BUILDING IN SAFETY AND SAFETY IN BUILDINGS: A LEARNING CONTINUUM

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INTRODUCTION

What do we mean by Building In safety and Safety In Buildings?

Building in safety can be termed as site safety during the construction period whilst safety in buildings is the safety for the occupants of the building. To achieve both site safety and have safety in the building for the occupants, the processes must start at the inception of the project i.e. from the time the client is deciding on the designers.

This paper which is in two parts, therefore services to assist key stakeholders on the process of design safety and transfer of vital safety and health information along the construction process chain. To facilitate this, duties of the various stakeholders are specified creating a framework which allows every stakeholder to participate in making vital safety and health decisions.

PART 1- BUILDING IN SAFETY

Design for safety

Design and planning is an essential component in every construction work. In line with standard practice, reducing risk at source is one of the components to improving building in safety. To address the risk at source there is a need to look at who creates the risk and address the issue from there.

Whilst it is the duty of the owners and or occupier to ensure that the building is maintained, the risks inherent in the design also needs to be addressed and means to mitigate the risk identified. In addition accidents are often as a result of either poor planning or lack of communication between the designer and occupier resulting in loss of information

Roles & Responsibilities

The designers of buildings i.e. architects and engineers must ensure that the risk created as a result of their designs are reviewed through a systematic process and the resultant mitigated risk passed to the contractor.

In specifying the design of a building or structure, the designer should understand how the building or structure can be constructed, cleared, maintained and decommissioned or demolished safety

Duties of the designer (architects & engineers)

- Assess the design so as to review the safety and health risks that the design creates.

- Eliminate the hazards as far as reasonably practicable.
- Considering maintenance issues in the design process e.g. cleaning windows, ceiling, changing fittings & fixtures.

The Client

The client first fulfils his role by choosing a competent co-ordinator and designer to undertake his project. The client must demonstrate that he has checked the competence of the coordinator and designer and not mainly appoint them based on fees quoted.

In addition while the client has the right to specify the type of construction and materials, he requires for the project, he has to be advised by the designer of the safety and health aspects of the design. He has to participate in the design reviews to understand the bases of the design. The client should also be advised on the time required for the completion of the project.

Finally when appointing a contractor, the client must ensure he selects the contractor based on professional advice on some form of assessment based on both the price and the quality.

The Main Contractor

Contractors, being responsible for the planning, management and co-ordination of construction works play a critical role in ensuring that hazards identified both prior to and during construction works, are properly addressed.
The main contractor must be competent to carry out the work he is engaged to do in a safe manner. He should take reasonable steps to ensure that risks identified are properly managed.

The Guide Process

To ensure the design is safe, a design Review Process is introduced in the project flow. There should be a systematic process whereby the risks are highlighted, reviewed and recorded. The outcome of the review process should be a safe design endorsed by all parties and a record of resultant or vital safety and health information.

Project Safety

Safety measures are good practice procedures that good construction should embrace to take care of all risk elements and avoid failure including accidents to operatives in the construction.

Safety and health issues are integral to the construction project process. They are not confined to the construction phase of a project but occur throughout the entire lifetime of the finished project i.e. design, construction, maintenance and even demolition.

Many safety and health problems encountered during construction and operation could be avoided by ensuring that due consideration is given to these issues during the design and procurement process. Projects that are well planned, well designed, carried out by competent, trained designers and contractors are not only inherently safer but also enable the client to achieve good value for the money invested.

It is standard practise requirement to ask contractors and indeed designers for their Health, Safety and Environment (HSE) policy.

In construction projects, it is very important that there is a good coordination between the client, the designer and contractor to avoid miscommunication of vital information that could affect safety and health risks in the project.
On some major projects an HSE supervisor is always a requirement for the works from the design stage to the handing over of the project. Some of his duties include:

- Facilitate the process to involve all stakeholders to review the design and mitigate the risks.
- Maintain records of safety and health issues and actions taken.
- Ensure the relevant safety and health information is passed on to the contractor.

