

IMPLICATIONS OF INSUFFICIENT AWARENESS OF STATUTORY REQUIREMENTS FOR BUILDING CONSTRUCTION ON CONSULTANT TEAM OF BUILDING CONSTRUCTION PROJECTS

M.A.N.M. Sarathchandra

Central Tendering Division, Amana Contracting and Steel Buildings LLC, Dubai

B.A.K.S. Perera and R.A.G. Nawarathna*

Department of Building Economics, University of Moratuwa, Sri Lanka

ABSTRACT

All over the world, the construction industry is inherently subjected to a wide range of statutory requirements which are empowered by various bodies. Though, it is vital to comply with these statutory requirements, the rate of non-conformity is still high in the Sri Lankan construction industry giving rise to punitive actions, cost increases and overruns of project schedules. The researchers assume that either insufficient or lack of awareness of statutory regulations among members of construction consultant team is the main reason for this state of affairs.

The present study therefore focuses on identifying the substantial statutory requirements laid by the Urban Development Authority, Sri Lanka, vis-à-vis building construction in the Colombo Municipal area and their implications for construction consultant team such as Architects, Quantity Surveyors and Engineers, who may be unaware of the existence of such statutory requirements. Accordingly, the research was approached through a document survey and semi-structured interviews respectively. The gathered data was subjected to a content analysis based on the findings of which conclusions were drawn regarding implications and possible strategies to address the perceived problems.

The research reveals that the City of Colombo Development Plan 1999 and its amendment in 2008 with regard to zoning regulations are the twin sources of statutory requirements that are applicable for the Colombo Municipal area. They lay down the zoning regulations, planning regulations, building regulations, and required development guide plans that should be considered by architects and specify the statutory requirements relating to sanitation, mechanical ventilation and air-conditioning that engineers should adhere to when undertaking constructions in the area of the Colombo Municipal Council. The study findings also show how an understanding of Urban Development Authority regulations would help quantity surveyors to discharge their role as a member of consultant team better. On the basis of its findings, the study proposes strategies that could be implemented in order to overcome the identified problem of unawareness of statutory regulations in relation to the members of consultant team.

Keywords: *Building Construction; Colombo Municipal Council Area, Sri Lanka; Design Professionals; Implications; Statutory Requirements; Urban Development Authority.*

1. INTRODUCTION

The construction industry has become the 4th largest sector of the Sri Lankan economy, making up 6-7% of the Gross Domestic Product (GDP) during the past decade (Rameezdeen, 2009). The gradual expansion in the industry has necessitated government intervention in order to regulate it in terms of its performance, standards and the quality of the services that it provides to its customers (Weddikkara and Devapriya 2000). As Kumaraswamy put it, "The construction industry is the locomotive of physical development for the national economy" (cited in Enshassi, Al-Najjar and Kumaraswamy, 2009, p.127). Thus, in India, construction projects are subjected to a many Central and State government laws simultaneously in order to keep the projects both within the budget and in accordance with statutory

*Corresponding Author: E-mail - amalka.gayashini@gmail.com

requirements (Construction Industry Development Council, India, 2006). Statutory requirements, according to D. Singhal and Singhal (2012), are those requirements that are applicable in the industry by virtue of laws enacted by the government. In the case of Sri Lanka too, several statutory bodies have implemented numerous construction-related laws and regulations in order to ensure that the performance and quality of the industry reach and remain at certain specified standards. The Urban Development Authority (UDA) is one such statutory body that lays down regulations for the control and maintenance of standards within the Sri Lankan construction industry and it is the responsibility of key players in the construction industry to familiarise themselves and comply with the regulatory environment within which the construction industry operates (UDA, 2011). However, according to the Board of Investment (BOI), Sri Lanka (2013), the consultant team of construction projects have not complied with certain requirements specified for buildings due to lack of knowledge of the regulatory requirements. Such lack of awareness can result in unfortunate consequences: either discontinuation of the project or a higher budget than was anticipated. It is therefore essential for consultant team, as professionals who are responsible for the framework of the construction project on behalf of their client, to have a sound knowledge of regulatory requirements.

Therefore, the present study focused on identifying the construction laws and regulations imposed by the UDA that have a bearing on constructions in the Colombo Municipal Council area and their implications for construction consultant team who may lack awareness of these statutory requirements.

