BUILDING REGULATORY CAPACITY ASSESSMENT

Level 2 – Detailed Exploration

THE WORLD BANK
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Global Facility for Disaster Reduction and Recovery

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July 2017

Building Regulation for Resilience Program

The World Bank

and

Global Facility for Disaster Reduction and Recovery

The World Bank

1818 H Street NW
Washington, DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

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Acknowledgements

The development of the Building Regulatory Capacity Assessment was led by Thomas Moullier (Senior Urban Specialist, Program Team Lead), with substantial input from Brian Meacham (Senior Building Regulation Consultant) and support by Frederick Krimgold (Senior Building Regulation Consultant) and Vittoria Franchini (Disaster Risk Management Consultant).

We thank our colleagues, both internal and external, who provided helpful comments and reviews on this report and on its preliminary outline. These individuals include Marc Forni, Keiko Sakoda, Artessa Saldivar-Sali, Roland Bradshaw, Guido Licciardi, Svetlana Brzev, Asmita Tiwari, Ommid Saberi, Bill Dodds, Raj Nathan, Steven Louis Rubinyi, Kim Lovegrove, Polat Gulkan, Tatsuo Narafu, Amod Dixit, David Hattis, Rebecca Laberenne, Peter May, Dan Lewis and Gonzalo Lizarralde.

We thank Vladimir Herrera for the layout of the report.

Special thanks are due to Senait Assefa and her team from the Global Programs Unit at the Social, Urban, Rural and Resilience Global Practice, as well as Francis Ghesquiere and his team from the Global Facility for Disaster Reduction and Recovery for their generous funding and support.

Overview

Urbanization is simultaneously a major driver of development, wealth creation and poverty reduction, as well as one of the most pressing challenges of the 21st century. Between 1990 and 2015, the urban extent occupied by cities in less developed countries increased by a factor of 3.5.[1] By 2050, up to 70 percent of people will be living in cities. Urbanization can and should be embraced as an opportunity to reduce poverty. The goal, however, can be realized only if current patterns are significantly transformed to guide urban growth in developing countries towards a more sustainable trajectory.

The New Urban Agenda agreed upon in Quito in October 2016 conveys a sense of urgency by seeking to harness the transformative force of urbanization and shape the future of cities. It focuses on four major priorities: national urban policies; more effective municipal finance; territorial planning and design capacity; and laws, institutions and systems of governance to enhance the rule of law. The Building Regulatory Capacity Assessment provides an important contribution to help cities and project managers working with development agencies to implement this last priority by offering a new resource to assess building and land use regulatory systems, and facilitate the collection of critical information about the building regulatory framework in any given city or country.

The Building Regulatory Capacity Assessment is comprised of the following "Level 1 - Initial Screening," designed for government officials and project managers undertaking rapid preliminary assessments. It provides an opportunity to initiate conversations with clients and relevant parties on strategies for achieving relevant development objectives. Level 1 is complemented by a "Level 2 - Detailed Exploration", which provides a set of guidelines for team members and contractors who are tasked with gathering and analyzing data and information about the building regulatory capacity of the target country, region or municipality. Overall, the Assessment identifies critical gaps, it provides the necessary information to develop a baseline for formulating technical assistance to clients, as well as drawing findings that can be used to determine areas for improvement and investment.

As UN-Habitat points out in the World Cities Report[2], effective regulatory frameworks based on accountability and clear implementation mechanisms are key "development-enablers that provide a solid forward-looking framework to guide urban development", thus emphasizing the role of regulations as a means to integrate a wide range of societal objectives ranging from building resilience to acute and chronic risks, climate change adaptation, promoting accessibility in the built environment, reducing CO2 emissions, preserving cultural assets and attracting investment.

As part of the Building Regulation for Resilience Program supported by the Global Facility for Disaster Reduction and Recovery,[3] we hope that this assessment tool will offer an effective resource for interventions within a wide range of urban development initiatives in cities of low and middle-income countries.

[1] Angel, 2016.
[2] "World Cities Report, Urbanization and Development, Emerging Futures," UN-Habitat, 2016.
[3] www.gfdrr.org

Chapter

01

Background

Buildings are an essential component of societies and economies, providing safe and healthy environments for people to live and work. They provide shelter from the elements, housing, as well as a space for education and work. They house critical infrastructure necessary to keep government and business in operation. In many countries, they represent a significant percentage of gross national product in terms of the resources needed for design, building materials, construction labor, functional use, operations and maintenance.

A comprehensive building regulatory framework facilitates the achievement of many social and economic objectives. Political and legal systems in many countries require that most buildings meet some minimum level of performance in terms of health, safety, welfare, energy efficiency, and accessibility. Components of the building regulatory framework, including enabling legislation, planning, building and fire regulation, and compliance mechanisms, function holistically to assure that a particular building, on a particular site, is able to achieve the minimum levels of performance.

Building regulatory frameworks also facilitate economic development and stability by establishing effective, efficient and reliable regulatory practices that incentivize economic investment. They do so by providing the market with a clear set of design and construction requirements and quality standards, which in turn minimizes barriers to trade and facilitates investor confidence. They also benefit education and training across the sector, from skilled craftspersons to engineers and design professionals. Having a comprehensive building regulatory framework is particularly important in low- and middle-income countries since construction industries in emerging markets are forecast to continue to grow at a much faster rate than in advanced economies. With reference to the Construction Inteligence Center Global 50, emerging markets accounted for more than half of the world's construction output for the first time ever in 2012 (at 2010 US$) and by 2020 it will have a 56% share.[4]

Last, but not least, building regulatory frameworks help address emerging societal objectives.

[4] "Global Construction Market Worth $10.3 Trillion in 2020 (50 Largest, Most Influential Markets)," Market Reports Store, 2015.

BOX 1.1 – Building Regulatory Framework

The term "building regulatory framework" refers to the complex set of laws, regulatory documents, compliance mechanisms, education and training requirements, product testing and certification, professional qualifications and licensing schemes that support a safe, sustainable and resilient built environment.

Consistent with the Building Regulation for Resilience report, the Building Regulatory Capacity Assessment identifies three basic components that form the core of any "building regulatory framework": a set of legal and administrative documents at the national and/or subnational level; a regulatory development and maintenance process and a set of implementation mechanisms at the local level.

The term "building regulatory framework" used in this document encompasses building and land use regulations since the siting, design, construction and maintenance of buildings are closely intertwined and cannot readily be treated as separate issues. This report places primary emphasis on building regulatory regimes with specific focus on the core implementation activities of building codes, plan reviews, inspection and compliance assurance.

Historically, building regulation has focused primarily on the health and safety of occupants of buildings and on helping to reduce economic losses associated with a wide range and magnitude of hazards and disaster events. As disasters are becoming more frequent and intense, particularly as a result of climate change, building regulation must take into account additional measures to protect the increasing number of people at risk. In addition, building regulation is being used to address emerging societal objectives such as accessibility for all, affordability and resource efficiency. A well-designed and structured building regulatory framework provides the means to address such objectives holistically and comprehensively. Conversely, deficient building regulations can result in a vulnerable built environment that creates risk for structures and their occupants, which leads to higher exposure to natural and technological hazards and undermines the attainment of development objectives.

1.1– Assessment is Needed to Address Dysfunctional Building Regulatory Frameworks

Unfortunately, building regulatory frameworks are not always comprehensive or effective. In some cases, the appropriate legal and legislative foundations may be lacking. In others, the zoning, building and fire regulations needed to provide the necessary baseline building performance expectations for public safety and disaster resilience may present gaps, or may not be working in sync. Far too often, even if appropriate regulations and related technical documents are in place, the institutional infrastructure needed to implement the regulations and assure compliance during design, construction and in use, is incomplete or under-resourced. Further complicating the situation, the market may be lacking appropriate educational systems, expertise, insurance instruments and related components which can strengthen the overall framework.

1.2– The Building Regulatory Capacity Assessment

The Building Regulatory Capacity Assessment can be used as a tool to facilitate the collection of critical information about the building regulatory framework in a particular jurisdiction, identify where critical gaps exist, and develop a baseline for formulating technical assistance and training activities.

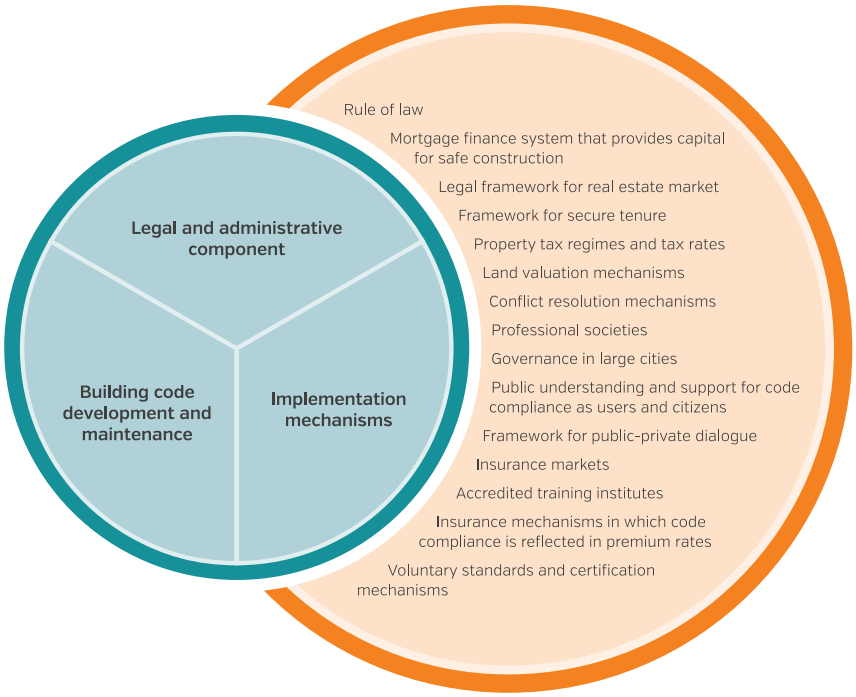
The Building Regulatory Capacity Assessment builds on the findings and recommendations provided in the Building Regulation for Resilience report[5] and aims to support project implementers in the definition of priority areas for intervention and project design for improving building regulatory efficiency and effectiveness across a wide range of development objectives, including hazard mitigation, energy efficiency, accessibility, cultural preservation, and disaster risk reduction.

The Building Regulatory Capacity Assessment focuses on three critical components of building regulatory frameworks:

A) Legal and Administrative
B) Development and Maintenance, and
C) Implementation

These components, are considered along with several support elements in a two-level evaluation: an Initial Screening (Level 1), which aims to quickly identify critical information and issues to inform initial project decisions, and a Detailed Exploration (Level 2), intended to be carried out by experts in policy and engineering, and disaster mitigation to develop strategies for the jurisdiction (see Figure 1.1).

Figure 1.1. Building Regulatory Components and Elements



Source: "Building Regulation for Resilience," World Bank, 2016.

[5] "Building Regulation for Resilience," World Bank, 2016.

Level 1 has been designed for project managers (task team leaders or TTLs for the World Bank) or others (e.g. government officials) undertaking preliminary assessments. Level 1 provides an opportunity to initiate conversations with clients and relevant parties on strategies for achieving relevant development objectives. This initial assessment will allow to quickly identify and gather existing information about framework components, as well as provide a preliminary assessment of the need to strengthen one or more components.

Level 2 is a more detailed set of guidelines for team members and contractors who will be tasked with gathering and assessing detailed data and information about the building regulatory capacity of the target country, region or municipality. Level 2 starts from the basic questions and information gathered through Level 1, and guides the regulatory capacity assessment into greater depth. Level 2 has been designed for project managers and their staff to help them identify in much greater detail the data and information needed to benchmark the existing building regulatory framework capacity and to recommend changes, across all three regulatory framework components.

Level 1 – Level 1 - Initial Screening describes:

- Why a building regulatory framework is important;
- How an effective building regulatory framework can be helpful in facilitating specific project objectives;
- A set of initial screening questions on the building regulatory framework currently in place for a particular client, and;
- Basic information to be collected about that framework.

The Level 1 assessment recognizes that project managers and equivalent decision-makers may not be experts in building regulatory frameworks. However, by identifying the key elements within each building regulatory component, it provides an initial baseline for determining the relative completeness of the building regulatory framework, and therefore its likelihood to enhance project objectives as is, or with enhancements in the core areas.

This Level 1 - Initial Screening can serve as a methodology to draw preliminary findings on the status of the building regulatory framework of concern. Such findings can be communicated to clients or relevant parties in the form of a set of recommendations and can contribute to the definition of specific project components and activities during the conceptual and design phases of a project.

Table 1. Objectives and Responsibilities for Level 1 and Level 2

	Objectives	Party Responsible
Level 1	Initial screening	Project manager/ non-regulatory expert
Level 2	Detailed exploration	Consultant/technical expert

Chapter

02

Why an Effective Building Regulatory Framework is Important

A building regulatory framework encompasses legislation and regulation that addresses land use planning, zoning, building and fire regulation; supporting infrastructure, including education and training of key actors; and market instruments, such as insurance. Building regulatory framework components function holistically to assure that a particular building, on a particular site, exposed to well-characterized hazards, is able to achieve the minimum levels of performance.

Comprehensive building regulatory frameworks are enablers. They enable safe, healthy, energy-efficient, accessible, and disaster resilient buildings by providing a robust socio-technical framework. The framework helps the market understand what is expected, provides tools for use by the market to deliver well-performing buildings, and provides the necessary oversight to help assure designs and constructed buildings meet societal expectations. The following are some ways in which building regulatory frameworks achieve this.

2.1– Establishes Minimum Standards for Acceptable Performance

In order to achieve uniformity in building performance relative to hazard resiliency, occupant safety, sanitation, energy efficiency, or related objectives, a set of minimum design, construction and maintenance standards is needed. Left solely to the market, there could be significant variation in the minimum level of building performance, within and between communities, over a wide range of building functions and occupancy. This can be seen in low-income countries, where there may be little or no regulation of informal settlements, as well as in high-income countries, where comprehensive compliance mechanisms and property insurance requirements may facilitate highly resilient buildings in some building types or jurisdictions, but be largely absent in others.

For such reasons, governments often find it necessary to intervene in the market to ensure certain minimum, uniform standards of health, safety and welfare across a country, region or municipality. As new global pressures and challenges emerge, such as climate change, accommodating increased urban densification, rapidly aging populations, and access for all within the built environment, a robust building regulatory framework and human capacity to support the framework is essential for identifying solutions for a more sustainable and resilient built environment.

2.2– Reduces Uncertainty, Facilitates Trade and Stimulates Economic Growth

Building regulations outline a common set of requirements for buildings to be constructed within, and sometimes between, jurisdictions. For most buildings, this allows a high degree of certainty in terms of factors such as acceptable methods and materials of design and construction, minimum building features and functions, and approval of designs. For the market, this means that operational efficiencies can be gained across the product certification and building design, construction and approval processes.

A building regulatory framework can also facilitate trade between jurisdictions, offering minimum performance and quality criteria and a clear path to approval of building products and materials. This has been exemplified by the EU Construction Products Directive (and now Regulation), which set out essential requirements for construction products in terms of function and performance, and led to common testing and labeling. This significantly reduced differences in how products were assessed between member states, and facilitated movement of products across borders, stimulating regional economic activity.

2.3– Addresses Challenges of Complex Information and Knowledge Gaps

Building regulation provides consumers and investors with confidence that all buildings of a similar type constructed within a jurisdiction are benchmarked against the same standards. This can serve to reduce uncertainty in real estate transactions and to help increase the value of real estate assets. For example, Japan, Peru and some other seismically risky countries use ‘earthquake-safe structure’ as a value-add feature in advertisement. The requirement for energy performance labeling of buildings within the EU Energy Performance of Buildings Directive (and now Regulation) is used to advertise energy efficient buildings as a value-add feature.

This role of providing knowledge and confidence is important, as it is difficult for some buyers and users of buildings to ascertain and understand some building characteristics. Purchasers, who are infrequent buyers, are not easily able to check that the building meets the qualities they beleave they are paying for and are often not even aware of what could go wrong. Also, users (such as tenants and workers) are often not in a position to fully assess building performance, as once a building is completed some aspects are concealed and impossible to inspect thoroughly. For investors, regulations reduce uncertainty about

expected building performance across several key performance indicators, including resiliency to hazard events, energy efficiency, comfort and accessibility. This can have a positive influence on stimulating the wider market.

2.4– Addresses Negative Externalities

One potential aspect that a market-based approach may not adequately address is spillover costs: the negative impacts experienced by people other than those directly engaged in a particular activity. In the absence of government intervention or other means of action, the responsible entity does not bear the full costs of the adverse effects and, therefore, has no incentive to mitigate or compensate for related outcomes. Other aspects of buildings that may have adverse effects include:

- Deficiencies in building safety, wherein damage to one building can impact surrounding buildings and people (e.g., via fire, collapse or natural hazard events);
- Incomplete sharing of liabilities across design professionals, contractors, operators;
- Adverse environmental impacts from emission of toxic substances resulting from fires and other events; and
- Adverse environmental impacts from energy use, where the price does not reflect the effects of greenhouse gas emissions or other pollution.

2.5– Helps Facilitate Appropriate Solutions

As a general rule, there is no 'one size fits all' solution for any of the numerous complex socio-technical challenges which exist within and between countries. A building regulatory framework designed for the USA, for example, is not likely to be directly applicable to a low- or middle-income country for a wide range of reasons, including legal structure, litigation environment, licensure of technical professionals, level of available technology, implicit level of acceptable risk and availability of risk transfer mechanisms, and education and training requirements for local crafts-persons.

A comprehensive building regulatory framework designed for a specific country will provide a robust socio-technical framework within which the country can identify and address physical, social, cultural and economic conditions and needs and can facilitate interactions between government institutions, the market and the public to deliver appropriate solutions. For example, a building regulatory framework can consider local building materials, technology and skills, as well as local climate conditions and natural hazard concerns, to deliver resilient, energy efficient and cost-effective designs.

An appropriate building regulatory framework is one in which the required legal and social foundations are in place, appropriate regulatory instruments and enforcement mechanisms are designed and implemented to the educational, technological and resource capacity of the jurisdiction, and supporting regulatory infrastructure and market mechanisms (e.g., insurance) are operational and effective for that environment.

Chapter

03

Legal and Administrative Component

3.1– Context

The Legal and Administrative component of the Building Regulatory Capacity Assessment focuses on identifying whether the necessary legal and administrative structure is in place to implement and support a comprehensive building regulatory framework.

A fundamental responsibility of most governments is to protect the health, safety and welfare of the general public. This responsibility is often articulated within the constitution, charter or other foundational document, which defines and enables the authorities and responsibilities of the state.

The level of government at which particular protections are provided can vary based on the type and form of government and on the authority and accountability of responsible entities within the government. By type of government we refer to the difference between a unitary state and a federation of states. Forms of government include Republics, Constitutional Republics, Federations, Monarchies and Constitutional Monarchies. The form of government determines how acts, laws, ordinances, orders and related instruments are developed and by whom. Authority and accountability speaks to such issues as scopes, limits and responsibilities of relevant governmental entities within the system with respect to development, promulgation and enforcement.

