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INTERNATIONAL BEST PRACTICE - BUILDING AND CONSTRUCTION PERMITTING SYSTEM

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ACKNOWLEDGEMENTS

This paper refers to research from various quarters including;

- Good Practices for Construction Regulation and Enforcement Reform, January 2013: A World Bank publication.1
- NKB (1976). Nordic Committee on Building Regulations (NKB), Programme of Work for the NKB, Report No. 28, Stockholm
- Strengths and Weaknesses of the New Zealand Building Control Regulatory System and Recommendations for Reform: A Strategic Assessment: Meacham Associates, 2009
- Allen and Clarke, Policy and regulatory specialists, New Zealand
- CRC for Construction Innovation, 2007
- Productivity In The Building Network: Assessing the Impacts of Building Information Models, The Allen Consulting Group, 2010
- http://www.building.co.uk/
- http://www.buildingsmart.org/

[1] Good Practices for Construction Regulation and Enforcement Reform", January 2013
https://www.wbginvestmentclimate.org/publications/loader.cfm?csModule=security/getfile&pageid=33965

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EXECUTIVE SUMMARY

The scope for this paper was to provide an analysis of international best practices in the Building and Construction Permitting System as background for the USAID BEP in Serbia. The report provides observations and recommendations about ways to enhance existing systems and processes and also sets out options for more far-reaching reforms that warrant further consideration.

For those areas where more substantive reform is recommended, examples of similar reforms that have been implemented successfully internationally are provided. Key enablers/pre-conditions for successful international reforms are noted and, conversely, where such reforms have failed, the key lessons learnt are identified that may have relevance for Serbia.

1 OBJECTIVE

Serbia is aiming to implement short, medium and long term reforms to improve overall construction permitting regulation and streamline procedures which will improve the quality of its construction permitting system

1.1 PAPER FRAMEWORK

To provide a reference framework for the paper, the paper uses the model outline provided by the Investment Climate Department of the World Bank. This model summarises how a building permit process should operate based on international best practice and suggests what reforms may be suitable for countries making adjustments to their systems (refer figure 1).

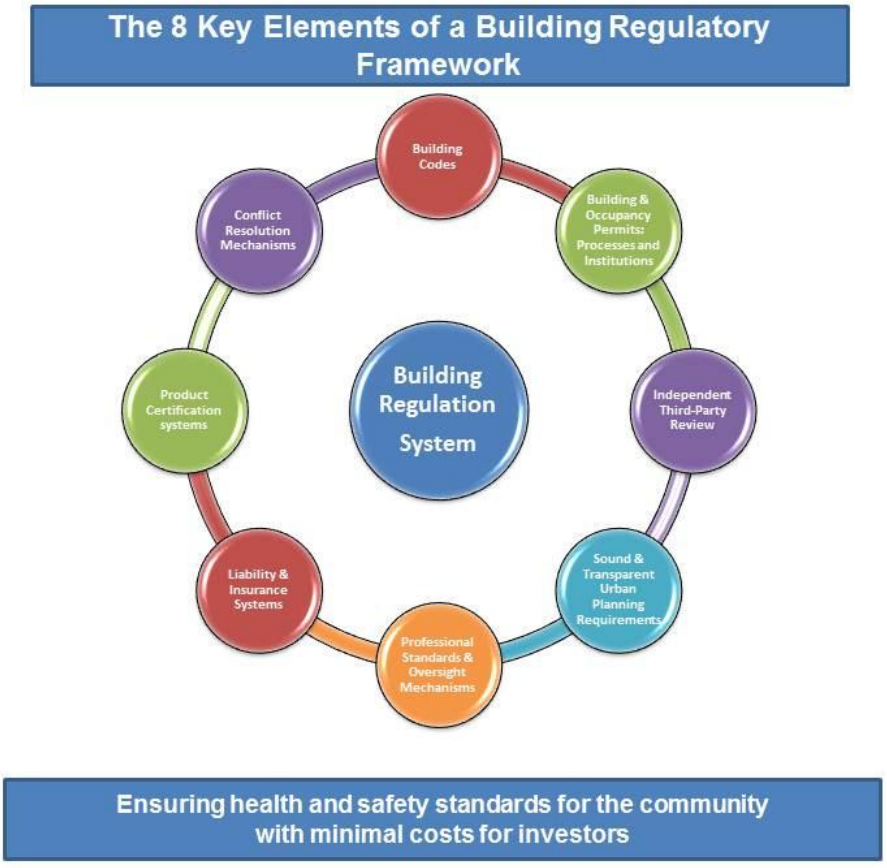
The core elements of the framework consist of a building code, which includes reference standards and related documents; a building permitting process; a mechanism for independent third party review (meaning review by someone other than the designer/contractor and who is technically competent to conduct such peer reviews); sound and transparent urban planning requirements, appropriate professional standards (e.g. licensing and accreditation); a building product certification system (testing and approval of building construction products); an effective liability and insurance regime; and suitable interpretations, dispute, appeals, and audit mechanisms.

1.2 TYPICAL REFORM SEQUENCE

Initiating reform and addressing typical challenges based on common observations made in reforming countries examined produces a typical sequence of engagement which runs as follows:

- Consultation with key stakeholders to identify actual problems and information sources
- Prioritization of key issues
- Development of a reform strategy
- Consultation with key stakeholders on the proposed reform strategy
- Training and information seminars with key stakeholder groups
- Establishment of a range of pilot projects to test and improve the reform proposals
- Implementation of key reform proposals
- Ongoing communication with and training of key stakeholders to facilitate implementation and provide continuous feedback.

FIGURE 1: THE 8 KEY ELEMENTS OF BUILDING REGULATORY FRAMEWORK2



When combined, these elements can support an effective and efficient system for issuing building permits, while balancing the costs to developers and investors without compromising fundamental health and safety outcomes for building users.

[2] Good Practices for Construction Regulation and Enforcement Reform", January 2013
https://www.wbginvestmentclimate.org/publications/loader.cfm?csModule=security/getfile&pageid=33965

2 BUILDING CODES

2.1 DEFINITION AND SCOPE

Building Codes or Technical Norms, as they are otherwise known, provide a set of uniform building requirements and standards which set out acceptance levels of health and safety in buildings. Usually a building code is mandatory and all practitioners must comply with its requirements.

2.2 WHY BUILDING CODES ARE IMPORTANT

All building professionals, developers and investors should have a single point of reference that establishes common and transparent standards for public health, safety, fire protection, structural efficiency and environmental integrity. Without a building code, significant disconnects can arise between the design professionals and regulators. In the absence of common references, builders do not know what to expect and the permitting process cannot be straightforward and transparent. Where a national or subnational jurisdiction fails to present a comprehensive set of building standards and requirements in the form of a uniform building code, development of an efficient risk-based regulatory system can be impeded. Countries with no building code at all expose themselves to higher risks of exposure to substandard construction and massive loss of human lives and infrastructure[3].

Building codes are leveraged as key risk management tools. Good-practice codes impose different technical requirements for buildings depending on structural characteristics and occupancy and geographic and geologic constraints. The process of categorising building is called *classification*, and its purpose is to determine the degree and intensity of regulatory controls necessary according to the class of risk into which the building falls.

2.3 INTERNATIONAL BEST PRACTICE

2.3.1 Construction Eurocodes

The EN Eurocodes (European technical standards) are the Europe-wide series of ten European Standards EN 1990 - EN 1999 providing a common approach for the design of buildings and other civil engineering works and construction products.

The Eurocodes cover:

- basis of structural design (EN 1990);
- actions on structures (EN 1991);
- the design of concrete (EN 1992);
- steel (EN 1993);
- composite steel and concrete (EN 1994);
- timber (EN 1995);
- masonry (EN 1996);
- aluminium structures (EN 1999);

[3] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

- geotechnical design (EN 1997) and
- the design, assessment and retrofitting of structures for earthquake resistance (EN 1998).

The European Commission Recommendation 2003/887/EC of 11 December 2003 strongly encourages EU Member States to adopt the Eurocodes as their national design codes.[4]

Eurocodes: http://eurocodes.jrc.ec.europa.eu/

Other examples of international building codes for reference include:

New Zealand	http://www.dbh.govt.nz/building-code-compliance-documents
Canada	http://www.nationalcodes.ca/nbc/index_e.shtml
Australia	http://www.abcb.gov.au/index.cfm?objectid=B960D660-28B0-11DE-835E001B2FB900AA
USA	http://www.iccsafe.org/Pages/default.aspx
United Kingdom	http://www.communities.gov.uk/planningandbuilding/buildingregulations

2.3.2 Performance Based Building Regulations

Countries that are members of the Inter-jurisdictional Regulatory Collaboration Committee (IRCC) include Australia, Austria, Canada, China, England, Japan, New Zealand, Scotland, Singapore, Spain, Sweden, and the United States. Of those IRCC member countries which have performance based building regulations, most have adopted the model outlined by the Nordic Committee on Building Regulations (NKB) in 1976.

In the NKB model[5], the regulatory provisions are based on a set of broad societal goals – essential interests of the community at large with regard to the built environment. Increasing levels of detail, functional and operational requirements for buildings are described, including functional requirements being qualitative requirements of buildings or specific building elements, and operative requirements being actual (quantitative) requirements, in terms of performance criteria or expanded functional descriptions.

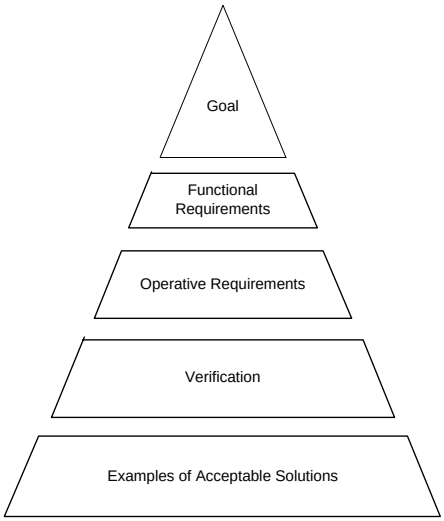
Instead of prescribing a single set of design specifications for compliance, the approach outlines the need for verification methods – instructions or guidelines for verification of compliance. This could include engineering analyses, test methods, etc., that can be used to demonstrate compliance with the operative requirements. The approach also allows examples of acceptable solutions to supplement the regulations with examples of solutions deemed to satisfy what may be quite prescriptive requirements.

The NKB model is attractive because it places the focus on societal (policy level) goals and allows for a variety of forms of regulatory provisions to provide the detail required to demonstrate compliance, by function based, objective based, or performance based regulations.

[4] http://ec.europa.eu/enterprise/sectors/construction/eurocodes/index_en.htm

[5] NKB (1976). Nordic Committee on Building Regulations (NKB), Programme of Work for the NKB, Report No. 28,
Stockholm

FIGURE 2: NKB MODEL (NKB, 1976)



Although the structure is generally the same across the various IRCC countries, there is diversity in terms of which aspects sit within legislation (and are therefore mandatory) and those aspects are considered to be guidance. Performance (operative) requirements are usually stated in qualitative or quantitative terms. The interaction is described between the various components from a legal and practical perspective.

