



# CODEWORD®

THE OFFICIAL NEWSLETTER OF THE BOARD OF BUILDING REGULATIONS & STANDARDS

~July 1999~

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Administrator

## BBRS HOLDS STATUTORY PUBLIC HEARING

The BBRs held its first Public Hearing of 1999 on May 11, 1999, in Boston.



Chairman Kentaro Tsutsumi, P.E. & Vice Chairman Dan O'Sullivan preside at the May 11 Public Hearing

Testimony was heard on 29 proposed code changes filed with the BBRs. State law requires the BBRs to hold public hearings in Boston, in May and November each year. The public hearings are required specifically to hear testimony on changes proposed to the State Building Code. The BBRs is required to take an action on the proposals within 90 days of the hearing. Results will be published in *Codeword*.

Anyone can file a proposal to amend the State Building Code. Please note, the BBRs must be in receipt of any proposed amendments at least 60 days prior to a Public Hearing. Mark your calendars, the next public hearing is scheduled for November 9, 1999 at One Ashburton Place, Boston.

Proposals must be submitted on forms provided by the BBRs. You can either download a form from the BBRs Web Page at [www.state.ma.us/bbrs](http://www.state.ma.us/bbrs) (click on "the Massachusetts State Building Code" then "Code Change Process") or contact the BBRs and request a form.

## PROFESSIONAL ENGINEER DISCIPLINED BY BOARD OF REGISTRATION

The Board of Registration of Professional Engineers and Professional Land Surveyors has suspended the license of Frederick Dzialo (license number 17657) for a period of 18 months effective March 9, 1999.

The Board suspended Mr. Dzialo's license for improprieties in sealing plans for a condominium complex in Granby and a hotel in Hadley.

To verify licenses, disciplinary action taken within the last 5 years and findings of closed complaints, visit the Division of Registration web site at [www.state.ma.us/reg](http://www.state.ma.us/reg) click "enter" then click on either "Board" or "Consumer" option. Then click on "license search" and follow instructions.

## IS YOUR CODE UP TO DATE? AMENDMENT HISTORY OF THE SIXTH EDITION OF THE MASSACHUSETTS STATE BUILDING CODE TO DATE

The following is a list of amendment dates made to the 6<sup>th</sup> Edition of the Massachusetts State Building Code since initial promulgation.

Date	Action
2-28-97	Initial Promulgation
8-28-97	Amendment #1
12-12-97	Amendment #2
3-1-98	Amendment #3
11-27-98	Amendment #4

Initial Issue Date – 2/28/97, with existing 5<sup>th</sup> Edition Code "running concurrently" until 8/28/97, at which time only the 6<sup>th</sup> Edition Code would then be allowed used



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except for One- and Two-Family Dwellings (Chapter 36) for which the 5<sup>th</sup> Edition One- and Two-Family Code was allowed to "run concurrently" until 2/28/93.

Amendment Package #1 Issue Date - 8/28/97 and consisting of two (?) parts; one part being a series of grammatical or format and/or cross-reference corrections; the second part being actual amendments by emergency action of the BERS. Note that simple corrections can be applied/used retroactive to the initial issue date of the 6<sup>th</sup> Edition (2/28/97).

Amendment Package #2 Issue Date - 12/12/97; note that these amendments essentially replace the "emergency" amendments of Amendment Package #1 with final amendments that were affirmed by the BERS at a required Public Hearing held within 90 days of the "emergency actions" taken by the BERS; i.e., Amendment Package #1. Note that the Secretary of State does not "cull" emergency amendments into complete Building Codes but only "culls" in such amendments after these amendments have been affirmed and promulgated via a Public Hearing process.

Amendment Package #3 Issue Date - 3/1/98 consisting of BERS adopted proposals from the November 1997 standard Code Cycle.

Amendment Package #4 Issue Date - 11/27/98, consisting of BERS adopted proposals from the May 1998 standard Code Cycle, as well as amendments, initially adopted by emergency action but affirmed, via an "out of sequence" Public Hearing in September 1998.