The form of law, or legal system, is also an important consideration with respect to enabling, enacting, promulgating and enforcing regulatory instruments, as well as market instruments, such as insurance. By form (rule) of law we refer to largely to Common Law, Civil Law, Customary Law, and various combinations or permutations thereof.

For example, the USA is a federation, of the Constitutional Republic type, where the Constitution defines the specific powers of the federal government, with the states having power to regulate other areas. In the case of the USA, building regulation is at the state level or local level, with various forms in existence, from regulations that are enacted and implemented statewide, to regulations that are all at the local level, to combinations of these. One example of such structure is shown in Figure 3.3, which shows the legal and administrative relationships for building regulation in the State of Massachusetts, (note: this is building regulation only, and not land use planning or fire regulation.) To understand the situation in the USA, one would have to understand how each of the 50 states operates. By contrast, in a unitary government system, the legal and administrative basis may be concentrated at the national government level.

In addition to legal and administrative components focused only on buildings, legislative foundations are needed for land use and fire prevention and safety policy, in addition to building design and construction. This translates into the need for laws, orders and ordinances that regulate land use, building and fire safety, as well as regulations for implementation and enforcement. Table 3.1 illustrates the relationship between building and fire codes in the State of Massachusetts.

Figure 3.1 – Building Regulatory Structure in Massachusetts

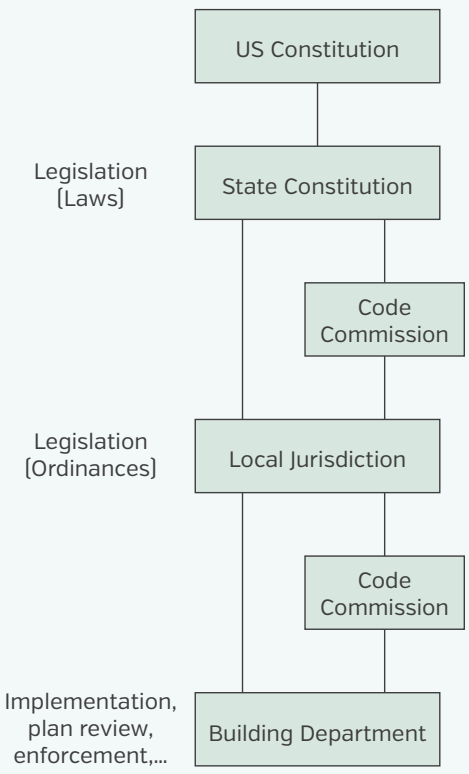


Table 3.1 – Summary of Major Components of a Building Regulatory Framework in Massachusetts

	Building Code	Fire Code
Enabling Legislation	*Massachusetts General Law, Chapter 143, Inspection and Regulation of, and Licenses for, Buildings, Elevators and Cinematographs*	*Massachusetts General Law, Chapter 148, Fire Prevention*
Code Provisions	*Massachusetts State Building Code, which is Title780, Code of Massachusetts Regulations*	*Massachusetts Comprehensive Fire Safety Code*, which is *Title 527, Code of Massachusetts Regulations*
Basis of Code Provisions	2009 editions of the IBC, IEBC, IECC, IMC and IFC, as well as several Massachusetts codes (780 CMR, 527 CMR, 521 CMR, 248 CMR and 524 CMR)	Numerous individual standards from ASTM, FM, NFPA, UL, and other private sector organizations, the CFR, EPA, DOD and other federal regulations, and more.
Code Development Responsibility	Executive Office of Public Safety and Security (EOPSS), Department of Public Safety, *Board of Building Regulations and Standards* (BBRS)	Executive Office of Public Safety and Security (EOPSS), Department of Fire Services, Division of Fire Safety, *Board of Fire Prevention Regulations* (BFPR)
Code Enforcement Responsibility	Local municipalities (except for state owned buildings, which then varies by state agency). Note: capability at local level will vary with size of municipality and local requirements (e.g., the City of Boston has own ordinances as well).	Local fire departments and the Executive Office of Public Safety and Security (EOPSS), Department of Fire Services, Division of Fire Safety, Code Compliance Enforcement Unit (CCEU) for any suspected problems. Note: capability at local level will vary with size of municipality and local requirements (e.g., the City of Boston has own ordinances as well).
Appeals	Local and state level (BBRS)	Local and state level (CCEU) and various appeals boards

The situation can be more complicated. While, in fact, implementation is by the government, the development and maintenance of building regulations (i.e. codes / standards) may be within the private sector, and enforcement can be responsibility of the government, private sector, or a combination of the two. There may also be legislation that is critical for the successful implementation and use of building regulation which focus on various actors in the market. There may be legislation providing for the certification or licensing of building professionals, contractors and regulators and other actors. There may also be government or market requirements for the testing and certification of building materials and equipment. Legislation can prescribe penalties for failure to comply with building regulation and define professional liability for errors and omissions in design and construction, providing an essential check on professional practice. There may be laws regulating the insurance industry, which may have major implications for construction finance. Land tenure laws may also affect to what extent buildings comply with building codes and their structural safety.

Is should also be understood that the regulatory development process varies from country to country. In countries with a unitary government system, the building regulatory development process is often managed by a unit of the national government (e.g., ministry of construction, public works, urban development, etc.). In federal systems, building regulations may be developed by a government entity, a quasi-government entity, a research institution, or a private sector entity, but are not legally enforceable until adopted via enabling legislation. The process varies by country, and can be a reflection of the form of law (i.e., Civil Law, Common Law, Customary Law or some combination or variation) and of the regulatory style (i.e., adversarial, elite consensual, or strong central government).

Why Does Understanding the Legal Basis Matter?

Inadequate or incomplete legal and administrative systems can undermine the effectiveness of a building regulatory framework, making it difficult to achieve intended benefits. Assessment of the existing legislative and legal foundation for laws and regulations related to buildings can identify

shortcomings and provide the basis for relevant technical and legal assistance. Before the framework can be assessed, one must collect the foundational information.

Since there is a wide range of legal and administrative systems in use around the world, and the required information can exist in many government entities and various levels of government, one needs to know where to look. In a unitary government system, this might be a small number of central government ministries or agencies (e.g., New Zealand), or dozens of national, state and local government entities within a federal government structure (e.g., the USA). Establishing the baseline type and form of government inform at what level of government pertinent information might be found.

There may also be several government entities with some type or level of responsibility, depending on the overall objective of the project (e.g., 'disaster risk / vulnerability reduction' as compared with 'facilitating energy efficient buildings'). For this reason, it is important to understand which entities may be responsible for the types of information required for a project.

Regulations may be promulgated at a national level (unitary government system), state (territory, provincial) level (federation), or municipal level (in either system). There can often be overlaps within and between levels, as illustrated in the table below for a Unitary government system. The provisions of the building regulation establish the legally mandated design requirements, functional requirements, and construction practices.

Unitary System (e.g., National / Central Government focused responsibility)

Legislated Area	Level of Government	Type of Document	Where to Look
Land use	National	Resource Management Act or equivalent	Ministry of Environment or equivalent
	National or Local	Planning / Zoning Regulations or equivalent	
Buildings	National	Building Act or equivalent	Ministry of Construction or equivalent
		Building Regulations (Codes, Standards[6], Laws)	Ministry of Construction or equivalent
	Regional or local	Building regulation orders, ordinances, etc.	Local Council or equivalent
Fire prevention	National	Fire Services Act or equivalent	Ministry of Public Safety or equivalent

[6] It should be noted that in this context, Regulations, Codes and Standards all have equivalent meanings, e.g., the Building Regulations (England) is equivalent to the Building Code (New Zealand) and the Building Standards (Scotland) or Building Standards Law (Japan). Terminology is a function of the country and legal system. It should also be noted that Standards, in this respect, are different than 'reference standards,' which provide details on such areas as testing, design, installation and maintenance, and are developed by standards-making organizations, such as the International Organization for Standardization (ISO) or equivalent in each country. Such 'reference standards' are referenced by the top-level regulations as means to demonstrate compliance.

Legislated Area	Level of Government	Type of Document	Where to Look
	National, Regional or Local	Fire Regulations (Codes, Laws)	National, Regional or Local authority
Energy conservation / efficiency	National	National Climate Policy, Energy Policy, Resource Management Policy	Office of the PM, Ministry of Environment, Ministry of Energy, etc.
Climate Change / Hazard Resiliency	National	National Climate Policy, Resiliency Policy, Disaster Recovery Policy, etc.	Office of the PM, Ministry of Environment, Ministry of Disaster Response and Recovery, etc.
Licensing and certification of practitioners	National or Local (or market, e.g., professional society)	Building Act, Planning Act, etc.; Building Regulations, Zoning Regulations, etc.;, Consumer Protection Policy	Office of Consumer Affairs, Board of Professional Engineers, Institution of Architects, etc.
Licensing and certification of contractors	National or Local (or market, e.g., professional society, industry association)	Building Act or equivalent, Building Regulations, Consumer Protection Policy	Office of Consumer Affairs, Board of Contractor Licensing, etc. (or Association of Electricians or so forth)
Product certification	National (or market, e.g., insurance entity)	Building Act or equivalent, Building Regulations, reference standards; Consumer Protection Policy	National Bureau of Standards, National Product Testing Laboratory and so forth (or Underwriters Laboratories or so forth)
Insurance	National (e.g., flood insurance) or market	Resiliency Policy, Disaster Recovery Policy, and so forth	Emergency Management Agency (or market)

Federation (e.g., combination of national government and regional / local government responsibility)

In federal system countries, one will need to identify the above types of information at each level of government – national, regional (e.g., state, territory, or province) and local (as appropriate). It will be important to know the regulatory hierarchy as well. For example, in the USA, buildings are regulated at the state or local level, as is planning and zoning. However, there are resource management and environmental regulations at national and state level. As such, understanding how the hierarchy of regulations works will be important to inform on what land areas it might be possible to build, what types of assessments and permission will be needed, and so forth.

Potential Informants

Texts of legislation and laws related to building regulation may be publicly accessible. However, it may be necessary to consult with local experts in construction law and parties active in the construction sector, including building professionals, contractors and owners to understand the actual functioning of the legal process. One should consult those agencies to which responsibility for code development and implementation has been clearly assigned.

In a unitary (national) government system, starting at the ministerial level (or equivalent) will be helpful. In federal systems, one will need to reach out to parties at each level of government, consistent with project objectives.

3.2– Screening Questions

These questions are repeated from the Level 1 - Initial Screening as a reminder of the preliminary information that has been collected. It should be noted that Level 2 - Detailed Exploration should focus on questions and issues identified in Section 3.3 below, recognizing that some of the pertinent information may have already been collected.

Screening Questions

	Questions	Why This is Important
3.2.1	What is the form of government: national / centralized, federation, or other?	In a national government, the enabling legislation for building regulation will be at the national level. In a federation, the enabling legislation may be at the state (territory, provincial) level. However, even in a centralized system, it is important to understand the level of decentralization that may render national and sub-national laws and regulations at odds.
3.2.2	Which acts, decrees, laws or similar enable the regulation of: (a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning), and whether disaster risk management elements are integrated into the legislation; (b) the design, construction and operation of buildings, and the strengthening or upgrading of existing buildings; (c) fire prevention / control, and/or the fire service; (d) resource / energy conservation; (e) accessibility / usability rights; and (f) historic / cultural heritage preservation?	The first step in the assessment process is to identify whether the fundamental enabling legislation for such regulations is in place. For disaster mitigation and related projects, land use, building design and construction, and fire safety regulation is critical, so related enabling legislation must be in place. A parallel condition exists for other areas where regulation can be helpful (e.g., energy conservation, accessibility, etc.). *Obtaining text of the relevant legislation is needed for the assessment.*
3.2.3	Are there regulations[7] for the following: (a) land use planning/zoning; (b) building design and construction, and retrofitting of existing buildings; (c) fire prevention; (d) resource / energy conservation; (e) accessibility; and (f) historic / cultural preservation?	Assuming the enabling legislation is in place, it is then important to understand what specific regulations are in place in each pertinent area. *It will be necessary to obtain text of the pertinent regulations.*
3.2.4	What entity has primary responsibility for the development of regulations for: (a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning); (b) the design, construction or operation of buildings; (c) fire prevention / control, and/or the fire service; (d) resource / energy conservation; (e) accessibility / usability rights; and (f) historic or cultural heritage preservation?	The development and promulgation of regulations may not be by the same entity, so it is important to know what entity is responsible for each function. For example, development may be by a private sector 'model code' development organization, but promulgation is typically the responsibility of government. *Here we need to know which entities are responsible for the development of the associated regulations.* It will also be helpful to know if influence peddling or corruption is of concern in the client country, as it might influence development of the regulation.

[7] Note that the term 'regulation' is used to encompass the document, or set of documents, which define the legally mandated building requirements. With respect to buildings, such documents may be referred to as Building Regulations (as in England), Building Codes (as in Australia and the USA), or Building Standards (as in Scotland, or the Building Standard Law, as in Japan).

	Questions	Why This is Important
3.2.5	What Ministry, Agency, Department or other entity has primary responsibility for promulgation of regulations for: (a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning); (b) the design, construction or operation of buildings; (c) fire prevention / control, and/or the fire service; (d) resource / energy conservation; (e) accessibility / usability rights; and (f) historic or cultural heritage preservation?	The development and promulgation of regulations may not be by the same entity, so it is important to know what entity is responsible for each function. For example, development may be by a private sector 'model code' development organization, but promulgation is typically the responsibility of government. *Here we need to know which entities are responsible for promulgating the associated regulations.* It will also be helpful to know if influence peddling or corruption is of concern in the client country, as it might influence promulgation of the regulation.
3.2.6	Which acts, decrees, laws or similar enable the regulation / licensing / certification of, and define the roles of: (a) architects / planners; (b) engineers; (c) builders (carpenters, masons, ...); (d) trades (plumbers, electricians, ...); (e) contractors, installers, ...; (f) building / fire officials (inspectors, ...); and (g) third-party reviewers?	The extent to which the professions and trades associated with design and construction are controlled, including minimum qualifications and competency requirements, experience, and so forth, can have a significant influence on the quality of construction and compliance with regulation. Identifying who is controlled by legislation, and how, is the first step in the assessment process.
3.2.7	Which acts, decrees, laws or similar enable the regulation / certification / testing / quality control of: (a) building materials (e.g., steel, timber, masonry, concrete, ...) (b) building products and systems (e.g., walls, doors, windows, heating appliances, lighting systems, etc.); and (c) contents or aspects of contents (e.g., materials which may be toxic, ...)?	The extent to which construction materials and contents are controlled, in terms of quality, strength, and overall fitness for purpose, can have a significant effect on the ultimate safety, health, energy or other performance of a building. Identifying what legislation and regulation is in place with respect to material control is important. It will also be helpful to know if corruption is of concern in the client country, as it relates in this case to building materials.
3.2.8	Within the legal framework of the country, which stakeholders have responsibility, accountability and liability with respect to assuring compliance with building-related legislation, and how is the responsibility and liability apportioned?	Who has liability in relation to compliance with regulations, and how liability is apportioned, are importance aspects to understanding the effectiveness of the regulatory framework and what measures are needed to facilitate enforcement.
3.2.9	Within the legal framework of the country, what types and forms of penalties are possible with respect to non-compliance with building-related regulations, and to what extent are such penalties levied?	Closely related to the above, understanding what penalties are in place for non-compliance, and the extent to which they are enforced, provides insight into the effectiveness of the regulatory framework.
3.2.10	Is there legislation in place that facilitates the establishment and collection of fees or levies that can be used to financially support implementation of regulations for planning, zoning, design, and construction of buildings?	Many jurisdictions utilize fees or levies on various stages of the building regulatory process, including when applying for permits to build, for plan review and approval, and for inspection and witnessing of building commissioning. The intent here is to identify the enabling legislation or regulation used to allow and govern the fee levels that can be charged.

3.3– Detailed Exploration

This section builds on the screening questions, providing addition commentary as to why requested information is important, and including additional questions and informational requirements to be resolved during in-depth investigation.

Form of Government (supports Screening Question 3.2.1)

Understanding the form of government is essential for knowing where to look for relevant legislation and regulation for the built environment.

In unitary government countries, one typically finds responsibility, and therefore enabling legislation for areas such as land resource conservation, building regulation and fire services regulation at the national government level.

In countries with a federal system of government, the power for developing and promulgating regulations for these areas more typically rests with states, territories or provinces, as defined in the country's constitution.

With either type of governmental structure, the authority for the implementation and application of building regulations may be delegated to a regional or local level of government, and in some countries there will be several layers of responsibility. In these countries, one will need to explore each layer of government to obtain a complete picture of the regulatory scheme.

Enabling Legislation (supports Screening Question 3.2.2)

Are there Acts, Decrees, Laws or similar which enable the regulation of:

(a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning);
(b) the design, construction or operation of buildings;
(c) fire prevention / control, and/or the fire service;
(d) resource / energy conservation;
(e) accessibility / usability rights; and
(f) historic / cultural heritage preservation?

Once the form of government has been identified, and there is a sense of where to look for associated legislation, the next step is to identify whether the fundamental enabling legislation for such regulations are in place, and if so, to collect text of the legislation (acts, decrees, laws). As appropriate to the scope of the project, one should collect text from all enabling legislation, from all appropriate levels of government and describe the distribution of legal responsibility (between legislated areas and between layers of government).

Legal Responsibility for Enabling Legislation (supports Screening Question 3.2.2)

What entity (or entities) in the government have legal responsibility for enacting the enabling acts, decrees, laws associated with the regulation of:

(a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning);
(b) the design, construction or operation of buildings;
(c) fire prevention / control, and/or the fire service;
(d) resource / energy conservation;
(e) accessibility / usability rights; and
(f) historic / cultural heritage preservation?

At a national level, this might often be the parliament, legislature or similar body responsible to formulation and promulgation of laws. A parallel structure might be expected at a state, provincial or territorial level in a federal system. This will likely depend on the form of government in place.

Legislative Process for Enabling Legislation (supports Screening Question 3.2.2)

This area is intended to obtain information on the legislative process used for the adoption and promulgation of enabling legislation for the above areas, as applicable to the project. In democratic countries, elected members of parliament or the legislature are constitutionally empowered with the responsibility to develop and promulgate laws and do so as representatives of the citizenry. In non-democratic governments, the responsibility may lie with appointed officials. This question aims to understand not only the responsibilities, but the representativeness of public will in the process.

Formally Adopted / Enacted Regulations (supports Screening Question 3.2.3)

Are there formally adopted / enacted regulations for the following:

(a) land use planning/zoning;
(b) building;
(c) fire prevention;
(d) resource / energy conservation;
(e) accessibility; and
(f) historic / cultural preservation?

This area aims to identify, and if in force, collect the text of the promulgated regulations for those areas pertinent to the scope of the project. When seeking this information, there are two important considerations. First, the aim is to identify the existence of 'formal,' or promulgated regulations – documents which have been enacted under the power of enabling legislation. Second, the term 'regulation', as used in this context, refers generically to formal document, with the understanding that the actual name / title will vary by country. For example, it might be called the Building Regulations (as in England), the Building Code (as in many states in the USA), or the Building Standards (as in Scotland), or the Building Standard Law (as in Japan).