Building codes aim to quantify performance and to make performance requirements align more closely with acceptable risk. This move to more quantification is consistent with recommendations by the IRCC, and efforts in countries such as Australia which have started to move in this direction. Although the flexibility of performance is well recognised and valued, measures are needed to limit interpretations, or to provide sufficient guidance to help those assessing performance make good decisions. This is typically the role of compliance documents, reference standards, and verification methods.

Although most countries choose to cover approximately the same issues in their building regulations there is still significant variation. Figure 3 highlights some of these variations from best practice jurisdictions. Some of this variation is due to differences in climatic or geological conditions, political priorities or sociological changes.

FIGURE 3: SCOPE OF BUILDING REGULATIONS6

STRUCTURE, FIRE, ENVIRONMENT, SAFETY, NOISE	ENERGY	ACCESSIBILITY	WELLBEING	SUSTAINABILITY	CIVIL ENGINEERING WORKS
Australia, Austria, Canada, China, England, Japan, Netherlands, New Zealand, Norway, Scotland, Singapore, Spain, Sweden, USA	Australia, Austria, Canada, China, England, Netherlands, New Zealand, Norway, Scotland, Singapore, Spain, Sweden, USA	Australia, Austria, Canada, China, England, New Zealand, Norway, Singapore, Sweden, Spain, USA	New Zealand Singapore	Netherlands, Singapore	Austria, New Zealand, Norway, Singapore, Sweden

2.3.3 International Seismic Building Codes

In countries where there is seismic activity, the risk of earthquakes is ever present. There needs to be a clear understanding of the responsibilities and tasks associated with earthquake protection for buildings. It is recommended that the compulsory adoption of the International seismic building codes for all buildings designed and constructed in countries subject to seismic events.

2.3.4 Earthquake Prone Buildings

The risk of earthquake-prone buildings can be measured by comparing the assessed performance of each building to the performance required of a new building. A key factor for Municipalities in determining their policy for earthquake-prone buildings within their urban plan is likely to be the level of earthquake risk in their area: what is the probability and severity of earthquakes and what impact could they have on life and property. The policy would become a vital tool in ensuring the structural integrity of the country's commercial building stock, including special heritage buildings.

The draft policy should outline the governments intended approach to:

- identifying earthquake-prone buildings
- the extent to which, legislation permitting, earthquake-prone buildings meet national standards
- the government's priorities for upgrading earthquake-prone buildings
- working with owners to upgrade their buildings
- managing buildings considered to be dangerous or insanitary
- managing heritage buildings that may be earthquake-prone, dangerous and insanitary

2.4 International Building Complexity Classifications

2.4.1 New Zealand's Building Categorisation System

The New Zealand building categorisation levels have been grouped into residential and commercial. There are three residential levels and three commercial levels.

[6] Strengths and Weaknesses of the New Zealand Building Control Regulatory System and Recommendations for Reform: A Strategic Assessment: Meacham Associates, 2009

The six levels represent significant steps in technical knowledge and building type complexity. Decision making goes from simple to more complex analysis with each level step. The levels also split residential and commercial areas of knowledge, for example, light timber frame construction usually used in residential construction and more complex specific design commercial construction systems. The levels also identify specific areas of Building Code knowledge as it relates to the type of construction.

The levels are all underpinned by technical considerations. To simplify this, a number of issues were considered including:

- building type (e.g, garage, carport, retaining wall, dwelling, school, office etc)
- classified use taken from the 1992 Building Regulations (e.g, commercial, industrial, outbuildings)
- activity or purpose group (single household (SH), single residential (SR), crowd large (CL), etc)
- external moisture risk scores and evaluation matrix
- structural importance AS/NZS 1170
- complexity of design
- life safety (risk of injury to user)
- intended outcome.

Because the levels reflect risk, complexity and knowledge steps there is some cross-over between residential 3 and commercial 1. The defining knowledge steps between residential 3 and commercial 1 levels relate to knowledge of vertical and horizontal fire separations and the use of specified systems. Therefore, a three-storey apartment block with horizontal fire separation is defined as a commercial building for the purposes of this assessment system.

FIGURE 4: NEW ZEALAND'S BUILDING CATEGORISATION SYSTEM

Residential 1 Residential outbuildings and ancillary buildings – as defined by the Building Regulations 1992. Detached dwellings (SH) designed to a common standard (eg, NZS 3604, NZS 4229) that are single storey and have an external moisture risk matrix score less than or equal to 6.
Residential 2 Detached dwellings (SH) designed to a common standard (eg, NZS 3604, NZS 4229) that are less than or equal to two storeys and have an E2/AS1 risk matrix score less than or equal to 12.
Residential 3 Detached dwellings (SH) or other dwellings (SR) that are less than or equal to three storeys but limited to vertical plane fire separation and direct egress to the outside. E2/AS1 risk matrix score of 13–20
Commercial 1 Commercial, industrial and communal non-residential buildings and their associated outbuildings and ancillary buildings equal to or less than two storeys and an occupancy load of equal to or less than 100 people or SR or SA residential buildings up to two storeys and with horizontal fire separation
Commercial 2 Commercial, industrial, communal residential and communal non-residential buildings equal to or less than four storey and an occupancy load of equal to or less than 500 people or SC or SD that are single storey
Commercial 3 All uses of buildings that are over four storeys high, or contain over 500 occupants or SC or SD greater than single storey

2.4.2 Exempt Building Work

New Zealand has defined low risk building work that does not require a building permit. This approach recognises that certain minor and low risk building work should not be subject to the normal requirements of the building permit approval process, including the declaration system. Low-risk work presents little danger to people or property, and the compliance costs associated with permitting such work are not offset by the benefits obtained from the permit process.

Exempt building work is generally work that will not affect the structural integrity or safety components of the building. Common examples include:

- Interior non-structural alterations
- Public tents and marquees
- Platforms/decks
- Temporary storage
- Detached uninhabitable small buildings
- Awnings
- Garages and sheds

Important note: Even if building work does not require a building permit, it should still be a requirement of the building legislation that all building work must comply with the Building Code. For this reason skilled building practitioners will often need to be engaged to carry out the work

2.4.3 National Building Code of Canada: Building Occupancy Classification

Examples of major occupancy classifications for Canadian buildings include the following;

FIGURE 5: CANADA'S BUILDING CATEGORISATION SYSTEM

Assembly occupancies: Including lecture halls, auditoria, restaurants, and libraries
Detention facilities: Including prisons and psychiatric hospitals
Care facilities: Including homes for the aged, hospitals, and nursing homes
Residential occupancies: Including houses, apartments, hotels, and residential schools
Office occupancies: Including office buildings, banks, and medical offices.
Mercantile occupancies: Including department stores, shops, markets, and supermarkets
High-hazard industrial occupancies: Such as flammable chemical manufacturing plants
Medium-hazard industrial occupancies: Including laboratories and service stations
Low-hazard industrial occupancies: Including warehouses, storage rooms, and creameries

Within these occupancy classes, risks vary depending on the size of the building. In some jurisdictions, buildings over 3 stories and 600 square meters in building area are generally subject to more robust requirements. Still more robust requirements often apply to buildings over about 18 to 20 meters in height, higher than the reach of most fire ladders. A further escalation of requirements

applies to buildings considered “post-disaster” buildings, such as hospitals, police stations, and power plants

Toronto Streamlined Building Classifications

Residential FASTRACK projects include:

- first floor and basement additions, up to 50 square metres
- minor interior alterations (not including the creation of second suites)
- decks, verandahs and porches
- garages and carports
- accessory structures (such as gazebos and storage sheds)
- basement entrances, underpinning
- pool enclosures

Commercial *Xpress* projects include:

Commercial *Xpress* is an enhanced Building Permit service for certain types of projects. The goal is to review eligible applications within 10 working days.

- Interior alterations to Assembly, Business, Industrial, Office and Retail uses:
  - up to 300m^2 in area
  - no change of use
  - no change in patron area for restaurants
  - no increase in occupant load
  - minor structural changes
  - minor changes to life safety systems
- Tents
- Minor fire damage repair

2.4.4 Australian Building Classifications

Classification Summary of Buildings and Structures defined in the Building Code of Australia

FIGURE 6: AUSTRALIA'S BUILDING CATEGORISATION SYSTEM

Class 1	**Class 1a**	A single dwelling being a detached house, or one or more attached dwellings, each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit.
	Class 1b	A boarding house, guest house, hostel or the like with a total area of all floors not exceeding 300m2, and where not more than 12 reside, and is not located above or below another dwelling or another Class of building other than a private garage.
Class 2	A building containing 2 or more sole-occupancy units each being a separate dwelling.	
Class 3	A residential building, other than a Class 1 or 2 building, which is a common place of long term or transient living for a number of unrelated persons. Example: boarding-house, hostel, back packers accommodation or residential part of a hotel, motel, school or detention centre.	
Class 4	A dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.	
Class 5	An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	
Class 6	A shop or other building for the sale of goods by retail or the supply of services direct to the public. Example: café, restaurant, kiosk, hairdressers, showroom or service station.	
Class 7	Class 7a	A building which is a car park.
	Class 7b	A building which is for storage or display of goods or produce for sale by wholesale.
Class 8	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.	
Class 9	A building of a public nature -	
	Class 9a	A health care building, including those parts of the building set aside as a laboratory.
	Class 9b	An assembly building, including a trade workshop, laboratory or the like, in a primary or secondary school, but excluding any other parts of the building that are of another class.
	Class 9c	An aged care building.
Class 10	A non-habitable building or structure -	
	Class 10a	A private garage, carport, shed or the like.
	Class 10b	A structure being a fence, mast, antenna, retaining or free standing wall, swimming pool or the like.

FIGURE 7: AUSTRALIAN TYPE OF CONSTRUCTION

Rise in storeys	Class of building 2,3,9	Class of building 5,6,7,8
4 or More	A	A
3	A	B
2	B	C
1	C	C

Note: The classification of buildings and the type of construction can vary from the standard model depicted in the tables. Concessions can be provided that change the type of construction. The concessions can relate to the design of the building, its size, and the number of escapes.

2.4.5 Eurocodes Building Classifications

EN 1991-1-1 Clause 6.3, characteristic values of imposed loads in areas according to their specific uses (areas for domestic activities, office and shopping areas, etc).

