Approved Inspector). The Approved Inspectors operate in competition with the local building control authorities. The option of what is called 'self-certification' of architects to verify their own plans has been taken into consideration (Department for Transport, Local Government and the Regions, 1999; Construction Industry Council, 2001). The most far-reaching form of the privatization of technical building control can be found in Norway and Sweden. Since a few years technical building control has ceased to be the task of the local authorities. Now, applicants for a building permit are responsible for arranging adequate control. The design, engineering and construction companies can perform self-control, or an external bureau may be engaged. The municipality still grants the building permits, carries out checks on the aspects associated with a location and evaluates the proposed 'control plan' (Gustafson, 1995; Grønvold, 1994, Boverket, 1996).

The organization models for privatization of control can be divided into: a) contracting control out to private organizations (Germany); or b) by recognition of private building control as a voluntary alternative (England) or, c) making private organizations responsible for the provision of adequate control (Norway, Sweden). This observation raises the question which model provides the most effective and efficient building control? This question is not easy to be answered. The conditions of the regulatory framework and the characteristics of the building processes in the various countries create obstacles for qualitative comparisons. A system cannot easily be transferred from one country into another because they must be considered within their cultural and legislative history and present situation. Nevertheless, the examples of other countries can provide ideas and inspiration for alternative approaches. The introduction of the Approved Inspectors as an alternative for local authority building control has had a positive effect on the quality and efficiency of building control in England. Self-certification however is seen nowadays as a possibility for more efficiency. The shift of the responsibility of control to the private sector in Norway and Sweden has caused a somewhat chaotic situation in the building sector, but the change has also given a big push to the development of quality assurance of the private sector.

3. Effectiveness of the regulatory systems

The effectiveness of a regulatory system could be defined as the way the regulations contribute to the defined goals of the regulations. The goals can be found at the starting points of the technical requirements. In the Netherlands these are: safety, health, energy economy, utility and environment. The effectiveness of the whole system of building control could be measured by the actual quality of the buildings. It is difficult to gather reliable data for conclusions in this direction. An alternative can be found in some indicators for the way the minimum requirements are met or in the way the system of building control functions. If the building industry functions in a perfect way and the compliance with public requirements could be assured in the primary development processes, actual building control could be minimised and still be very effective. This implies the eminent importance of technical requirements be made known in the building industry and that the people dealing with the work are sufficiently educated to handle the work. The system of the performance requirements of the Dutch Building Decree provides a clear theory, design freedom and optimal chances for keen designers. The abstract formulation however, requires good explanation and simple guidelines of how to interpret the requirements for standard solutions. The English Approved Documents seem to be a good example for an effective explanation of requirements. The effectiveness of the actual checks on building plans and site inspections can be determined by the way these controls are organized and performed. These organizational characteristics indicate the chance of effectiveness, but there are a lot of other aspects that will determine how far these chances are affected in practice. The current Dutch organization model does not function well. Local authorities are the only organizations carrying out the technical building control and a number of investigations showed poor performance. The authors' analysis indicated that some areas could be improved with this approach, but a better alternative approach has greater possibilities of achieving an effective system. Local authorities vary a lot in size. Small towns have too little capacity and quality to perform their tasks. However, the larger towns also have problems. Sometimes the results of building control observations are frustrated by local politics which serve other interests. Although the technical requirements are laid down at national level, the interpretation at local level can vary considerably. Local authorities are contracting more control work to private companies.

Checking of building plans by local authorities for the building permit take place very late in the design phase (end of pipeline). Deficiencies that are found have to be solved within a worked out plan. This can have major consequences and will probably not lead to optimal designs. Control within the primary phase

(during the design) could give an early indication of problematic aspects in the design and could lead to early improvements. Organizational models for building control that address this situation have a better possibility of leading to an effective system.