This is important to understand for two primary reasons: first, to be able to identify the document, and second, because the term 'standard' is also used for a wide range of documents, often referenced within the regulation, which are essential for attaining consistency in material properties, design, construction and the like. Exemplar definitions of this type of standard are provided in the text box.

An example would be any of the wide range of standards published by the International Organization for Standardization (ISO), the European Committee for Standardization (CEN) and the national standards-making organizations of a country.

Extent of Land Use / Building Design & Construction Controlled by Formal Regulations (supports Screening Question 3.2.3)

In many low- and middle-income countries, while there may be formal regulations in place for key areas such as land use planning, building design and construction, and fire safety, the regulations

Standards may be classified as (1) government or statutory agency standards and specifications enforced by law, (2) proprietary standards developed by a firm or organization and placed in public domain to encourage their widespread use, and (3) voluntary standards established by consultation and consensus and available for use by any person, organization, or industry. (http://www.businessdictionary.com/definition/standards.html)

A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. (http://www.iso.org/iso/home/standards.htm)

may not be applied to all geographic areas, or to all buildings within all geographic areas. There can be several conditions in which a combination of formal regulation, information regulation and no regulation can exist.

In many countries, there are different requirements for different building uses, such as domestic' housing, 'commercial' (sometimes called 'public') buildings, and 'heavy' industrial facilities. The delineation is often around such factors as places where people live (domestic housing), places used by the public for work and commerce (e.g., offices, shops), temporary housing (e.g., hotel) and care (e.g., hospitals), and places of industry and storage of all types of materials, including hazardous materials.

Each area may have formal regulations or not. Where formal regulations exist for each area, they may have different sets of requirements or levels of performance delivered in terms of health, safety and welfare, and may even be regulated by different government ministries, agencies or departments. Even when formal regulations exist, they may not address all building types within a use type (e.g., small sheds not meant for human habitation, but associated with domestic housing, are often not regulated).

In some cases, formal regulations may be in place for some or all uses, but are not applied to all buildings or geographic areas equally. An example is informal housing and other unregulated buildings, which may co-exist with regulated buildings in slum or other areas, or which may exist in part of a municipality, state or country where formal regulations have not been promulgated, even though there is a regulatory framework in place.

It is extremely important to determine the breadth and depth of application of formal regulation, as this will have a significant bearing on the efficacy of the building regulatory framework, and the resources that are needed to overcome the lack of formal regulatory framework in currently unregulated areas.

Regulatory Development Responsibilities (supports Screening Question 3.2.4)

What Ministry, Agency, Department or other entity has primary responsibility for development of regulations for:

(a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning);
(b) the design, construction or operation of buildings;
(c) fire prevention / control, and/or the fire service;
(d) resource / energy conservation;
(e) accessibility / usability rights; and
(f) historic or cultural heritage preservation?

The development and promulgation of regulations may not be by the same entity, so it is important to know which entity is responsible for each function. It may or may not be by government.

For example, development may be by a private sector 'model code' development organization, but promulgation is typically the responsibility of government. Here we need to know which entities are responsible for developing the associated regulations (Codes or Standards). Who develops regulatory provisions on what authority? Is this done within government agencies or with external consultation with technical experts and stakeholders? What is the process for modification of the regulations? Who has standing to recommend and approve regulatory changes? It will also be helpful to know if influence peddling or corruption is of concern in the client country, as it might influence development of the regulation.

Authority / Responsibility for Promulgation of Regulations (supports Screening Question 3.2.5)

What Ministry, Agency, Department or other entity has primary responsibility for promulgation of regulations for:

(a) the use or condition of land upon which a building can be constructed (i.e., planning or zoning);
(b) the design, construction or operation of buildings;
(c) fire prevention / control, and/or the fire service;
(d) resource / energy conservation;
(e) accessibility / usability rights; and
(f) historic or cultural heritage preservation?

The development and promulgation of regulations may not be done by the same entity, so it is important to know what entity is responsible for each function. For example, development may be by a private sector 'model code' development organization, but promulgation is typically the responsibility of government. *Here we need to know which entities are responsible for promulgating the associated regulations* (*Codes or Standards*). It will also be helpful to know if influence peddling or corruption is of concern in the client country, as it might influence promulgation of the regulation.

Legislative Process for Adoption and Promulgation of Regulation (supports Screening Question 3.2.5)

This area is intended to obtain information on the legislative process used for the adoption and promulgation of regulations for the areas identified above, as applicable to the project. Whereas development and promulgation of regulation may be at different levels of government than the enabling legislation which permits it, this question gets to the processes in place at the level of government where regulation of the target areas becomes adopted into law and promulgated within the jurisdiction. Also, it is important to identify what entities have responsibilities, and across how many entities and levels of government coordination is required.

Certification / Registration / Licensing of Professionals (supports Screening Question 3.2.6)

Are there acts, decrees, laws or similar which enable the regulation / licensing / certification of:

(a) architects / planners;
(b) engineers;
(c) builders (carpenters, masons, ...);
(d) trades (plumbers, electricians, ...);
(e) contractors, installers, ...;
(f) building / fire officials (inspectors, ...); and
(g) third-party reviewers?

There are a variety of quality assurance mechanisms that can be employed across the building regulatory process, from use of recognized reference standards for building materials and products, as noted above, to the accreditation of testing laboratories for material, system and component qualification, to the registration and licensing of design professionals and building contractors. Quality assurance may also be applied to the building regulatory process through certification of building officials and accreditation of building departments. This section focuses on the certification / registration / licensing of design professionals, building contractors and enforcement officials.

A system of qualification and licensing for building professionals must be supported by effective oversight procedures that ensure that they meet licensing requirements and that they are subject to disciplinary action in cases of negligence or defective work. In some cases, professional societies or trade associations participate in this role. Oversight can involve either private or public entities or joint public-private entities.

There are generally two approaches taken: government-based and market-based. In a government-based system, there will typically be laws governing the practice of the profession, with requirements for professional certification / registration / licensing overseen by the government. An example is licensing of Professional Engineers in the USA, which is overseen by individual states via board of Professional Engineers and Land Surveyors or similar. In this system, there are clear education and experience requirements, the need to successfully pass nationally consistent and administered examinations in engineering, and then licensing by the state. In a market-oriented system, the benchmarking of professional qualifications and competencies is by a professional body (e.g., Institute of Structural Engineers), which 'oversees' the profession, but there are no legal requirements for certification or oversight by government.

The extent to which the professions and trades associated with design and construction are controlled, including minimum qualifications and competency requirements, experience, and so forth, can have a significant influence on the quality of construction and compliance with regulation. National, state (provincial), or local building regulatory legislation may define requirements for the licensing or registration of building professionals, contractors, and building regulators. Such building regulatory legislation may also provide for enforcement of regulations and penalties for failure to comply. Identifying who is controlled by legislation, and how, is the first step in the assessment process. Built environment professionals must be adequately trained in accredited institutions and individually licensed on the basis of tested technical competence. Professional accreditation, certification and licensing can be reinforced by requirements related to building finance and insurance.

The types of information and data to collect include a description of legal requirements and certification processes for building professionals (architects and engineers), building contractors, building services manufacturers and installers, specialty building trades (e.g., plumbers, electricians, etc.), building enforcement officials, and others in the building regulatory framework. In addition, accreditation standards for training institutions contribute to the preparation of qualified building professionals including building engineers, architects, contractors, and regulators. Evidence of such accreditation standards should be compiled, as well as, accredited curricula for planning, design, engineering and enforcement, and evidence of accredited curricula, as delivered by recognized institutions.

Enabling Legislation for Third Party Certification (supports Screening Question 3.2.6)

In some countries, the use of third party (non-governmental) entities for regulatory review, inspection and approval is permitted. Third parties can be an alternative to government (e.g., private certification in Australia or England), contractors to government (e.g., contract plans reviewers), or independent reviewers used on specific project types, such as performance-based designs. Such arrangements facilitate the expansion of building regulatory capacity through collaboration with the private sector. This can be an important means to expand regulatory coverage and expertise, particularly in low and middle-income countries.

It therefore needs to be determined if there are legal provisions for the employment of certified third party (private) specialized professionals in building control activities including plan review and inspection, and if so, to collect text of the enabling legislation. Enabling legislation should be specific about the modalities and the process of involving private professionals in building control and specify the professional certification requirements. They should have provisions on transparency and conflict of interest and create or enable accountability mechanisms in the form of a public or a public-private entity in charge of establishing and monitoring the standards.

In a robust framework, third party entities must be officially qualified and registered. There must be provision to avoid conflicts of interest for firms practicing in the same market. Provisions for registration and management of third party reviewers and inspectors should be described.

Documentation to be collected includes explanation of the enabling legislation, the process of employment, and the regulation of private third party plan review and inspection professionals. Third party registration and management, and rules and provisions for liability coverage should also be obtained.

Quality Control of Materials / Systems / Components (supports Screening Question 3.2.7)

Are there acts, decrees, laws or similar which enable the regulation / certification / testing / quality control of the following building regulatory framework components, and for accreditation of the entities undertaking the qualification testing:

(a) building materials (e.g., steel, timber, masonry, concrete...);
(b) building products and systems (e.g., walls, doors, windows, heating appliances, lighting systems, etc.);
(c) contents or aspects of contents (e.g., materials which may be toxic...);
(d) accreditation of testing and approvals laboratories; and
(e) market surveillance?

As noted above, there are a variety of quality assurance mechanisms that can be employed across the building regulatory process, including the accreditation of testing laboratories for material, system and component qualification, and requirements for testing and certification of material, system and component performance.

The extent to which construction materials and contents are controlled, in terms of quality, strength, and overall fitness for purpose, can have a significant effect on the ultimate safety, health, energy or other performance of a building. Identifying what legislation and regulation is in place with respect to material control is important. It will also be helpful to know if corruption is of concern in the client country, as it relates in this case to building materials.

The types of information and data to collect include a description of legal requirements and certification processes for construction products (building materials, components, systems), building contents (e.g., flammability requirements), products testing and certification laboratories, and others associated with qualification testing and market surveillance, as appropriate.

Liability Scheme and Products (supports Screening Question 3.2.8)

The liability scheme in place in a country, namely joint- and several or proportionate, may influence which parties assume what levels of liability, and the extent to which the liability can be transferred or limited. There are a number of questions associated with understanding the liability landscape.

First, are liability and accountability legally defined to ensure that fault and responsibility for construction failures are linked to the party that occasioned the failure? National legislation can provide for allocation of liability. It should be identified if there are legal provisions that ensure that those responsible for construction failure can be identified and held accountable. In jurisdictions where such provisions exist, proportional liability may apply. Proportional liability requires parties to pay only in proportion to their share of fault. Proportional liability is often introduced with mandatory insurance and registration of building professionals.

Second, is there a legal foundation for a mandatory liability insurance regime for building professionals?

Here the aim is to identify whether there are legal provisions establishing a mandatory liability insurance regime that can enable all building professionals involved in the construction sector to be insured so that members of the public and institutional users are protected. If local conditions are appropriate, it is desirable to introduce mandatory insurance as a vital complement of proportional liability.

Third, it is useful to identify to what extent there are legislated or market-based warrantees and guarantees around services and products for buildings. Many countries have consumer protection legislation aimed at providing some level of quality assurance for initial purchases, for which responsibilities and liabilities can be assigned to manufacturers, designers, contractors and installers (e.g., warrantee that a new home meets the requisite level of performance and compliance for at least X months). One should determine the existence and role of such consumer protection legislation and related market instruments.

Stakeholder Responsibilities and Accountability (supports Screening Question 3.2.8)

This area aims to identify the legal roles and responsibilities of stakeholders within the client country. In many countries, the building owner has responsibility for compliance with regulations. This responsibility, and associated liability, can be shared / transferred via contract. In other countries, however, there are limits on liability, and the government may ultimately bear responsibility and liability, especially if they are the 'last entity standing' relative to those entities with some responsibility for building compliance and performance with the regulations.

The aim here is to identify which stakeholders have responsibility, accountability and liability with respect to assuring compliance with building legislation. The below discussion seeks information on how the responsibility and liability is apportioned. Together, understanding who is accountable for compliance with regulations, and how liability is apportioned in cases on non-compliance, are important aspects to understanding the effectiveness of the regulatory framework and what measures are needed to facilitate enforcement.

It may also be necessary to understand the role of contract law. In many countries, there is a single entity who is liable (often building owner or agent that constructs on behalf of owner), but liability is shared via contract (contract law). In Sweden, the owner/agent is responsible. In Spain, the Architect has significant responsibility. In New Zealand, it is often the territorial authority (local authority) who is the last person standing.

One should gather documentation of provisions for liability of building professionals, contractors and owners for consequences of building failure.

Codes / Canons of Professional Ethics (supports Screening Question 3.2.8)

In addition to legislated requirements for regulatory compliance, and associated penalties for non-compliance, many countries significantly rely on the professional ethics of practitioners. The intent here is it identify whether there are any legal provisions and/or professional codes of ethics that serve to monitor professional practices of engineers, architects, contractors and building regulators. Information to look for includes documentation of established canons of ethics, codes of practice and related documents which benchmark professional ethics for building professions and contractors.

Legal Requirements around Compliance with Regulations (supports Screening Question 3.2.9)

Robust regulatory frameworks for land use planning, building design and construction and fire prevention and control are characterized by a set of procedures for helping to identify works being planned and carried out, and for their review and approval. Using the building design and construction process as an example, this would typically involve starting with the entity requesting to conduct building works submitting an application for a building permit from the local authority, and would include a process wherein the government or its designees carry out one or more functions of review, inspection and approval before issuing notification of compliance, occupancy permit or similar.

This aspect of the assessment aims to understand what legal requirements are in place with respect to planning, design and construction, fire prevention, filing for permission to construct and/or occupy a building, components and steps in the process that need to be completed and by whom, and who has what responsibilities in the process.

With respect to responsibilities, this is both for determination of compliance (e.g., local authority, third-party reviewer, self-certification by practitioner), and responsibility for compliance (e.g., often the building owner, as further discussed below).

The determination of compliance can vary widely, and is discussed in more detail in section 5.0 Implementation. At this stage, however, the focus is on legal requirements and assignments of responsibility. One should collect the text of the legislations regulations, administrative ordinances and such, which identify issues around compliance.

Penalties for Non-Compliance with Formal Regulations (supports Screening Question 3.2.9)

In parallel with understanding the legal requirements around compliance, it is also necessary to understand what types and forms of penalties are possible with respect to non-compliance with building-related regulations, and to what extent such penalties are levied. These can range from stop work orders, to civil penalties, and in some countries, criminal penalties. Information should be collected on the legal requirements and the history of enforcement of associated penalties.

Appeals Mechanisms / Processes (supports Screening Question 3.2.9)

This area aims to identify if there are provisions in the legislation, and if so, at what level, for the establishment of an appeals or a conflict resolution process related to interpretation or application of building laws.

The mandate of such appeals and conflict resolution processes would include: conflicts pertaining to the interpretation of technical requirements; sufficiency of building-code design compliance; and licensing of building professionals (e.g. disciplinary measures, revocation of practitioner's license, or renewal of license). Setting up a professional dispute-resolution mechanism regarding building regulation is an important policy element to promote procedural justice and level the playing field. Relevant building legislation should include provisions for such processes.

The type of information to collect includes provisions for the establishment of an appeals process and conflict resolution, as well as evidence of successful utilization of these processes.

Enabling Legislation for Collection of Fees / Levies (supports Screening Question 3.2.10)

Many jurisdictions utilize fees or levies on various stages of the building regulatory process, including when applying for permits to build, for plans review and approval, and for inspection and witnessing of building commissioning. The aim here is to identify the enabling legislation or regulation used to allow and govern the fee levels that can be charged. Areas of research include whether legislation exists regarding the adequacy, uniformity or allocation of building permit fees, and if so, at what level(s) of government, and whether building regulatory legislation provides for the allocation of financial resources to building authorities that are consistent with their workload and associated overhead costs.

The level of fees to be charged should be proportional to the effort and should not duplicate other sources of funding. In general, fees charged by local building authorities should be based on the actual cost associated with the review of building plans and site inspections, including overhead costs. Fees charged for construction permitting and building inspection may be expected to cover the costs of regulatory services. Data to be collected includes fee schedules for building authorities at the local level and one should assess the uniformity of application across jurisdictions.

Chapter

04

Development and Maintenance Component

4.1– Context

With the establishment of the authority and responsibility for design, construction and building use control, the next element for review within the building regulatory framework is the regulatory documents themselves: those documents which define / describe specific requirements that must be complied with.

This assessment seeks to identify and describe the organizations responsible for regulatory development and promulgation, the particulars of the regulatory development process, the level and inclusiveness of participation in regulatory development, and the extent to which the regulations reflect appropriate solutions for local political, social, cultural, technical and economic conditions.

For the purpose of the Building Regulatory Capacity Assessment, the building regulatory framework includes land use planning, zoning, building and fire regulation. There can be numerous applicable regulations depending on the type of project (e.g., disaster risk / vulnerability reduction as compared with climate change mitigation or cultural heritage protection). The range of regulations can include: Planning and Zoning Regulations, Building Regulations, Fire (or Fire Prevention) Regulations, Energy Use / Efficiency Regulations, Accessibility / Universal Design Regulations, Cultural / Heritage Protection Regulations, and the like. Components of the building regulatory framework function holistically to assure that a particular building, on a particular site, exposed to well-characterized hazards, is able to achieve the minimum levels of performance.

Using the term 'building regulation' for the legally-enforceable regulatory document also helps differentiate these regulatory documents from 'reference standards,' developed by standards development organizations (such as the International Organization for Standardization (ISO)), and

'design codes,' such as the Eurocodes for Structural Design. Such reference standards and design codes are often developed in the private sector through a consensus process involving stakeholders across different areas, and focus on specific requirements associated with testing, design, installation and maintenance of materials and systems. Such reference standards and design codes are cited by reference in building regulation, which makes them legally enforceable, or are available as voluntary guidance. There can be many hundreds of applicable reference standards and design codes that underpin a comprehensive building regulatory framework.

Consider the relationships between the International Building Code (IBC) in the USA and related regulations, standards, and market entities. The IBC is a model code developed by the International Code Council (ICC), a private sector code development organization. The IBC contains the 'top level' regulatory provisions for buildings, which if adopted into law at a state or local level, becomes the legally enforceable building code (regulation).

However, the IBC is not the only applicable code which must be adopted into law. There are numerous other codes that support the IBC, including the International Mechanical Code (IMC), the International Plumbing Code (IPC), the International Fire Code (IFC) and several others, which address specific attributes of a building's framework or features.