#### Selected Examples of Adopted Code Changes per Amendment Package

(this is not to be considered as a comprehensive list of amendments -- for comprehensive requirements refer to the Code proper)

Amendment #1 (8/28/97):

Section 108.3.5.1

Homeowner "OSI exemption" refined to limit exemption to ownership of one- or two family dwellings (was, at one time, up to 6 family)

Section 405.3.2: Requiring of a secondary water supply for high-rise sprinkler systems.

Section 906.1.3: Recognition of Licensed Trades Personnel exemption from certain (also Chapter 1)

Professional Engineering services - MGL c.122S 81R

Section 1022.3: Acquires 5<sup>th</sup> Edition requirement for the testing and certification of existing exterior stairways and fire escapes.

Section 1206.2.1: Refines requirement for mechanical ventilation of bathrooms by only requiring such in bathrooms with a tub or shower.

Chapter 36: Numerous changes per Home Builder Organization adopted proposals

Amendment #2 (12/12/97):

Essentially a repeat of the emergency amendments of Package #1; note, however, that where amendments issued by emergency action are not "culled" into the Building Code proper, once such emergency amendments have been affirmed in a Public Hearing process, then the Secretary of State places such affirmed amendments into the Code proper, but such affirmed amendments retain the effective date of the emergency amendments.

Amendment #3 (3/1/98):

Section 108.3.5.2(b): Allows for Licensed Trades personnel to perform certain building permissible activities without the possession of a Construction Supervisor's License.

Section 116.1.1: Places the design and erection of telecommunication towers and similar structures into "Construction Control" (no CSI required).

Chapter 15: Refined in recognition of the revised appendix J low-rise residential energy code

Section 340.2: Refined energy conservation requirements for existing buildings.

Appendix J: Complete revision in order to reflect the Massachusetts version of the Model Energy Code, 1995.

Amendment #4 (11/27/98):

Section 111.7: New requirements relative to "hazards to air navigation" for consistency with MGL c.90 S 35B.

Section 124.1: Further expands the consensus makeup of the Fire Prevention Fire Protection Advisory Committee.

Section 310.5: Reduces the number of lodgers from 5 to 4 in R-3 structures for consistency with Massachusetts State Law.

Sections 427 and 428: Numerous - refines fire alarm supervision requirements by defaulting to Section 923.

Chapter 5: Eliminates special consideration of certain USE GROUP R buildings; and also eliminates special consideration of TYPE 3A and TYPE 2B construction buildings of R-2 USE (refer to Sections 504.2, 504.6 and 504.7 of the Code, prior to the 11/27/98 Amendment Package).

Section 1023.2: The use of red or green letters or other suitable colors in exit signage is now explicitly allowed (by reference such colors have always been allowed in the 6<sup>th</sup> Edition and also in the 5<sup>th</sup> Edition of the Code).

Sections 1023.4 and 1024.4: Emergency power must now be available for exit signage and means of egress lighting for 1 1/2 hours after loss of primary power.

Section 1507.3: Low slope roof coverings may be installed at 1/8 inch per foot, rather than 1/4 inch per foot if the membrane roof manufacturer/installer allows such by design/warranty.

R5.2.1: Construction Supervisor License Regulations amended to allow one (1) year of experience to graduates of a three or four (3 or 4) year vocational school program in the field of building construction.

NOTE: WHEN YOU PURCHASE A BUILDING CODE - THE REGULATION FILING SHEET (THE FRONT SHEET) WILL IDENTIFY WHICH AMENDMENTS ARE CONTAINED WITHIN THE CODE YOU PURCHASE. IF YOU PURCHASED A BUILDING CODE TODAY THE SHEET WOULD IDENTIFY THAT THE CODE "INCLUDES ALL AMENDMENTS THROUGH 11-27-98"

### THE ENERGY CORNER RESIDENTIAL BOILER & FURNACE EFFICIENCY

*Q. What is the minimum allowable heating system efficiency for new homes?*

A. Appendix J of the building code lists minimum efficiency requirements for boilers and furnaces (J4.4.3.2.) Tables J4.4.3.2a through c show the AFUE ratings (Annual Fuel Utilization Efficiency) for gas- and oil-fired systems. The minimum allowed AFUE ratings are summarized below:

AFUE (minimum)	Gas	Oil
Boiler	80%	80%
Furnace	78%	78%

These numbers correspond with the minimum Federal manufacturing requirements, so any new equipment being installed will satisfy them. However, as you probably know, builders can take credit in their energy analysis (MASScheck or Manual Trade-Off) by installing a system with a higher AFUE rating.