2. RELEVANCE OF THE RESEARCH

Although studies have focused on the fees and delays imposed on design professionals on account of the statutory requirements of governing bodies, equal attention has not been paid to the implications in terms of time, cost and quality that might be the result of lack of awareness or knowledge of such rules and regulations on the part of consultant team relating to the design and structure or even output with respect to the product's performance, all of which in turn run the risk of losing the project even at the end of the project's completion. The negative implications to the project arising from the lack of knowledge of statutory requirements by design professionals may not be confined to time, cost and quality but may extend to the whole built environment. These unfortunate fall-outs may arise owing mainly to either the low attention given to or even ignorance regarding the legal aspects by the professionals who provide consultancy services in the fields of architecture, quantity surveying and engineering to particular building constructions at the outset of the project. The present study therefore focuses on a topic given scant attention in previous studies and addresses thus a gap in the literature by underscoring the need to pay special and urgent attention to the aspect of statutory regulations by design professionals involved in the building construction industry in Sri Lanka.

3. IMPORTANCE OF STATUTORY REQUIREMENTS AND THE STATUTORY BODIES FOR THE CONSTRUCTION INDUSTRY OF SRI LANKA

Given the centrality of construction outputs on the quality of life, and in supporting all other economic and social activities, the government of a country pays particular attention to the regulatory aspect of the construction industry (Ministry of Housing, Transport, Water and Works and Minister of Information and Development, Jamaica, 2007). Regulatory requirements are those coming within a legally binding requirement issued and enforced by some government agencies and authorised by applicable legislation (Serocki, 1988). Thus, a government establishes a number of regulatory bodies covering numerous aspects of the construction industry. In the field of construction, these regulatory bodies are entities which impose control on design, construction and operation of a project (Rameezdeen, 2006).

Accordingly, in the case of Sri Lanka, the Urban Development Authority (UDA), Central Environmental Authority (CEA), Coast Conservation Department (CCD), Board of Investment (BOI), Civil Aviation Authority (CAA), Condominium Management Authority (CMA), the Ministry of Defence, various local, urban and municipal councils and other local authorities play the role of regulatory bodies, which impose certain laws and regulations in relation to the construction. Of these, the UDA is a multi-disciplinary organisation engaged in urban planning and sustainable urban development in Sri Lanka while CEA integrates environmental considerations into the development processes of the country (Sri

Lanka Tourism Development Authority, 2013). The BOI, is structured to function as a central facilitation point for investors (Board of Investors, 2013), while CCD has been formed to ensure the engineering and management of the coastal zone to facilitate and improve economic development based upon coastal resources (Coast Conservation and Coastal Resource Management Department, 2010). Similarly, CMA has been established for the management and maintenance of condominium properties by amending the Common Amenities Board (Amendment) Act No. 24 of 2003 (Ministry of Construction, Engineering Services, Housing and Common Amenities, 2013). The Civil Aviation Authority of Sri Lanka, on the other hand, which was established under the Civil Aviation Authority Act No. 34 of 2002, generates requirements to be complied with regard to the construction of any building, tower or other structure or the making of any alterations to existing building, tower or other structure within the protected areas of the local airports (Civil Aviation Authority of Sri Lanka, 2010). The Ministry of Defence and Urban Development oversees the security clearance of a construction which is planned in a high security zone (Ministry of Defence and Urban Development, Sri Lanka, 2013) while municipal councils and other local level governing bodies set rules and regulations that are relevant to housing activities in their respective areas (National Housing Development Authority, Sri Lanka, 2005).

According to Smith and Sims (1990), all stakeholders in the construction industry are obliged to comply with and give all notices required under the regulatory requirements imposed by government agencies. Given the vast scale of the construction industry and with such an important remit, it is very important that rules and regulations are clearly laid out and obeyed in order to ensure that those undertaking building work do so according to certain standards that are considered reasonable within the industry (Everything Legal Ltd., 2013).

4. IMPORTANCE OF AWARENESS OF STATUTORY REQUIREMENTS

There are many statutes that should secure the attention of a consultant team in the world of construction (Cornes, 1985). Architects, engineers and quantity surveyors, as three main groups of professionals who are members of the consultant team with regard to building and structure constructions should therefore have a sound knowledge of the statutory requirements relating to construction when they divide up their duties in relation to a project.

