## UNIFIED FACILITIES CRITERIA (UFC)

# GENERAL BUILDING REQUIREMENTS



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## UNIFIED FACILITIES CRITERIA (UFC) GENERAL BUILDING REQUIREMENTS

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U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

Record of Changes (changes are indicated by \1\ ... /1/)

Change No.	Date	Location

#### **FOREWORD**

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD(AT&L) Memorandum dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate. All construction outside of the United States is also governed by Status of Forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA.) Therefore, the acquisition team must ensure compliance with the more stringent of the UFC, the SOFA, the HNFA, and the BIA, as applicable.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Center for Engineering and the Environment (AFCEE) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: Criteria Change Request (CCR). The form is also accessible from the Internet sites listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following source:

Whole Building Design Guide web site <a href="http://dod.wbdg.org/">http://dod.wbdg.org/</a>.

Hard copies of UFC printed from electronic media should be checked against the current electronic version prior to use to ensure that they are current.

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## UNIFIED FACILITIES CRITERIA (UFC) REVISION SUMMARY SHEET

**Subject:** UFC 1-200-01, GENERAL BUILDING REQUIREMENTS

Cancels: UFC 1-200-01, GENERAL BUILDING REQUIREMENTS, dated 27 November 2008,

with change 1, implemented 6 May 2009 and change 2, implemented 27 January 2010.

**Description of Change:** This update to UFC 1-200-01 represents another step in the joint Services effort to bring uniformity to the military use of existing non-government building codes. Technical representatives of each of the four Services developed this document to require the use of the International Building Code 2009 consistent with the scope of current military requirements and procedures. The International Building Code (IBC) 2000 was used with modifications as the basic building code for the Department of Defense, in the first UFC 1-200-01 published 31 July 2002. Subsequent revisions of UFC 1-200-01 referenced the 2003 and 2006 versions of the International Building Code. This revision of UFC 1-200-01 contains modifications in the following areas:

- □ The document requires the use of the latest published version of the International Building Code (2009), and replaces the previous IBC 2006.
- □ References to other codes, standards, and UFC's are also updated.
- □ The terms "Building Official" and "Authority Having Jurisdiction" have been clarified.
- Modifications in deference to the continued use of the NFPA Fire Code and Life Safety Code were retained and expanded.
- References were added to numerous other UFC's that are applicable to most DoD building facilities. These "core" UFC's include requirements for the architectural and civil, structural, mechanical, plumbing and electrical engineering design of buildings.

**Reasons for Change:** The existing guidance was inadequate for the following reasons:

- □ The existing UFC 1-200-01 required the use of the IBC 2006 which was revised and replaced in 2009 by the International Code Council.
- □ The existing UFC did not properly reference and identify recently updated and published codes and standards.
- □ The existing UFC did not reflect recent changes in the Fire Code and Life Safety Code published by the NFPA.
- □ The existing UFC did not reference the "core" UFC's regarding the architectural and civil, structural, mechanical, plumbing and electrical engineering design of buildings.

**Impact:** The following direct benefits will result from the update of UFC 1-200-01:

- □ Creation of a single source reference for modifications to a building code that provides guidance for the design of DoD facilities.
  - Reduces interpretation and ambiguity that could lead to design and construction conflicts.
  - Continues DoD reliance upon NFPA Fire Code and Life Safety Code, and where they are to be specifically used and applied.

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#### **CHAPTER 1 - INTRODUCTION**

#### 1-1 **APPLICABILITY**

This UFC applies to the design and construction of all new and renovated Government-owned facilities for the Department of Defense. It is applicable to all methods of project delivery. It is not applicable to public-private ventures (PPV).

#### 1-2 **BUILDING CODE**

Except as indicated below, use the 2009 International Building Code (IBC-2009) as modified by Chapter 2 and Chapter 3 of this UFC as the building code for the Department of Defense.

#### 1-2.1 **Substitutions**

All references in the International Building Code to the International Fire Code shall be considered to be references to NFPA 1.

All references in the International Building Code to the International Fuel Gas Code shall be considered to be references to NFPA 54 and NFPA 58.

#### 1-3 **CORE UFC'S**

The International Building Code is modified in Chapters 2 and 3 of this UFC through reference to "core" UFCs (Appendix A, References) and other military criteria. Core UFCs provide the unique military building criteria that parallel the building code and apply to building systems found in most DoD facilities. In the case of conflicts between the International Building Code and the military criteria, use the military requirements.

