BUILDING CODE

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with the assistance of

UNITED NATIONS CENTRE FOR HUMAN SETTLEMENTS

and

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PREFACE

The chain of islands which comprise the Organisation of Eastern Caribbean States is historically subject to the frequent invasions of destructive hurricanes, and in some islands the additional hazard of earthquakes. Volcanic eruptions are also hazards in at least two of the islands of the group. Unfortunately also many houses, generally owned or occupied by the poor, are sited in gullies or in flood plains and are especially vulnerable to floods caused by high rainfall resulting from the frequent tropical depressions and hurricanes.

The Governments of the OECS have recognised that the damages caused by these extreme natural events affect the poor to a significant extent, and have placed emphasis on the development of building standards which would prevent or mitigate the damage so caused. The Governments are also revising existing planning and building regulations so as to more responsive to the current needs, and to ensure as far as it possible to do so that all buildings are constructed in a "safe" manner and resistant to the natural hazards.

The OECS Secretariat has therefore, with the assistance of the United Nations Development Programme and through the UNCHS/UNDP Project for Programme Support to the Human Settlements Sector in the OECS (CAR/89/006), developed standard building codes and guidelines which speak directly to the specific requirement of each OECS country. The codes and guidelines are based on the Caribbean Uniform Building Code (CUBiC) and other regional codes such as the Bahamas Building Code, the Jamaica National Building Code and the Turks and Caicos Islands Building Code. A list of codes and standards quoted is appended. The codes and guidelines so developed should become part of each country's regulatory mechanisms for ensuring adequate building standards.

It is recognised that the large amount of informal housing present in most countries will be outside of the regulatory stream, and that other mechanisms must be devised to improve such housing. It is recognised also that the imposition of building code and guidelines may appear to lead to higher costs of buildings especially for those persons who cannot afford the costs required to construct or upgrade a house to the minimum acceptable standard. It is recommended that each country encourage house owners and occupiers to improve their housing to the minimum standards of safety and structural integrity and that technical advice be offered to such persons who may be applying for permission to construct a new home or to renovate an existing one. The cost of upgrading a house to the minimum acceptable standard will in most cases be very small when compared to the costs of complete rebuilding which may be necessary in the event of damage by a hurricane, flood or earthquake.

The development of an adequately staffed building inspectorate is necessary to ensure that the minimum standards stated in the code and guidelines are maintained. The inspectorate will be expected to ensure compliance with the minimum standards set out in the code and also to assist home owners where possible in understanding the requirements of the code and guidelines.

No code can be expected to provide answers to all of the problems faced by builders. It is considered however that the code and guidelines produced for the OECS countries are responsive to the environmental concerns of the countries and in keeping with the accepted building practices in the Region. The code provides administrative and enforcement requirements relating to the building practices and use of acceptable materials and building systems. The code also provides for approval of any system or material which can be demonstratively proven to be resistant to the natural hazards. In this way new building systems which may be more efficient than the ones in

current use can be accepted without endangering the integrity of the buildings or the lives of the occupants.

The OECS Secretariat is grateful to the UNDP for its assistance in this vital area of the principles of design and construction of the housing sector.

PREFACE TO THE SECOND EDITION

This edition of the Code results from reviews of and comments on the draft Building Code by some of the Planning Authorities/Boards of the OECS with the assistance of the UNCHS Consultant.

Since the draft Code was circulated in 1992, there have been other parallel efforts by the OECS and UNCHS to improve the standard of building and infrastructure in the Region. It is to be noted that the OECS Secretariat has prepared and circulated an Environmental Impact Assessment Procedures Handbook and the UNCHS has assisted the OECS in the preparation of planning and infrastructure standards. A draft Model Physical planning Act has also been circulated to the OECS.

These documents provide planning and environmental guidelines, which along with the Building Code will provide the Planning Authorities with the tools needed for examination of development proposals to ensure that all developments are in concert with the physical, social and economic environment of the States. There are other laws of Antigua and Barbuda which must be adhered in the construction and maintenance of developments. Of particular interest to designers and developers are those laws which control the use of land and any developments on the land, public health electricity and the generation and distribution of electricity. Developers are required to contact the relevant Ministry for copies of the legislation which affects the proposed developments.