Cornes (1985) has further stated that while the architect need not have the detailed knowledge of a lawyer, she or he is expected to have a reasonable working knowledge of laws and legislation which affects him/her in the discharge of his/her duties as an architect. Building regulations, for instance, lay down the minimum standards of design that pertain to many areas of the architect's work, including some aspects of design such as resistance to moisture, structural stability, fire safety, thermal insulation, sound insulation and the height of rooms (Cornes, 1985).

It is obvious that a building or project that is designed disregarding relevant public legislation, by-laws, or the rights of adjoining owners may be banned outright, be open to fines, or incur the risk of demolition orders and/or litigation (Wallace, 1970). Hence, Wallace (1970) further stated that the engineer involved in the project should possess a reasonable working knowledge of laws relating to such matters.

One of the basic attributes that produce a competent quantity surveyor is basic knowledge of national laws and regulations relating to construction (Said, Shafiei, and Omarn, 2010). According to them, a comprehensive understanding of construction laws and regulations comprise should be part of the scope of a quantity surveyor's characteristics, abilities and knowledge.

However, due to the inadequate or total of absence awareness of such rules and regulations on the part of the professionals relating to design, structure and sometimes the output of the product's performance, numerous negative implications have arisen.

5. RESEARCH METHODOLOGY

The literature relevant to the research topic was extensively reviewed with the aim of examining the impact of the government on the construction industry, the importance of statutory requirements on construction as well as the important statutory requirements empowered in the case of the Sri Lankan construction industry, the role of the UDA with regard to statutory requirements, and the importance of awareness of the statutory requirements on the part of the design team.

Through a survey which was carried out using semi-structured interviews, the data for the study was collected. In order to capture the data, an interview guideline was prepared. The guideline was divided into three sections as (i) a general introduction to the respondent, (ii) investigation of substantial statutory requirements empowered by the UDA for consultant team, and (iii) implications arising from the lack of unawareness of such statutory requirements on the part of professionals. The interviews were conducted with three key participants in the design: architects, engineers and quantity surveyors and the survey size was limited to 20 interviews as it was saturated at that point. Efficacious responses were obtained from Architects (40%), Engineers (30%) and Quantity Surveyors (30%), who hold high managerial positions in Design side of the construction industry such as former director generals, deputy directors, chairmen of organisations and senior professionals in the field. The experience of the respondents in the construction industry ranged from ten years to over thirty five years and their experience in building construction projects ranged from five years to over thirty five years. Additionally, a document survey was conducted with the intention of capturing missing information regarding statutory requirements empowered under the UDA, which may not have been captured in detail via the interviews conducted. This document survey was basically carried out by referring to the City of Colombo Development Plan 1999, volumes I and II, and its amendment published in the year 2008.

After acquiring free-flowing texts from semi-structured interviews, a code-based content analysis was used for an effective interpretation.

6. RESEARCH FINDINGS

6.1. ROLE OF URBAN DEVELOPMENT AUTHORITY AS A STATUTORY BODY AND ITS REGULATIONS IN RELATION TO BUILDING CONSTRUCTIONS IN THE COLOMBO MUNICIPAL AREA

The UDA is the prime planner and promoter of urban areas to meet the aspirations of urban dwellers whilst improving its quality of life (Weerasoori, 2012). It was established under the Parliament Act no 41 of 1978, to achieve integrated planning and implementation of declared urban areas. It was amended in the year 1979, 1982, 1987 and 1988. The special provisions of this act were amended in the year 1984 while generating the Urban Development Projects (Special Provisions) Act in 1980. However, this Act does not have provisions for the design teams of construction projects though it provides necessary powers to the UDA to create guidelines and apply them in declared areas under the UDA. These guidelines are very important to the design team. The City of Colombo Development Plan which was prepared and gazetted by the Urban Development Authority in 1985 enabled the UDA to implement zoning and building regulations though this was superseded by the City of Colombo Development Plan of 1999 and its amendment in 2008 City of Colombo Development Plan (UDA, 1999, 2011). Further, the Development Guide Plans were a direct result of the establishment of the UDA. While the amendment of the City of Colombo Development Plan in 2008 specifically elaborates zoning regulations for the area, the development guide plans elaborates on some special regulations established for certain areas within the zones of the Colombo Development Plan. Hence, the design team needs to be aware of and adhere to these regulations when carrying out a building construction project in any Colombo suburb.