Within each code are numerous reference standards that address all types of material, system, and product performance, quality, design, installation, test and maintenance features. For example, requirements for material, system and component performance, design, installation, test and maintenance associated with fire protection are largely addressed by standards of the National Fire Protection Association (NFPA), but also by test standards, such as from the American Society of Testing and Materials (ASTM), and product certification standards, such as from Underwriters Laboratories (UL) and others. Likewise, structural design provisions, and basic structural material properties, are largely addressed by standards of the American Society of Civil Engineers (ASCE), but supported by the American Iron and Steel Institute (AISI), the American Concrete Institute (ACI), and Others. These, in turn, are supported by test standards, such as from the ASTM, and product certification standards, such as from UL.

The IBC alone references more than 500 standards, many of which reference several others. There can be literally thousands of applicable standards within the regulatory framework.

Building regulations may be promulgated at a national level (unitary government system), state (territory, provincial) level (federation), or municipal level (in either system). Building regulation provisions establish the legally mandated design requirements, functional requirements, and construction practices.

The regulatory development process varies from country to country. In countries with a unitary government system, the building regulatory development process is often managed by a unit of the national government (e.g., Ministry of Construction, Public Works, Urban Development, etc.). In federal systems, the building regulations may be developed by a government entity, a quasi-government entity, a research institution, or a private sector entity, but are not legally enforceable until adopted via enabling legislation. The process varies by country, and can be a reflection of the form of law (i.e., Civil Law, Common Law, Customary Law or some combination or variation) and of the regulatory style (i.e., adversarial, elite consensual, or strong central government).

In many respects, building regulations represent the embodiment of data, political policies, public perceptions and expectations, and expert judgment about technical aspects of building performance and social evaluation of tolerable or acceptable risk. In order to adequately reflect the breadth of issues

and perspectives, the building regulatory development process should be broadly representative of technical experts, such as engineers, architects, building researchers, manufacturers and suppliers of construction materials and systems, the construction and real estate industry, the building finance and insurance industries, those who represent the concerns of public health and safety, and those who represent the owners and occupants of buildings.

Building regulations should be periodically reviewed and updated to address shortcomings or reflect improvements based on loss experience to hazard events, research and technology, to reflect new policy objectives, such as climate change adaptation or universal accessibility, to reflect changes in social norms, and to meet affordability objectives. Critical functions of building regulations include setting the benchmark for the minimum level of acceptable performance in terms of safety, health and welfare of the occupants, and doing so in a way that facilitates the introduction of new knowledge and improved processes into building practice. This requires that codes be written in clear language, accessible to designers and builders and, to the extent possible, accessible to informal sector builders. Codes should aim to cover all prevalent construction types, providing guidance for safe construction and use of buildings.

At the end of the day, building regulations must be local instruments that address local economic, social and technical capacity. This is particularly true for low- and middle-income countries, which rely on the regulations to be appropriate to local conditions. However, for expediency, reference is sometimes made to building regulations from developed countries (e.g., the International Building Code, the Building Code of Australia, the Building Standards Law of Japan, etc.). In these cases, it is imperative to understand the extent to which such documents, if used, are effectively adapted to meet local conditions, materials, expertise and values, and that the associated level of required regulatory infrastructure is in place.

Potential Informants

First contact may be with the head of the government entity designated with primary responsibility for development and maintenance of building regulations. Within a unitary (national) government system, this may be a unit of the ministry concerned with construction or urban development (e.g., Ministry of Construction, Public Works, Economic Development, etc.). Regulation related to buildings may also reside with the Ministries of Health, Energy, Civil Defense or Interior. Within a federal system, this may be the equivalent entity within a state, territory or province. In some instances, entities may be commissions or boards (e.g., Building Regulation (Code) Commission, Board of Building Regulations). This structure may also be observed at a county or municipal level.

Occasionally, the regulatory development process may be managed by a non-governmental organization (as in the case of the USA) or quasi-governmental organization (such as in Australia, Austria and Canada). In such cases assessment questions should be addressed to the relevant official of that organization.

4.2– Screening Questions

The second component of Building Regulatory Capacity Assessment focuses on the regulatory documents themselves: those documents which define / describe specific requirements that must be complied with, as well as how they are developed and maintained (updated). This includes land use planning, building and fire regulation.

The Screening Questions in this section are repeated from the Level 1 - Initial Screening as a reminder of preliminary information which has been collected. It should be noted that Level 2 - Detailed Exploration should focus on questions and issues identified in Section 4.3 below, recognizing that some of the pertinent information may have already been collected.

Screening Questions

	Questions	Why This is Important
4.2.1	What are the sources for hazard / risk data, maps, etc. reference in the regulations (land use planning, zoning, building, and fire)?	Hazard and risk data, as used in regulations, needs to come from a credible source, such as a relevant government ministry, agency, etc. in the country of the project. It is important to understand the level of institutionalization (e.g., research program, or fixed bureau/agency) of these sources, and mechanisms/frequency of updating, especially exposure and fragility information.
4.2.2	Do formal land use planning / zoning regulations exist, and if so, do they incorporate: a) hazard maps or related means that identify areas in which building is not permitted due to natural hazards; b) hazard maps or related means that identify minimum separation between residential and hazardous occupancies; c) maps or related means that identify areas in which building is not permitted in relation to natural resources; and d) requirements for infrastructure associated with building density, population or related factors?	For any building project, and in particular for projects addressing disaster risk and vulnerability mitigation, disaster recovery, and urban densification, it is critical to have a set of comprehensive planning, building and fire regulations in place. This first question focuses on the land use planning and zoning regulations, as this gets to the issue of what building can be constructed in which locations, and to what extent are those locations within, or external to, hazards that need to be mitigated (natural or man-made). Obtaining text of such regulations is essential.
4.2.3	Do formal building regulations exist, and if so, do they have specific provisions for, or is there a separate building code, for indigenous, "non-engineered" and/or "informal" construction (buildings)? By 'formal' we mean adopted by law and are enforceable, and not used simply as guidance.	In low and middle-income countries, building codes, if they exist, may not include provisions related to indigenous, "non-engineered" and/or "informal" construction. Significant vulnerability resides in the buildings of the "informal" sector, in particular, so having this information is critical to investment decisions. Texts of regulations will be needed.
4.2.4	If building regulations exist, do they incorporate provisions for: a) structural design for normal and expected loading and hazard conditions; b) material requirements (e.g., strength, testing, quality, etc.); c) means of access and egress, including for people with disabilities; d) fire prevention and protection systems; e) mechanical systems (e.g., heating, cooling, ventilation); f) plumbing & sanitary systems; g) electrical systems; h) energy / resource efficiency; i) elevators, escalators and lifts; j) fire service access; and k) environmental protection?	The extent to which a building regulation comprehensively addresses the wide range of health, safety, welfare, sustainability and resiliency issues will have a direct relationship to the effectiveness of the building regulation in mitigating health, safety & welfare vulnerabilities, and/or enhancing sustainability and resiliency objectives. If a robust building regulation is not in place, there can be significant questions around the quality of buildings and the performance they deliver. If a robust building regulation is not in place, there may be need for investment to put a framework into place, before construction / reconstruction, to help assure objectives for buildings are met.
4.2.5	With respect to material requirements (e.g., strength, testing, quality, etc.), are the requirements consistent with the quality of locally available materials, and are accredited test laboratories locally available to accredit local materials?	The utility of comprehensive material performance criteria in the regulations is reduced or can even be negated if there are not materials locally available that can be, and have been tested and certified to meet, the requirements. It is important to make sure that the regulatory requirements match available materials and production capacities, and that local, accredited and trusted laboratories exist to certify materials against the material performance requirements.

4.2.6	If building regulations exist, do they have: a) hazard maps identifying expected natural hazard loads by region; b) requirements for structural resistance to expected hazard loads; c) importance factors for critical facilities; d) requirements for resistance to moisture penetration of the building envelope; and e) requirements for fire separation from other buildings, wildland interfaces, etc.?	Robust building regulations differentiate structural, moisture, wind and related requirements according to the geographic distribution of expected loads or disaster impacts. Hazard (or risk) maps are used to show such vulnerable areas as flood plains, earthquake and liquefaction zones, wind, rain and snow loads, storm surge and tsunami hazard areas, and wildland (bush) fire prone areas. Important facilities, which need to operate during emergencies, including as safe refuge for people, may require higher levels of performance during hazard events.
4.2.7	If building regulations exist, do they have specific provisions for: a) assembly spaces (restaurants, theaters,...); b) businesses (offices); c) educational buildings (schools); d) healthcare structures (hospitals, nursing homes,...); e) correction and detention buildings; f) domestic housing (homes, apartments); g) hotels and motels; h) dormitories, hostels, ...; i) light industry; j) heavy industry; k) hazardous industry; l) light storage; m) hazardous storage; n) above and below grade parking; o) underground structures; p) high-rise structures; q) small to medium shops; r) malls and large shopping complexes; and s) mixed use buildings?	The extent to which a building regulation comprehensively addresses the wide range of building uses, or occupancies, is important in terms of understanding how health, safety & welfare vulnerabilities are addressed for different population groups (e.g., families in dwellings, workers in a factory, patients in a hospital, urban poor). It is also important in regards to the extent to which 'high risk' buildings (as either posing risk to the community, such as a chemical processing facility, or placing large numbers of occupants at risk, such as a space of assembly or high-rise building) have associated requirements, specific to those particular building uses.
4.2.8	If building regulations exist, do they have specific provisions for: a) minor repairs to existing buildings; b) renovation of existing buildings; c) structural retrofit of existing buildings; d) extensions to existing buildings; e) change of use of existing buildings; and f) culturally / historically 'listed' buildings?	Building regulations typically apply only to new construction, unless major changes are made to a building. A robust building regulation will identify what types of changes require upgrading of some or all of the building to meet current requirements. Historically or culturally protected buildings may have exemptions for some otherwise required change.
4.2.9	To what extent are access, use and egress requirements for disabled and aged populations addressed within the building regulation?	The World Bank estimates that 15 percent of the world's population have some kind of disability, with 80 percent living in developing countries. Effective implementation of building and urban development standards for accessibility and protection of persons with disabilities and elderly requires policies and principles to be translated into actual change in the configuration of the built environment.

4.2.10	Do formal fire regulations exist, and if so, what do they address, and what is their relationship to the building regulations (codes, standards)?	This is important, especially in countries for which requirements for fire protection systems are located in the fire regulations and not within the building regulations (e.g., Japan, Singapore, Hong Kong). In such cases, one can only assess fire safety by assessing both building and fire regulations.
4.2.11	In question 4.1.4 above, it was asked what entities have responsibility for development of land use, building and fire regulations. For each of these entities, *what is the process used for development and maintenance of the documents*, and to what extent are pertinent stakeholders consulted or involved in the development, review and/or approval of the final provisions?	Developers of regulations can range from bureaucrats within a government ministry (department, agency), to contractors working for government, to private sector organizations which form committees of stakeholders to develop regulatory provisions. Furthermore, consultation with industry can range from little or none, to review of text with no obligation by the developer to change the text, to requiring the developer to act and report on every proposal to change the regulatory text. In general, the more stakeholder involvement the better, and the more transparency the better. There can be particular concerns in 'opaque' regulatory development frameworks, especially within countries where influence peddling or corruption is of concern.
4.2.12	If formal building and fire regulations exist, do they require, by reference, the use of nationally or internationally recognized *consensus standards*[8] which specify required material properties and performance (e.g., strength, durability, fire resistance, ...), the tests to confirm performance, and which specify requirements for design, installation, testing and maintenance of building and safety products, components, systems and assemblies? If so, what standards are referenced and what entities develop them?	Robust building regulatory frameworks include both regulations, which identify societal expectations for buildings (e.g., resilience against earthquakes, resistance to fire, ...), as well as *consensus standards*, that are legally enforceable by being referenced or cited in the regulations (thus sometimes referred to as reference standards), which specify what types of materials, systems and components are acceptable for use in meeting building regulation requirements, but defining such aspects as material properties, test methods, and installation requirements. These may be developed by nationally-recognized standards development organizations (SDOs), such as the National Fire Protection Association (NFPA) in the USA, regional SDOs, such as the European Committee for Normalization (CEN), or international SDOs, such as the International Organization for Standardization (ISO). Having a robust set of recognized consensus / reference standards is essential to assuring quality of building construction.
4.2.13	Do educational curricula exist regarding the structure, content and use of land use planning, building, and fire regulation that can be used as a basis of formal education, continuing professional development and outreach to the informal sector?	A well-functioning building regulatory framework needs suitably educated professionals and properly trained skilled craftspersons for the framework to work well. It is also essential to socialize the benefits of the building regulatory framework via social networks outside of traditional channels, especially within informal settlements and other unregulated areas, where traditional communication paths may be absent.

[8] As used here, a 'consensus standard' is a standard, developed by an accredited standards-making organization (e.g., the International Organization for Standardization (ISO)), which is required to have a 'balanced' committee of varied interests participate and reach consensus on the content. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution.

4.3– Detailed Exploration

This section builds from the screening questions, providing addition commentary as to why requested information is important, and including additional questions and informational requirements to be resolved during in depth investigation. These areas and questions start from the fact that formal regulations are in use, as identified in the Legal and Administrative Component.

Risk & Hazard Source(s) and Data Sets (Supports Screening Question 4.2.1)

A fundamental objective of planning, building and fire safety regulation is to protect the public from a wide range of hazards, both natural and technological (man-made). In order to assess the capacity of the regulatory framework overall, it is essential to understand the risks and hazards of concern in the jurisdiction, as well as the depth of knowledge and available data about the risks and hazards to inform regulatory decisions, including the establishment of hazard resiliency criteria within the regulations.

It is therefore important to gather information regarding government ministries, agencies, departments, research institutions and others that collect, analyze and publish such data for the country. The search should extend to academia, non-governmental organizations, private sector research laboratories and others. The primary aim is to identify credible sources of hazard information.

Once the sources have been identified, it is important to understand the risks and hazards of concern within the jurisdiction, as identified by these sources, and the level of knowledge and data available on the risks and hazards of concern.

To the extent possible, one should compile data and/or data sources to assess the risks and hazards, and the capacity of the building regulatory framework to adequately address such risks and hazards.

Hazard Mapping within Land Use Planning Regulations (Supports Screening Question 4.2.2)

Having robust maps of risks and hazards is important in order to assess the appropriateness of land on which buildings can be sited, to zone building uses based on the number of people at risk from natural or technological hazards, or for similar risk management purposes achieved by regulation. Such maps are typically developed by the entities identified above. Here, the question is to what extent such risk or hazard maps are utilized in formal land use planning and zoning regulation. Specifically, it should be determined if the formal land use planning / zoning regulation incorporate the following:

a) hazard maps or related means that identify areas in which building is not permitted due to natural hazards;
b) hazard maps or related means that identify minimum separation between residential and hazardous occupancies;
c) maps or related means that identify areas in which building is not permitted in relation to natural resources; and
d) requirements for infrastructure associated with building density, population or related factors.

Hazard zone maps are typically developed for flood plains, earthquake shaking and liquefaction, wind load and snow load and coastal zone hazards, such as storm surge and tsunami. Risk maps present expected frequency and intensity of hazard loads. Planning and zoning regulations may also include hazard and risk maps as associated with technological hazards, such as minimum separation distances from fuel storage depots and domestic housing, for example, as well as related safety and health risks.

In addition to collecting maps (or regulations that include the maps), one should assess the data on which the maps are based against data obtained above.

Extent of Coverage of Formal Building Regulation (Supports Screening Question 4.2.3)

If formal building regulations (codes, standards) exist, do they have specific provisions or a separate building code for indigenous buildings, "non-engineered" and/or "informal" construction? By 'formal' we mean adopted by law and are enforceable, and not used simply as guidance.

As discussed earlier in Section 3.3., even if a jurisdiction has formal regulations in place, they may not be applied to all geographic areas, they may have different sets of requirements or levels of performance in terms of health, safety and welfare, and they may not address all building types (e.g., small sheds not meant for human habitation but associated with domestic housing are often not regulated). The intent is to determine, within formal building regulations, whether specific code provisions exist for indigenous construction, if there are separate regulations for indigenous, "non-engineered" and/or "informal" construction, if there are any specific types, uses, sizes of buildings that fall outside of formal regulation, and if so, the extent to which indigenous, "non-engineered" and/or "informal" construction is used for these buildings.

In many low and middle-income countries, building codes do not include provisions related to indigenous or "non-engineered" structures. While building codes are relatively well-developed for more sophisticated engineered construction, significant vulnerability resides in the buildings of the "informal" sector. If this is the case, it is of critical importance that either the regulatory framework be modified to address "informal" construction, or that appropriate guidance be provided for the safest possible use of local methods and materials of construction. This guidance may consist of best practice principles or "rules of thumb". Such authoritative guidance is an important link to the informal building sector.

Basis of Formal Building Regulations (Supports Screening Question 4.2.3)

Several countries take advantage of 'model' regulations, or codes, which are developed as 'comprehensive' regulatory documents that can be adopted by legislation, with or without modification, and promulgated by a jurisdiction. This approach is often found in federal type governments. Examples include the National Construction Code (Australia), the National Building Code (Canada), and the International Building Code (USA).

While such model regulations work well in the countries for which they are design, they may not be applicable, without significant modification, for other countries, especially low- and middle-income countries. There are numerous reasons for this, including different social objectives, economic conditions, risk tolerance, different materials and methods of construction (including indigenous materials and methods), lack of systems and components as included in associated reference standards, and lack of knowledge about the use, applicability and enforcement of the regulation. The process of adaptation and modification of model international codes should be examined and documented. If such model regulations are used as a basis, this needs to be determined, and applicability needs to be assessed.

Regulations developed within the country of concern may be by government ministries or agencies, government research entities, or private sector entities. While such locally-developed regulations may be more targeted to the needs of the country, their completeness will likely be a function of the knowledge base of the persons responsible for development. Data should be gathered with respect to who is developing the regulation, how (process), and the data and information used as the basis. Subsequent focus areas below help expand on data and assessment needs.

Structure of Formal Building Regulations (Supports Screening Question 4.2.4)

There are two primary forms of building regulation: prescriptive- and functional-based (also known as performance- or objective-based). Prescriptive building regulations are characterized by detailed provisions which specify requirements that, if complied with, result in compliance with health, safety and welfare objectives. Such regulations include items such as material properties (e.g., strengths, fire resistance, emissivity), limits on height and area based on type of construction (e.g., concrete, timber, steel, masonry), safety requirements (e.g., fire safety systems, signage) and access and egress specifications. Such prescriptive regulations can be several hundred pages in length. An example is the International Building Code (IBC), a mode building code (regulation) developed by the International Code Council (ICC) in the USA.

Functional regulations, by contrast, are typified by including only functional, operative and/or performance requirements (i.e., what is expected, not how to achieve it). These documents are typically much shorter, as they have far fewer provisions (e.g., the Building Regulation in England consists of 19 pages of text). However, functional regulations have associated with them sets of compliance documents, approved documents, deemed-to-satisfy documents, or other largely prescriptive means that can be used to demonstrate compliance. The fundamental difference between this approach and a prescriptive system is that in the functional system, compliance documents are not mandatory.