#### 1-4 ADMINISTRATION AND ENFORCEMENT

The terms "Building Official" and "Authority Having Jurisdiction" (AHJ) as used in the codes and standards referenced in this UFC must mean the component office of responsibility, i.e., U.S. Army, HQ USACE/CECW-CE; U.S. Navy, NAVFACENGCOM HQ Code CHE; U.S. Marine Corps, HQMC Code LFF-1; and U.S. Air Force, HQ AFCESA/CEO.

#### **CHAPTER 2 - MODIFICATIONS TO THE INTERNATIONAL BUILDING CODE (IBC)**

#### 2-1 CHAPTER 1 – ADMINISTRATION

Use Sections 101, 102, 110, and 112 of IBC Chapter 1.

#### 2-2 **CHAPTER 2 – DEFINITIONS**

Use IBC Chapter 2. Definitions apply to terms used in the model code and are not intended to replace definitions and terms in military documents.

#### 2-3 CHAPTER 3 – USE AND OCCUPANCY CLASSIFICATION

Use IBC Chapter 3 and UFC 3-600-01. If any conflict occurs between IBC Chapter 3 and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence.

## 2-4 CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

Use UFC 3-600-01 in lieu of IBC Chapter 4.

#### 2-5 CHAPTER 5 – GENERAL BUILDING HEIGHTS AND AREAS

Use IBC Chapter 5. The building area for funding and planning purposes may be calculated differently than the method defined in IBC Chapter 5.

#### 2-6 CHAPTER 6 – TYPES OF CONSTRUCTION

Use IBC Chapter 6 and UFC 3-600-01. If any conflict occurs between IBC Chapter 6 and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence.

#### 2-7 CHAPTER 7 – FIRE-RESISTANCE-RATED CONSTRUCTION

Use IBC Chapter 7 and UFC 3-600-01. If any conflict occurs between IBC Chapter 7 and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence.

#### 2-8 **CHAPTER 8 – INTERIOR FINISHES**

Use UFC 3-600-01 in lieu of IBC Chapter 8.

#### 2-9 **CHAPTER 9 – FIRE PROTECTION SYSTEMS**

Use UFC 3-600-01 in lieu of IBC Chapter 9.

#### 2-10 CHAPTER 10 – MEANS OF EGRESS

Use UFC 3-600-01 in lieu of IBC Chapter 10.

#### 2-11 CHAPTER 11 – ACCESSIBILITY

Use the ABA Accessibility Standard for Department of Defense Facilities as adopted by the Deputy Secretary of Defense memorandum dated October 31, 2008, in lieu of IBC Chapter 11.

#### 2-12 CHAPTER 12 – INTERIOR ENVIRONMENT

Use IBC Chapter 12, except as modified below:

- 2-12.1 Delete paragraph 1204.1, including the exception, and replace with the following:
  - "1204.1 Use the applicable Unified Facilities Criteria and individual military service standards for temperature control criteria."
- 2-12.2 For Navy and Marine Corps bachelor housing facilities, delete paragraphs 1207.2, 1207.3, 1208.3 and 1208.4, and use UFC 4-721-10 for air-borne and structure-borne sound transmission criteria, for minimum room sizes, and for dwelling unit criteria.

#### 2-13 **CHAPTER 13 – ENERGY EFFICIENCY**

Use UFC 3-400-01 in lieu of IBC Chapter 13.

#### 2-14 CHAPTER 14 – EXTERIOR WALLS

Use IBC Chapter 14.

#### 2-15 CHAPTER 15 – ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

Use IBC Chapter 15.

#### 2-16 CHAPTER 16 – STRUCTURAL DESIGN

Use IBC Chapter 16 as modified by UFC 3-301-01. Use IBC Chapter 16 and UFC 3-310-04 for seismic design.

#### 2-17 CHAPTER 17 – STRUCTURAL TESTS AND INSPECTIONS

Use IBC Chapter 17 as modified by UFC 3-301-01.

2-17.1 In Paragraph 1704.1 General, add the following after the first paragraph:

"When the construction contractor is required by the Government to provide special inspections as part of his work, the contractor shall retain third-party quality assurance agencies to conduct the special inspections required by the IBC. The inspecting agency shall provide reports of the special inspections directly to the government."