6.2. SIGNIFICANT REGULATIONS OF THE URBAN DEVELOPMENT AUTHORITY THAT REQUIRE COMPLIANCE FROM THE CONSULTANT TEAM

6.2.1. SUBSTANTIAL REGULATIONS TO BE CONSIDERED BY AN ARCHITECT

It was found that the regulations of the Colombo Development Plan are more important to architects than to the other consultants. According to the data gathered, the most important regulations for an architect are the zoning regulations. The other substantial regulation categories to be considered by an architect when designing are planning regulations, building regulations, regulations relating to submission of plans for approval of land subdivisions and buildings, and the Development Guide Plans.

Table 1 gives a summary of the substantial UDA regulations applicable to an architect at the design stage, which were identified through interviews and further enriched via information collected through the document survey.

Table 1: Substantial UDA Regulations to be Considered by an Architect

Section	Provisions under Each Section
Zoning regulations	<ul style="list-style-type: none"> • Permissible building type • Minimum plot size • Maximum plot coverage • Maximum floor area ratio • Other specifications
Planning regulations	<ul style="list-style-type: none"> • Street line and building line • Parking and traffic control • Minimum site frontage • Maximum plot coverage • Maximum floor area ratio
Building regulations	<ul style="list-style-type: none"> • Minimum side space (on one or both sides)
Space around the building	<ul style="list-style-type: none"> • Rear space • Overhangs and other sun shading device requirements
Space inside the building	<ul style="list-style-type: none"> • Minimum width of building • Minimum area of rooms • Minimum dimensions of lavatories, water closets and bathrooms • Minimum height of rooms
Light and ventilation	<ul style="list-style-type: none"> • Location of source of natural light and ventilation • Sources of natural light and ventilation • Provision of air-well for the purpose of natural light and ventilation of court yards
Other	<ul style="list-style-type: none"> • Provision of facilities for disabled persons • Provisions for approvals under the Environment Act
Submission of plans for approval of land subdivisions and buildings	<ul style="list-style-type: none"> • Submission of plan for approval • Preliminary planning clearance • Scales of plans • Particulars to be on plans, site plan and sub-division plans
Development Guide Plans	<ul style="list-style-type: none"> • Same as zoning • Landscaping

6.2.2. SUBSTANTIAL REGULATIONS TO BE CONSIDERED BY AN ENGINEER

The findings of the survey suggest that, broadly speaking, the UDA regulations are not as concerned with the engineers' role as that of the architects. However, it is undisputable that the durability of a building hinges on its structural stability. Hence, the contribution of an engineer is undoubtedly critical vis-a-vis the design. Accordingly, most of the interviewees were of the opinion that an engineer should ensure that the proposed building adheres to the structural requirements at the design stage. Hence, regulations regarding the submission of plans for approval of land subdivisions and buildings are most important to the engineer. Additionally, regulations relating to sanitation, mechanical ventilation, and air-conditioning and building regulations can be considered substantial in the case of an engineer.

Table 2 gives a summary of substantial UDA regulations applicable to an engineer that were identified in the interviews conducted with professionals in the industry which were almost identical to those highlighted in the subsequent document survey.

Table 2: Substantial UDA Regulations to be Considered by an Engineer

Section	Provisions under Each Section
Submission of plans for approval of land subdivisions and buildings	<ul style="list-style-type: none"> • Particulars to be on plans, site plan and sub-division plans • Structural details and calculation
Sanitation	<ul style="list-style-type: none"> • Water supply and sewerage • Sanitary convenience • Drainage • Water disposal • Electrical and plumbing work
Building regulations	<ul style="list-style-type: none"> • Provisions for approvals under the Environmental Act
Other	<ul style="list-style-type: none"> • Fire safety
Mechanical ventilation and air-conditioning	<ul style="list-style-type: none"> • Mechanical ventilation for a residential room • Other rooms requiring mechanical ventilation • Plans for air-conditioning or other ventilation system