A prescriptive approach provides for relative ease in determining compliance, as the regulatory requirements are clearly specified. However, the need to specify all parameters is not practical, and this can result in loss of flexibility and innovation in materials, systems and design. The functional (objective-performance-based) approach has the advantage of allowing for innovation and possible greater efficiency; however, it places a greater burden on the technical capacity of the regulatory agency and requires greater technical sophistication in application.

It should be noted that even with a prescriptive approach, regulations typically include one or more provisions that allow for performance-based or engineered designs to be undertaken through an 'equivalency' or 'alternate methods and materials' clause, subject to the approval of the authority having jurisdiction.

To support evaluation, one should collect texts of the building regulations and if functional-(objective- or performance-based), one should also collect the text of the associated compliance documents, approved documents or deemed-to-satisfy solution.

Requirements for Recognized Design Professionals (Supports Screening Question 4.2.4)

As noted in the Legal and Administrative component, there may be (and arguably should be) legal requirements for the certification, registration or licensing of design professionals. This is a measure often applied to help increase the quality of building design. Such requirements would reflect the certification, registration or licensing of building designers (engineers, surveyors, architects, planners), and perhaps builders (developers, contractors, subcontractors), on the basis of completion of accredited professional education and training programs, examinations and professional experience.

As part of the system, building regulations need to reference the required use of recognized design professionals to assure continuity of legislation, in addition to being a means to achieve quality designs. Documentation of the requirement for work to be conducted by recognized design professionals

needs to be obtained. This can often be found in the 'administrative' chapter of a building or other regulation.

Technical Contents of Building Regulations (Supports Screening Question 4.2.4)

Building regulations are largely technical documents which reflect societal expectations for health, safety and welfare of people in and around a building and its neighboring buildings. Robust building regulations address a wide range of technical areas in this regard, including:

a) structural design for normal and expected loading (hazard) conditions;
b) material requirements (e.g., strength, testing, quality, etc.);
c) means of access and egress;
d) fire prevention and protection systems
e) mechanical systems (e.g., heating, cooling, ventilation);
f) plumbing & sanitary systems;
g) electrical systems;
h) energy / resource efficiency;
i) elevators, escalators and lifts;
j) fire service access; and
k) environmental protection.

The investigation should collect texts from the building regulations (and/or compliance documents if within a functional-based regulatory framework) and determine if, and to what extent, these technical areas are addressed. Adequately addressing these issues is critical for establishing levels of building performance necessary to safeguard occupants from expected risks and hazards, providing healthy and comfortable environments, facilitating resource conservation and management, and facilitating emergency responder activities.

With respect to hazard mitigation and occupant risk reduction, it should be noted that equal performance of all buildings is not typically expected for all hazards, and the level of performance may vary by hazard. For example, structural and fire safety requirements for buildings may vary according to the consequences of potential failure. In structural design, an "importance factor" is often assigned to particular classes of buildings, which are expected to be available during and after a hazard event, such as hospitals, fire stations, police stations, utilities, and places of safe haven. Likewise, different levels of fire safety performance is often warranted based on the risk to the exposed occupants, be it due to vulnerability (e.g., hospital patients, aged persons), numbers of people (e.g., large occupant load buildings, such as malls, arenas, and the like), difficulty of access and egress (such as high-rise buildings), or the hazardous nature of the operations or storage (e.g., industrial facilities, fuel storage, etc.). One should obtain evidence of such importance or risk categories and how they are applied.

In addition, there may be associated design codes, reference codes, and complementary regulations. In Europe, for example, the Eurocodes for Structural Design, developed by the European Committee for Standardization (CEN), are used to define and verify structural requirements, with local modification via nationally determined parameters (NDPs). In the USA, the American Society for Civil Engineers (ASCE) Standard 7 serves a similar role. Also in the USA, the International Fire Code (IFC) and National Fire Protection Association (NFPA), the National Fire Code, are complements to the International Building Code (IBC), including fire safety provisions, which need to be accounted for in building design and approval.

With respect to energy and resource efficiency, it may be that associated regulations exist and reference standards exist, defining together the requirements. For example, in the USA, the International Building Code (IBC), International Mechanical Code (IMC), International Energy Conservation Code (IECC), and International

Green Construction Code (IGCC) may all be applicable, as well as the International Code Council Green Building Standard, standards of the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE), and others.

There will likely be accessibility legislation, regulations and or standards that also need to be complied with, as well as environmental, occupational health and safety, and related areas. One should collect texts of applicable provisions and associated regulations, and design codes.

Appropriateness of Material Requirements (Supports Screening Question 4.2.5)

While it is important to have a clear set of building regulatory requirements regarding the properties of construction materials, such as strength, resistance to moisture and so forth, the utility of including comprehensive material performance criteria within the regulations (and reference standards) can be significantly reduced or negated if there are no materials available locally that can and have been tested and certified to meet the requirements.

This is in some ways tied to question 4.2.3 above in understanding the local conditions and applicability of formal regulation as compared with indigenous materials and construction, and matching the regulations to the materials and skills within the sector. With respect to material performance requirements, it is important to make sure that the regulatory requirements match available materials, and that local, accredited and trusted laboratories exist to certify materials against the material performance requirements.

Hazard Mapping within Building Regulations (Supports Screening Question 4.2.6)

Having robust maps of risks and hazards is important in order to assess the appropriateness of technical building provisions aimed at safeguarding people in buildings from risks associated with natural or technological hazards, or for similar risk management purposes achieved by regulation. Such maps are typically developed by the entities identified in 4.3.1 above. Here, the question is to what extent such risk or hazard maps are utilized in formal building regulation. Specifically, it should be determined if the formal building regulation incorporates the following:

a) hazard maps identifying expected natural hazard loads by region;
b) requirements for structural resistance to expected hazard loads;
c) requirements for moisture resistance to expected hazard loads; and
d) requirements for fire separation from other buildings, wildland interfaces, etc.

Adequate provision of risk and hazard maps is important as building regulations should differentiate structural and other requirements according to the geographic distribution of expected loads or disaster impacts. Hazard zone maps are typically developed for flood plains, earthquake shaking and liquefaction, wind load and snow load and coastal zone hazards, such as storm surge and tsunami. Risk maps present expected frequency and intensity of hazard loads to provide design parameters and structural requirements. Building regulation may also include hazard and risk maps as associated with technological hazards, such as minimum separation distances from fuel storage depots and domestic housing, for example, as well as related safety and health risks.

Occupancy Types in Building Regulations (Supports Screening Question 4.2.7)

Buildings are used for a wide range of purposes and the requirements for the design and performance of the buildings will vary by use and occupancy type. As such, it is important to identify the extent to which building regulations have specific provisions for different uses and occupancy types, including:

a) assembly spaces (restaurants, theaters,..);
b) businesses (offices);
c) educational buildings (schools);
d) healthcare buildings (hospitals, nursing homes,...);
e) correction and detention buildings;
f) domestic housing (homes, apartments);
g) hotels and motels;
h) dormitories, hostels,...;
i) light industry;
j) heavy industry;
k) hazardous industry;
l) light storage;
m) hazardous storage;
n) above and below grade parking;
o) underground structures;
p) high-rise structures;
q) small to medium shops;
r) malls and large shopping complexes; and
s) mixed use buildings.

Such 'classifications' exist in both prescriptive and functional regulatory frameworks. In prescriptive systems, the uses and occupancies are typically included in the body of the regulation, with specific requirements noted by occupancy classification. In functional-based systems, such use and occupancy classifications are typically found in the approved documents, compliance documents, or deemed-to-satisfy documents.

One should collect the text which identifies and defines the uses and occupancy classifications.

Regulations for Existing Buildings (Supports Screening Question 4.2.8)

In most jurisdictions building regulations apply primarily to new construction. Building regulatory authority therefore stops once a certificate of occupancy (or equivalent) is issued. In some cases, there are provisions in building regulations that address changes that are made to an existing building, usually based on the extent of the change. Such delineations often trigger the need for building permits, review and approval and design documentation, and inspection functions.

The issue of existing buildings and how they are risk-managed is important, since for most jurisdictions changes to existing buildings exceeds new construction. As such, it is necessary to identify if building regulations have specific provisions for the following:

a) minor repairs to existing buildings;
b) renovation of existing buildings;
c) extensions to existing buildings;
d) change of use of existing buildings;
e) culturally / historically 'listed' buildings.

If such provisions exist, one should collect the text of the provisions and trigger conditions, as well as guidance on decision-making around level of compliance to be achieved.

In some jurisdictions, specific regulations for existing buildings are used. In these cases, text of the regulations for existing buildings should be collected.

In some jurisdictions, specific regulations for culturally and/or historically significant buildings are in place. In these cases, one should collect the text of the regulations for such buildings.

Fire Regulations (Supports Screening Question 4.2.9)

In most countries, fire regulations are separate from building regulations, but are intended to be applied jointly in the design and construction of buildings. Enabling legislation will be different for each, as well as regulations and enforcement authorities.

In some countries, such as Australia, England and the USA, most of the pertinent fire safety features that are required in buildings are addressed in building regulations, with reference being made to additional requirements in the associated fire regulations. In other countries, such as Japan and Singapore, fire regulations are completely separate, and the combination of building and fire regulations are needed to identify required fire safety features in buildings.

It is important to identify the relationship between building and fire regulations, and if fire safety requirements are included in both, one needs to collect the text of applicable requirements from the fire regulations.

Regulatory Development Processes (Supports Screening Question 4.2.10)

Responsibilities for the development and promulgation of regulation were addressed under the Legal and Administrative Component in Chapter 3. For this question, the issue is what is the process used for development and maintenance of regulations. Unlike enabling legislation, which is typically developed by parliaments and legislatures, the development of regulations can be by ministries, agencies, or departments of a government, as well as by private sector organizations.

In many jurisdictions, it is deemed important to have broad stakeholder involvement in the regulatory development process. This raises question: Does the legal system support effective stakeholder consultation and participation with notice of comments or public review processes, surveys and focus group discussions? Is there a consensus process for the approval of regulatory provisions or changes that requires addressing objections to proposed requirements? Is there a process for public review and comment for proposed regulatory changes? Provisions for open participation and fairness in the regulatory process are a foundation for legitimacy and compliance in a democratic system of government. An inclusive approach to regulatory development for the built environment should involve the participation of representatives from building professionals, builders, owners, occupants, as well as those with expertise on health, safety and disaster risk reduction.

This breadth of participation is important both to develop relevant and feasible codes and to communicate the social rationale for the building regulatory process. One should gather information on provisions for inclusive public participation in code development, provisions for providing response to regulatory change proponents (those who submit regulatory change proposals), and process(es) for dispute resolution.

In addition, by engaging stakeholders, even those aspects of the regulatory framework that are non-mandatory can be more easily embraced. Research points to participation and legitimacy as a major driver of voluntary compliance, which is also a significant aspect of a regulatory framework.

The regulatory development process is not static, as there is little expectation that political, societal and technical components remain static. As such, updating the regulation on a regular basis is needed. To this end, one needs information on whether there are planned periodic reviews and updates of building regulations to incorporate current and changing technical, social and economic factors. One needs to obtain documentation on the revision period or cycle, change process (i.e., who has standing to recommend such changes whether the process formally defined, and who oversees the

process), and approval process.

The information to be collected here includes written process(es) for regulatory development, written processes for public consultation, review, feedback on proposed regulations, and evidence of public consultation and review of proposed and subsequently promulgated regulation in the areas pertinent to the project.

Extent to Which Formal Regulations Incorporate Local Modifications (Supports Screening Question 4.2.10)

In many countries, especially of the federal government type, the constitution, charter or other enabling document allows or retains for the municipality the right to regulate planning, zoning, building design and construction, and fire safety. In some cases, municipalities may create their own regulations. However, they may also adopt model regulations, either developed within the government at a higher level, or in the private sector, or even from another jurisdiction. In any of these cases, modifications are likely required to fit the local situation. Determining the extent and appropriateness of local modification is therefore quite important. One needs to collect the text of the regulations, with indication of local modifications.

Process(es) for Local Modification to Formally Promulgated Regulations (Supports Screening Question 4.2.10)

If local modifications are made to some base (model) regulation, it is important to identify and document the procedure for local amendment or modification of the administrative or technical content of the code. In some jurisdictions, this may be accomplished by a local board or commission (e.g., Municipal Board of Building Regulations). It would be expected that enabling legislation for such a Board will have been identified in Chapter 3 above. Here, it is important to document the process and responsible parties for amending and promulgating amended documents.

Reference Standards (Supports Screening Question 4.2.11)

Comprehensive building regulatory frameworks make extensive use of 'reference standards,' developed by recognized standards-development organizations, which when referenced by a legally promulgated regulation have the force of law, even though they are not developed within the legislative or regulatory development processes of a country.

Such reference standards and design codes are often developed in the private sector through a consensus process involving stakeholders across many areas, and focus on specific areas such as testing, design, installation and maintenance of materials and systems. There can be many hundreds of applicable reference standards and design codes that underpin a comprehensive building regulatory framework. Such reference standards are a critical element of building codes in that they provide standards of predictable performance for materials and procedures based on standard test methods. Design is based on the assumption of material performance under various conditions of loading. An essential component of code compliance is the provision for certification of materials, equipment and processes.

To assess the strength and capacity of the building regulatory framework, it is important to understand if such standards are legally enforceable, or if such standards are only available as voluntary guidance. If legally enforceable, documentation of legislative and regulatory text that establishes this should be collected. It should be determined if there is a national standards agency and/or recognized standards-making organizations within the country. If so, it needs to be determined what standards are developed and made available for the building sector, and to what extent they are referenced in the regulations. One should determine the extent to which international standards are referenced and/or

accepted as guidance. In this regard, 'international' standards means both the standards developed by recognized national standard-development organizations (e.g., the British Standards Institute (BSI), or Standards Australia Inc. (SAI)), as well as the international standards of the International Organization of Standardization (ISO). Where non-locally developed standards are used, it should be determined if modifications are made to reflect local conditions, and if so, what they are.

Educational Curricula and Outreach Materials (Supports Screening Question 4.2.12)

A well-functioning building regulatory framework needs educated professionals and properly trained skilled craftspersons for the framework to work well. This relies on having a sound set of university educational programs for professionals, such as architecture and engineering, but also appropriate training institutions for skilled tradespersons and craftspersons, who are involved in areas such as construction, installation and maintenance of buildings and systems.

In addition, these people should be trained on the regulations and supporting infrastructure (e.g., standards). As such, it is helpful to have educational curricula regarding the structure, content and use of land use planning, building, and fire regulation that can serve as a basis of formal education and continuing professional development.

It is also essential to socialize the benefits of the building regulatory framework via social networks outside of traditional channels, especially within informal settlements and other unregulated areas, where traditional communication paths may be absent. This may be through social workers, medical professionals or others, who work with inhabitants, observe conditions, and can help facilitate changes. Having outreach materials about the benefits of formal regulatory frameworks and components can be very useful in this regard.

Chapter

05

Implementation Component

5.1– Context

Once the legislative and legal foundation for planning, building and fire regulation is established and planning, building and fire regulations have been promulgated by the relevant authority having jurisdiction, the next area of focus is on the implementation and management of the regulatory framework at the target level, which is often the municipal or local level.

The Implementation Component of the assessment focuses on the type, organization, efficiency and effectiveness of the building control framework. In particular, it explores the regulatory implementation by governmental entities responsible for compliance and enforcement of building regulations and other jurisdictional ordinances relating to enhancing the safety and quality of life within their jurisdictions, such as planning, zoning, building, fire, resource conservation or accessibility ordinances. Having an adequate building control framework is critical for ensuring building quality and safety.

Implementation and management of the related building regulatory components is often addressed via three distinct entities: the local Planning and Zoning Department, the local Building Department, and the local Fire Department, (note that different names are used in different countries and that there may be national components within implementation mechanisms).

Regardless of the name of the entity, the focus is on regulatory implementation by those governmental entities, or legally authorized private sector entities, which are responsible for compliance with planning, building and fire regulations, as well as with other jurisdictional ordinances involved in enhancing the safety and quality of life of persons within the jurisdiction.

While responsibility for planning and fire service regulatory implementation at a local level is typically of the government, building control may see more private sector involvement. Building control may be solely or fundamentally

governmental, solely or fundamentally private sector, or some combination, often with both a governmental option and private sector option.

Broadly, building control in such systems may contain some or all of the following functions: planning and zoning control (e.g., siting of the building); control of technical requirements (e.g., permitting, plan review, building regulation and code compliance); control activities during construction (e.g., inspection); completion of the building (e.g., final inspection and/or commissioning); and, maintenance and use (e.g., inspection and enforcement). Within governmental systems, these functions may be across several agencies or departments (e.g., Planning, Building and Fire). In systems with private certification and building control, some or all of the functions are undertaken by private sector entities.

There are also more 'quality management' systems, where 'self-certification' or 'self-approval' of designs is made by qualified design professionals, without any significant government or private sector building control.

Building control is one of the most important aspects of the building regulatory framework, as this is the point at which compliance is to be determined and assured. If the building control component is weak, it can negate the benefits of strong legal foundations and technical regulations. The adequacy of building control functions is fundamentally dependent on the number, competency and qualifications or building control practitioners (government, private sector or both). Local implementation and enforcement is in many cases a critical point of failure in the pursuit of resilience.

A well-functioning building regulatory framework needs educated professionals and properly trained skilled craftspersons for the framework to work well. This relies on having a sound set of university educational programs for professionals, such as architecture and engineering, but also appropriate training institutions for skilled tradespersons and craftspersons, who are involved in areas such as construction, installation and maintenance of buildings and systems.

In addition, these people should be trained on the regulations and supporting infrastructure (e.g., standards). As such, it is helpful to have educational curricula regarding the structure, content and use of land use planning, building, and fire regulation that can be used as a basis for formal education and continuing professional development.

It is also essential to socialize the benefits of the building regulatory framework via social networks outside of traditional channels, especially within informal settlements and other unregulated areas, where traditional communication paths may be absent. This may be through social workers, medical professionals, NGOs or others, who work with inhabitants, observe conditions, and can help facilitate changes. Having outreach materials about the benefits of formal regulatory frameworks and components can be very useful in this regard.

Potential Informants

The primary focus of this assessment are the Planning, Building and Fire Departments (or equivalents), and/or private sector organizations with implementation and enforcement functions. Within government entities, the chief official (planning, building, fire) of the jurisdiction, or CEO of a private sector entity, will typically be the principal informant, with reference to relevant subordinates when appropriate. It is also highly desirable to consult with relevant senior jurisdiction officials such as mayors, city managers, related city department heads and members of the building community, including designers, builders, developers, building owners and contract regulatory staff.

5.2– Screening Questions

This third component of the Building Regulatory Capacity Assessment focuses on the implementation and management of the building regulatory framework at the level(s) associated with the project scope. The screening questions are aimed at identifying a minimal set of information for preliminary assessment of local capacity. These questions are repeated from the Level 1 - Initial Screening as a reminder of preliminary information which has been collected. It should be noted that Level 2 - Detailed Exploration should focus on questions and issues identified in Section 5.3 below, recognizing that some of the pertinent information may have already been collected.