*Q. How do I determine the AFUE rating of a boiler or furnace?*

A. AFUE ratings labels are affixed to new boilers and furnaces. Generally, you should check to see that the rating on the label matches or exceeds the AFUE number indicated in the construction documents. However, there are some exceptions to this. In the case of oil-fired systems, the AFUE is affected by the orifice size on the fuel nozzle; a smaller diameter orifice will spray a finer mix of oil, which provides a higher AFUE. The boiler or furnace, however, lists only the worst-case AFUE rating, assuming the largest orifice. If the installing contractor has installed a smaller size orifice, they should submit documentation indicating what they have installed, along with a manufacturer's cut-sheet listing the AFUE rating for the installed orifice size. In such cases only, the building inspector should allow an AFUE rating different from the one listed on the boiler or furnace label.

Plywood and OSB as vapor retarders

*Q. What is a vapor retarder?*

A. Section J4.2.1 of the building code requires that a vapor retarder be installed on the warm-in-winter side of insulation in all exterior walls, floors and ceilings in new homes (with the exception of ceilings if sufficient attic ventilation is provided.) The reason for this requirement is to limit water vapor diffusion into building cavities to a slow enough rate that the vapor will not damage the structure. (NOTE: Remember that much more moisture will enter the structure riding on the back of leaking air than will enter by vapor diffusion.) Materials that have a "perm" rating of 1 or less are deemed satisfactory vapor retarders, and include products such as kraft-faced batt insulation, foil facing, polyethylene sheeting.

*Q. What about plywood and OSB?*

A. Certain grades of plywood and oriented strand board (OSB) can act as vapor retarders. If these structural sheathings are "Exterior" or "Exposure 1" rated, then they are made with waterproof glues so that they do not delaminate when exposed to the elements. The multiple layers of glue also give the sheathing a permeability of under one if the sheathing is 1/2" or greater <sup>(1)</sup>. This means that "Exposure 1" sheathing, the most typically used sub-flooring, is an acceptable vapor retarder when used over basements or garages with insulated ceilings. In other words, the insulation installed in a basement or garage ceiling does not necessarily need a separate vapor retarder such as kraft facing if this type of sheathing is used.

(1) APA - The Engineered Wood Association, Technical Services Bulletin, 1994

### **BBRS MEMBER PROFILE ROBERT BANKS**

This issue of *Codeword* profiles BBRs member Robert Banks. Bob is appointed to the BBRs as the Building Trades representative.

Bob is currently the Director of Apprentice Training for the Ironworkers Local 7. Bob also serves on numerous boards and committees, including:

Chairman of the New England District Council of Ironworkers Health and Safety Committee; Member of the Central Artery/Tunnel Labor Management Safety Committee; Member of the Department of Industrial Accident Workers Compensation Advisory Council; Chairman of the Workers Compensation Rating and Inspection Bureau Board of Governors; member of the Massachusetts Workers Compensation Performance report Advisory Committee for the Workers Compensation Research Institute.

Bob is also the past business agent for Ironworkers Local 7.

In addition to his regular duties on the BBRs, Bob is a member of the Construction Supervisor License Review Committee, which adjudicates complaints against construction supervisor license holders.

In his spare time, Bob enjoys marathon running and has competed in twenty Boston Marathons.

## **CHAPTER 34 THE EXISTING BUILDING CHAPTER OF THE SIXTH EDITION OF THE MASSACHUSETTS STATE BUILDING CODE**

The Massachusetts State Building Code regulates the construction of new buildings and the alteration, renovation or change of use of existing buildings. The provisions for existing buildings are contained in Chapter 34 of the Code.