6.2.3. SUBSTANTIAL REGULATIONS TO BE CONSIDERED BY A QUANTITY SURVEYOR

It was evident that there are no specific UDA regulations to be considered by a Quantity Surveyor since Quantity Surveyors are not all that much involved in the design, their involvement at this stage being limited to preparing the document base of the design. However, it can be said that an overall knowledge of UDA regulations is nevertheless important to a quantity surveyor too and is beneficial to the project. For instance, if an error in the design went undetected by the engineer and the architect of the project, there is still a chance that the QS might detect it and rectify it before it causes irreparable damage to the project if the QS had a proper understanding with regard to the subject. Several interviewees identified parking regulations as something important to a quantity surveyor to a certain extent. For examples, UDA regulations specify the number of parking spots per building as a schedule based on the purpose and size of the building. Thus, if the required parking is not available, the developer has to pay service charges to the government to fulfil the requirement which would affect his or her budget. Similarly, a few respondents claimed that UDA insists on landscaping and planting of trees in certain areas, especially in some development guide plan areas, which would noticeably increase the cost of the project. Consequently, it is essential for a quantity surveyor to have an awareness of these regulations. Table 3 gives a summary of substantial UDA regulations applicable to a quantity surveyor identified through interviews and the document survey.

Table 3: Substantial UDA Regulations to be considered by a Quantity Surveyor at the Design Stage

Section	Provisions under Each Section
Planning regulations	<ul style="list-style-type: none"> • Parking and traffic control
Development guide plans	<ul style="list-style-type: none"> • Landscaping

6.3. IMPLICATIONS FOR CONSULTANT TEAM DUE TO LACK OF AWARENESS OF UDA REGULATIONS

There are three main categories of implications that the study was able to identify, namely, project implications, indirect implications and other implications.

Project implications are the implications to the project, from the inception to the end of the project and even after completion, covering the whole life cycle of the project. These implications are mainly divided into three categories: time, cost and quality implications.

Indirect implications are those that would indirectly affect the client's or occupant's desired objectives in relation to the project.

Other implications refer to impacts on society owing to the failure to apply the necessary UDA regulations to the project.

6.3.1. IMPLICATIONS FOR ARCHITECTS

Table 4 gives a summary of subsequent implications arising from lack of awareness of UDA regulations for architects, which could also be captured through interviews conducted with the professionals in the construction industry.

Table 4: Implications for Architects

Section	Project Implications			Indirect Implications	Other Implications
	Implication	Time	Cost		
All Sections	<ul style="list-style-type: none"> • Reform of design • Risk of being designated an unauthorized building 	X	X	X	<ul style="list-style-type: none"> • Reselling is difficult • Loans are not granted by financial institutions
Planning					
a). Street line and Building line	<ul style="list-style-type: none"> • Demolition 		X	X	<ul style="list-style-type: none"> • No compensation possible from the government
b). Parking and traffic control	<ul style="list-style-type: none"> • Rejection of planning approvals • Annual payments/fee to government 	X	X	X	<ul style="list-style-type: none"> • Reduction in customer satisfaction • Reduction in profits • Traffic congestion • Road rule violations • Increase in number of accidents

Section	Project Implications			Indirect Implications	Other Implications
	Implication	Time	Cost		
Zoning	• Penalty		X		• Unpleasant environment to live
	• Demolition		X	X	• Health hazards
Building					
a). Space around building	• Discard project proposal	X	X		
b). Space inside building	• Insufficient space			X	• Occupants feel uncomfortable
c). Others					• Reduction in customer attraction leading to reduction in profits
Provision of facilities for disabled persons					
d). Lighting and ventilation	• Required mechanical lighting and ventilation systems		X		• Unfavourable conditions to work or live in
	• Becomes a sick building			X	

6.3.2. IMPLICATIONS FOR ENGINEERS

Table 5 gives the summary of subsequence implications arising from lack of awareness of UDA regulations by an engineer at the design stage.

Table 5: Implications for Engineers

Section	Project Implications			Indirect Implications	Other Implications
	Implication	Time	Cost		
All Sections	• Redesign	X	X		
Submission of plans for approval of buildings	• Resubmission to obtain approvals	X	X		
Building a). Others					
Fire safety	• Insufficient safety for building			X	• Safety hazards for its occupants
Provisions for approval under the Environment					• Environment and social hazards
Mechanical lighting and ventilation	• Poor air quality inside the building			X	• Stand the risk of being designated as a sick building [Uninhabitable]
Sanitation water supply and sewerage Drainage	• Sewerage requirements not up to standards			X	• Health hazards for occupants • Surrounding buildings affected • Occurrence of floods

6.3.3. IMPLICATIONS FOR QUANTITY SURVEYORS

Table 6 gives the summary of subsequent implications that arise from lack of unawareness of UDA regulations by a quantity surveyor for each implication at the design stage. It shows that legal provisions attendant on a quantity surveyor's roles are very few and that the implications arising from a quantity surveyor's lack of awareness of UDA regulation are, therefore, minimal.