#### 2-18 CHAPTER 18 – SOILS AND FOUNDATIONS

Use IBC Chapter 18 as modified by UFC 3-301-01. For Navy and Marine Corps facilities, also use UFC 3-220-01N.

#### 2-19 **CHAPTER 19 – CONCRETE**

Use IBC Chapter 19 as modified by UFC 3-301-01.

#### 2-20 **CHAPTER 20 – ALUMINUM**

Use IBC Chapter 20.

#### 2-21 CHAPTER 21 – MASONRY

Use IBC Chapter 21 as modified by UFC 3-301-01.

#### 2-22 **CHAPTER 22 – STEEL**

Use IBC Chapter 22 as modified by UFC 3-301-01.

#### 2-23 **CHAPTER 23 – WOOD**

Use IBC Chapter 23.

#### 2-24 **CHAPTER 24 – GLASS AND GLAZING**

Use IBC Chapter 24.

#### 2-25 CHAPTER 25 – GYPSUM BOARD AND PLASTER

Use IBC Chapter 25.

#### 2-26 **CHAPTER 26 – PLASTIC**

Use IBC Chapter 26.

#### 2-27 CHAPTER 27 – ELECTRICAL

Use IBC Chapter 27 and the following:

- 1. Use UFC 3-501-01 for general electrical requirement criteria.
- 2. Use UFC 3-520-01 for interior electrical systems criteria.
- 3. Use UFC 3-530-01 for interior and exterior lighting and controls criteria.

- 4. Use UFC 3-550-01 for exterior power distribution systems criteria.
- 5. Use UFC 3-560-01 for electrical safety and electrical O&M criteria.
- 6. Use UFC 3-580-01 for interior telecommunications criteria.
- 7. Use UFC 4-021-01 for mass notification systems criteria.

#### 2-28 **CHAPTER 28 – MECHANICAL SYSTEMS**

- 2-28.1 Use IBC Chapter 28 and UFC 3-400-10N for Navy and Marine Corps facilities.
- 2-28.2 Use UFC 3-410-01FA in lieu of IBC Chapter 28 for Army and Air Force facilities.
- 2-28.3 Use UFC 3-400-02 to access climatological data for use in designing mechanical systems.

#### 2-29 **CHAPTER 29 – PLUMBING SYSTEMS**

Use IBC Chapter 29 and UFC 3-420-01.

#### 2-30 CHAPTER 30 – ELEVATOR AND CONVEYING SYSTEMS

Use IBC Chapter 30, UFC 3-600-01, and ITG 01-01.

2-31 **CHAPTER 31 – SPECIAL CONSTRUCTION.** 

Use IBC Chapter 31.

#### 2-32 CHAPTER 32 – ENCROACHMENT INTO THE PUBLIC RIGHT-OF-WAY

Use IBC Chapter 32.

#### 2-33 CHAPTER 33 – SAFEGUARDS DURING CONSTRUCTION

Use IBC Chapter 33 and UFC 3-600-01. If any conflict occurs between IBC Chapter 33 and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence.

#### 2-34 **CHAPTER 34 – EXISTING STRUCTURES**

Use IBC Chapter 34 and the International Existing Building Code, except as modified below.

2-34.1 Use Section 3410 with UFC 3-600-01. If any conflict occurs between Section 3410 or the International Existing Building Code and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence.

2-34.2 Use IBC Chapter 34 with UFC 3-310-04 for seismic evaluation and seismic rehabilitation of existing buildings. Existing buildings inside the United States, its territories and possessions must comply with ICSSC RP6 / NISTIR 6762. All references in ICSSC RP6 / NISTIR 6762 to FEMA 310 and FEMA 356 shall be considered to be references to ASCE/SEI 31-03 and ASCE/SEI 41-06 respectively.

#### 2-35 **CHAPTER 35 – REFERENCED STANDARDS**

Use IBC Chapter 35 and Appendix A of this UFC.

#### 2-36 **APPENDICES**

Delete Appendix A through Appendix K of the IBC.