FIGURE 8: EUROCODES CATEGORIES OF USE

CATEGORY	SPECIFIC USE	EXAMPLE
A	Areas for domestic and residential activities	Rooms in residential buildings and houses; bedrooms and wards in hospitals; bedrooms in hotels and hostels kitchens and toilets.
B	Office areas	
C	Areas where people may congregate (with the exception of areas defined under category A, B, and D1	**Cl:** Areas with tables, etc. e.g. areas in schools, cafes, restaurants, dining halls, reading rooms, receptions. **C2**: Areas with fixed seats, e.g. areas in churches, theatres or cinemas, conference rooms, lecture halls, assembly halls, waiting rooms, railway waiting rooms. **C3:** Areas without obstacles for moving people, e.g. areas in museums, exhibition rooms, etc. and access areas in public and administration buildings, hotels, hospitals, Railway station forecourts. **C4**: Areas with possible physical activities, e.g. dance halls, gymnastic room, stages. **C5**: Areas susceptible to large crowds, e.g. in buildings for public events like concert halls, sports halls including stands, terraces and access areas and railway platforms.
D	Shopping areas	**Dl:** Areas in general retail shops **D2:** Areas in department stores
I) Attention is drawn to 6.3.1.1 (2), in particular for C4 and C5. See EN 1990 when dynamic effects need to be considered. For Category E, see Table 6.3		
NOTE 1 Depending on their anticipated uses, areas likely to be categorised as C2, C3, C4 may be categorised as C5 by decision of the client and/or National annex. NOTE 2 The National annex may provide sub categories to A, B, Cl to C5, D I and D2 NOTE 3 See 6.3.2 for storage or industrial activity		

- EN 1991-1-2 Annex E, fire load densities according to the occupancies (museum, offices, hotel, etc).
- EN 1998-1 Clause 4.2.5, importance classes for the seismic design of buildings according to their occupancies (agricultural buildings, ordinary buildings, schools, etc).

2.4.6 UK Building Classifications

FIGURE 9: UK BUILDING CLASSES

CLASSES	BUILDING TYPE AND OCCUPANCY
1	Houses not exceeding 4 storeys
	Agricultural buildings
	Buildings into which people rarely go, provided no part of the building is closer to another building, or area where people do go, than a distance of 1.5 times the building height
2A	5 storey single occupancy houses
	Hotels not exceeding 4 storeys
	Flats, apartments and other residential buildings not exceeding 4 storeys
	Offices not exceeding 4 storeys
	Industrial buildings not exceeding 3 storeys
	Retailing premises not exceeding 3 storeys of less than 2000m² floor area in each storey
	Single-storey educational buildings
	All buildings not exceeding 2 storeys to which members of the public are admitted and which contain floor areas not exceeding 2000m² at each storey
2B	Hotels, flats, apartments and other residential buildings greater than 4 storeys but not exceeding 15 storeys
	Educational buildings greater than 1 storey but not exceeding 15 storeys
	Retailing premises greater than 3 storeys but not exceeding 15 storeys
	Hospitals not exceeding 3 storeys
	Offices greater than 4 storeys but not exceeding 15 storeys
	All buildings to which members of the public are admitted which contain floor areas exceeding 2000m² but less than 5000m² at each storey
	Car parking not exceeding 6 storeys
3	All buildings defined above as Class 2A and 2B that exceed the limits on area and/or number of storeys
	Grandstands accommodating more than 5000 spectators
	Buildings containing hazardous substances and/or processes

Notes:

1. For buildings intended for more than one type of use the Class should be that pertaining to the most onerous type.
2. In determining the number of storeys in a building, basement storeys may be excluded provided such basement storeys fulfil the robustness requirements of Class 2B buildings.

2.5 International Best Practice Recommendations

ISSUE 1: NO UNIFORM BUILDING CODE EXISTS

Possible Solution:
Mandate a building code under a construction law, building act, or the equivalent. The best approach is to engage professional designers, builders, developers, and other building professionals and stakeholders in offering advice on adopting a code. Existing building codes, such as the Eurocode from the European Union or the International Building Code (IBC) from the United States, can serve as potential models. Countries frequently modify these codes to address local circumstances. Building codes should be adopted early in any reform process since they provide the foundation for a risk-based approach, practitioner training, product approvals, and transparent and predictable regulatory systems.

ISSUE 2: THE BUILDING CODE IS OUT OF DATE

Possible Solution:
Establish the technical capacity to update the code by setting up a working group including private and public building practitioners. To limit the frequency of code changes and to maintain predictability, the country should establish a code update cycle, such as every five years.

ISSUE 3: NO PROCESS OR SET OF CRITERIA EXISTS FOR UPDATING THE CODE

Possible Solution:
Establish a transparent public consultation process for significant code changes. Private building practitioners should be allowed to suggest updates through a formal and transparent process. Such requests should lay out the rationale (that is, why the change is needed, its benefits, and anticipated costs), and they should be publicised.

ISSUE 4: THE BUILDING CODE LIMITS INNOVATION AND IS TOO PRESCRIPTIVE

Possible Solution:
Prescriptive components of existing codes should be retained, since they are useful for practitioners using traditional design methods or materials. But codes should be expanded to included performance measures and provisions that allow for alternative or innovative solutions that meet the same performance levels already set by regulators. Performance- and objective-based codes are important factors allowing speedy, efficient building controls to be carried out by enforcement agencies.

3 Building Occupancy Permits: Processes and Institutions

3.1 Definition And Scope

For investors, one of the most difficult elements of starting a business is often to build commercial or production facilities. The building permit process refers to the process of obtaining a building permit and associated requirements. The building permit authority acts as a gatekeeper, ensuring that permits are issued only when applicants comply with other “applicable laws” including prior clearance and requirements such as land-use planning regulations; regulations concerning airports, farmland and heritage site and environmental regulations.

Beyond the construction logistics, many administrative rules and requirements by the public authorities are imposed on investors. While there is often sound policy justification for these rules, there are sometimes cases where this is not so or where those regulated either do not understand the rationale for the rules or think it is overly bureaucratic. Precious time and money can be expended because of overly complex procedures, imposed interactions with an excessive number of authorities, and unclear and discretionary procedures.

3.2 Why The Permitting Processes Are Important

Delays in obtaining a building permit particularly with planning approvals, can create adverse effects on a building project and can lead to developers to abandon otherwise viable investments. In many jurisdictions across the world, builders may choose to bribe building officials for a 'fast track' permit or may resort to building informally. These practices can lead to poor compliance with standards and increased risk for the community.

The lack of transparency and accountability from building from building authorities can contribute to market distortions and additional transactions costs, especially when these authorities are under equipped, under resourced and not guided by basic standards of service delivery. Lengthy or obscure permitting processes can have a negative effect on developers in another way, they may hamper innovative projects that are more likely than traditional ones to face uncertainties and delays[7].

3.3 International Best Practice

3.3.1 Public Information about the Building Permit Requirements

It is important to ensure applicants provide complete and accurate permit applications. Providing the list of permitting procedures ensures construction permit applicants have a clear view of the requirements.

However requirements are generally written in legal (policy) terms and the construction sector will quite often have difficulty translating this policy language into readily understandable language. In many countries it has become a standard practice for regulatory agencies to provide construction permit applicants with comprehensive and easy to understand advice and guidance, drafted in plain language.

This practice will ensure that applicants are in the best position to provide "quality" relevant and technically appropriate permit application information.

Information should be available in multiple media formats e.g. online via dedicated web pages, hard copy guidance and advice brochures available from application centres. Holding regular information seminars is another common means that other jurisdictions use to provide applicants the opportunity to learn first-hand and ask questions from permitting authorities. This will ensure best possible access to information to all interested parties.

3.3.2 Building Permit Submission Checklist

A building permit submission checklist is a tool commonly used internationally to communicate the minimum information required for building permit applications to the applicant. Such information sets out what information the various permit processing organisations require in order to accept and process a building permit application. The checklist should be at the very front of the permit application and include any declaration by the applicant that all the required is included and that it is

[7] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

technically correct. A checklist will reduce the number of applications declined due to insufficient or inappropriate information.

3.3.3 Digital Signatures

Modern technology has created systems where the verification and security of digital signatures is possible. Implementing this procedure within the records and archive legislation would assist the move to accepting completely digitised permit applications.

3.3.4 National Online Permitting

National Online Permitting systems allow centralised, paperless, internet based means of receiving, and processing building permit applications including categories I – III declaration requirements. The system would enable the tracking of the progression of a building permit application through the assessment and approval process and provide transparency of process and decisions.

3.3.5 Pre-application Meetings

Early discussions with the permit application agencies helps applicants to make informed decisions about the application and avoid unnecessary processing delays. The pre-application meetings typically help the applicant:

- understand the process
- confirm what permits or licenses are required
- give guidance about who the applicant should be talking to about the project and what expertise the applicant may need to assist in the preparation of the application
- find out what information is required to help prepare the application(s)
- identify any issues that may need to be addressed in the application(s)

3.3.6 Requests for Further Information Process

Keeping the applicant informed of the issues as they are identified during the technical assessment process promotes an environment in which clarifications or non-compliances can be addressed immediately rather than waiting until the entire evaluation process has been completed. Electronic communications with the applicant would also ensure speedy replies.

3.3.7 Major and Minor Amendments to Approved and Permitted Plans

Permits that have already been granted sometimes need to be amended because the applicant decides to change what they originally proposed to build or alternative building products or systems have been selected.

Many changes are often very minor and have no substantive bearing on the permit that has been granted, but other changes can represent a substantial departure on what was originally proposed when the permit application was being considered by the regulatory agency.

The process that needs to be followed to amend an existing building permit should be proportionate to the nature of the building work. For example a minor change to what was originally approved in the building permit may require a straight forward administrative approach. However, a major change could result in the applicant having to reapply for their building permit.

“Minor” and “major” amendment building work could be defined and an alternative method of dealing with each type of amendment could be implemented. For example: http://www.dbh.govt.nz/codewords-32-2

- Minor amendments could include non-structural amendments that could be confirmed with the designer/engineer and then annotated on the plans. This process would not require a new permit application to be submitted.

- Major amendments could include significant changes to the originally submitted plans. For example any structural changes, outside envelope modifications, and potential thermal efficiency amendments. These amendments would require a new permit application to be submitted.

3.3.8 Use of Private Building Professionals

With building codes becoming more complex and with sustained increases in construction across the world, the trend toward sharing the work-load for regulatory control functions, and hence leveraging expertise where it really sits, has led to growing use of the private sector. This trend has taken hold not only in traditional market economies but also, to a lesser degree, in transitional economies such as Macedonia, the Czech Republic, or more recently Kazakhstan. The turn to private-sector expertise is visible as well in middle-income countries, as illustrated by the emergence of a large contingent of private third-party reviewers. A more systematic use of private building professionals for permits and inspections has helped remove bottlenecks associated with resource-constrained public building authorities.

3.4 ONE-STOP-SHOP PERMITTING

The establishment of an OSS will create a “centre of excellence” that co-ordinates building permit applications.

The OSS facilitates the submission process for applications. Applicants would complete a single application form and submit all the relevant documents at the OSS.

An online system would enhance this operation greatly by allowing the applicant to upload all documents and plans through a completely digitized process. The application file would then be forwarded to the various departments in the OSS who review it in parallel, or allow access from other departments to a common computer program and a common database to facilitate processing of permit applications.

Significant co-operation could been achieved by incorporating practitioners from the Municipality, State Architecture, Technical Norm Assessment, and the utility agencies into a single processing centre and establishing electronic file transfer systems. Enabling online access to a single document repository would allow parties such as utility providers to process their appropriate requirements without the physical transfer of documents.