The general philosophy of Chapter 34 is to encourage incremental improvement of existing buildings, which are undergoing additions, alterations or renovations (including change in use). The scope of Chapter 34 generally encompasses all existing buildings regardless of USE GROUP or CONSTRUCTION TYPE.

WHEN DETERMINING WHICH BUILDING CODE REQUIREMENTS IMPACT AN EXISTING BUILDING UNDERGOING BUILDING PERMITABLE WORK, ONE SHOULD ALWAYS START BY REVIEWING CHAPTER 34 AS OPPOSED TO STARTING IN THE "NEW CONSTRUCTION" SECTIONS. CHAPTER 34 IS WRITTEN IN SUCH A WAY AS TO DIRECT THE USER TO THOSE PORTIONS OF THE CODE FOR NEW CONSTRUCTION, ONLY WHEN APPLICABLE.

In order to establish life-safety requirements in existing buildings, Chapter 34 assigns a numerical value between 1 and 8 to every use group. This number is termed the HAZARD INDEX and reflects the relative life safety hazard associated with each use group. Generally, the higher the HAZARD INDEX, the more life safety features are required by the code. Hazard Indices are listed in Table 3403 and in Appendix F of the Code. The Hazard Index is subject to modification depending upon the building's construction type - see footnotes to Table 3403

Work done to an existing building generally falls into one of three categories (or a combination of any):

1. Additions
2. Renovation with a change in Use
3. Renovation with no change in Use

Chapter 34 requires the user to assign a hazard index number to both the new and existing uses as specified in Table 3403 and Appendix F. The algebraic difference is then used to determine which code provisions must be applied. If there is no change in use the number will be

zero. If going from a more hazardous use to one which is less hazardous, the number would be negative and if going to a more hazardous use the number would be positive.

In the case where the work results in a change in hazard index of one or less, Chapter 34 requires a series of improvements which must be made in order to comply with the Code. Typically these improvements would not require the building to be completely upgraded to new construction standards.

The Code, however, imposes more rigorous standards when the change in hazard index is 2 or more and requires the building to be upgraded to new construction standards (with some exceptions) "to the fullest extent practicable" (See this issue of *Codeword* for a description of the use of COMPLIANCE ALTERNATIVES).

Section 3408 addresses structural requirements for existing buildings and generally does not require that an existing building be reconstructed to satisfy the structural requirements for "ground-up new construction"; however, if live loads are increased, existing structural components must be capable of safely supporting the new live loads.

The Code also establishes "energy conservation requirements" for existing buildings. The energy conservation requirements for existing buildings are independent of hazard index change, and only Section 3407 is applicable for "energy conservation-only" upgrades (see 3404.3, 3404.19, 3405.1 and 3407).

Finally, Section 3409 addresses both totally preserved and partially preserved historic buildings.

#### **CHAPTER 34, SECTION 3402.1.1 INVESTIGATION AND EVALUATION /THE POWER OF THE "FIELD SURVEY"**

For existing buildings which are subject to Construction Control, (i.e. those buildings over 35,000 cubic feet of enclosed space) and which are being remodeled or renovated or changed in use, Section 3402 requires that a field survey of the existing building be performed. The field survey establishes the baseline level of safety for the building. This level of safety cannot be reduced as a result of any alteration, additions or change in use.

The field survey need only involve the area affected by the proposed work, which may or may not include the

entire building or a space or floor within a building. For example, a change from an office space to an assembly space on one floor of a building will typically increase the occupant load of the space. In such a case, the field survey should address the capacity of the exit components affected by increased number of people now using the original exits. Of course, other systems such as fire protection, ventilation, energy conservation and structural may also be affected and must be considered, where necessary, in the field survey

Such investigation and evaluation ("field survey") is required to be submitted as a written report, to the Building Official at the time of building permit application.

Sections 3402.1.2 and 3402.1.3, require the written report to identify any Code non-compliances that would be created by the proposed work and also to identify any proposed compliance alternatives which will be utilized to correct such non-compliances (see Section 3406 - "Compliance Alternatives").