The use of the Caribbean Uniform Building Code (CUBiC) as the preferred code of reference has been emphasised. CUBiC was developed specifically for use in the Caribbean and contains the design and construction standards applicable to the environment. It is therefore recommended that designers of structures consult CUBiC where indicated in the Antigua and Barbuda Building Code. As CUBiC does not yet include standards for foundations and building services, the appropriate US and UK standards have been used and are so noted.

The changes and amendments in this edition have generally been to clarify certain specifications, particularly in the use of concrete block for load bearing walls, and in the construction of steel framed building systems. Designers are given some latitude in submitting alternate designs for approval of the Board provide the designs submitted meet with basic criteria set out in the Building Code and in the Environmental Impact Assessment Procedures Handbook.

Additional appendices have been added to provide more specific information on:

- the construction requirements of each Occupancy Group and for each Construction Type
- weights of building material commonly used in the Caribbean
- general guidelines for fire resistive construction
- Accessibility guidelines for disabled persons

The committees which reviewed the draft Building Code and Building Guidelines considered that there should be provision made for access to public buildings by disabled persons. This appendix provides basic information and other references for the construction of access ways and facilities for disabled persons.This information has also been included in the Planning and Infrastructure Standards prepared by UNCHS/OECS.

It is recommended that the Planning Authority arrange for periodic reviews of the Code. The primary objectives of these reviews will be to ensure that the Code is responsive to the

environmental needs of Antigua and Barbuda and is in keeping with current design and construction technology.

March 1995

PREFACE TO THE THIRD EDITION

(ANTIGUA AND BARBUDA)

This edition includes changes and amendments resulting from discussions in Antigua and Barbuda with the Ministry responsible for planning and with engineers, architects, and planning officials.

The main changes have been to introduce development standards as Section 19 of the Code. This has been done in response to the request of the Development Control Authority and to ensure that applicants for development permission have all of the relevant information in one document. This new Section however, does not replace the need for developers to follow the requirements laid down in the Planning and Infrastructure Standards Manual, in the same way that the other Sections of the Code require engineers to examine other relevant Codes and Standards for technical information.

Other amendments have been made to include technical information now in the Land Development (Interim Control) Regulations 1976. This has been done as a preliminary to amending the Regulations to include and mandate the use of the Antigua and Barbuda Building Code.

Amendments have been also made to Sections 1, 2, 3, 5, 7, 8, 10, and 11. The amendments to these Sections are noted on every other page of the documents amended.

June 1995

PREFACE TO THE FOURTH EDITION

(COMMONWEALTH OF DOMINICA)

This edition includes the changes and amendments resulting from the UNCHS mission to the Commonwealth of Dominica in November 1996.

The changes have been made to customize the documents to the procedures and practices of the Planning Authority of Dominica and to include information on the relevant legislation applicable to Dominica.

The maximum size of building for which the Building Guidelines have been developed has been reduced from 3,000 square feet to 2,500 square feet. It must be recognised however that the requirements of the Building Code govern the construction of all buildings and that the information given in the Building Guidelines is consistent with that given in the Code.

The use of a Special Inspector has been made more specific. All buildings which are accessible to the public must be carefully designed and constructed and it is mandatory that a Special Inspector be employed for certain classes of buildings as described in the Code.

Discussions with most of the Planning Authorities of the OECS have indicated that there is a great difficulty in attracting and keeping the cadre of experienced engineers and technicians required to staff a functioning Authority. It is recommended that the Authority examine other management models for ensuring effective control of developments. One model used in France and in the neighbouring Islands of Martinique and Guadeloupe is worthy of examination for possible adoption in the OECS.

The amended Sections are dated on every other page of the Section amended.

November 1996

PREFACE TO THE 5TH EDITION

(ST. LUCIA)

This preface provides information on the amendments made to include more details on the procedure for the review of plans and inspection of construction, and on the design of exterior windows and doors for important buildings.