Even where accountability for clearances is fragmented among various Ministries an OSS system can improve the level of service to investors. Under a OSS system, representatives from the clearance agencies undertake a coordinated review of applications which allows the agencies to understand better the requirements of the various agencies participating in the OSS system.

Ultimately, on any complex or controversial issue, the one-window representative will be unable to make a decision, and therefore permit applicants should still submit a complete and correct application.

Nonetheless, an OSS does allow for better communication and co-ordination and better outcomes, particularly when used in conjunction with other measures, including improved transparency, advice and guidelines, checklists and time-limits.

3.5 International Best Practice Recommendations

ISSUE 5: SIGNIFICANT BOTTLENECKS IMPEDE LOCAL BUILDING AUTHORITIES, RESULTING IN A BACKLOG OF APPLICATIONS

Possible Solution:
Involve private building practitioners in building-control functions (plan reviews and inspections) and consider relying on self-certification for low-risk building applications. This approach can only be enforced gradually as qualification and accountability systems for building professionals become sufficiently robust.

ISSUE 6: THE PROCEDURE LACKS TRANSPARENCY

Possible Solution:
Introduce automated procedures and publish information online, including complete application requirements and process guidelines. This information should be on the main building agency's website. Mandate planning departments, airport authorities, and highway, heritage, and agricultural agencies to publish their requirements related to new construction, including digital maps delineating areas of concern where development is prohibited or clearances may be required.

ISSUE 7: LARGE- AND SMALL-SCALE PROJECTS FOLLOW THE SAME PERMIT PROCESS

Possible Solution:
Introduce risk management into the building permit process. Smaller, less complex and less risky projects may depend on self-certification, while more complex and riskier projects will require more robust third-party reviews. Less differentiation will be required for other building permit process functions, such as clearance and zoning review, which apply to most projects anyway.

ISSUE 8: OBTAINING A CONSTRUCTION PERMIT TAKES TOO LONG

Possible Solution:
Establish time limits for plan reviews and other clearances required from other agencies. The time limit may vary with the different building classes (for example, more time may be allowed for a high-rise commercial building than for a small residential building). Provide guidelines on complete applications that can "start the clock" for permit reviews that include checklists and guidelines for all application requirements.

4 Independent Third Party Review

4.1 Definition And Scope

A third party review refers to the practice of having an independent party (not the designer or the contractor) review the design and construction of the building. It provides essential and independent "checks and balances" in the building control systems. A third party review is intended to help ensure that building projects above a certain level of complexity and risk are handled in such a way that public health and safety is ensured (as much as possible) during the design and construction process, with minimal conflicts of interests.

4.2 WHY INDEPENDENT THIRD PARTY REVIEW IS IMPORTANT

To a very large degree, a functioning third party review mechanism determines the ability of a construction permitting system to produce robust regulatory outcomes. Note reforms should be undertaken at the cost of weakening this crucially important element of building control. This function is important for four reasons:

- Buildings have a major impact on public safety, including that of persons both within and near the building
- Buildings are complex, and mistakes in building design and construction are highly possible and often likely
- Building defects can be very expensive to repair once the building is complete. This factor can add considerable uncertainty for investors. Design adjustments or repairs are much less expensive during the design or construction process
- Some project stakeholders can be pressured to cut corners thus reducing public safety. Building owners or designers subject to cost and other pressures may have a higher tolerance for risk than would the building occupants or the public. A third party control provides the check and balance needed to minimise such risks[8]

4.3 INTERNATIONAL BEST PRACTICE

4.3.1 Options of Third Party Review

Third-party review can be accomplished in several ways, ranging from review by government inspectors, usually from municipal authorities, to private-sector review. The range of options for independent third party, technical review includes the following:

- **Third-party review by government inspectors from the local permitting authority:** design review and/or construction inspections done directly by municipal inspectors.
- **Third-party review by consultants or private inspectors retained by permitting authorities:** local authorities may rely on expert private inspectors to advise or sign off on the technical review.
- **Accredited third-party inspection agencies retained directly by project developer owner:** government-approved inspection agencies review designs and building construction for the owner.
- **Peer review of building design and construction by another professional engineer:** owners engage another licensed engineer not involved in design or construction to review the design and/or construction.
- **Third-party review provided or engaged by insurer/warranty provider:** in jurisdictions where insurance or warranty providers have a large role, they may arrange the technical review as well.

Jurisdictions sometimes combine several of these potential third-party technical review modalities

4.3.2 Construction Inspections

Construction inspections are an audit and verification, by an appropriate authority or licensed inspector, to confirm that critical construction elements have been completed at specific stages during construction and are correct technically.

Inspections will be required to verify that the technical aspects and the validity of construction methods as detailed in the submitted plans and specifications are being adhered to. The inspections

[8] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

are to ensure that the structural integrity, health and safety of the building and that it is being constructed correctly. Inspections are project specific and should be identified by the State Architecture and Construction Inspectorate during the assessment of the plans and specifications submitted for permit approval. The number and technical level of inspections may differ for different permit application types and will be dependent upon the technical complexity of each of the projects.

It is also desirable to implement minimum standardised inspection for each category of building project with the flexibility to add inspections for more complex building and elements. Standardised inspections improve the transparency, fixes cost and provides certainty.

Generally inspections will capture the following main areas and would be determined by the complexity and risk of the project.

FIGURE 10: TYPICAL SCOPE OF TECHNICAL INSPECTIONS

INSPECTION TYPE	DESCRIPTION
Foundation	An inspection of strip or bored pile foundations before the concrete is poured
Concrete block or concrete reinforcing	An inspection of block work construction, cast in situ panels, columns or walls before the concrete is poured
Concrete floor slab	An inspection, excluding plumbing, of any floor slab and its associated building work before the concrete is poured
Plumbing (under slab)	An inspection of plumbing work under the slab; plumbing to be on test; as-built plan required
Framing	A detailed inspection of the timber structure of the building before the roof cladding and building wraps are installed
Cavity wrap	An inspection of the building wrap and cavity construction before the cladding is installed
Cladding	An inspection of the specific cladding installation to check fixings, flashings, etc.
Pre-line building	An inspection of the building work before the installation of any internal linings
Plumbing	An inspection of any plumbing works in any part of the building; pipe work to be leak and pressure tested
Post-line	An inspection of bracing elements and internal linings
Fire rated linings	An inspection of any fire rated product installed to comply with the building permit and the building code
Membrane tanking	An inspection of a roof, deck or internal wet area membrane or below ground wall requiring waterproofing
Drainage	Any surface water or foul water drainage system associated with the building permit; an as-built drainage plan is required
Residential final	A final inspection to confirm the building work covered by the approved building permit has been completed and complies with that permit and the building code
Commercial final	A final inspection to confirm the building work covered by

	the approved building permit has been completed and complies with that permit and the building code
Solid fuel appliance	An inspection to confirm the installation of the appliance is in accordance with the manufacturer's specifications and the building code
Acoustic testing	The on-site testing of acoustic construction for multi-unit and multi-level co-joined residential buildings.
Site meeting	The minuted record of any onsite discussion held on site to discuss areas of compliance
Certificate for public use	An inspection of part of the building work of a current building permit to ensure the public can access, move around and exit a building safely before the entire project is complete. This applies only to buildings to which the public would normally have access

Further information about inspections is readily available from a number of sources.

- Ref appendix 12: 1201 Inspections, Outline of policy and procedures for booking and undertaking inspections of building work
- Ref appendix 13: 1211 Foundations, Example Foundations Inspection Checklist
- Ref appendix 14: 1212 Framing, Example Framing Inspection Checklist
- Ref appendix 15: 1216 Pre-line Building, Example Pre-line Inspection Checklist
- Ref appendix 16: 1217 Plumbing, Example Plumbing Inspection Checklist
- Ref appendix 19: 1804 How building work is inspected

4.3.3 Low risk exempt building work

It is possible to define low risk building work that does not require a building permit and a number of countries have developed such a system. This approach recognises that certain minor and low risk building work should not be subject to the normal requirements of the building permit approval process, including the declaration system. Low-risk work presents little danger to people or property, and the compliance costs associated with permitting such work are not offset by the benefits obtained from the permit process.

Exempt building work is generally work that will not affect the structural integrity or safety components of the building. Common examples include:

- Interior non-structural alterations
- Public tents and marquees
- Platforms/decks
- Temporary storage
- Detached uninhabitable small buildings
- Awnings
- Garages and sheds

Important note: Even if building work does not require a building permit, it should still be a requirement of the building legislation that all building work must comply with the Building Code. For this reason skilled building practitioners will often need to be engaged to carry out the work.

4.3.4 Peer Review Process

A peer review is a collaborative expert support for the proposed design model. This could be a review of the proposed solution or opinions obtained from credible organisations. It provides expert verification of the design philosophy.

4.3.5 Commentary on Self Certification

In order to streamline the building control process it is reasonable to look for opportunities to allow some form of self certification, with reduced oversight, for low risk building work. Self-certification will be effective, so long as the measures identified below are addressed.

If the building permitting system is based upon compliance with a National Building Code (e.g. Eurocodes), then some self-certification and a shift from a building permit process to more of an audit-based system (for some types of low risk building work) may be appropriate as a means of streamlining the building control system.

A majority of countries in Europe and the IRCC (Inter-jurisdictional Regulatory Collaboration Committee) have some form of third party certification or verification of requirements against a National Building Code. Most of these regimes involve a level of government involvement acting as the third party reviewer (usually local government or regional government agencies).

However a growing number of countries have reformed their systems to include private sector building certifiers. There are a number of international examples where private providers operate in the provision of building control services alongside regulatory authorities. Within Australia, building control is undertaken by both public and private providers in Tasmania, South Australia, Victoria, New South Wales and Queensland with Western Australia in the process of moving to a two-tier system. Each state has set up an independent organisation as the statutory authority for building control. England and Wales operate with national and local providers within a national framework with The Construction Industry Council responsible for monitoring private providers. While the USA has an accreditation model similar to New Zealand with accreditation being offered to council and county building control functions via the International Accreditation Service (IAS). The IAS operates in a similar function to IANZ in New Zealand.

The split of responsibility differs between the countries concerned. In some countries the private sector is empowered to do almost as much third party certification as the public sector, while in others private certifiers can undertake only a limited subset of tasks.

Those countries that have significant components of self-certification in their building control systems do so because, either their legislative structure empowers it (i.e. a Civil Code), or because they have chosen to implement a quality management based approach instead of (or alongside) a third party review system.

In this regard, it is reasonable to look at different levels of risk and the consequences with respect to determining who can self-certify and who cannot, and under what conditions. For example, such an approach may allow self-certification for simple, low risk buildings (e.g., farm buildings, sheds, garages etc.), with a strong focus on contracts between applicants and practitioners. More complex buildings (e.g., residential housing) could require a building permit application to the municipalities, with a check of correct licensing and subcontractors, and periodic inspection of works (random and risk-based). Buildings that are even more complex and are regarded as high risk/high consequence could require more thorough oversight by the permitting agencies and additional review (e.g. peer review or expert panels), more risk-based audits, and a higher level of warranty/certification of products.