4. Efficiency of the regulatory systems

The question of efficiency is far too complex to be answered on the basis of the available data. The level of administrative and financial burden can indicate the efficiency of a system of building control for citizens, companies and governments caused by the obligations of the regulatory system. Citizens and companies need to make their building plans in compliance with the requirements, have to submit applications for a building permit and pay fees for permit and control. The national government draws up the regulations and needs to communicate them to the users of the regulations and the local authorities have to handle the permit procedures and carry out control tasks and receive fees. In France and Belgium lower insurance fees compensate the expenses for actual control and inspection. In England the control by Approved Inspectors sometimes gives the clients 10 years warranty.

In the current situation applications for building permits in the Netherlands seem extensive. A system of self-control or control by an advice organization could decrease the administrative burden in this respect. The certification of self-control, on the other hand, could also introduce new additional administrative obligations. The costs of certified private building control could be compensated by a reduction in fees for the building permit and cheaper insurance's or warranty arrangements.

Self-control offers the optimum chance for effective and efficient actual control and inspection (Visscher, 2000). During the design phase the architects and advisors should carry out the inspection on compliance, integrated in their working processes. Similarly for site inspections that can be best carried out by construction firms. Designers, advisors and builders know all the ins and outs of their plans and construction works and can most effectively and efficiently carry out the necessary quality control. In some countries a development towards the introduction of self-control has been made. Self-control is only possible if its quality is adequately assured. In Norway and Sweden systems of self-control have operated for a few years. Germany also has some form of self-control. The Netherlands is developing a certification scheme for self-control and England is also considering the introduction of some kind of self-certification, as referred to. For the future it will be challenging to develop an international standard for the certification of self-control for plan checking and site-inspection.

5. Alternative building control in the Netherlands

In the Netherlands a draft assessment guideline (AGL) indicating the requirements for processing a certificate for testing building permit applications in compliance with the requirements of the Building Decree has been completed in the summer of 2002. It has been developed by the OTB Research Institute for Housing, Urban and Mobility Studies in collaboration with SWK Certification commissioned by the Ministry of Housing, Physical Planning and Environment.

For this project a working group of fourteen experts on the Building Decree and building control, being representatives of some important organizations in the building sector (architects, technical advisors, contractors, local building control, ministry of housing, normalization and certification institutions) have discussed proposals in a long series of meetings and agreed on the final draft of the AGL. Besides that group, another 40 to 50 representatives of all interest groups in the building sector have been asked to

comment on several versions of the AGL draft. The AGL should function in accordance to public requirements and its functionality could only be regarded reliable if it is broadly accepted by the public.

Any organization or individual that can meet with the requirements of the AGL could acquire the certificate. Practically, this will probably be engineering companies, architects or construction firms that develop their own construction plans. Local building control authorities are also eligible for certification. The AGL controls and observes that the requirements of the Building Decree is met in 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 whole Building Decree, but certification for one ore more parts of the Building Decree is also possible. The following scopes have been specified:

A. General subjects, (no specific calculations required) and co-ordination.
B. Structural safety.
C. Fire safety.
D. Building physics.
E. Installations.
F. Environment.

Co-ordination concerns the contacts with all parties involved, including local authorities for the permit procedure, the 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. First of all there are some general requirements to the certificate holder (a company) that controls its independence. Then there are requirements on the qualifications of the responsible controllers. These are specified for every scope which also asked for general (technical) education and additional specific courses. All specialists have to follow some 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, they have to be described in detail. The AGL contains requirements for a series of about twenty specific procedures. There is a general checking procedure for subjects which can be checked on drawing (presence 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.

Certified controllers must indicate in their reports the following points:

- which requirements are relevant for the project,
- on which building components the requirements will be affected,,
- how the design complies with the requirement,
- which drawings and calculations were used,
- which checking procedure has been used,
- which specialist carried out the check on which date and the result of the test and
- were appropriate: some remarks for specific attention for the site inspection.

If organizations want to be certified, they have to apply for a certificate by themselves in a way that they can meet the requirements. In the admittance procedure the certification institute checks the quality book

on compliance of the requirements with the AGL. Finally, the candidate-organizations have to carry out a kind of admittance exam in the form of controlling a construction plan. Other (certified) Building Decree-test organizations referee the quality of control of the candidates.