Adequate Construction Site Management

The need for adequate site management cannot be overemphasised. The contractor being responsible for the safety of the construction site has to provide the following items:.

i. An All-Risk-Insurance against collapse of structures and injury to men is absolutely essential.
ii. Adequate site accommodation for men and materials. Some materials require special storage conditions e.g. cement, paints etc
iii. Enforcement of site safety rules
iv. Provision of First-Aid facilities and adequate emergency procedures
v. Adequate physical provision for height safety including temporary provision of railings to unfinished stairs, voids, balconies, edges etc.
vi. Adequate provision against falling objects

vii. Adequate provision for Electrical Safety
viii. Adequate protection of trenches and excavations
ix. Adequate stability of formwork and scaffolding
x. Demarcated and protected and secure access to the construction site.
xi. Remember to make provision for workmen's lift for structures above 10 floors.
xii. A Safe Work Method System (SWMS) should be developed for Demolition Works
xiii. Use of Cranes, Hoists and Load Shifting Equipment should be operated by qualified personnel with the application of adequate health and safety procedures.
xiv. Operators of specified sophisticated site plants must have Certificate of Competency for Operating Plant: Tower Cranes, Fork Lift Trucks, Vehicle Loading Cranes, Excavators, Front End Loaders etc.
xv. A daily Log Book of site activities should be kept

If all these items are provided and adhered to there will be relative safety in the building process.

PART TWO – SAFETY IN BUILDINGS

Public Duty for Safety

It is the duty of professional i.e. architects, engineers, contractors, approval authorities to ensure public safety in buildings. The licensing boards for the various professionals must ensure that and in cases of negligence resulting in the compromise of safety in the buildings then the professionals must be sanctioned in accordance with the provisions of the relevant professional registration board.

Indeed this has long been established as far back as the Babylonian times when the sixth Babylonian King, Hammurabi enacted the Hammurabi Codes about 282 codes which covered the entire spectrum of human living.

There are five Hammurabi codes (nos. 229-233) which apply to buildings and can be termed penalties for non-compliance of safety codes in buildings. The codes are as follows:

> *229 If a builder builds a house for someone, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.*

230. If it kills the son of the owner the son of that builder shall be put to death.
231. If it kills a slave of the owner, then he shall pay slave for slave to the owner of the house.
232. If it ruins goods, he shall make compensation for all that has been ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means.
233. If a builder build a house for someone, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means.

STANDARDS IN DESIGN

There are various international standards and codes which have been developed over time and if these standards and codes are applied to the design process, the buildings constructed will be safe. These standards are what are called specifications. Quite a number of domestic accidents occur in homes due to inappropriate use of materials and poor construction methods. For example architects must specify non-slip tiles for wet areas like bathrooms. Contractors must construct staircases with even treads and risers.

Other considerations to ensure that buildings are safe are:

Fire Safety

Adequate consideration must be given to fire safety by ensuring that building materials meet the minimum fire resistance and thought is given at design stage to compartmentalization to reduce spread of fire.
For high rise buildings there must be sprinklers, Smoke evacuation systems, Fire-lifts and elevator automatic recall systems.

There must also be regular fire-drills for all occupants.

Electricity Hazards

Fire hazards from small leakages
Shock hazards from small leakages
Good housekeeping vital for electrical safety.

Other requirements

Adequate washrooms and toilet facilities
Proper air circulation
Ample sunlight
Clearances for emergency vehicles
Noise mitigation measures
Handrails
Exit signage
Emergency lights

CONCLUSION

In conclusion prevention of accidents in buildings should be the guiding principle for building safety and occupational safety. Safety and health issues are integral to the construction project process. They are not confined to the construction phase of the project but occur throughout the entire lifetime of the finished project: design, construction, maintenance and in some cases demolition. Many safety and health problems encountered during construction and operation could be avoided by ensuring that due consideration is given to these issues during the design and procurement process. Projects that are well planned, well designed, carried out by competent, trained designers and contractors are not only inherently safer but also enable the client to achieve good value for the money invested.

Thank You.

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