Screening Questions

	Questions	Why This is Important
5.2.1	If formal land use planning, building, and fire regulations exist, are they legally promulgated and enforced *throughout all areas of the country, region (state, territory, province), or city(ies)* covered by the project?	While it may be that a country has appropriate legislation to enable pertinent regulation, that fact alone does not mean such regulations have been adopted into use throughout the entirety of the area addressed by the project. In order to assess the effectiveness of the building regulatory framework, the extent of promulgation and enforcement needs to be known.
5.2.2	If the answer to 4.3.1 is no, estimate the percentage of the country, region or city(ies) covered by the project does not have a set of comprehensive land use planning, building, and fire regulations legally promulgated and enforced for all buildings. Include in this estimate any areas of indigenous, "non-engineered" and/or "informal" construction, which may be materially affected by the project, in particular disaster risk / vulnerability mitigation, disaster recovery, urban densification, and energy conservation type projects. Estimate the percentage of buildings not currently subject to formal regulations.	This question gets to the issue of to what extent are (or will) buildings subject to formal regulations on planning, zoning, design, construction and use. In the case that a significant portion of the building stock is somehow outside of the building regulatory framework (e.g., 'informal' construction, shanties, etc.), there are limits on the effectiveness of a formal building regulatory framework. Conversely, a higher level of investment in the building regulatory framework may be needed to facilitate the target resiliency, sustainability, or energy efficiency of the building stock.
5.2.3	What are the natural and technological hazards and risks of concern in the country, region or city(ies) covered by the project? What is the recent loss history related to such hazards and risks?	The range of natural and technological hazards, which can be expected to impact the building stock that is affected by a project, should be well-understood for all geographic regions addressed by the project. This is to help assess whether the hazard / risk maps in the regulations, if they exist, are appropriate to the required mitigation targets.
5.2.4	Are hazard and risk data, maps, etc., pertinent to the country, region or city(ies) covered by the project, comprehensive, up to date, and appropriately cited in the regulations and available for use in assessing the adequacy of the regulations in helping to mitigate or avoid the hazard or risk as part of the project?	Related to 4.3.3 above, the presence of hazard and risk data, maps, and related information within the regulations does not assure that they are up to date and appropriate to the needs of the project, especially for disaster risk and vulnerability mitigation. It also does not assure that sufficient technical capacity is available to properly apply and use hazard and risk information in decision-making. This is especially true with respect to projected climate change related hazards and mitigation needs in the future.
5.2.5	What are the 10-year historical and 10-year projected number of building projects – new construction, renovation, expansion, etc. – for the country, region or city(ies) covered by the project?	Aside from having the legislation and regulations in place, building regulatory capacity is largely a function of how many projects are being controlled, and how many people are involved in the regulatory control of those projects. This question provides benchmarking data on the historical and projected volume of construction.

5.2.6	How many fulltime-staffed Planning Departments, Building Departments and Fire Departments (or equivalent) are there in the country, region or city(ies) covered by the project, how many fulltime staff are employed in each Department in the relevant geographic area (i.e., country, region or city(ies) covered by the project), and what are their salary levels? If contractors are used in support of fulltime staff, what is the associated number of contractors by department and geographic area?	The best, most up-to-date, and comprehensive set of planning, building and fire legislation and regulations will only be effective if they are implemented and adequately enforced. While neither the only nor a complete measure, obtaining a count of the total number of relevant departments, and of the fulltime staff working in each relevant department in all relevant areas of the country can provide insight on capacity and quality. This is especially true where rapid urban expansion is taking place, and the need for large staff exists due to the volume of construction.
5.2.7	What is the number of staff and, where applicable, contractors, in each Planning Department, Building Department and Fire Department (or equivalent), who are responsible for reviewing and approving land use, zoning, building and fire regulation compliance, in the country, region or city(ies) covered by the project, such as: a) site review; b) plan / drawing review and approval; c) calculation verification; d) permit issuance, and for what (e.g., foundation, construction, ...); e) site inspection, and for what (e.g., foundation, structure, materials, electrical, mechanical, plumbing, fire, ...); f) witnessing of commissioning tests; and g) Issuance of certificate of occupancy?	Following on the above, this question aims to provide additional detail on the number of staff and/or contractors assigned to the key functions of regulatory review and approval.
5.2.8	Identify the types, turnaround times and frequency of review and approval activities undertaken by relevant Planning Departments, Building Departments and Fire Departments (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the country, region or city(ies) covered by the project, such as: a) site review; b) plan / drawing review and approval; c) calculation verification; d) permit issuance, and for what (e.g., foundation, construction, ...); e) site inspection, and for what (e.g., foundation, structure, materials, electrical, mechanical, plumbing, fire, ...); f) witnessing of commissioning tests; and g) issuance of certificate of occupancy.	Along with the numbers of building projects to be undertaken, and the staff and contractors in any given department, the number of activities that the staff need to perform, and the target time allotted or required to perform those tasks, is essential information for assessing capacity. In some countries, very short turnaround times are mandated by law (e.g., 2-4 weeks for review and approval of drawings and issuance of building permits), where in others up to a year might be expected.[9] To be efficient, there needs to be an appropriate balance of available time and resource. One should collect information on the documents used or referenced during the review process.
5.2.9	What actual, verifiable qualifications are held by fulltime staff of the Planning Departments, Building Departments and Fire Departments (or equivalent, such as third-parties), who are responsible for reviewing and approving land use, zoning, building and fire regulation compliance, in the country, region or city(ies) covered by the project?	The capacity assessment rests on the qualifications as well as the numbers of staff involved in regulatory review. Use of un- or ill-qualified persons might 'make the numbers look good' in terms of capacity, but the outcomes can be dangerous, especially when it comes to approving safety-related issues (e.g., geotechnical assessments and design, structural analysis and design, fire safety design, etc.).

[9] For examples, see http://www.doingbusiness.org/data/exploretopics/dealing-with-construction-permits

5.2.10	What is the number of staff in each Planning Department, Building Department and Fire Department (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the country, region or city(ies) covered by the project, such as: a) wetlands infringement; b) improper building use; c) building modification, including increase in area, height, change of use; d) improper storage of hazardous materials; and e) inadequate upkeep of required safety systems (e.g., fire systems)?	Similar to the above line of questioning, this question seeks to understand the capacity, in numbers, of persons available for enforcement activities. In this case, we focus largely on post-occupancy enforcement, as improper use of permitted buildings, improper storage, etc. can lead to significant losses in hazard events – much more so than in compliant buildings.
5.2.11	Identify the types and frequency of enforcement activities undertaken by relevant Planning Departments, Building Departments and Fire Departments (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the country, region or city(ies) covered by the project, such as: a) site inspection; b) building inspection; c) stop work orders; and d) stop use of building orders.	As with 4.3.9 above, the number of enforcement activities which staff need to perform, and the target time allotted or required to perform those tasks, is essential information for assessing capacity.
5.2.12	What actual, verifiable qualifications are held by staff of the Planning Departments, Building Departments and Fire Departments (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the country, region or city(ies) covered by the project?	As with question 4.3.9 above, the capacity assessment rests on the qualifications as well as the numbers of staff involved in regulatory enforcement. Use of un- or ill-qualified persons might 'make the numbers look good' in terms of capacity, but the outcomes can be dangerous, especially when it comes to inspecting safety-related issues in operational buildings.
5.2.13	To what extent are land use planning, building and fire regulations used in the education of professionals in the country, region or city(ies) covered by the project? What are the different types of trainings and capacity-building programs available for building officials (course titles, content) and are they carried out by the government, associations of engineers/ architects, or other training institutions, and what level of expertise do they have in the topic areas?"	A well-functioning building regulatory framework needs suitably educated professionals and properly trained skilled craftspersons for building regulation to work effectively.
5.2.14	To what extent are land use planning, building and fire regulations used as educational tools for describing the benefit of regulation to be applied to any informal sectors which exist in the country, region or city(ies) covered by the project?	It is essential to socialize the benefits of the building regulatory framework via social networks outside of traditional channels, especially within informal settlements and other unregulated areas, where traditional communication paths may be absent.

5.3– Detailed Exploration

This implementation Component focuses on the implementation and management of the building regulatory framework at the level(s) associated with the project scope. The detailed exploration questions expand on the information highlighted in the screening questions for preliminary assessment of local capacity. (Note: Chapter 6 provides more detailed questions for assessment of regulatory and enforcement bodies, with respect to policies, procedures, staffing, function and capacity).

Documentation on the Jurisdiction of Concern (supports Screening Question 5.2.1)

As a starting point, one should document basic information on the characteristics of the jurisdiction and the organization of the local building regulatory function for the selected jurisdiction. This should include a wide range of documentation, such as: historical and political information on the administering entity, including a copy of the Charter and incorporation details, if any; copy of enabling legislation; organizational chart showing lines of authority within the jurisdiction; and map showing boundaries of the jurisdictional area.

One should collect environmental and topographical information as well, including: area (in square kilometers); geographical and topographical features that might have a bearing on structural performance, such as wind speeds and direction, rainfall, and coastal exposure. Geological information is also needed, especially in earthquake prone areas. One should collect information on industry, hazardous processes and storage, hazardous materials transportation, and related issues which may impact local environmental and human health and safety.

Social, economic and demographic information is important as well, including: current residential and daytime populations; population growth trends and projections; current housing count and future-needs projection; median housing price; property tax rate; and major contributors to local economy (tourism, manufacturing, education, etc.).

Extent of Promulgated Formal Regulations within Jurisdiction of Concern (supports Screening Question 5.2.1)

While it may be that a country has appropriate legislation to enable pertinent regulation, that fact alone does not mean such regulations have been adopted into use. One should know the extent of promulgation and enforcement in order to assess the effectiveness of the building regulatory framework.

As discussed earlier, even if a jurisdiction has formal regulations in place, they may not be applied to all geographic areas, they may have different sets of requirements or levels of performance delivered in terms of health, safety and welfare, and they may not address all building types within a use type (e.g., small sheds not meant for human habitation, but associated with domestic housing, are often not regulated). With this line of investigation, the intent is to determine, within formal building regulations, whether specific code provisions exist for indigenous buildings “non-engineered” and/or “informal” construction, if there are separate regulations for indigenous, “non-engineered” and/or “informal” construction, if there are any specific types, uses, sizes of buildings, which fall outside of formal regulation, and if so, the extent to which indigenous, “non-engineered” and/or “informal construction is used for these buildings.

In many low and middle-income countries, building codes do not include provisions related to indigenous or “non-engineered” structures. While building codes are relatively well-developed for more sophisticated engineered construction, significant vulnerability resides in the buildings

of the "informal" sector. If this is the case, it is of critical importance that either the regulatory framework be modified to address "informal" construction, or that appropriate guidance be provided for the safest possible use of local methods and materials of construction. This guidance may consist of best practice principles or "rules of thumb". Such authoritative guidance is an important link to the informal building sector.

A critical question, therefore, is whether formal land use planning, building, and fire regulations are legally promulgated and enforced throughout all areas of the country, region (state, territory, province), or municipality(ies) which will be materially affected by the World Bank project. Information that documents the extent of regulatory coverage should be collected.

Extent of Unregulated Area with Jurisdiction of Concern (supports Screening Question 5.2.2)

This question addresses to what extent are (or will be) buildings subject to formal regulations on planning, zoning, design, construction and use. In the case that a significant portion of the building stock is somehow outside of the building regulatory framework (e.g., 'informal' construction, shanties, etc.), there are limits on the effectiveness of a formal building regulatory framework.

To help assess the extent to which formal regulation is in place, and if it is desired or needed, this question aims to develop an estimate of the percentage of the country, region or city(ies) covered by the project which *does not* have a set of comprehensive land use planning, building, and fire regulations legally promulgated and enforced for all buildings.

This estimate should cover any areas of indigenous construction, which may be materially affected by the project, in particular disaster risk and vulnerability mitigation, disaster recovery, urban densification, and energy conservation type projects. One should estimate the percentage of buildings not currently subject to formal regulations.

Risks and Hazard Concerns for Jurisdiction(s) of Focus (supports Screening Question 5.2.3)

The range of natural and technological hazards that can be expected to impact the building stock covered by a project, should be well-understood for all geographic regions addressed by the project. In part this is to help assess whether the hazard and risk maps in the existing regulations are appropriate to meet the required mitigation targets.

Here it is important to identify the natural and technological hazards and risks of concern in the jurisdiction of the project, for comparison with building regulations, capacity of the practitioners, and related areas. Collection of information should include documentation on number and values of all annual losses by type, details on annual losses of note (e.g., large life loss or large monetary loss), and history of each for the past 50 years.

Relevancy of Hazard & Risk Maps for Jurisdiction(s) of Focus (supports Screening Question 5.2.4)

Related to the above, the presence of hazard and risk data, maps, and related information, within the regulations, does not assure that they are up to date and appropriate to the needs of the project, especially for disaster risk and vulnerability mitigation. This is especially true with respect to projected climate change related hazards and mitigation needs in the future.

This question aims to collect data relative to whether hazard and risk data, maps, etc., that are pertinent to the city(ies) covered by the project, are comprehensive, up to date, appropriately implemented in the regulations and available for use in assessing the adequacy of the regulations in mitigating or avoiding the hazards or risks.

Current and Projected Construction Outlook (supports Screening Question 5.2.5)

Aside from having the legislation and regulations in place, building regulatory capacity is largely a function of how many projects are being controlled, and how many people are involved in the regulatory control of those projects. This question provides benchmarking data on the historical and projected volume of construction. By estimating the 10-year historical and 10-year projected number of building projects – new construction, renovation, expansion, etc. – for the country, region or city(ies) covered by the project, this will provide helpful input on evaluating the capacity of the framework to adequately fulfill regulatory needs.

Number and Location of Applicable Planning, Building and Fire Departments (supports Screening Question 5.2.6)

The best, most up-to-date, and comprehensive set of planning, building and fire legislation and regulations will only be effective if they are implemented and adequately enforced. While neither the only nor a complete measure, obtaining a count of the total number of relevant departments, and of the fulltime staff working in each relevant department, in all relevant areas of the country, can provide insight into capacity and quality. This is especially true where rapid urban expansion is taking place, and the need for large staffs exist due to the volume of construction.

Data should be collected on how many fulltime-staffed Planning Departments, Building Departments and Fire Departments (or equivalent) are there in the jurisdictions covered by the project, and how many fulltime staff are employed in each Department in the relevant geographic area (i.e., country, region or municipality(ies) covered by the project). If contractors are used in support of fulltime staff, the associated number of contractors by department and geographic area should be obtained.

Baseline Staffing Situation – Fulltime and Contract Regulatory Staff (supports Screening Question 5.2.7)

Following on the above, this question aims to provide additional detail on the number of staff and/or contractors assigned to the key functions of regulatory review and approval. One should collect data on the number of staff, and where applicable, contractors, in each Planning Department, Building Department and Fire Department (or equivalent), who are responsible for reviewing and approving land use, zoning, building and fire regulation compliance, in the jurisdiction(s) covered by the project.

Baseline Regulatory Staff Functions and Loads (supports Screening Question 5.2.8)

The number of activities which staff need to perform and the target time allotted or required to perform those tasks is essential information for capacity assessment. In some countries, very short turnaround times are mandated by law (e.g., perhaps 2 weeks for review and approval or drawings and issuance of building permits), where in others up to a year might be expected. To be efficient, there needs to be an appropriate balance of available time and resources.

One should obtain data regarding the relevant department's responsibility for regulatory enforcement and administration of zoning, transportation, storm-water, floodplain management, utilities (water and sewer), landscaping, fire inspections, contractor licensing, occupational licensing, etc.

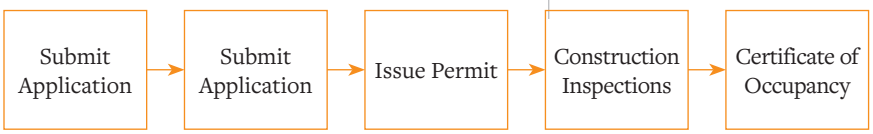
It is also important to identify the types, turnaround times and frequency of review and approval activities undertaken by relevant Planning

Departments, Building Departments and Fire Departments (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the jurisdictions covered by the project, such as:

a) site review;
b) plan / drawing review and approval;
c) calculation verification;
d) permit issuance, and for what (e.g., foundation, construction, ...);
e) site inspection, and for what (e.g., foundation, structure, materials, electrical, mechanical, plumbing, fire, ...);
f) witnessing of commissioning tests; and
g) issuance of certificate of occupancy.

Processes for Compliance with Regulations (supports Screening Question 5.2.8)

Robust regulatory frameworks for land use planning, building design and construction and fire prevention and control are characterized by a set of procedures for helping identify works being planned and carried out, and for review and approval of such works. Using the building design and construction process as an example, this would typically involve the entity requesting to conduct building works through an application for a building permit from the local authority and a process wherein the government or its designees would carry out one or more functions of review, inspection and approval before issuing notification of compliance, occupancy permit or similar.



This aspect of the assessment aims to understand what local processes are in place in relation to planning, design and construction, and fire prevention, to filings for permission to construct and/or occupy a building, components and steps in the process that need to be completed and by whom, and who has what responsibilities in the process. With respect to responsibilities, this is both for determination of compliance (e.g., local authority, third party reviewer, self-certification by practitioner), and responsibility for compliance (e.g., often the building owner, as further discussed below). One should collect the text of the processes.

Processes and Penalties for Non-Compliance with Formal Regulations (supports Screening Question 5.2.8)

In parallel with understanding the processes around compliance, it is also necessary to understand what types and forms of penalties are possible with respect to non-compliance with building-related regulations, and to what extent are such penalties levied. In many countries these can range from stop work orders, to civil penalties, and in some countries, criminal penalties. Information should be collected on the legal requirements and the history of enforcement of associated penalties.

Appeals Mechanisms and Processes (supports Screening Question 5.2.8)

This area aims to identify if there is an appeals process or a conflict resolution process related to interpretation or application of building regulations. Information to collect includes text of the appeals process, conflict resolution process, identification of adjudicating parties and how they are selected, appointed, the qualifications and experience that they are required to have, and evidence of successful utilization of these processes.

Processes for Third Party Certification (supports Screening Question 5.2.8)

In some countries, the use of third party (non-governmental) entities for regulatory review, inspection and approval is permitted. This can be an alternative to government (e.g., private certification in Australia or England), contractors to government (e.g., contract plans reviewers), or independent reviewers used on specific project types, such as performance-based designs. Such arrangements facilitate the expansion of building regulatory capacity through collaboration with the private sector. This can be an important means to expand regulatory coverage and expertise, particularly in low and middle-income countries.

It needs to be determined if there are legal provisions for the employment of certified third-party (private) specialized professionals in building control activities including plan review and inspection, and if so, to collect text of the enabling legislation. Enabling legislation should be specific about the modalities and the process of involving private professionals in building control and specify the professional certification requirements. They should have provisions on transparency and conflict of interest and create or enable accountability mechanisms in the form of a public or a public-private entity in charge of establishing and monitoring the standards.

In a robust framework, third party entities (individuals, firms) must be officially qualified and registered. There must be provisions to avoid conflicts of interest for firms practicing in the same market. Provisions for registration and management of third party reviewers and inspectors should be described.