Table 6: Implications for Quantity Surveyors

Section	Project Implications			Indirect Implications	Other Implications
	Implication	Time	Cost		
All Sections	• Incorrect estimate		X		• Underestimated budget
	• Re-estimate	X			• Difficulties in arranging finance
DGP	• Occurrence of variations		X		

6.4. STRATEGIES TO BE ADOPTED TO INCREASE THE AWARENESS OF PROFESSIONALS ABOUT UDA REGULATIONS

Only a few of the respondents addressed the issue of suitable strategies that can be adopted to increase the awareness of UDA regulations among design professionals. The summary of strategies that can be adopted to increase the awareness of design professionals regarding substantial UDA regulations applicable to the design stage as captured in the interviews are given below:

- Organising CPD programmes on UDA regulations

CPD programmes assist in the lifelong learning of professionals. Both the organization of CPD programmes and active participation in such seminars will enable professionals to keep abreast of existing and new regulations with respect to their practice which would in turn help them avoid the implications mentioned in the previous sections.

- Introducing awareness of such regulations via the university curriculum

It is evident that awareness of statutory requirements should initially come from the formal education and training that each design professional has undergone, at university, for instance, which would enable them to enter the industry with a sound knowledge of UDA regulations. It will definitely help towards keeping issues that arise from lack of awareness of such regulations to a minimum.

- Control through professional ethics

Most of the design professionals are members of incorporated professional bodies such as Institute of Engineers Sri Lanka (IESL), Institute of Quantity Surveyors Sri Lanka (IQSSL) etc. When members of such professional bodies practice in their relevant fields, they are bound by the ethics governing their bodies to discharge their duties in the best manner possible. Hence, wrongful practices of design professionals can also be controlled via introduction of professional ethics.

- Education of the public through programmes on the media

There is a responsibility upon the government to educate the public so that, in case of wrongful practices on the part of the professionals, they will lodge complaints with the relevant authorities about them. Educating the public can be done through available media such as the television, radio, print media, etc. Implementation of this strategy would aid in raising the awareness of professionals as well as the general public.

- Encouragement of experts to publish books related to the subject of regulations

Encouraging experts in the field to publish construction-related books is another means by which the gap in knowledge of construction laws and regulations can be mitigated.

6.5. THE CONCEPTUAL MODEL DEVELOPED FROM THE KEY FINDINGS

Figure 1 presents the summary of the key findings of the research on substantial statutory requirements empowered by the UDA and the implications arising from not being aware of such requirements by consultant team while also emphasising suitable strategies to be implemented in this regard. It offers thereby a conceptual model to mitigate the adverse implications arising from lack of awareness of UDA regulations by professionals in the industry.

7. CONCLUSIONS AND RECOMMENDATIONS

The literature review for the study underscores the vital role that the UDA plays as the prime planner and promoter of urban areas in Sri Lanka. The research findings show that the City of Colombo Development Plan of 1999, together with its amendment of 2008, basically governs the statutory requirements relating to building construction in the Colombo municipal council area. The analysis shows why architects ought to be aware of zoning regulations, planning regulations, building regulations, regulations regarding planning approvals and development guide plans in the design stage while it also shows that engineers need to be aware of statutory requirements relating to sanitation, mechanical ventilation and air conditioning. It also reveals why an overall idea about statutory

requirements would be desirable in the case of quantity surveyors, enabling them to perform better in the design stage.