Such an approach would look to apportion the level of oversight, control and liability appropriate to the risk and consequences associated with the work. An overview of how this could work is summarised in Figure 6.

FIGURE 11: THIRD PARTY REVIEW OR SELF-CERTIFICATION OPTIONS

CONTROL	WHERE CONTROL COULD BE APPROPRIATE	EXAMPLES
Self-Certification	Where there is low risk to life and safety, low economic consequences from building failure, and low societal or cultural impact	• Design and construction of farm sheds, tool sheds, self-standing single car garages. • Electrical, plumbing, gas-fitting in 1-2 floor family dwellings. • Installation of carpets, showers, interior doors (residential – non fire rated). • Roofing, windows, cladding, solar collectors, etc. for 1-2 family dwellings (assumes licensing, competency requirements, claim system, warranty/insurance scheme, dispute resolution).
Permitting agency audits, site inspections and permits	Where there is low risk to life and safety, moderate economic consequences from building failure, and low or moderate societal or cultural impact	• Design and construction of 1-2 floor family dwellings (site, foundation, structural, envelope, weather tightness etc.) • Design and construction of moderate size residential blocks (less than 4 stories, 12 units) • Warehouses, low rise offices, etc. (refer to structural and fire working groups on performance levels)
Permitting agency plan approval, site inspection, construction inspection, systems commissioning tests, peer review, etc.	Where there is moderate or higher risk to life and safety, high economic impact from building failure, or high societal or cultural impact	• Places of public assembly • Schools • High-rise buildings • Hospitals • Critical facilities

4.3.6 Third Party Certification versus Self Certification

Norway and Sweden[9] are two countries that have had just over 10 years' experience with quality approaches to self-certification. Both countries have experienced a sufficiently high number of problems that their governments are now reconsidering the self-certification approach. The problems experienced do not reflect a complete failure of a quality approach, but are associated with a lack of regulatory or market mechanisms to check for potential problems and to resolve disputes. Figure 7 below summarises some jurisdictions that have considered third party certification and self-certification models.

FIGURE 12: SELF CERTIFICATION INTERNATIONAL OBSERVATIONS[10]

Vancouver	Self-certification is allowed for low-risk work either by trade professionals (e.g. electrical

[9] Based on information provided by Norway and Sweden to the IRCC

[10] Summarised from a research paper prepared for the New Zealand Department of Building and Housing to inform the Department's policy work on third party review and quality assurance issues. The research was prepared by Allen and Clarke, Policy and regulatory specialists (www.allenandclarke.com)

City, British Columbia, Canada	work with a value less than $250), and some minor repairs and works are specified as being exempt from permit requirements; however those works must meet all other legal requirements for safety and suitability.
Western Australia	Western Australia is currently making a shift from solely public building regulatory enforcement to a system where private sector involvement is possible. The new legislation will formalise private sector participation in the building certification process.
Victoria, Australia	Victoria opened building regulatory enforcement to the private sector in 1993, leading a national shift toward private sector involvement in Australian building control. The intention was to introduce competition into the sector, and therefore increase quality and efficiency. No results of any evaluation against this goal are yet available. Victoria uses general private sector involvement: private sector parties are allowed to carry out all statutory assessment tasks, issues permits, and oversee the regulatory enforcement regime. Private sector parties are used widely: 75% of building permits are issued by private certifiers.
England and Wales	Certain types of low risk building work can be self-certificated as compliant with Building Regulations by a member of a Competent Person Scheme without the need to notify and a Building Control Body. The Department for Communities and Local Government is also responsible for the authorisation and monitoring of Competent Person Schemes. As of January 2013, there are currently 19 existing competent person schemes. The work of organisations or individuals accepted as members of a scheme is not subject to third party building control. The type of building work is very restricted, (e.g., replacing windows and doors, electrical safety in dwellings, plumbing, heating systems and hot water service systems for non-dwellings). The Department for Communities and Local Government has developed a set of criteria to assess those who apply for management of a competent persons scheme under the Building Regulations – these criteria are being reformed to include a range of functions – including quality assurance and performance monitoring criteria covering scheme operators and their members.
Norway	Approved Building Enterprise (ABE) are eligible to certify others' and their own designs or construction work. In July 2012 the Building Act was amended to re-balance the system, retain self-certification but add a requirement for mandatory independent plans review and inspection of certain key building components, by state-approved private-sector practitioners, including those related to fire safety, structural safety, and energy efficiency. Third-party review requirements apply to all building types and classifications. Since the effectiveness of the new system relies on self-certification and third-party review of key building elements by state-qualified persons, the system relies heavily on the quality and robustness of the state qualification and licensing system for designers, contractors, and firms undertaking third-party review[11].

[11] Good Practices for Construction Regulation and Enforcement Reform, January 2013
https://www.wbginvestmentclimate.org/publications/loader.cfm?csModule=security/getfile&pageid=33965

4.3.7 Geospatial Information Systems (GIS)

Geospatial Information Systems (GIS) is an integrated system of computer hardware, software, and trained personnel capable of assembling, storing, manipulating, and displaying topographic, demographic, utility, facility, image and other resource data that is geographically referenced.

NOTE: If a robust and detailed GIS system was introduced, then applicants who produced their conceptual drawings electronically with a CAD or BIM system may be in a position to overlay these plans with the zoning and planning requirements captured in the GIS system. In certain circumstances (mainly low risk applications) this functionality may be able to have the effect of pre-approving some elements of the project before it is checked by the permitting authorities which would save permit processing time.

5 SOUND AND TRANSPARENT URBAN PLANNING REQUIREMENTS

5.1 DEFINITION AND SCOPE

The requirements for obtaining a building permit entails compliance with applicable law, a term referring to regulations governing where and under what conditions something can be built. Applicable laws may also be referred to as prior clearances, since building authorities will require prior clearances from agencies overseeing adherence to the law in question.

In some countries, verifying compliance with zoning and other land-use planning regulations causes the most concern. Developers, quite reasonably, expect that the review of building proposals, particularly those for larger and more complex building projects not in conformance with existing zoning or land-use policies, will take time to gain approval. Such projects often require research studies on their impact on local infrastructure, traffic, and the environmental and other matters. One or more public consultations may also be required. Where a proposed project appears consistent with an area's existing land use development, the approval process should be relatively simple and straightforward. This is unfortunately not the case with most jurisdictions.

5.2 WHY SOUND AND TRANSPARENT URBAN PLANNING REQUIREMENTS ARE IMPORTANT

Urban planning approval issues arise often in countries formally part of the Soviet Union, transitioning from state-controlled to market-based economies. In some of these countries, planning information is seriously outdated; it may even be treated as secret information and not made available to the public. Access to up-to-date land use planning information is crucial for developers because building projects involve large up-front investments of time and money for feasibility studies and preliminary plans[12].

5.3 INTERNATIONAL BEST PRACTICE

The most notable and successful reforms focus on introducing information technology to provide users and certified professionals with access to planning information. In Vienna, land-use plans including zoning and infrastructure information, as well as officials' plans for future growth and development policies of the city, are all available online. The zoning map, for example, allows the user to zoom in on particular areas of the city to determine the current zoning and relevant land-use

[12] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

policies. Legal reforms have created a predetermined "right to build" for projects complying with planning and zoning requirements.

The most notable and successful reforms focus on introducing ICT to provide users and certified professionals with access to planning information. In Vienna, land-use plans, including zoning and infrastructure information as well as official plans for the future growth and development policies of the city, are all available online. The zoning map, for example, allows the user to zoom in on particular areas of the city to determine the current zoning and relevant land-use policies. Legal reforms have consistently created a predetermined "right to build" for projects complying with planning and zoning requirements.

5.4 INTERNATIONAL BEST PRACTICE

FRANCE: A PARTICIPATORY AND TRANSPARENT ZONING SYSTEM

Similar to other countries in Europe, France has a standard two-tier mechanism for establishing zoning requirements.

- **First, a regional Master Plan, or Schéma de Cohérence Territoriale (SCT) is typically developed for a period of about 10 to 15 years, usually by a large group of municipalities under a dedicated association chaired by an elected mayor from one of the group's municipalities. The SCT results from a codified, thorough consultation process involving regional stakeholders and the concerned municipalities**
- **Second, a municipal Zoning Plan, or Plan Local d'Urbanisme (PLU), is updated and digitized, on average, every 5 years. The PLU must be entirely consistent with the SCT in all aspects. Any individual or firm (i.e., the project developer) can have a PLU (or certain aspects of a PLU) annulled by a court, if it is found to be inconsistent with the SCT. A PLU is a detailed document that includes graphic explanations, maps, and the coefficient of land use. It also includes detailed information about utility networks and regulations relevant to the mapped area (e.g., the environment, the national heritage, etc.)**

Both the SCT and the PLU are developed by private specialized firms, which are selected as a result of a public tendering process. Although local elected authorities are fully empowered in the process, the central government can establish key requirements at the start (for example, preservation of agricultural zones, flood prevention, etc.) and will monitor the final compliance of the PLU with specialized controllers. This early notification of requirements is referred to as *porter à connaissance*. A PLU creates a "right to build" for any building applicant, as long as the proposed project is located in one area opened for development. Municipalities have the obligation to allow access of their PLUs to all citizens, via a website or at the municipality office. Areas within the outreach of utility companies and that have adequate infrastructure to allow immediate physical connections are marked with a specific code (1AU). Building projects developed in these areas are not subject to any form of preliminary approval or notification requirements.

The French system illustrates a widespread European practice of not requiring preliminary zoning permits, on the following basis:

- **A predetermined right to build exists in areas for which zoning plans allow such building.**
- **Applicants for construction permits can access all relevant zoning information with no restrictions, at a minimal cost, and can determine, ex ante, if the project meets zoning conditions.**

With the notable exception of the United Kingdom, most European countries, such as Austria and Germany, have assigned their building authorities the task, integrated into review of the building

permit application, of verifying that a project complies with zoning requirements.

ISSUE 9: LAND-USE PLANS ARE ADMINISTERED BY THE SENIOR (OR STATE) LEVEL OF GOVERNMENT

Possible Solution:
Assign core planning and zoning responsibilities to local authorities. Planning approval should be decentralized to the extent possible to improve efficiency, accountability, and coordination with building permit approvals. Local municipalities and their residents are most directly affected by land-use decisions: they are always in a better position to evaluate the impact of development proposals on infrastructure, the community, and the local tax base. Senior level (or state) governments have a more natural role in policy issues that cut across municipal boundaries. This includes major transportation, transit, infrastructure, investment, or broad impact issues.

ISSUE 10: LAND-USE PLANS ARE OUT OF DATE

Possible Solution:
Enforce periodical planning update cycles, such as every 5 to 10 years, involving local stakeholders and systematic public consultations. Updating city master plans and zoning requirements is essential to avoid the development of excess discretion in individual planning permits. An updated zoning plan should create a straightforward and predetermined “right to build” when a building project is in compliance with zoning requirements.