One should collet documentation on all processes and qualifications regulating the use of third party reviewers / verifiers, the process of employment, and the control of private third party plan review and inspection professionals. Third party registration and management, and rules and provisions for liability coverage should also be obtained.

Collection and Values of Fees and Levies (supports Screening Question 5.2.8)

Many jurisdictions utilize fees or levies on various stages of the building regulatory process, including when applying for permits to build, for plans review and approval, and for inspection and witnessing of building commissioning.

It is assumed that the level of fees to be charged are proportional to the effort, and should not duplicate other sources of funding. Fees charged by local building authorities should be based on the actual cost associated with the review of building plans and site inspections, including overhead costs. Fees charged for construction permitting and building inspection may be expected to cover the costs of regulatory services. Data to be collected includes fee schedules for building authorities at the local level and assessment should be made regarding uniformity of application across jurisdictions.

Baseline Qualifications of the Fulltime Regulatory Staff (supports Screening Question 5.2.9)

The capacity assessment rests on the qualifications as well as the numbers of staff involved in regulatory review. Use of un- or ill-qualified persons might ‘make the numbers look good’ in terms of capacity, but the outcomes can be dangerous, especially when it comes to approving safety-related issues (e.g., geotechnical assessments and design, structural analysis and design, fire safety design, etc.).

The qualifications held by the fulltime staff of the Planning Departments, Building Departments and Fire Departments (or equivalent), who are responsible for reviewing and approving land use, zoning, building and fire regulation compliance, in the jurisdiction(s) covered by the project, should be identified and documented.

Baseline Staffing Situation – Fulltime Enforcement Staff (supports Screening Question 5.2.10)

Similar to the above line of questioning, this question seeks to understand the capacity, in numbers, of persons available for enforcement activities. In this case, we focus largely on post-occupancy enforcement, as improper use of permitted buildings, and improper storage, etc. can lead to significant losses in hazard events – much more so than in compliant buildings.

One should document the number of staff in each Planning Department, Building Department and Fire Department (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance in the jurisdictions covered by the project, such as the following:

a) wetlands infringement;
b) improper building use;
c) improper storage of hazardous materials; and
d) inadequate upkeep of required safety systems (e.g., fire systems).

Baseline Enforcement Staff Functions and Loads (supports Screening Question 5.2.11)

The number of enforcement activities that staff needs to perform and the target time allotted or required to perform those tasks is essential information for capacity assessment. In some countries, annual 'warrant of fitness' reports and inspections are required. In other countries, by legislation, enforcement entities may only enter a premises if it is suspected that a clear and present danger exists.

The types and frequency of enforcement activities undertaken by relevant Planning Departments, Building Departments and Fire Departments (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the jurisdiction(s) covered by the project, such as the following, should be documented:

a) site inspection;
b) building inspection;
c) stop work orders; and
d) stop use of building orders.

Baseline Qualifications of the Fulltime Enforcement Staff (supports Screening Question 5.2.12)

The capacity assessment rests on the qualifications as well as the numbers of staff involved in regulatory enforcement. Use of un- or ill-qualified persons might 'make the numbers look good' in terms of capacity, but the outcomes can be dangerous, especially when it comes to inspecting safety-related issues in operational buildings.

One should identify and document the qualifications held by fulltime staff of the Planning Departments, Building Departments and Fire Departments (or equivalent), who are responsible for enforcing land use, zoning, building and fire regulation compliance, in the jurisdiction(s) covered by the project.

Extent of Education and Training Based on Regulatory Documents (supports Screening Question 5.2.13)

Building codes should be the subject matter of building professional education and construction workforce training, especially at the local level. This area focuses on the extent to which building regulations are included in the curriculum of professional schools of architecture, planning and engineering, as well as being part of training programs for local practitioners and regulatory and enforcement officials. One should collect examples of regulation related training materials and description of educational and training programs.

Educational Curricula and Outreach Materials (supports Screening Question 5.2.13 and 14)

A well-functioning building regulatory framework needs educated professionals and properly trained skilled craftspersons for the framework to work well. This relies on having a sound set of university educational programs for professionals, such as architecture and engineering, but also appropriate training institutions for skilled tradespersons and craftspersons who are involved in areas such as construction, installation and maintenance of buildings and systems.

In addition, these people should be trained on the regulations and supporting infrastructure (e.g., standards). As such, it is helpful to have educational curricula regarding the structure, content and use of land use planning, building, and fire regulation that can be used as a basis of formal education and continuing professional development.

It is also essential to socialize the benefits of the building regulatory framework via social networks outside of traditional channels, especially within informal settlements and other unregulated areas, where traditional communication paths may be absent. This may be through social workers, medical professionals or others, who work with inhabitants, observe conditions, and can help facilitate changes. Having outreach materials about the benefits of formal regulatory frameworks and components can be very useful in this regard.

Free Access to Regulatory Documents (supports Screening Question 5.2.13 and 14)

Access to regulatory documents is critical to facilitate uptake, proper application of and compliance with regulations. Documents should be readily available in hard copy and digitally, if possible. They should be distributed freely or at nominal cost to designers and builders. They must be available in all official languages and written in accessible form.

It is understood, however, that regulatory development has costs associated with it. As such, it should be determined how development and dissemination costs are covered (e.g., by permit fees, education sessions, government support, or other). If regulations are not free, it should be determined what is covered by the sales costs of the regulatory documents, i.e., the regulatory development process, maintenance process, development of handbooks and associated explanatory material, development of training materials, etc. One should collect evidence of on-line availability of regulations and, if applicable, the price list for regulatory documents.

Chapter 06

Operational Capacity – Detailed Information Requirements

This section lists a set of data, which if available, will be helpful in assessing the operational capacity of specific Planning, Building and/or Fire Departments in jurisdictions of concern. These build on the Detailed Exploration for Implementation discussed in Chapter 5.

Staff Information (supports Screening Question 5.3.7)

- Does the building department have a sufficient number of permanent or contract staff with the range of expertise to carry out its normal functions?

  Collect text: Organizational chart providing employee names and titles for all full- and part-time staff positions within the code enforcement organization and the total number of employees. Job descriptions of full-time and part-time staff positions, including information on minimum qualifications, education and certification and/or licensing requirements for contract code officials (including all administrative functions: Administration, Plan Review, etc.).

- What are the methods of hiring, training and supervising code officials?

  Collect text: Written hiring and training procedures.

- How are individuals' qualifications, education, etc. verified?

- What are current standings and expiration dates of required certification(s) issued by a national construction code promulgation organization or acceptable certification organization, as determined by local ordinance or state laws?

- Does the department have a system of

performance evaluation? Are clearly defined performance goals evaluated on a regular schedule?

Collect text: Departmental performance goals

- Does the department have minimum continuing education requirements?

  Collect text: Departmental continuing education requirements.

- What is the participation of individual code officials in code development activities?

- Are there education, experience and training requirements for performing post-disaster assessments and making substantial damage determinations in earthquake, flood or storm hazard areas?

  Collect text: Documentation on post-disaster assessment training.

Plan Review (supports Screening Question 5.3.8)

- Does the department employ an adequate number of plan reviewers, by category (i.e. single-trade, such as structural, mechanical, plumbing, electrical, etc.)?

- What is the percentage of plan reviews completed by contract staff?

- Are there bonding requirements for contract plan reviewers?

- Are there registered design professionals on staff, full-time, part-time or contract?

  Collect text: Data on number and qualification of registered design professionals on staff.

- Are there policies, procedures and checklists for plan reviews?

  Collect text: Written policies and checklists for plan review.

- What is the number of reviews done annually, by category, such as residential buildings, commercial buildings, site development plan reviews, and others, such as fire sprinklers, alarms, etc.?

- What is the system used for tracking and coordinating plan review activities?

- What are department requirements for review of building plans for structural parameters?

- What is the number of plan reviews done by department staff in the last 12 months that resulted in rejection or correction of designs (residential and commercial)? What is the number of plan reviews done by contract staff in the last 12 months that resulted in rejection or correction of designs (residential and commercial)?

- What are typical reasons for rejections or correction of designs?

- What are policies and procedures for approving alternate materials and methods of construction?

  Collect text: Policies and methods for approval of alternative materials.

- Are service goals for plan review established with stakeholder input and is performance toward meeting stated goals monitored regularly?

Permitting Information (supports Screening Question 5.3.8)

- What is the process for issuance of permits?

- How is the permitting process coordinated with other government departments?

- What is the process for establishment of permit fees?

- What is the number of permits issued in the

last 12 months, by category for:

1) Residential permits:
   a. new;
   b. alterations;
   c. repairs;
   d. additions; and
   e. single family and multifamily.
2) Commercial permits:
   a. new;
   b. alterations;
   c. repairs; and
   d. Additions.
3) Construction type:
   a. number of permits issued for each construction type and occupancy classification (including mixed-use occupancies);
   b. permit type: number issued by category, such as building, mechanical, electrical, plumbing, fuel gas, etc., or combination/master permits;
   c. flood hazard areas: number of permits for new buildings and substantially improved buildings issued in the last 12 months for construction in designated flood hazard areas; and
   d. historic building preservation.

- What is the size (in square meters) most typical of buildings permitted in the past 12 months?
- What is the size (in square meters) of the largest building permitted in the last 12 months?
- What is the story height of the tallest building permitted in the last 12 months?
- Are service goals for permitting established with stakeholder input and performance toward meeting stated goals monitored regularly?
- Is there a procedure for dealing with expired or inactive permits?

Inspection (supports Screening Question 6.3.8)

- Does the department employ an adequate number of inspectors by category (i.e. single-trade, such as structural, mechanical, plumbing, electrical, or multi- trade)?
- What are the number of private inspectors employed and their types of contract?
- Percentage of inspections completed by contract staff?
- What are policies, procedures and checklists for inspections?

  Collect text: Written policies and checklists for inspection.
- What is the number and what are the types of inspections done (by category, such as structural, mechanical, plumbing, electrical, fuel gas, fire) in the last 12 months?
- What is the percentage of work rejected and corrected?
- What are typical reasons for rejections and corrections?
- What are the procedures for overseeing work done by private inspection providers hired by owners?

Special Inspections (supports Screening Question 5.3.8)

- Are special inspectors, structural observers, approved fabricators/welders utilized?
- What are accreditation requirements or field monitoring of special inspection?
- What is the procedures for approving third-party inspection and testing agencies?
- What are special inspector reporting requirements?

Final Inspection (supports Screening Question 5.3.8)

- What are procedures for final inspections conducted by the department? Are there procedures for collection of as-built elevation certificates prior to certificate of occupancy in flood hazard areas?
- What provisions are made for clear, concise and accurate reporting of inspection results? What are procedures to guard against the alteration of inspection report records?
- Are service goals for inspection established with stakeholder input and is performance toward meeting stated goals monitored regularly?
- Is there a documented procedure for the issuance of certificate of occupancy or certificate of completion or temporary certificate of occupancy?

  Collect text: Written procedure for issuance of Certificate of Occupancy.

Verifications of Credentials/ Professional Licenses (supports Screening Question 5.3.8)

- What is the process for verifying builder and contractor licenses and insurance?

  Collect text: Written process for verifying licenses and insurance.
- What is the process for verification of licenses of registered design professionals?

  Collect text: Design professional registration criteria.
- What is the process for verification of special inspector's special inspection agency credentials?

  Collect text: Special inspector credential criteria.

Complaints and Appeals (supports Screening Question 5.3.8)

- Is there a documented procedure in place to record, investigate and resolve complaints against contractors, work without permits and other similar violations?

  Collect text: Written procedure for investigation and resolution of complaints.
- Is there an established board of appeals with documented procedure for hearing and deciding appeals in accordance with other adopted national construction codes?

  Collect text: Rules of the Board of Appeals.

Existing Buildings (supports Screening Question 5.3.10)

- Does the department have responsibility for the implementation of an existing building code and the inspection of existing buildings for protection of public health and safety?
- Does the department have the authority to require improvement or to condemn and remove hazardous existing buildings?
- How many corrective actions involving existing hazardous buildings have been initiated in the past 12 months?

Outreach and Community Relations (supports Screening Question 5.3.14)

- What efforts are made to bring the benefits of safer construction to the informal sector?
- What awareness programs and community outreach activities are conducted by the department?

  Collect text: Program documents from outreach activities. Provide description of all documents provided to the public.
- Is the department engaged in any training

or code compliance support for the building sector, owner-builders or students?

- Are there examples of innovative outreach practices developed by the department?

Policies and Procedures (General capacity)

- Can the department provide documented evidence of steps taken to avoid potential conflicts of interest?
- Does the department have established standard operating procedures and a process in place to control uniformity of operations?
- Describe accessibility of information and records, documented minimum retention times for records, and provide evidence of safe storage of records.
- Does the department maintain control of access to records? Are there adequate safeguards in place to prevent unauthorized access or modifications to records?
- Does the department have a quality assurance plan?
- Does the Department have written policies or statutes in place which provide code officials freedom from external and internal pressures and influences that may impair the enforcement of codes?

  Collect text: Written policies protecting code officials from external influence.
- Can the department provide documented evidence of steps taken to avoid potential conflicts of interest?

Equipment and Technology (General capacity)

- Does the department provide adequate facilities and equipment to employees and contract personnel (i.e. computers, internet access, books, manuals and tools, gauges, meters and equipment used for plan review and inspection functions)? What relevant computer programs are in use?
- Does the department provide adequate transportation equipment and provide policies on use and maintenance?
- Is adequate support provided for information technology (ITC) applications?
- What is the validation procedure for computer programs used for plan checking (e.g. hand calculations)?

  Collect evidence of validation of computer programs.
- Does the department have policies guiding appropriate employee and contract personnel use of wireless voice and data communication, such as cell phones, wireless networks, etc.?

Department Budget (General capacity)

- What was the budget for code implementation and enforcement for the past fiscal year? What was the revenue versus expenditure? Is the department self-supporting?
- What is the operating budget type (i.e., General Fund, Enterprise Fund, other means of funding)? What part of the department budget is funded from permit fees?
- What is the method of financial audit (i.e. internal or third-party)?
- Does the building department have access to legal counsel and prosecution support?

Chapter

07

Quick Assessment Scorecard

While a detailed assessment of the building regulatory capacity of a country is expected to appropriately determine investment decisions on the benefits of building regulatory capacity enhancement, one can obtain a 'first-order' estimate, based on answers to the questions posed in Chapters 3, 4 and 5. The scorecard is meant to provide a quick snapshot, or summary, of the regulatory environment through closed questions prompting 'yes' or 'no' answers.

The Background is intended to baseline the scope of the effort. The breadth in terms of number of government agencies or levels of government involved gives insight into the number of entities that may one may need to contact and the complexity and magnitude of assessment effort. A small country with a national government system and national scope will likely require less resources than a large federal system, where differences exist between states (territories, provinces) and municipalities, and the regulatory framework needs to be addressed at all levels.

1	Background	
1.1	The project scope is: (a) national; (b) regional (state, territory, province within the country); (c) municipal (city level).	
1.2	The project type is: (a) disaster risk / vulnerability reduction; (b) disaster recovery; (c) rapid urbanization; (d) climate change adaptation; (e) resource / energy management; (f) upgrade of informal settlements; (g) protection of cultural heritage.	
1.3	What are the natural and technological hazards and risks of concern in the country, region or city(ies) covered by the project?	

Chapte 3 Legal and Administrative Component provides a quick snapshot of the extent of regulatory capacity-building that may be needed with respect to enabling legislation. Quite simply, the more enabling legislation in place, the less resources will be needed to build capacity. All 'yes' responses likely means a good legislative infrastructure is in place, and investment needs are comparatively low. All 'no' responses might suggest significant investment and time are needed.

2	Legal and Administrative Basis for Building Regulation	Yes	No	Partial
2.1	Are there acts, decrees, laws or similar that enable the regulation of building aspects pertinent to the project (i.e., land use, building design and construction, fire prevention, energy conservation, accessibility, or preservation of cultural heritage)?			
2.2	Are there formal regulations (codes / standards) for those areas pertinent to the project?			
2.3	Are there acts, decrees, laws or similar that enable the regulation / licensing / certification of: architects / planners; engineers; builders (carpenters, masons, ...); trades (plumbers, electricians, ...); contractors / installers; building officials; fire officials?			
2.4	Are there acts, decrees, laws or similar that enable the regulation / certification / testing / quality control of: building materials (e.g., steel, timber, masonry, concrete, ...); building products and systems (e.g., walls, doors, windows, heating appliances, lighting systems, etc.); and contents or aspects of contents (e.g., materials which may be toxic, ...)?			

Much like above, Chapter 4 Development and Maintenance Component provides a quick snapshot of the extent of regulatory capacity building that may be needed around the specific regulations (e.g., planning and zoning, building, fire, etc.). As with the above, the more formal regulatory components in place, the less capacity building resource will be required. All 'yes' responses likely means a good regulatory infrastructure is in place, and investment needs comparatively low. All 'no' responses might suggest significant investment is needed.

3	Regulations (Codes/Standards), Development and Maintenance	Yes	No	Partial
3.1	If formal land use planning / zoning regulations exist, do they incorporate: (a) hazard maps or related means that identify areas in which building is not permitted due to natural hazards; (b) hazard maps or related means that identify minimum separation between residential and hazardous occupancies; (c) maps or related means that identify areas in which building is not permitted in relation to natural resources; and (d) requirements for infrastructure associated with building density, population or related factors?			
3.2	If formal building regulations (codes, standards) exist, do they have specific provisions for, or is there a separate building code, for indigenous buildings, "non-engineered" and/or "informal" construction? By 'formal' we mean adopted by law and are enforceable, not used simply as guidance.			
3.3	If building regulations (codes, standards) exist, do they have: (a) Hazard maps identifying expected natural hazard loads by region; (b) Requirements for structural resistance to expected hazard loads; (c) Requirements for moisture resistance to expected hazard loads; (d) Requirements for fire separation from other buildings, wildland interfaces, etc.?			
3.4	If formal building and fire regulations exist, do they require, by reference, the use of nationally or internationally recognized *consensus standards* that specify required material properties and performance (e.g., strength, durability, fire resistance, ...), the tests to confirm performance, and requirements for design, installation, testing and maintenance of building and safety products, components, systems and assemblies? If so, what standards are referenced?			

Chapter 5 Implementation Component is a more detailed assessment to determine to what extent the systems, documents and appropriately educated and trained people are in place to facilitate the regulatory framework. The rating here may require somewhat detailed information, especially with respect to percentage coverage of 'formal' building code, and numbers and training of regulatory and enforcement personnel. In particular, on 4.2, having a solid 'formal' framework in place is all well and good, so long as it applies to a significant portion of the country for which the project is targeted. If not, and the 'informal' sector is dominant, that much work and resource may be needed to achieve objectives.

