

CD-ROM

Culture of prevention

A review of a CD-ROM from the Mitigation Directorate of the US Federal Emergency Management Agency

Coastal areas throughout the world are at high risk from natural hazards. The risks are magnified in poor and developing countries where large numbers of coastal communities are traditionally impoverished and have poor access to any kind of disaster prevention or management programmes.

The 26 December 2004 tsunami in the Indian Ocean brought out this fact very clearly, considering that the loss in housing amounted to over US\$2,000 mn in India, Indonesia and Sri Lanka alone. In the rehabilitation phase, governments seem to have woken up, and plans are being made and executed to at least build reasonably secure homes so that another similar event will not result in such a scale of disaster.

The United States has extensive experience in coastal disasters, being a country whose coasts are regularly hit by typhoons, hurricanes and even the occasional tsunami. This has led not only to extensive studies on the coastal areas but also the development of principles and legislation that guide the development of coasts.

The Federal Emergency Management Agency (FEMA, www.fema.gov), part of the US Department of Homeland Security since 2003 (though it can trace its beginnings to the Congressional Act of 1803), helps people before and after a disaster, especially with suggestions and guidelines on how to make their homes safe.

The CD-ROM version of the third edition of FEMA's *Coastal Construction Manual* is meant to provide guidance for the design and construction of coastal residential buildings in the US that can be more resistant to the damaging effects of

natural hazards. Though it primarily addresses conditions in the US, the CD-ROM will also be useful for those in other countries as it is a veritable storehouse of information on the systematic procedures, tasks and decisions that need to be made before the actual construction of residential properties.

The manual is divided into three parts: Part I (Chapters 1-9) deals with relatively general information, Part II (Chapters 11-14) is technical, and Part III contains the appendices. Appendix B (Glossary) and Appendix J (Material Durability in Coastal Environment) are especially useful for non-US readers. The alphabetical, hyperlinked index makes any query just a click away.

The chapters in the CD-ROM have been rendered as PDF (portable document format) files, a popular format that can be easily read on-screen using the free Adobe Reader software, while also incorporating hyperlinked navigation and printing options. Hyperlinked cross-references (some of which are Web-linked) are useful to jump to sections whose existence you may not have been aware of, or to navigate to sections containing a clearer explanation of the topic.

Historical perspective

A historical perspective is presented in Chapter 2, while Chapter 4 (Fundamentals) helps us understand that a successful coastal building is one that is able to withstand the effects of coastal hazards and processes over a period of decades. Structurally, a building may be intact after an 'event', but the siting may have been incorrect—or vice versa—and so the whole thing can be regarded a failure. But even failures are useful because the development of guidelines is being continuously revised.

If one is interested only in the technical guidelines and not in general background information, the flowchart on Page 5 and summaries on Page 6 tell you that you need to look only at Chapters 5-8 and 11-14. Chapter 5 outlines the steps in identifying and evaluating a site, Chapter 6 identifies regulatory requirements, including where to find such information, Chapter 7 deals with identifying hazards and Chapter 8 is on siting. Chapter 11 provides instructions on how to calculate site-specific loads, which, as explained in Chapter 12, form the basis for the design and construction of buildings and the selection of appropriate construction materials. This chapter also explains why failures can occur. Chapter 13 highlights the importance of having the right kind of foundation, while Chapter 14, "Maintaining the Building", deals with something that we tend to neglect, but is perhaps as important as design and construction in the long run because the effects of salt-laden, wind-driven moisture in coastal areas cannot be overstated.

Throughout the manual, the language has been kept simple, and where technical information is presented, extensive worked-out problems help clarify doubts. Each disaster is analyzed in terms of the prediction of the place of occurrence and the damage caused. The damage to homes is analyzed for the cause(s) construction,

use of materials, design, siting, and so on. Thus, both good and bad examples of siting, design and construction practices are given. Coupled with photographs and illustrations, they give us a clear picture of the dos and don'ts.

The manual stresses that constructing to a model building code and complying with regulatory siting requirements will provide a building with a certain level of protection against damage from natural hazards. Going for more stringent conditions *may* provide an added measure of safety, but at a cost. The manual also explains why following the minimum code is not always sufficient because the coast is a vulnerable area prone to multiple hazards, and the science of prediction, though considerably advanced, is still evolving.

COASTAL CONSTRUCTION MANUAL. FEMA 55CD. THIRD EDITION Federal Emergency Management Agency, Mitigation Directorate. Reviewed by Ahana Lakshmi (ahanal@vsnl.net), a Chennai-based researcher