ISSUE 11: PLANNING REQUIREMENTS LACK TRANSPARENCY

Possible Solution:
Ensure full disclosure of planning information and public consultations. In countries transitioning from a command-and-control to a market economy and with only a recent history of embracing private land ownership, full disclosure of planning information is not always widely accepted. Establishing web-based, detailed land-use plans, such as those used in Vienna, remains the most effective measure for ensuring high standards of transparency.

6 PROFESSIONAL STANDARDS AND OVERSIGHT MECHANISMS

6.1 DEFINITION AND SCOPE

Building design and construction relies heavily on the expertise of designers and contractors, especially for more complex, higher risk buildings, where the design follows performance based rather than prescriptive codes. Where a heavy reliance is made on professional designers, they must be qualified in building design, building science and be able to interpret and comply with relevant building codes and standards. Similarly, where heavy reliance is made on the building contractor, the contractor must be able to read plans and specifications and to understand construction materials and methods.

6.2 WHY PROFESSIONAL STANDARDS & OVERSIGHT MECHANISMS ARE IMPORTANT

In the past ten to fifteen years, building controls in reforming countries have been shifting away from old fashioned public enforcement policies (centred on public building authorities) towards strategies that rely on private practitioners for enforcement. This is a positive trend because it reduces delays and bottle necks with local building authorities. The result however, is greater reliance on the expertise of private sector designers and engineers. The licensing of professionals involved in the building process is therefore a significant part of most building regulatory systems and a robust system of qualifications and licensing for these professionals is crucially important to ensure a higher degree of building code compliance[13].

6.3 INTERNATIONAL BEST PRACTICE

To varying degrees almost all countries in Europe have in the last 10 years moved from traditional public enforcement strategies towards practitioner focused enforcement strategies.

6.3.1 Building and Construction Licensing Scheme

It is important that governments implement robust and transparent construction industry licensing schemes that detail the requirements for qualifications, skills and competencies before licenses are issued. The benefits of such a system include:

- Provide investors and consumers with greater assurance that the designers and constructors engaged are competent to do the job
- Hold constructors accountable when things go wrong
- Increase incentives for professional builders
- Enable risk to be balanced between designers, constructors and the municipalities
- Create an essential element if mandatory insurance/warranty schemes are implemented.

6.3.2 Training Programme

All stakeholder and practitioners should understand the processes, document requirements and conditions for the assessment and approval of permits. A lack of knowledge leads to incomplete applications being submitted and potentially inappropriate applications being accepted by the permitting agencies for processing.

[13] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

6.3.3 Continued Professional Development

Ensure that all building and construction practitioners are required to undertake appropriate continuing professional development (CPD). CPD is the systematic maintenance, improvement and broadening of knowledge and skill and the development of personal qualities necessary for the execution of professional and technical duties throughout the practitioner's working life.

6.3.4 Major Trends in Reforming Countries

The very different practices in the United Kingdom and in Austria respond to the needs and constraints prevailing in each country. Both provide a model illustrating trends observed in other reforming countries.

In the U.K. approach, enforcement strategies relying on private practitioners allow individual persons or legal entities to perform independent building-controls. These private building professionals are called *approved inspectors,* and they perform building controls in place of the state or municipal building authority[14]. The building permit can be issued by the private approved inspector. The United Kingdom developed and set by law, the qualification criteria for approved inspectors. Approval of private inspectors is carried out by a government body, the Construction Industry Council (CIC)[15].

In the model followed in both Germany and Austria, private qualified individuals or engineering firms can be commissioned by the local municipal building authority to do checks and inspections. The construction permit is formally issued by the local building authority, based on the reports of the private expert. Both countries have robust entry licensing systems for designers and builders.

AUSTRIA AND GERMANY FRANCE: SETTING UP ROBUST PROFESSIONAL QUALIFICATION REQUIREMENTS TO SUPPORT A MODERN PRACTITIONER-BASED ENFORCEMENT STRATEGY

Similar to other countries in Europe, France has a standard two-tier mechanism for establishing zoning requirements.

- First, a regional Master Plan, or Schéma de Cohérence Territoriale (SCT) is typically developed for a period of about 10 to 15 years, usually by a large group of municipalities under a dedicated association chaired by an elected mayor from one of the group's municipalities. The SCT results from a codified, thorough consultation process involving regional stakeholders and the concerned municipalities
- Second, a municipal Zoning Plan, or Plan Local d'Urbanisme (PLU), is updated and digitized, on average, every 5 years. The PLU must be entirely consistent with the SCT in all aspects. Any individual or firm (i.e., the project developer) can have a PLU (or certain aspects of a PLU) annulled by a court, if it is found to be inconsistent with the SCT. A PLU is a detailed document that includes graphic explanations, maps, and the coefficient of land use. It also includes detailed information about utility networks and regulations relevant to the mapped area (e.g., the environment, the national heritage, etc.)

Both the SCT and the PLU are developed by private specialized firms, which are selected as a result of a public tendering process. Although local elected authorities are fully empowered in the process, the central government can establish key requirements at the start (for example, preservation of

[14] Applicants can choose to apply for a building permit either at the building authority or with an approved inspector

[15] See www.cic.org.uk.

Austria has two relevant professional groups for professional qualification requirements:

- The Baumeister (master builder) must successfully pass both an apprenticeship and a master craftsman's examination or must complete secondary education, ending with a high school certificate. In both cases, some years of specific professional experience plus an official examination by a special commission are also required.
- The Architekt/Zivilingenieur goes through a post-secondary technical education followed by at least three years of professional experience and passage of an official examination organized by a special commission composed of public administration officials and representatives of the Chamber of Architects and Engineers.

Local authorities typically have only limited or light additional requirements when hiring private experts because the candidate's engineering skills will already have been adequately and thoroughly examined through the licensing process.

Both the U.K. and the German and Austrian models can inspire improvements to existing building control systems elsewhere. Neither approach is considered superior to the other, as both fit well the structures and needs of the respective nation's industry. It is worth noting that the system of qualification and the degree of entry level expertise required for professionals reflects two systems with practical consequences for building-permitting procedures:

- The Austrian and German system depends on high entry standards for the designer and builder, with a consequently lower intensity of inspections in individual buildings.
- The U.K. model minimizes barriers to entry and therefore places a larger focus on third-party inspection of individual buildings.

The Austrian system is "builder"- rather building-focused, with the U.K. implementing a "building" related approach.

6.4 International Best Practice Recommendations

ISSUE 12: NO MANDATORY PROFESSIONAL STANDARDS HAVE BEEN SET FOR DESIGNERS

Possible Solution:
Create mandatory professional standards based on the compliance strategy chosen by the country (see, for example, the U.K. model and the Austrian and German model. Many countries blend mandatory professional licensing for larger and more complex buildings with a more open system covering smaller, less complex buildings. In best-practice countries, having a project designed by an architect or engineer is not the only check on safety. Building designs are still reviewed by a third party, and construction is still subject to inspections. A building design carried out by a designer, however, is less likely to have a defective design and so is more likely to lead to a safe building.

ISSUE 13: THE REGULATION OF PROFESSIONALS CREATES CONFLICTS OF INTEREST

Possible Solution:
Problems with professional licensing bodies usually relate to a conflict of interest. The association seeks to improve its image and serve its members and therefore avoids disciplinary actions against members that may bring unwanted attention to the profession. Typical problems include inadequate qualification requirements and, more frequently, inadequate discipline, allowing incompetent or negligent practitioners to continue to practice regardless of their track records. Once diagnosed, the problem admits of the following remedies:

- Modify the governance structure of the licensing body so that the majority of directors are not professional practitioners, or at least increase the representation of non-practitioners or other stakeholders to better represent the public interest
- Improve government oversight of the governance body
- Introduce more robust insurance requirements, peer review, and continuing professional training

7 LIABILITY AND INSURANCE SYSTEMS

7.1 DEFINITION AND SCOPE

Liability and insurance regimes are crucial in the construction sector because they ensure the accountability of practitioners and enforcement agencies. Insurance systems also contribute to a restitution mechanism for an aggrieved party.

Generally building code compliance and building safety are a shared responsibility among the designer, builder and permitting authority. Liability for negligent or defective work, depending on the nature of the liability regime, is usually restricted in time to an finite liability period. In practice, liability regimes can be complex, fragmented in terms of legislation, poorly aligned with insurance coverage, and often poorly understood. These factors create delays and confusion and consistently increase costs for regulators and the industry.

7.2 WHY LIABILITY AND INSURANCE SYSTEMS ARE IMPORTANT

Promoting efficient, fair and transparent liability systems with reasonably priced insurance mechanisms is important in helping to prevent building officials or enforcement agencies from stalling the issuance of permits. The simple fear of legal uncertainty can create significant delays and impede the capacity of enforcement agencies to make timely and sound decisions[16].

7.3 INTERNATIONAL BEST PRACTICE

7.3.1 Risks & Liability

A key issue in any move away from complete government backing is the requirement to be able to identify clearly risks and liability. If insurers cannot determine the exposure, or who could be assigned the liability in case of failure (and therefore impacting the ability to recover damages), there will be little incentive for insurers to enter the market. This is a particularly important issue around the self-certification – will self-certified buildings be able to find insurance?, It is possible that the only option a legislated alternative such as mandatory industry supported fidelity fund?

An industry based fidelity fund approach could work with industry support, proper governance, a sound claims system, an effective dispute resolution mechanism, and a sound disciplinary system to ensure bad performers cannot close down their business and start a new one in the same area of practice.

The consumer also has some responsibility and accountability and should therefore bear some of the liability. It is worth exploring more contract-based approaches where tort law and negligence claims can be mechanisms to force better industry and consumer accountability.

[16] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

Legislation of the disciplinary process may also incorporate criminal liability, complete with an appropriate punishment regime for offending at the upper end of the scale, e.g. gross negligence leading to loss of life or injury.

7.3.2 Major Trends in Reforming Countries

Two notable features of a modern and functioning conflict resolution emerge.

- **A dedicated instrument outside the main court system**. Common to good-practice jurisdictions, a separate entity, sometimes having a "conciliation" mandate, is usually in charge of conflict resolution. In the United Kingdom, an appeal relating to planning permits is possible at the Planning Inspectorate. For building permits, the applicant can try to follow an arbitration and conciliation procedure with the national association of the Local Authority Building Control (LABC). If no solution is found, a formal appeal can be lodged with the Department of Communities and Local Government. The applicant can go to court only after having exhausted these instruments.
- **Conflict resolution carried out by knowledgeable professionals**. An important element in the efficiency and fairness of appeal decisions is that professional regulators and industry professionals participate in the specialized conflict resolution bodies and that their views carry weight equal to that accorded to other members. In Canada, for example, the Building Code Commission (BCC) is established by law. While its members are appointed by the minister of housing, all commission members have appropriate technical expertise and are appointed from both the regulatory and the industry sectors. BCC decisions are binding but case specific. Interestingly, decisions by the BCC are final—no further appeal can be made. Hearings on technical issues almost never exceed 6 to 8 weeks, which presents another decisive advantage of the BCC over the main court system

7.4 International Best Practice Recommendations

ISSUE 14: THE RESPONSIBILITIES OF KEY PARTIES ARE NOT DELINEATED

Possible Solution:
Delineate roles and responsibilities of key parties, including the building owner, designer, manufacturers, contractors, inspectors, and any private inspection agencies. This can be done through legislation, regulation, or interpretive guidelines. Clarifying the roles and responsibilities of all parties will help to ensure that all parties and practitioners recognize that building safety and compliance with building codes are a shared responsibility.