It should be noted that CUBiC was approved for use by the Caricom Heads of Governments in 1986, and in the recent meeting in Barbados in May 1997 between the Caricom Heads of Government and the US Government, it was agreed that 'the Caribbean nations will take steps to reduce damage by hurricane and other natural disasters, by encouraging effective building design and construction standards through the promotion of the Caribbean Uniform Building Code (CUBiC)'. The provisions of the St. Lucia Code reflect the content and thrust of CUBiC to ensure effective building design and construction standards, while recognising that the regulatory provisions must reflect the laws of St. Lucia with respect to the control of developments.

The reviews of damage from the more recent hurricanes have shown the need to be specific about the design and installation of exterior doors and windows and other non-structural items. The Code requires that such windows and doors be designed by experienced structural engineers to resist hurricane winds in accordance with Section 12 of the Code. This may require a reconsideration of the traditional responsibilities of the architect and structural engineer, but it is considered important that building failures be minimised by improving the system of delivery of the buildings.

Discussions with the executive of the Professional Engineers Association of St. Lucia and with the Executive Secretary of the Development Control Authority of St. Lucia (DCA) have indicated that until the DCA is equipped with the staff required to carry out the review of plans and inspection of construction as mandated by the Code, there should be self regulation by the engineering fraternity as required in CUBiC Part 1 and in Section 1 of this Code. The St. Lucia Code therefore while providing for the review of plans and inspection of construction by the DCA staff and by a Check Consultant, also allows inspection and reporting by the engineers and architects employed by the owner, with the DCA reserving the discretionary power to carry out detailed reviews of the plans and inspection of construction at any time deemed necessary. This provision applies principally to the design and construction of public, institutional, commercial and hazardous use buildings, and for all buildings to which the public have access as defined in Section 3 of the Code.

June 1997

HOW TO USE THIS DOCUMENT

1. Determine the building purpose and occupancy requirements - see Table 3-1 and minium areas for habitable rooms - Table 5.1 and Appendices H and I.

2. Determine Construction Type by Classification - see Table 3-2.

3. Permissible heights and areas for specific classifications of buildings - Table 3-3

4. Fire resistance ratings for buildings - Tables 3-4 to 3-7 and Appendix G.

5. Protection of structural parts required - Tables 4-1 to 4-3.

6. Design of the structure to withstand loads - Section 12

7. For specific requirements for small buildings such as size and spacing of floor and roof members see Section 18 and Building Guidelines

8. Design of exit doors and windows - Section 5. Attention must be paid to 503.7 and 504.7 for the design of windows and doors to resist hurricane forces and to other non-structural items which may be affected by earthquake forces.

9. For arrangements for disabled persons see Appendix F of the Code or Section F of the Building Guidelines

SOME CONVERSION FACTORS FOR THE UNITS USED IN BUILDNG COSTRUCTION.

METRIC TO IMPERIAL

a) LENGTH

1 km	= 0.621 371 mile
1 m	= 1.093 61 yd

b) AREA

1 km^2	= 0.386 101 $mile^2$
1 ha	= 2.471 04 acre
1 m^2	= 10.7639 ft^2
1 mm^2	= 0.001 550 in

c) MASS

1 kg	= 2.204 62 lb
1 metric ton	= 1.102 31 ton (short 2000 lb)
1 g	= 0.035 274 oz

d) MASS PER UNIT AREA

1 kg/m^2	= 0.204 816 lb/ft^2
1 g/m^2	= 0.029 494 oz/yd^2

e) FORCE

1 MN	= 112.404 tonf (ton-force)
1 kN	= 224.809 lbf (pound-force)
1 N	= 0.224 809 lbf

f) FORCE PER UNIT LENGTH

1 N/m	= 0.068 522 lbf/ft
1 K/m	= 0.034 261 tonf/ft

g) PRESSURE, STRESS, MODULUS OF ELASTICITY

1 MPa	= 145.038 lbf/in^2
1 kPa	= 20.8854 lbf/ft^2

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APPENDICES