The study makes it clear that the implications mainly come under three major categories: implications to the project in terms of time, cost and quality; indirect implications to the client; and other implications to the society at large. These implications could be categorized under each major section of the statutory requirements with respect to each professional separately. The content analysis also yields strategies to overcome the identified implications. Among them, CPD programmes on UDA regulations for industry professionals and introduction of modules to undergraduate education at university where industry professionals are first trained were seen as the best options to overcome the negative implications arising from inadequate awareness. In addition, ensuring minimum standards on knowledge of and adherence to statutory regulations through the concept of professional ethics via the accreditation bodies, education of the general public regarding the existence of such regulations through media programmes and encouraging experts in the industry to publish books on relevant subjects were also identified as the other approaches to minimise the adverse implications. The study advocates the adoption of the conceptual model for use by consultant team members in order to be informed of substantial statutory requirements enacted under UDA and the negative implications arising from lack of unawareness of such requirements so as to pre-empt such situations in the future.

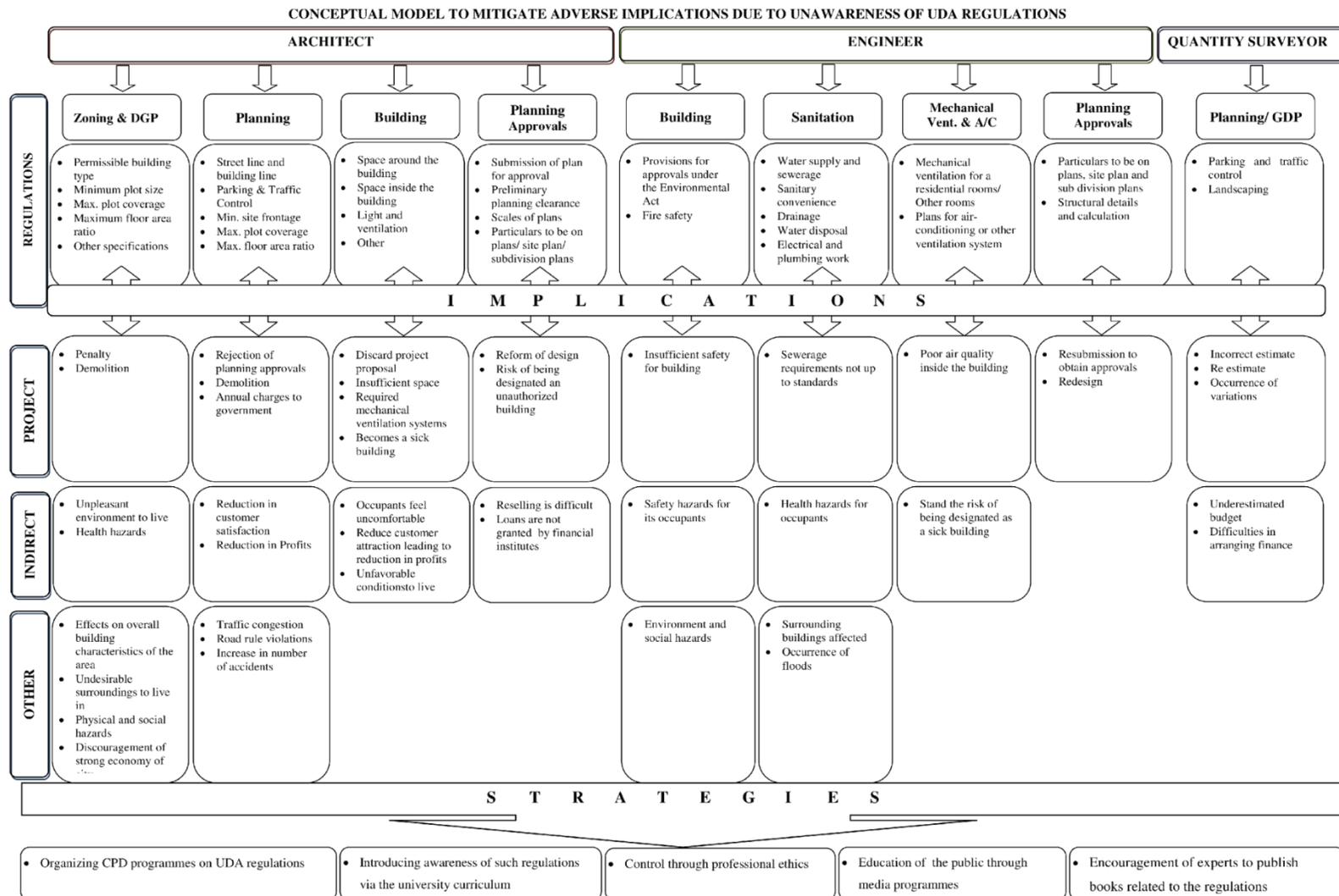


Figure 1: Conceptual Model

8. REFERENCES

- Board of Investment, 2013. *General Guidelines for Factory Buildings*. Colombo: Board of Investment of Sri Lanka.
- Civil Aviation Authority of Sri Lanka, 2010. *About Civil Aviation Authority* [Online]. Available from: <http://www.caa.lk/newcaa/aboutus.php> [Accessed on 10 April 2013]
- Coast Conservation and Coastal Resource Management Department, 2010. *About us* [Online]. Available from: http://www.coastal.gov.lk/about_us_ccd.htm [Accessed on 10 April 2013]
- Construction Industry Development Council, India, 2006. *Indian construction industry – An overview of practices* [Online]. Available from: http://www.asiaconst.com/past_conference/conference/13th/AC13India.pdf [Accessed on 19 April 2013]
- Cornes, D. L., 1985. *Design liability in the construction industry*. 2nd ed. London: Collins professional and technical books.
- Everything Legal Ltd, 2013. *Construction Law* [Online]. Available from: http://www.lawonthe web.co.uk/Construction_Law [Accessed 18 March 2013]