ISSUE 15: THE PERMITTING AGENCY HAS NO FORMAL LIABILITY

Possible Solution:
Extend liability to the permitting agency. In good-practice jurisdictions, building permitting agencies are liable for acts of both omission and commission. In other words, permitting agencies should be liable for what they do as well as for what they fail to do. In common-law countries, case law has established that once a permitting system is created, the permitting body has a duty of care to all persons, not just to the building owner.

ISSUE 16: THE LIABILITY IS ALLOCATED INAPPROPRIATELY OR KEY PARTIES HAVE NO LIABILITY

Possible Solution:
Extend liability to additional practitioners, such as contractors and small building designers.

ISSUE 17: KEY PARTIES HAVE NO INSURANCE

Possible Solution:
Require certain key practitioners to carry liability insurance. In many good-practice jurisdictions, professional designers such as architects and engineers are required by their professional associations to carry liability insurance, with the extent of coverage determined by building type. The challenge for policy makers is to avoid creating barriers to entry for smaller and new entrants into the design or construction business while avoiding unfair competition between responsible firms that obtain insurance and firms unable or unwilling to obtain coverage and that can thus operate at lower cost.

8 PRODUCT CERTIFICATION SYSTEMS

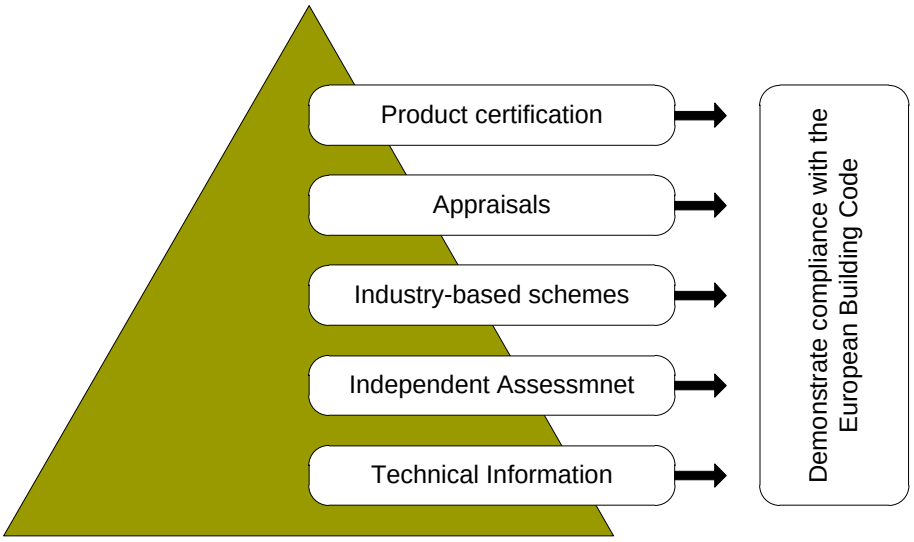
8.1 DEFINITION AND SCOPE

An authorised product database is an authoritative repository of building products and processes containing information required in the decision to grant a building permit.

Products would be categorised according to the level of assurance provided. The product assurance framework below outlines options for achieving product assurance and demonstrating Building Code compliance[17].

The database would have version control and provide for categories recording the reliability or veracity of information.

FIGURE 13: PRODUCT ASSURANCE FRAMEWORK



Product Assurance Framework

Product, or process, information would be stored in a digital format, including 3D plans. Where product, or process, information is available in a 3D format it will be capable of being incorporated into an enhanced Building Information Modelling system (BIM).

[17] http://www.dbh.govt.nz/codewords-42-6

8.2 WHY PRODUCT CERTIFICATION SYSTEMS ARE IMPORTANT

A country with a functioning product certification system can ensure smooth incorporation of new designs and techniques and can respond to innovations in building designs and systems suited to the market and consumer demands that comply with or exceed public-policy objectives for buildings. New or innovative building designs, systems, materials and equipment may also prove less costly and better performing than more traditional approaches[18].

8.3 INTERNATIONAL BEST PRACTICE

8.3.1 Approved/Listed/Certified Products

Internationally there is a strong connection between product approvals (listing), standards and building codes.

Manufacturers, importers, suppliers and marketers can have their building products or methods of construction assessed and certified to demonstrate that they meet the performance requirements of the Building Code. A product certificate provides independent confirmation that a product or construction method complies with the Building Code.

Product certification is designed to streamline and speed up the building permit and inspection process, and to avoid repeated assessment of the same products.

The product certificate would state information and conditions on specifying and installing the building product or construction method to ensure that it complies with the Building Code.

A building permit would still be required. However, where a certified product or construction method is used, the building permit approver must accept the product or construction method as complying with the Building Code where that product or construction method is being used in accordance with the certificate and its instructions.

In Europe, the Construction Products Regulation (CPR) and its six essential requirements has had a significant positive impact on the building regulatory environment.

Construction Products Regulation (the CPR) aims to ensure reliable information on construction products in relation to their performances. This is achieved by providing a “common technical language" offering uniform assessment methods for the performance of construction products.

The Construction Products Regulation (305/2011/EU - CPR) was adopted on 9 March 2011.

These methods have been compiled in harmonised European standards (hEN) and European Assessment Documents (EAD). This common technical language is to be applied by:

- manufacturers when declaring the performance of products,
- authorities of Member States when specifying requirements for products or processes,
- users (architects, engineers, constructors etc) when choosing the products most suitable for the intended use in construction works.

The CPR requires the amendment or replacement of existing EU member states’ references to national technical standards in their national construction regulations by adopting the European-wide harmonised technical specifications for construction products. Subsequently, all European Union Member States have re-drafted their building regulations in order to adopt the European approach.

[18] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

Currently there are several hundred harmonised European standards applicable to the building industry. The CPR was introduced to create an effective single market for construction products across the European Union, reducing barriers to trade which could result from highly prescriptive requirements and methods of verification. It aimed to accomplish this objective through a system which focused on six essential requirements, which are established for buildings and civil engineering works and not for construction products. Conformity with the principles of the CPR is to be assessed by application of harmonised technical specifications.

The harmonised European standards on construction products together with the relevant horizontal standards on assessment methods are available for:

- resistance to fire
- reaction to fire
- external fire performance
- noise absorption
- construction products in contact with drinking water
- release of dangerous substances into indoor air, soil and (ground) water.

The harmonised European standards create a common European technical language to be used by all participants in the construction sector to:

- express requirements (regulatory authorities in Member States)
- declare the product performance (manufacturers)
- verify compliance with such requirements (design engineers, contractors).

In the United States and Canada there are a number of test standards promulgated by groups such as the American Society for Testing and Materials (ASTM), Underwriters Laboratories (UL), and others, that develop product test standards. Testing and listing organisations, such as UL, then test products against the standards and, if they pass the tests, they are deemed 'listed for the purpose.'

The building codes and design and installation standards then reference ASTM, UL, and related standards and require that only systems listed for the purpose be used (this applies to a wide range of safety related issues, from electrical hazard, to fire resistance, to off-gassing of material in construction products). This reliance on 'listed products' facilitates quick approvals from building code officials for most buildings.

When designers want to use materials, products, systems or methods not listed by UL or other organisations, there are options to obtain an evaluation from groups such as the International Code Council (ICC) Evaluation Service. This service will assess the product for the desired use, or independent analysis and testing can be conducted, with supporting material provided to the building official as part of the design submission. This is not usually seen as an excessive burden as it is used only for unique materials, products, and designs, which may constitute 10% of the market. The remaining 90% of products can be addressed through the standard testing and listing regime.

The New Zealand Situation

New Zealand has a wide range of standards for products, materials and systems. Testing can be conducted against the standards through a product appraisal process by the Building Research Association of New Zealand (BRANZ). Appraisals carry significant weight in the industry and with Building Consent Authorities (BCAs) (equivalent to Municipalities' permitting units).

However under the current scheme such appraisals are not mandatory and industry can offer products and systems which have not been appraised against New Zealand standards for use in buildings. In such circumstances the BCAs must somehow make a determination on whether the product, system or material is fit for purpose, and the BCA may look to overseas approvals, tests, and other mechanisms to assist with the decision.

Such an approach places a significant burden on the BCAs, who in most cases will not have on staff the range of technical expertise to make product performance assessment decisions. When faced with documentation regarding approval or listing against international standards, BCA staff have to try and understand if those standards are appropriate to New Zealand (e.g. do they consider local climatic conditions, UV intensity, or other factors unique to New Zealand or reflect of New Zealand societal and regulatory objectives).

This is complicated further by a lack of standards or recognised procedures in use across the country to assist BCAs in the decision process. As a result, inconsistency in approvals from one BCA to another can occur. This is a challenge for both industry and BCAs.

New Zealand is now developing a national product assessment program and register of appraised products and construction systems. This registration will be eventually be available via the web for all designers, architects, engineers and BCAs to assist in the design and permitting of building materials.

9 Conflict Resolutions Mechanisms

9.1 Definition And Scope

Conflict resolutions and appeal mechanisms provide potential remedies for persons or firms that consider themselves adversely affected by the decisions of permitting authorities'. Legislative and regulatory provisions may also be subject to different interpretations, which can be addressed by dedicated dispute resolution or interpretive bodies created by law. In best practice jurisdictions appeal processes are established to address situations such as the following:

- **Interpretation of technical requirements**: Disputes between building practitioners and regulators regarding the interpretation of technical building code provisions
- **Sufficiency of building code design compliance**: Disputes about whether a particular building design or alternative solution achieves sufficiency of compliance with a regulatory requirement
- **Licensing of building professionals**: Appeals of disputes between an applicant or registered person and a licensing authority regarding a licensing decision such as initial licensing, renewal, revocation, or discipline can be addressed through specialised tribunals
- **Appeal to civil court**: Building laws typically provide for an appeal to a civil court for persons who consider themselves aggrieved by a decision made by a local building authority

9.2 Why Conflict Resolution Mechanisms Are Important

Setting up a professional dispute resolution mechanism regarding building regulation is an important policy element to promote transparency and a level playing field. Some countries have responded to this need by setting up dedicated dispute resolution organisations, which typically leverage professional expertise within regulating bodies and the private sector. A significant gap exists between good practice countries which tend to have dedicated conflict resolution instruments and countries that do not have them[19].