4	Implementation and Enforcement Mechanisms	Yes	No	Partial
4.1	Are formal land use planning, building, and fire regulations legally promulgated and enforced *throughout all areas of the country, region (state, territory, province), or city(ies).*			
		> 80%	**50% - 80%**	**< 50%**
4.2	If the answer to 4.1 is no, indicate the estimated percentage of the country, region or city covered by the project which *does not* have a set of comprehensive land use planning, building, and fire regulations legally promulgated and enforced for all buildings. Include in this estimate any areas of indigenous, "non-engineered" and/or "informal" construction that may be materially affected by the project, in particular disaster risk / vulnerability mitigation, disaster recovery, urban densification, and energy conservation type projects. Estimate the percentage of buildings not currently subject to formal regulations.			
4.3	Are hazard and risk data, maps, etc. pertinent to the country, region or city(ies) covered by the project: comprehensive, current, and appropriately cited in the regulations and available to assess the adequacy of the regulations in helping mitigate or avoid the hazard or risk?			
4.4	Are there fulltime-staffed Planning Departments, Building Departments, and Fire Departments in the geographic region of importance to the project?			
4.5	Based on initial assessments, are the departments in 4.4 above reported to be adequately staffed in terms of number and qualifications of staff?			

Glossary

Accreditation system:
The term "accreditation system" describes a national framework through which a national accreditation body attests that a conformity assessment body (e.g. a testing laboratory, inspection body, or certification body) meets the set standard requirements. Where applicable, additional requirements, such as those set out in relevant sectoral schemes, may be necessary to carry out a specific conformity assessment activity.

Alternate materials and methods of construction
A material, design or method of construction that does not comply with one or more specific provisions of a building code, but which has been deemed acceptable for use by the authority having jurisdiction, where the authority finds that the proposed design or product adequately and satisfactorily complies with the intent of the provisions of the code.

Appeal
Request for reconsideration of any administrative decision by the department related to its enforcement authority. Administrative decisions include:

- refusal to accept an application for issuance of a permit
- refusal to proceed with plan check or inspections
- corrective action requests
- refusal to agree with the designer's code interpretation
- decisions to deny, suspend or halt construction work
- any other action that impedes the attainment of a permit for construction or certificate of occupancy.

Applicant
An individual or corporation applying for a building construction permit or plan review in accordance with local codes or other normative documents.

Approved
Acceptable to the official having jurisdiction.

Approved Agency
An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved through an established accreditation process.

Authority Having Jurisdiction (AHJ)
An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

Building
Any structure used or intended to support or shelter any use or occupancy.

Building Regulation (Building Code, Building Standard)
A set of rules that specify the standards for constructed objects such as buildings and non-building structures. The term used can differ by country (e.g., in Australia and the USA, the term *building code* is used, in England and Wales, the term *building regulation* is used, and in Scotland, the term *building standards* is used, all with the same meaning).

Building Department/Code Enforcement Agency
Authoritative body which performs functions related

to enforcement of construction and other laws.

Building Code (Regulation) Administrator / Building Official / Code Official / Building Surveyor / Building Authority / Certifier / Verifier
The officer or other designated authority charged with the administration and enforcement of codes as adopted in their jurisdiction. May be governmental or private sector.

Certificate of Occupancy
A document issued by a local government agency or building department certifying a building's compliance with applicable building codes and other laws, and indicating it to be in a condition suitable for occupancy.

Certified/Licensed Contractor
Any contractor who possesses a certificate of competency issued by state regulators and who is allowed to contract in any jurisdiction of the state.

Code Commentary
Non-mandatory, explanatory text, provided as a supplement to code provisions, to support understanding of technical aspects and rationale for code provisions.

Code Promulgation
The formal proclamation or declaration that a new statutory or administrative code is in force.

Comprehensive building code
An adopted law or ordinance with the purpose of providing minimum standards to safeguard life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures within a jurisdiction. A comprehensive building code includes an integrated compatible set of provisions that facilitates unified design and compliance.

Consensus Process
A decision-making process in which group members develop, and agree to support a decision in the best interest of the whole. Consensus may be defined professionally as an acceptable resolution, one that can be supported, even if not the "favorite" of each individual.

Construction Documents
Written, graphic and pictorial documents prepared or assembled to describe the design, location and physical characteristics of a building project. These typically include design drawings, material / system specifications, design calculations and similar.

Contract Staff
A third-party individual or entity hired by the local jurisdiction to carry out functions on behalf of the government on a contractual basis instead of as a member of staff..

Control
The direction, regulation and coordination of procedures and related documents to assure consistency of operations.

External/Internal Pressures and Influences
Interference with due process of code development, adoption, promulgation or enforcement by persons in a position of power (such as elected officials or others influential in the community).

Historic/Heritage Buildings
Buildings that are designated as being historic or reflecting cultural heritage, and are protected as such, under appropriate legislation.

Implementation Rules / Ordinances / Ministerial Orders
Administrative rules that govern the activities of building officials in the application of building code provisions to the design and construction process.

Informal Construction Sector
Construction without building permits including four dimensions of informality: (i) employment of workers; (ii) form of enterprise; (iii)

compliance with procedural requirements; and (iv) compliance with planning and building regulations.

Building failure and collapse stem principally from hasty construction, low quality workmanship, poor supervision, inexperience, ignorance, evasion/ non-compliance with building regulations and non-enforcement of building quality, standards and control. Construction quality is threatened by informality of land tenure and lack of access to formal financial mechanisms

Internal Quality Audits
Internal studies to identify the extent to which documented procedures are followed and the effectiveness of current processes.

Jurisdiction
The territory over which the authority to enforce adopted codes is exercised.

Management or Operational Audits
Independent evaluations conducted by a qualified entity, at the request of the elected or appointed officials, to measure the operational consistency and overall efficiency of the department/code enforcement agency.

Management Reviews
Reviews performed by management of internal audit findings (including quality audits) to assess the organization's level of procedural conformance, identify and correct areas of nonconformance and inefficiency, and engage staff in improving processes and procedures.

Permit
An official document issued by the authority having jurisdiction which authorizes performance of a specified activity, such as the initiation of construction or occupancy of a building.

Professional Certification / Licensure
The process of quality control for the building and regulatory professionals (e.g. architects, engineers, contractors). Typical requirements include: completion of accredited educational program, professional apprenticeship and examination.

Proportional Liability
A system of proportional liability permits a defendant to be held liable for damages only in proportion to their fault (negligence?) in creating an unintended or unacceptable outcome due to non-compliance with the code or failure to act in accordance with the prevailing standard of care. On contrary, at common law the all-or-nothing rule requires that a plaintiff have either a full recovery against the defendant or none at all.

Quality Assurance
The maintenance of a desired level of quality in a service or product, especially by means of attention to every stage of the process of delivery or production.

Quality Assurance Plan
Documents which set forth the policies and practices aimed at ensuring the quality of the organization's services.

Reference Standard
Reference standards typically refer to standards produced by national or international standards-making organizations, following well-defined processes for development and agreement as reflecting the consensus of the parties involved, which are part of a building code / building regulation through reference in the code to the standard. Such standards are instrumental in specifying, evaluating, and testing the dimensional, mechanical, rheological, and other performance requirements of the materials used in the manufacture of main and auxiliary building parts and components. Such reference standards are helpful in defining for manufacturers, construction companies, architectural firms, and other users of such parts and components their proper fabrication, installation, test and maintenance procedures.

Registered / Licensed / Certified Contractor
Any contractor who has registered with the appropriate state agency pursuant to fulfilling the competency requirements in the jurisdiction for which the registration is issued. Registered contractors may contract only in such jurisdictions.

Registered / Licensed Design Professionals
Individuals registered or licensed to practice their respective design professions as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be implemented.

Service Goals
Goals set for performance in each area of service offered by the building department or code enforcement agency. Goals must be quantified (expressed as a number, rating or grade) and established in cooperation with users of department services (citizens, architects, engineers, contractors, etc.), as well as elected and appointed officials. A system must be in place to regularly measure progress in meeting service goals. As part of this system, targets should be established for improvements in three separate areas of overall service: timeliness (turnaround time); quality (error rate); and professionalism (quality of interactions with staff [e.g., knowledge, attitude, responsiveness and helpfulness of staff members] as perceived by users of department services).

Special Inspection
Inspection as herein required of the materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards. Special inspection agencies are required to demonstrate competence, to the satisfaction of the building or other code official, for inspection of the particular type of construction or operation requiring special inspection.

Temporary Certificate of Occupancy
A Temporary Certificate of Occupancy grants residents and building owners all of the same rights as a certificate of occupancy, however it is only for a temporary period of time. Temporary certificates of occupancy are generally sought after and acquired when a building is still under minor construction, but there is a certain section or number of floors that are deemed to be habitable and, upon issuance of a temporary certificate of occupancy, can legally be occupied or sold.

Third Party Reviewer / Inspector
A competent, independent entity approved by the building official having jurisdiction to perform specified tasks, such as plan review and building inspection.

Third Party Review
A third-party review consists of having an independent party (other than the designer or the building department) review a building design to assess its compliance with building codes and other relevant regulations. Modern, effective construction systems increasingly involve licensed or approved private engineers, often delegated by the municipality or the responsible local enforcement agencies, to fulfill this function.

Voluntary Compliance
The act of obeying a particular rule or law, or of acting according to an agreement without being forced to.

References

Angel, S., Blei, A., Parent, J., Lamson-Hall, P., and Galarza Sánchez, N. 2016. Atlas of urban Expansion. NYU Urban Expansion Program at New York University, UN-Habitat, and the Lincoln Institute of Land Policy.

Meacham, B.J. and van Straalen, I.J. 2017. "A Socio-Technical System Framework for Risk-Informed Performance-Based Building Regulation." Building Research & Information.

UN-Habitat. 2016. "World Cities Report, Urbanization and Development, Emerging Futures." Nairobi: UN-Habitat.

Market Reports Store. 2015. "Global Construction Market Worth $10.3 Trillion in 2020 (50 Largest, Most Influential Markets)."

World Bank. 2016. "Building Regulation for Resilience: Managing Risks for Safer Cities." Washington, D.C.: The World Bank.

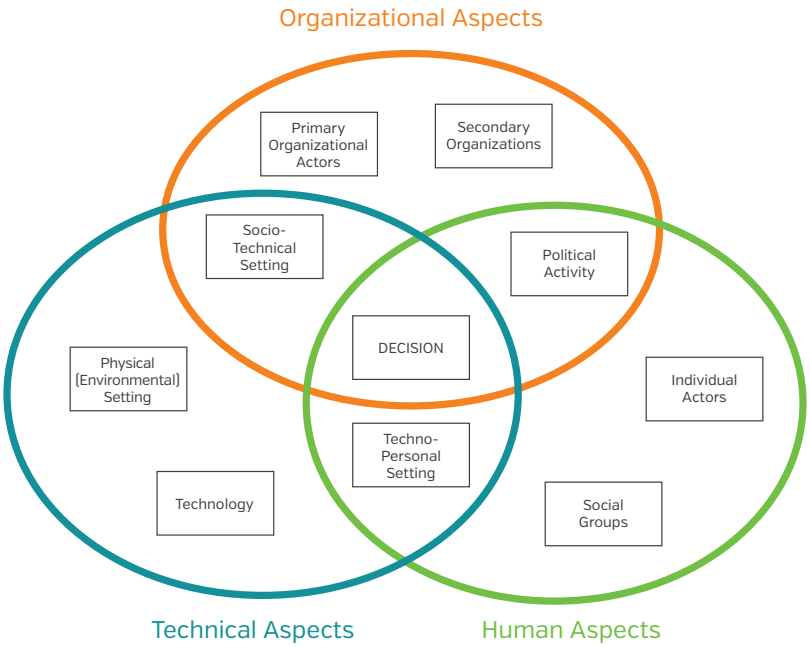
Annexes

Annex A: Overview of Building Regulation as a Socio-Technical System

Building regulatory frameworks are complex socio-technical systems (STS). STS theory and concepts emerged from studies of organizations and the roles of social and technological components, and the realization that they are integrally linked. There are many definitions of STS. But most share core concepts of: understanding the component parts, and how each contributes to the performance of the enterprise and creates or meets the requirements of other parts; the interrelation of these parts, with particular reference to the problems of internal coordination and control; and the analysis of the relevant external environment of the enterprise and the way the enterprise manages its relations to it. One representation of STS is illustrated in Figure B.1.

Viewing the building regulatory framework as a STS is useful as it helps to place into context the major subsystems that impact policy adoption and the implementation decision-making process. This is needed given the complexity of the building regulatory framework. Complex dynamic economic forces, business practices, technological options, alternative regulations, scientific understanding and public opinion influence each of the interrelated subsystems. Social values, and public perceptions and demands shape strategies designed to address public interest concerns. Being able to see how these influences interact is important in order to facilitate good outcomes. Any policy decision related to the built environment must take into account the form of law and regulatory environment of a jurisdiction, as well as the relationship and balance with market forces, whether one is operating in a more regulatory-driven or a more market-driven environment. These attributes can impact

Figure B.1 – Framework for socio-technical decision making



Source: Meacham and van Straalen, 2017.

the extent to which the public and experts are involved, and when, which in turn can influence, and are influenced by, public perception of risk associated with the hazards and the acceptability of approaches to quantify and manage the hazards and risks. The perceptions and responses are influenced by whom is at risk, from what, and under what circumstances. Ultimately, the success of risk-informed policies or strategies to mitigate the risk to a tolerable level are influenced by these complex interactions.

Annex B: Contractor Terms of Reference

Adequate assessment of building regulatory capacity will require a combination of expertise, at a minimum, policy and technical. The specific expertise and qualifications will depend on the scope of the project (e.g., disaster risk and vulnerability mitigation versus energy performance), as well as the component level for analysis (e.g., legal and administrative, regulatory development and structure, or implementation and enforcement). Representative qualifications are provided below by component level. These areas serve as a template for constructing a project-specific set of terms of reference.

TOR Template

Specific terms of reference (TOR) will need to be developed for each project. The type of project will dictate specific policy and technical needs. The following serves as a template, for identification of specific contract skills and expertise by building regulatory framework component.

Component 1 – Legal and Administrative

Policy Expertise

At this level, it would be ideal to have someone with a legal background, who understands legislative processes, and has experience interacting with senior politicians and policy makers, such as Members of Parliament, Ministers, Agency or Department Directors, and so forth. This is particularly important if the legal and administrative frameworks necessary to support planning, building and fire regulations are not in place.

Technical Expertise

At this level, technical expertise may be focused around issues of economics, finance and risk, in terms of being able to support economic impact analysis, benefit-cost analysis and the like, as related to impact of regulation and market.

Component 2 – Regulatory Development and Structure

Policy Expertise

The ideal qualifications and expertise to facilitate policy-level assessment of this component includes either an engineering, architecture or building control degre, with experience serving as head of a planning, building or fire regulatory development agency. The candidate should have served at least 10 years in a lead management or administrative role with responsibilities for development of regulation, consultation with industry and the public, and promulgation of the regulations. The experience may come from the national, regional or local level.

Technical Expertise

Technical expertise at this level will depend greatly on the type of project and associated needs. Building regulations, for example, are largely developed in 'silos' based on input from appropriate technical professions. Structural engineers input to structural stability issues with specific expertise from earthquake engineers, wind engineers and others as appropriate to design requirements. Geotechnical and civil engineers are involved in requirements around soils, foundations, drainage and the like. This will be important for assessing capacity of regulations relative to such hazards as liquefaction, earthquake ground motion, landslides, etc. Fire protection engineers address fire and life safety (egress) issues in buildings. Building services engineers (sometimes mechanical engineers and/or architectural engineers) are largely responsible for building energy related issues (e.g., heating, cooling, ventilation, and the like). Depending on the needs of the project, appropriate technical expertise will be needed to assess the regulations, reference standards, codes of practice (for engineers), design guidance, technical qualifications, etc. These persons should hold university qualifications in their discipline, and hold Professional Engineer or Chartered Engineer status in their respective disciplines. They should have at least 10 years of experience in design of appropriate components (e.g., foundations, structure, etc). Experience in forensic investigation is also helpful. For those working on disaster risk and vulnerability mitigation, experience in investigative studies will be helpful (e.g., post-earthquake assessment of buildings and infrastructure, post-landslide investigation of soils, foundations and retaining walls, etc.).

Component 3 – Implementation and Enforcement

Policy Expertise

The principal qualification for the policy expert at this level is 'hands-on' experience in implementation and enforcement, such as land use planner, building control officer (code official, verifier, certifier), and fire prevention officer. The ideal person will have had at least 10 years managing a local planning, building or fire prevention department, having had responsibility for hiring, training and assessment of staff, preparation and management of budgets for implementation and enforcement, and dealing with reviews, approvals, appeals and related legal matters. This person might have a qualification such as Certified Planner, Certified Building Code Official, or Certified Fire Prevention Officer. Education in a related discipline would be expected.

Technical Expertise

The expertise at this level would ideally be related to plans review, approval, and site inspection as

appropriate to the required technical discipline (e.g., foundations, structure, fire, etc.). An appropriate engineering or technical qualification would be expected, as well as at least 10 years of experience. This experience will likely to have been gained at the local (regulatory enforcement) level.

Local Knowledge and Experience

To supplement the policy and technical expertise and experience, it will be helpful to identify a local counterpart in the country of the project. This should be someone who understands the legal, regulatory and technical environments, as appropriate to the project, with experience at the appropriate level, as outlined above. This person will be essential in helping to make connections to the right persons for the purpose of collecting data and assessing capacity. They will serve as the conduit for local connections, helping to address language, culture and societal considerations.

Sociological and Culture Expertise

In some cases, it may be helpful to include contractors who have expertise in facilitating data collection from local populations through interviews, community meetings and other such interactions. It should not be expected that policy or technical experts will have these capabilities.

Vetting

As a corollary to the TOR template, the following outlines the suggested approach for identifying and vetting contractors, and developing assessment teams, as appropriate to project needs.

Identification and Vetting

There are essentially three stages to identifying, vetting and appointment of contractors.

First, a list of qualified contractors should be prepared, using the criteria in Section 3 to identify capabilities and expertise in policy and technical skills, as appropriate to the level of analysis and component of assessment. Contractors can be identified through past involvement with the World Bank, response to Requests for Qualifications (RFQs) or recommendation by existing World Bank staff and contractors.

Second, the contractors should attend a training program on building regulatory capacity assessment in low- and middle income countries, which will help orient them to the specific needs of such countries, and how they will apply the BCRA in support of project objectives. Training is anticipated to be conducted by the World Bank or designated contractor on the BCRA.. The aim is to help to achieve consistency in application, as well as prepare contractors for appropriate interactions in the field.

Third, appointment will be made of suitably qualified individuals, from the vetted pool, based on the specific needs of a project.

Finally, depending on the project country and need, one or more local collaborators, with appropriate experience and capabilities, will be identified.

Team Make-Up and Size

Regardless of level or component of analysis, a minimum team size is two persons: one with appropriate policy expertise and experience and the other with appropriate technical expertise and experience. This team will be supplemented by the local collaborator.

For large and complex projects (e.g., multi-hazard disaster risk and vulnerability mitigation), several different technical expertise sets may be needed. As appropriate, sociological or cultural expertise may be needed as well. Decisions will need to be made based on the scope of the project and available funds.

BUILDING REGULATORY CAPACITY ASSESSMENT

Level 2 – Detailed Exploration

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