- Enshassi, A., Al-Najjar, J., and Kumaraswamy, M., 2009. Delays and cost overruns in the construction projects in the Gaza Strip. *Journal of Financial Management of Property and Construction*, 14(2), 126-151.
- Ministry of Construction, Engineering Services, Housing and Common Amenities, Sri Lanka, 2013. *Condominium Management Authority* [Online]. Available from: <http://houseconmin.gov.lk/index.php/our-partners/condominium-management-authorityLaw> [Accessed 16 September 2013].
- Ministry of Defence and Urban Development, Sri Lanka, 2013. *Responsibilities and functions* [Online]. Available from: http://www.defence.lk/main_abt.asp?fname=resp_funcions [Accessed 10 April 2013].
- Ministry of Housing, Transport, Water and Works and Minister of Information and Development, Jamaica, 2007. *White paper: A Construction Industry Policy*, Jamaica.
- National Housing Development Authority, 2005. *Guidelines for housing development in coastal Sri Lanka*. Colombo: National Housing Development Authority.
- Rameezdeen, R., 2009. *Construction Waste Management: Current Status and Challenges in Sri Lanka*. Colombo: COWAM Publication.
- Said, I., Shafiei, M. W., and Omarn, A., 2010. The competency requirements for quantity surveyors: Enhancing continuous professional development. *ACTA Technica corviniensis- Bulletin of Engineering*, 3(3), 105-112.
- Serocki, J. J., 1988. Legislation, regulations, and standards. *Applied Industrial Hygiene*, 3(7), F-14-F-19.
- Singhal, D. and Singhal, K. R., 2012. *Statutory and regulatory requirements in ISO9001:2008QMS* [Online]. Available from: <http://iso9001-2008awareness.blogspot.com> [Accessed 12 March 2013]
- Smith, V. P. and Sims, J., 1990. *Contract documentation for contractors*. 2nd ed. London: BSP professional books.
- Sri Lanka Tourism Development Authority, 2013. *Urban Development Authority* [online]. Available from: http://www.sltda.gov.lk/urban_development [Accessed 15 May 2013]
- Urban Development Authority, 1999. *City of Colombo Development Plan 1999*. 1st ed. Colombo: Ministry of Urban Development, Housing and Construction.
- Urban Development Authority, 2011. *Knowledge Center* [Online]. Available from: <http://www.uda.lk/knowledge.html> [Accessed 12 March 2013].
- Wallace, I. N., 1970. *Hudson's Building and Engineering Contracts*. 10th ed. London: Sweet and Maxwell Ltd.
- Weddikkara, C. and Devapriya, K., 2000. *The Sri Lankan construction industry in the new millennium*, Rotterdam: In-house publishing.
- Weerasoori, I. S., 2012. *Preparation of urban development plans incorporating DRR to make cities safer* [Online] Available from: <http://www.dmc.gov.lk/Symposium/2012/Preparation%20of%20Urban%20Development%20plans%20in%20incorporating%20DRR%20to.pdf> [Accessed 10 May 2013].