#### **CHAPTER 3 - OTHER CRITERIA**

In addition to the International Building Code as modified in Chapter 2 of this UFC, comply with the following criteria:

#### 3-1 **HIGHER AUTHORITY MANDATES**

All construction must be in compliance with all Public Laws (P.L.), Executive Orders (E.O.), Code of Federal Regulations (CFR), Department of Defense Instructions (DODI), and Department of Defense Directives (DODD) or other higher authority documents as applicable, as listed in MIL-STD-3007F, Appendix B

#### 3-2 **UFC'S**

Comply with UFC's (Latest Version)

#### 3-3 **CORE UFC'S**

See Appendix A - References.

#### 3-3.1 **Antiterrorism**

Use UFC 4-010-01 and Geographic Combatant Commander Antiterrorism construction standards for antiterrorism requirements.

#### 3-3.2 **Sustainability**

Use UFC 4-030-01 for sustainability requirements.

#### 3-3.3 **Architectural**

- a. Use UFC 3-101-01 for architectural design criteria, target publication date Nov 2010. Use UFC 3-100-10 for Navy and Marines as interim criteria until publication.
- b. Use UFC 3-110-03 for roofing criteria.
- c. Use UFC 3-120-10 for interior design criteria.

#### 3-3.4 **Civil Engineering**

- a. Use UFC 3-210-10 for low-impact development criteria.
- b. Use UFC 3-201-01 for general civil engineering, and site planning and design criteria, target publication date, Nov 2011. Use UFC 3-210-01A and UFC 3-200-10N as interim criteria until publication.

- c. Use UFC 3-230-01 for water supply, target publication date, Dec 2010. Use UFC 3-230-03A and UFC 3-200-10N as interim criteria until publication.
- d. Use UFC 3-240-01 for wastewater collection, target publication date Dec 2010. Use UFC 3-240-04A and UFC 3-200-10N as interim criteria until publication.

#### 3-4 OTHER MILITARY CRITERIA

Military criteria other than those listed in this UFC may be applicable to specific types of structures, building systems, or building occupancies. Such structures, systems, or buildings must meet the additional requirements of the applicable military criteria.

#### **APPENDIX A - REFERENCES**

#### **GOVERNMENT PUBLICATIONS**

- ABA Accessibility Standard for Department of Defense Facilities, http://www.access-board.gov/ada-aba/aba-standards-dod.cfm
- FEMA-310, Handbook for the Seismic Evaluation of Buildings, http://www.wbdg.org/ccb/FEMA/ARCHIVES/fema310.pdf
- FEMA-356, Prestandard and Commentary for the Seismic Rehabilitation of Buildings, http://www.wbdg.org/ccb/FEMA/ARCHIVES/fema356.pdf
- ICSSC RP6 / NISTIR 6762, Standards of Seismic Safety for Existing Federally Owned and Leased Buildings, <a href="http://fire.nist.gov/bfrlpubs/build01/PDF/b01056.pdf">http://fire.nist.gov/bfrlpubs/build01/PDF/b01056.pdf</a>
- ITG 01-01, *Elevator Design*, 01 March 2001, <a href="http://www.wbdg.org/ccb/NAVFAC/INTCRIT/fy01\_01.pdf">http://www.wbdg.org/ccb/NAVFAC/INTCRIT/fy01\_01.pdf</a>
- MIL-STD-3007F, Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications, 13 December 2006, http://www.wbdg.org/ccb/FEDMIL/std3007f.pdf

#### CORE UFC's

- UFC 3-101-01, *Architecture*, target publication date Nov 2010; will supersede UFC 3-100-10, *Architecture* (DRAFT), <a href="http://www.wbdq.org/ndbm/pdfs/ufc3">http://www.wbdq.org/ndbm/pdfs/ufc3</a> 100 10 draft.pdf
- UFC 3-110-03, Roofing, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 110 03.pdf
- UFC 3-120-10, Interior Design, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 120 10.pdf
- UFC 3-200-10N, Civil Engineering (DRAFT), <a href="http://www.wbdg.org/ndbm/pdfs/ufc3">http://www.wbdg.org/ndbm/pdfs/ufc3</a> 200 10n draft.pdf
- UFC 3-201-01, Civil Engineering, target publication date, Nov 2011; will supersede UFC 3-210-01A, Area Planning, Site Planning, and Design, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 210 01a.pdf and UFC 3-200-10N, Civil Engineering, (DRAFT), <a href="http://www.wbdg.org/ndbm/pdfs/ufc3">http://www.wbdg.org/ndbm/pdfs/ufc3</a> 200 10n draft.pdf
- UFC 3-210-10, Low Impact Development, http://www.wbdg.org/ccb/DOD/UFC/ufc\_3\_210\_10.pdf
- UFC 3-220-01N, Geotechnical Engineering Procedures for Foundation Design of Buildings and Structures, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 220 01n.pdf