The field survey allows the Building Owner, and his or her agents, to develop a far clearer understanding of the Building Code compliance status of the existing building, and as a result they are in a better position to determine what life-safety compliance alternatives must be incorporated into any proposed work.

The field survey is also valuable to the Building Official in that such a report, when properly prepared, quickly and efficiently informs the Building Official of the life-safety status of the existing building and makes it easier for the Building Official to judge whether proposed compliance alternatives are acceptable.

In summary, for existing buildings subject to CONSTRUCTION CONTROL (Section 116 and/or 3402.1.1), and undergoing renovations, additions and/or change in use, the Code requires that:

- an investigation and evaluation ("field survey") of the subject building be performed by the building owner in accordance with the requirements of Chapter 1, Section 116 and Chapter 34, Section 3402, and;
- the resulting "survey" be filed with the Building Official as a written report as part of the construction documents, and;

- the report must identify any Building Code non-compliances that will exist as a result of the proposed work and to further identify any *compliance alternatives* being offered to correct or improve Code non-compliance matters.

It may be necessary to seek a variance or appeal to the State Building Code Appeals Board if issues between the building official and designer cannot be reconciled at the local level

The code precludes the building official from issuing the building permit until the "survey" is filed as part of the required construction documents (see 3402.1.3).

### CHAPTER 34 SECTION 3406 COMPLIANCE ALTERNATIVES / ACHIEVING LIFE-SAFETY IN EXISTING BUILDINGS USING ALTERNATE APPROACHES

*Compliance alternatives* are defined as ".....alternative life-safety construction features that meet or exceed the requirements or intent of a specific provision of the State Building Code" (see Section 3401.1).

Life-Safety construction features, are any Building Code-required systems including egress, fire protection, HVAC, structural, or light and ventilation or any other systems regulated by the Building Code.

*Compliance Alternatives* are typically used by designers when the code requires that certain work in an existing building be performed in accordance with new construction and when doing so would pose an issue of practicality. The code requires the work to be done to the "fullest extent practicable". A *compliance alternative* must demonstrate an alternate method of achieving what the code is requiring.

*Compliance alternatives* are not permitted for new construction or for additions to existing buildings.

Building Officials may accept or reject proposed *compliance alternatives* (see Section 3401.1 "Definitions", Section 3402.1.3 and Section 3406.2). This Code-allowed acceptance by a Building Official, of a life-safety alternative to specific Code-required systems, is unique to Chapter 34 – for new construction, the Building Official would normally have to

reject that which is not "letter-of-Code" and send the proponent to a Building Code Appeals Board for a waiver from, or a variance to, the Code.

Although Appendix F of the Code is intended to supplement Chapter 34 and offers guidelines for the development of the investigation and evaluation ("field survey") required by Section 3402 as well as providing *some SUGGESTED COMPLIANCE ALTERNATIVES*, Appendix F has not undergone any updating for the past several editions of the Code and could suggest *compliance alternatives* that may or may not be considered acceptable given fundamental requirements of the current State Building Code.

Appendix F, Table F-1 also provides additional guidance for hazard index classifications, but likewise, this portion of Appendix F has not been updated for several Code editions.

### RECENT APPEALS BOARD DECISION

The subject building is an existing, six-story building constructed circa 1900. The appellant testified that the construction type is type 4, heavy timber construction. The appellant further testified that the building was approximately, 74.5 feet in height above the mean grade and had floor areas ranging from 3,900 sf to 5525 sf. per floor. The building was occupied as offices (use group B) with a retail establishment (use group M) occupying a portion of the first floor. The building was planned to be converted to 28 apartments, use group R-2. The building was proposed to be equipped with an automatic fire suppression system; a fire pump; a generator and a fire alarm system as part of the renovations required for the change in use. The appellant also testified that the stairwells would be pressurized and that one of the two existing stairways would be reconstructed to meet new code standards.