In the case of certified building control the applicant for a building permit submits an application in outline. The local building control authority then grants a decision on the basis of a check against the zoning plan, architectural appearance and the notice that certified control for the Building Decree aspects will take place. The certified controller has to send in 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 sent in to the local authorities since it can also contain remarks for specific attention for the site inspection.

The Ministry of Housing Physical Planning and Environment has the intention to start soon an experiment with this draft AGL. If the results are positive, the implementation for this alternative form of building control can be expected in 2004.

6. Discussion

The introduction of certified building control in the Netherlands as an alternative for local authority building control could have effects on the completion time, quality and costs.

Prospects are good for the effect on the factor time. Certified control can take place close to the design process so that any deviations discovered can be dealt with quickly.

Expectations on the effects on quality are also positive. Certified control offers every opportunity for quality that is systematic, complete and good. However, quality can come under pressure because of costs and time factors. A more serious role of the certification institutions is therefore essential. An increasing pressure on organizations and companies in the building sector to develop quality systems is another effect of this change of system.

The effect on costs is most difficult to predict. The consequences emanating from changes of the determination system of municipal fees should be awaited. Applicants who submit a certified control, what discount can they receive from the municipality and how would that relate to the costs of the control? Certified control should be carried out more thoroughly than the current average municipal control. On the other hand, there are also advantages of scale to be gained for specialized bureau. Saving in cost can be expected from self-control even though the certification has to be paid for.

The consequences for the designers, advisors and building companies are difficult to predict. These consequences will be particularly noticeable if self-control comes into effect. The advantages of scale for the larger companies will provide them with more opportunities to develop new working methods and to meet 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 might well be necessary to support the smaller building companies in the development of tailor-made instruments. These organizations perceived current development not as deregulation, but as privatization and re-regulation; the transfer of government tasks to the business community.

Some consequences can also be expected for the situation of the departments of building control of local authorities. Some of the technical control activities will be discontinued with the expectation that this could lead to a better performance of the remaining tasks. However, this seems to be overoptimistic as

discontinuation would also affect the cost of the available (financial) resources and the (personal) capacity. As a result, on the short term it could become even more difficult to maintain the current quality level.

In current practice, technical control is increasingly contracted out to private companies. This development is expected to persevere if the certified test acquires a reasonable market share. It could well be that, local authority building control may contract out control activities to certified organizations.

7. Conclusions

In this paper the current development of an alternative approach for the organisation of building control in the Netherlands has been presented. Examples of other European countries show a broad variety of models for the privatisation of public building control. The search for an alternative in the Netherlands 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 capacities. Besides that it should be considered that checking within the actual design and construction procedures will have the potential to be more efficient and effective. An experiment project with the certified Building Decree Test will have to prove the extent of this potential reality. The same reasons and considerations which pushed the current policy in the Netherlands have also played a role in the development of alternative approaches in e.g. England, Norway and Sweden. The first step that was taken in England was the introduction of competition between private and public organisations performing building control. Although a good step forward has been made, the integration of control in the primary development processes has not yet been made. However, the English have considered introducing some form of self-certification for architects. The Scandinavian movement was quite radical with a complete change from public to private building control. This caused chaos, as there where no uniform instruments for the control activities. For every building project the decision if self-control would be allowed had to be reconsidered. A big advantage of the complete change was the effect on the development of quality assurance systems in many companies. The Dutch transformation is a step by step approach where certified building control operates next to public building control. In the long run only the private form of building control will remain, however the certified alternatives have to proof their quality first. Ideas for the next steps in re-regulation of building control are already made at the Ministry of Housing, Physical Planning and Environment: 'certified site inspection', 'certified small building activities' and 'certified periodical inspections of buildings (fire safety, structural safety, installations)'. In the coming months an experiment for testing the draft AGL for the Building Decree-test will be set up and carried out. This project will deliver more information and answers on the question weather certified building control can lead to a more effective and efficient form of building control, or not and the possible (intentional or unintentional) side-effects.

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