[19] Good practices for Construction Regulation & Enforcement Reform, Guidelines: Investment Climate I World Bank, January 2013

9.3 International Best Practice

9.3.1 A Dedicated Instrument Outside The Main Court System

Common to good practice jurisdictions is the establishment of a separate entity sometimes having a "conciliation" mandate is usually in charge of conflict resolution.

9.3.2 Conflict Resolution Carried Out By Knowledgably Professionals

An important element in the efficiency and fairness of the appeal decisions is that professional regulators and industry professionals participate in the specialised conflict resolution bodies and that their views carry weight equal to that accorded to other members.

9.4 International Best Practice Recommendations

ISSUE 18: CONFLICTS ARISE BETWEEN PERMITTING AGENCIES AND BUILDING PRACTITIONERS ON THE INTERPRETATION OF TECHNICAL AND ADMINISTRATIVE PROVISIONS

Possible Solution:
Senior regulating agencies must provide interpretations of technical and administrative provisions. The level of government that developed the legislative and regulatory articles should provide interpretations regarding their intent. Interpretation of legislative and regulatory articles can be nonbinding and offered to practitioners or enforcement agencies on an informal basis. Interpretations can also be binding, in which case a more rigorous development process may be used, with the results equally binding on the permitting authority.

ISSUE 19: PERMITTING AGENCIES OFTEN REJECT INNOVATIVE SOLUTIONS

Possible Solution:
Establish a commission of experts to make rulings on building innovations. An independent commission composed of experts in several technical fields should be empowered to make rulings on whether a particular innovative or alternative building system, material, or design complies with the objectives and performance levels defined in the building code.

ISSUE 20: THE SYSTEM HAS LIMITED CAPACITY TO DEAL WITH DISPUTES BETWEEN BUILDING PRACTITIONERS AND PERMITTING AGENCIES

Possible Solution:
Establish an independent, quasi-judicial dispute-resolution body. A quasi-judicial body that can make binding decisions within its area of expertise should be established to deal with disputes between practitioners and permitting authorities on matters related to the interpretation of building codes or the sufficiency of compliance.

10 Quality Management System

10.1 What is a quality Management system

A quality management system is usually a documented system describing, the organisational structure, responsibilities, authorities, policies, processes, procedures and resources for implementing quality management principals to achieve management goals and objectives (including statutory) within an organisation. This includes all activities which contribute to quality,

directly or indirectly. The system should describe common-sense rules or methods for undertaking specific tasks or functions.

A quality management system is usually aligned with a "Standard" e.g. ISO 9000 family of standards related to quality management systems. While quality management systems can come in a myriad of different models, there are essentially two core interlinked disciplines to any given system:

- A key set of defining principles based upon generic best business practices which are the pillars of the system and integral to a given system's design; and
- A more detailed set of process descriptors detailing the processes and mechanisms that are used to deliver the outputs of the business, system, service or whatever the quality management system is being applied to. In other words this layer makes up the technical body of the system.

Combined, these two overlapping disciplines will usually make up any quality management system, regardless of its specific attributes.

The detailed components of any quality management system will need to be developed around fundamental quality and regulatory issues while paying specific attention to the context the model is being designed in. For example, the liability system it operates in (proportionate or joint and several), the level of professionalism, technical competency, and track record of the industry, the supporting structures in the industry that can impact on quality (e.g., legislation, policy, workforce development, resource levels, consumer confidence, etc).

10.2 International Best Practice

10.2.1 Opportunities for Improvement

The current trend for quality assurance systems internationally, is a deliberate movement away from the traditional identification of non-conformances, to a new "culture" of viewing all issues, non-conformances and new ideas as "Opportunities for Improvement". This concept provides a more constructive environment for all staff to participate in improving the systems, processes and outcomes of the organisation.

Consequently, the traditional auditors' role is evolving from the identification of punitive non-conformances into a champion of improvements or as it is sometimes known "Agents of Change".

11 Building Information Modelling

11.1 Building Information Modelling (BIM)

Building Information Modelling (BIM) is a technology that allows a set of interacting policies, processes and technologies to generate a "methodology to manage the essential building design, construction, maintenance and overall project data in digital format throughout the building's life-cycle". This digital information, in its most simplistic form, is a three dimensional (3D) representation of a building (and its hidden specification details) to be available to the multiple parties involved in the project including, designers, clients and permitting agencies.

BIM has the ability to expand to 4D (project scheduling and logistics), 5D (project costing) and 6D (life cycle management).

BIM software is available internationally from a number of private providers.

"The key benefit of BIM is its accurate geometrical representation of the parts of a building in an integrated data environment"[20]

Related benefits are automated assembly, better design, controlled whole-life cost and environmental data, enhanced processes, higher production quality, improved customer service, lifecycle data[21].

The estimated cost savings arising from the use of BIM in Australia range from 5.5% to 9.6% depending on the user (architect, engineer, contractor or owner)[22].

The Allen Consulting Group study in Australia indicates that the progressive uptake of BIM will add an initial 0.002% to Australia's GDP rising to 0.52% over 15 years[23].

This action is being taken by a number of governments.

In the Netherlands, BIM has become a mandatory requirement in central government projects in the offices sector. From 1 November 2011, procurement contracts worth more than €10 million must use BIM[24].

The UK government has embarked on a five-year programme to introduce BIM into all public sector projects by 2016[25].

In Singapore the government is targeting a figure of 80% uptake of BIM by 2015, and the government is introducing a series of strategies to stimulate BIM use. The public sector is taking the lead, helping build BIM capability through training and certification and incentivising adopters with subsidies from a government BIM fund. Work is being done on pilots projects and to help the industry become BIM-ready. Larger projects will be required to use BIM for their architectural designs by 2013 and for engineering designs by 2014; smaller projects, both public and private, will be covered by 2015. The Singapore Building and Construction Authority runs workshops and road shows to raise awareness[26].

If BIM is considered to be a critical factor in raising productivity in the building sector then the government can encourage the uptake of BIM at a faster rate. This phase will require the incorporation of BIM into all government construction contracts over a certain dollar value or level of complexity.

[20] CRC for Construction Innovation, 2007c,p. 3-4
[21] Productivity In The Building Network: Assessing the Impacts of Building Information Models, The Allen Consulting Group, 2010, p13
[22] Iibid. p51
[23] Productivity In The Building Network: Assessing the Impacts of Building Information Models, The Allen Consulting Group, 2010, p57
[24] http://www.buildingsmart.no/sites/default/files/no_6_bsi_newsletter.pdf
[25] http://www.building.co.uk/news/all-government-projects-to-use-bim-within-five-years/5018349.article
[26] http://www.buildingsmart.no/sites/default/files/no_6_bsi_newsletter.pdf

12 ADDITIONAL RECOMMENDATIONS

12.1 SINGLE BUILDING AND CONSTRUCTION GOVERNMENT AGENCY

A national Building and Construction government agency would ensure the best possible standards of building and construction for all the citizens of Serbia. This agency would be responsible for managing the Building and Construction Codes which would outline all approved design criteria, building methods, rules for construction, inspection and approval criteria etc.

This agency could be achieved by either combining portfolios of appropriate government agencies into a new single entity or extending the responsibilities of one government agency to absorb the wider building and construction duties.

RECOMMENDATION (LONG TERM)

Develop a single Building and Construction Government agency. This agency to be responsible for developing, managing, and promoting all regulatory schemes, legislation and professional bodies associated with the building and construction sector.

12.2 SINGLE ENVIRONMENTAL GOVERNMENT AGENCY

The Convention on Environmental Impact Assessment in a Trans-boundary context as detailed by the United Nations Economic Commission for Europe.

The Espoo (EIA) Convention sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation of states to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries

Strategic recommendations include the introduction of 3 classifications of environmental impact.

Classification "A"
Significant impact on ecology. The agency has up to 60 working days to process application, plus extensions can be granted if exceptions occur. This class is subject to a public hearing.

Classification "B"
Direct impact on ecology. The agency has up to 40 working days to process application, plus extensions can be granted if exceptions occur. This class is subject to a public hearing.

Classification "C"
Minor impact with ecology. The agency has up to 20 working days to process, plus extensions can be granted if exceptions occur. Public hearings have been removed from class "C" applications as they are deemed to be part of the application.

Classifications can be designated during the initial design stage and the Ecological impact assessment should be applied for before going to the agency.

RECOMMENDATION (LONG TERM)

Consolidating of building and construction related "environmental" aspects into a single government agency. For example:

- the issue of national policy statements and national environmental standards
- intervening on proposals of national significance
- recommending the approval of an applicant as a requiring authority or as a heritage protection authority
- recommending the issue of water conservation orders
- monitoring the effect and implementation of the Environmental Act, national policy statements etc
- monitoring the relationship between the functions, powers, and duties of central and local government
- monitoring and investigating matters of environmental significance
- review the performance of municipalities
- direct a municipality to prepare a plan to address environmental management issues in a region.

12.3 Major Account Managers

RECOMMENDATION (IMMEDIATE)

Implementing major client "Account Managers" within the permitting agency, who can liaise on an on-going basis with key accounts and provide proactive assistance to enable permits to be processed more effectively and efficiently.

12.4 Building and Construction Information System

RECOMMENDATION (SHORT TO MEDIUM TERM)

There should be only one "Information Management" system for Building and Construction permit approvals and inspections within the permitting agencies. Multiple systems and multiple databases lead to disruptive and inaccurate data.

12.5 Cooperative Approach With Utility And Infrastructure Providers

With the development of Geospatial Information System (GIS) systems, it is possible for multiple layers of relevant information to be stored and accessed via an interoperable GIS system. It therefore becomes important that any entity that generates property relevant data, such as utility and infrastructure organisations, should have a good and close working relationship with other entities seeking to use their property data.

RECOMMENDATION (SHORT TERM)

Developing a closer cooperative approach, (including MOUs where appropriate), between utility and infrastructure organisations and the permitting agencies/National Territorial Planning Agency/Property Registrar etc. to share information appropriate for permit applications.

12.6 E Governance Standards

E-governance is the coordination and development of organisations moving into the digital world to allow the transfer of information between agencies. Defining the interoperability standards to ensure digitised data sets of development and construction information are able to be shared in an efficient and secure environment will be of increasing importance.

In order to achieve the maximum gains in efficiency and productivity, it is critical that agencies developing digitised systems ensure that "interoperability" between relevant agency systems is designed and built into any new systems.

RECOMMENDATION (MEDIUM TO LONG TERM)

Ensure that any developments in permit application digitisation are compatible with any e-governance initiatives.

12.7 National Land And Property Database

Multiple agencies including the municipalities, inspectorates, and utility operators have data sets of essentially the same information. It is difficult to determine what is the definitive data set. The development and implementation of a National Land and Property system would see the relevant "property" information stored and managed in a central and secure system thereby avoiding duplication.

RECOMMENDATION (MEDIUM TO LONG TERM)

Developing a National Land and Property database that would be available publically via a secure logon website.

13 Appendices