

Sound Practice No.3

Mandatory implementation of a National Building Code

Overview

The Bureau of Standards and Metrology has initiated a process for defining the draft Building Code as a Nepal Standard. Several of the 22 documents prepared for the National Building Code, which focuses on seismic safety, were accepted as Nepal Standards.

In 2003, the Council of Ministers decreed that the stipulations of the National Building Code should be made obligatory for all government-building constructions. It also urged the municipal authorities to strengthen the current building permit process so that code compliance will be mandatory for all new constructions in urban areas.

Kathmandu Metropolitan City (KMC) has started implementing building code-2060 from August 21, 2005, for the construction of buildings within the city. During an interview held by the 3rd Program Implementation Team on the first week of September 2005, Mr. Devendra Dongol, the head of the Urban Development Department informed that people who wish to construct buildings within the city now would have to fill the forms of both, building by-laws and building codes before they can get their blueprints endorsed.

Significant Background Information

On a recent interview with the Rising Nepal (TRN, Aug 25, 2005), a popular newspaper in the capital city, Mr. Dongol added: "The designer should be the guarantor that the codes have been strictly followed and should bear responsibility of unexpected damage to be caused by the earthquake".

Thus, KMC is the second local body to implement the codes. Lalitpur Sub Metropolitan City has already implemented it. The government had implemented the codes two years back in the construction of government buildings setting good precedents and providing a good example to be followed by private owners

and corporations.

Sound Practice Details

There are three types of codes as per types and size of buildings. The first one is for state of the art buildings and seeks international standards. The second one relates to professionally engineered buildings and emphasizes seismic design, fire safety measures, standard quality of concrete, architectural, electric and sanitary designs. The third category is for short masonry buildings, the designer does not need to present detailed designs but should you mandatory rules of thumb to assure good performance in case of earthquakes.

The implementation of the building code in KMC looks for engineering design and supervision of the buildings, ending a long term practice of using ordinary elevation drawings and promoting the active participation of professionals.

KMC is interested in creating some options to look for code compliance, among them, creation of a monitoring team to supervise the use of the new regulation and to follow up at the construction site. Some other mechanisms looking for the code enforcement include the seizure of the licenses provided by the municipality.

In October 2005 a National Building Code Implementation Committee was set up within KMC, it is comprised by six specialists who act on voluntary basis. This Committee along with the Building Permit Section are in charge of building code implementation and enforcement at KMC, nevertheless, no ordinance for building code is currently available, the municipality is using a set of outdated bylaws at the moment, in any case, nation-wide requirements for the three categories already described are also being enforced at KMC:

- International state of the art is applied for buildings having 6 floors and above, drawings and calculations need to be presented, to the recently established Review Committee is. Owner and constructor bear the responsibility.
- Professional engineered building category is applied to those structures having between 3-6 stories. Basic blue prints need to be submitted.
- Buildings under 3 floors, follow mandatory rule of thumb, guidelines are

available

In addition, other procedures for design and field control have been established, for example:

- Three stages to issue construction and habitability permits: foundation level, upper structure completion and final inspection.
- Minimum size of the reinforced concrete columns has been set as 23X30 cm as an earthquake safety measure

Some difficulties on the implementation process

Major problems encountered relates to the buy-in of the initiative particularly from the private owners who do not want to bear with additional costs and don't see the immediate benefits of such an initiative

Awareness and sensibilizing campaigns are needed to reverse the public's negative perception of such a tool that will certainly contribute to risk reduction in the intermediate and long run, if we consider that more than 5000 new buildings are being constructed every year in Kathmandu, the impact would be really high in the coming years.

A good model for implementation by Lalitpur Municipality

I. Frame Structure



Commercial Building

II. Load Bearing Wall System



Residential Building



School building



Residential Building

Lalitpur is one of the five municipalities comprising the Kathmandu Valley. This small city has taken a very successful and innovative approach to motivate different actors of the construction process, as well as end users, on the need to follow the minimum

regulations provided by the building code, as a good mitigation measure and as a way to protect life and property in their city. Therefore, Lalitpur established the Earthquake Safety Section, which is in charge of the implementation and BC compliance in the city.

A 10-point process has been put in place to educate, motivate and enforce the use of the norm. Positive results can be progressively seen in the city, as shown by the pictures bellow. A summary of the process implemented follows:

1. **Awareness raising:** the message is loud and clear, “we live on an earthquake prone area, we have suffered the impact of earthquakes in the past, we can reduce the losses in future events”.
2. **Partnerships:** a BCI Committee was constituted with the participation of a broad number of representatives from different sectors of the community.
3. **Assistance and Supervision:** the earthquake safety section was established within the municipality to provide technical assistance to the users and customers and supervise the implementation process in the construction site and in house through design control and supervision.
4. **Orientation programs:** assisted by NSET and addressed to end users, such as the association of house owners to emphasis the benefits of using the building code
5. **Training modules:** for professionals engaged in the construction cycle, especially masons who are the primary source in the actual building construction, particularly of medium high rise buildings which mostly use load bearing wall systems. At present, the municipal roster of trained masons includes 85 certified professionals.

Participants of Mason training on construction of Earthquake resistance Buildings



6. **Preparing building construction guidelines:** to be distributed among Lalitpur residents and construction workers. The cost of the publication has been so far covered entirely by the municipality in a effort to reach the biggest number of users.

7. **Public demonstration programs:** to show people the benefits of a sound construction. The shacking table demonstration, show in the picture, and scaled models to show details of the foundation, beams and columns for confinement or wall to beam connections are displayed for people to visualize proper way of construction.



8. **Set up an approval process:** basic blueprints are revised by the Unit of Earthquake Safety, if the design is suitable, then the process of approval will start within the municipality. So far, 80% of the applications are being accepted in the municipality.

9. **Differentiate categories of construction:** For RC frame structures, the approval procedure is more complex, assistance in-situ is provided to ensure good quality of the mix.

Full Scale models of Earthquake Resistance
Details Prepared by Masons



Load Bearing Wall



Frame Structure

10. **Provision of incentives:** all this process has been implemented with “0” cost to the end user to promote the application of the guidelines while people understand the benefits for life and property protection.

Knowledge Base Coding Reference:

Name of the Practice: Building Code Implementation
 Contact Person(s): Devendra Dongol, Head of the Urban Development Department, Kathmandu Metropolitan City. Niyam Maharjan, Chief Earthquake Safety Section, Lalitpur Municipality.
 Contact Address: planning@mail.com.np ; niyam@wlink.com.np
 Written by: J. Fernandez, 3cd Component 1 coordinator, based on personal interview with Mr. Devendra Dongol (KMC) and Mr. Niyam Maharjan (Lalitpur Eq. Safety)