- UFC 3-230-01, *Water Supply*, target publication date, Dec 2010; will supersede UFC 3-230-03A, *Water Supply*, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 230 03a.pdf
- UFC 3-240-01, Wastewater Collection, target publication date Dec 2010; will supersede UFC 3-240-04A, Wastewater Collection, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 240 04a.pdf
- UFC 3-301-01, Structural Engineering, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 301 01.pdf
- UFC 3-310-04, Seismic Design for Buildings, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 310 04.pdf
- UFC 3-400-01, Energy Conservation, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 400 01.pdf
- UFC 3-400-02, Design: Engineering Weather Data, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 400 02.pdf
- UFC 3-400-10N, *Mechanical Engineering*, (DRAFT), http://www.wbdg.org/ndbm/pdfs/ufc3 400 10n draft.pdf
- UFC 3-410-01FA, *Heating, Ventilating, and Air Conditioning*, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 410 01fa.pdf
- UFC 3-420-01, *Plumbing Systems*, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 420 01.pdf
- UFC 3-501-01, *Electrical Engineering*, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 501 01.pdf
- UFC 3-520-01, Interior Electrical Systems, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 520 01.pdf
- UFC 3-530-01, Design: Interior and Exterior Lighting and Controls, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 530 01.pdf
- UFC 3-550-01, Exterior Electrical Power Distribution, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 550 01.pdf
- UFC 3-560-01, *Electrical Safety, O&M*, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 560 01.pdf
- UFC 3-580-01, *Telecommunications Building Cabling Systems Planning and Design*, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 3 580 01.pdf

- UFC 3-600-01, Fire Protection Engineering for Facilities, http://www.wbdg.org/ccb/DOD/UFC/ufc 3 600 01.pdf
- UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*, <a href="http://www.wbdg.org/ccb/DOD/UFC/ufc">http://www.wbdg.org/ccb/DOD/UFC/ufc</a> 4 010 01.pdf
- UFC 4-021-01, Design and O&M: Mass Notification Systems, http://www.wbdg.org/ccb/DOD/UFC/ufc 4 021 01.pdf
- UFC 4-030-01, Sustainable Development, http://www.wbdg.org/ccb/DOD/UFC/ufc 4 030 01.pdf

#### **NON-CORE UFC**

UFC 4-721-10, Navy and Marine Corps Bachelor Housing, http://www.wbdg.org/ccb/DOD/UFC/ufc 4 721 10.pdf

#### **NON-GOVERNMENT PUBLICATIONS**

- ASCE/SEI 31-03, Seismic Evaluation of Existing Buildings, American Society of Civil Engineers, 1801 Bell Drive, Reston, VA 20191-4400, http://www.asce.org
- ASCE/SEI 41-06, Seismic Rehabilitation of Existing Buildings, American Society of Civil Engineers, 1801 Bell Drive, Reston, VA 20191-4400, <a href="http://www.asce.org">http://www.asce.org</a>
- International Building Code, 2009, International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001, <a href="http://www.iccsafe.org">http://www.iccsafe.org</a>
- International Existing Building Code, 2009, International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001, <a href="http://www.iccsafe.org">http://www.iccsafe.org</a>
- International Fire Code, 2009, International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001, <a href="http://www.iccsafe.org">http://www.iccsafe.org</a>
- International Fuel Gas Code, 2009, International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001, <a href="http://www.iccsafe.org">http://www.iccsafe.org</a>
- NFPA 1, *Fire Code*, 2009, National Fire Protection Association, 1 Batterymarch Park Quincy, Massachusetts, 02169, http://www.nfpa.org
- NFPA 54, *National Fuel Gas Code*, 2009, National Fire Protection Association, 1 Batterymarch Park Quincy, Massachusetts, 02169, <a href="http://www.nfpa.org">http://www.nfpa.org</a>
- NFPA 58, *Liquefied Petroleum Gas Code*, 2008, National Fire Protection Association, 1 Batterymarch Park Quincy, Massachusetts, 02169, http://www.nfpa.org