The local building commissioner ruled that the change in use from B and M to R-2 caused the building to be in violation of 780 CMR 3404.8 and 3404.9 and 780 CMR 503, specifically the building would exceed the limitations on the height and number of stories permitted for an R-2 type 4 building (five stories and 70 feet above the mean grade).

The appellant argued that the change in use of the building from B/M to R2 constitute a partial reduction in the Hazard Index and additionally, the addition of an automatic sprinkler system, fire alarm system, fire

pump and generator and the reconstruction of one of the interior stairways has the overall effect of enhancing the safety of the building.

Following testimony, the Board determined that the proposed life safety enhancements met the intent of 780 CMR 34 and that the level of safety had not been reduced. In reaching its decision the Board took into consideration the small floor plan and the proposed enhancements to life safety. The Board voted unanimously to grant a variance to section 3404.8 and 3404.9 and sections 503 to allow the building to remain six stories and at approximately 74.5 feet in height above the mean grade.

### WELCOME HEATHER



The BBRs and its staff extend a warm welcome to Heather Mackenzie who joined the staff of the BBRs on May 23, 1999 as a compliance officer.

Heather is a Katherine Gibbs graduate who has worked for the Commonwealth of Massachusetts for five years at the Division of Insurance. She will be working in the Home Improvement Contractor Registration program and looks forward to working with everyone at the BBRs.

The Division of Insurance loss is the BBRs gain - Welcome Heather.

### RECENT APPOINTMENTS

At the April 1999 board meeting the BBRs voted to appoint Gerry Mullaney to a position on the Building Official Certification Committee.

Gerry is currently the Building Commissioner of the Town of Petersham. Gerry is a Certified Building Commissioner and achieved certification by completing the rigorous examination process. Gerry is a Civil Engineering graduate of Worcester Polytechnic Institute and also a former builder of residential homes.

## DEPARTMENT OF PUBLIC SAFETY DISTRICT STATE INSPECTORS

The District State Inspectors of the Department of Public Safety are responsible for enforcement of the Massachusetts State Building Code for all State owned buildings (both new and existing). The District Inspectors also provide technical assistance to the building officials employed by the 351 municipalities of the Commonwealth. The Commonwealth is divided into districts and a District Inspector is assigned to each district.

District State Inspector's offices are listed below:

District Office	District Inspector
Boston	Peter Goodale Jeff Putnam
Pittsfield	Gordon Bailey
Springfield	Joseph McEvoy Louise Vera
Taunton	Paul Piepiora John Wojciechowicz Alfred Downey William Robbins
Tewkesbury	Louis Salemi Derek Creaser John McCarthy
Westboro	Gene Novak David Holmes

## CONSTRUCTION SUPERVISOR LICENSE EXAMINATION SCHEDULE

Registration and examination dates for the Construction Supervisor License Examination for the remainder of 1999 and for the year 2000 are:

Registration Deadline	Examination Date
August 6, 1999	September 11, 1999
November 12, 1999	December 11, 1999
February 11, 2000	March 11, 2000
May 12, 2000	June 10, 2000
August 11, 2000	September 9, 2000

Examinations are held in Boston, Lowell, Marshfield, North Dartmouth, Springfield and Worcester

For information or an application and candidate information package call the BBRs at:  
(617)- 727-7532 Extension 696

## MOUNT WACHUSETT REGIONAL DISTRICT 6 BUILDING OFFICIALS

The former "District 6" Building Officials Association has been renamed the Mount Wachusett Regional District 6 Building Officials. The association meets on the last Wednesday of each month at Leominster City Hall. The Association has a current membership of 40.

The president is Michael Mendoza, Building Commissioner from the Town of Hudson, Tom Dillon, Building Commissioner, Town of Clinton, is Secretary, and Ed Cataldo, Local Inspector from the City of Leominster serves as treasurer.

At its May 26 meeting, the Association toured the fire test laboratory at Worcester Polytechnic Institute. A tour of New England Homes, Greenland, NH (a manufacturer of modular buildings) is scheduled for the June 23, meeting.

The cities and towns forming the nucleus of the association are in the jurisdiction of District State Inspector David C. Holmes of the Westboro office of the Department of Public Safety.



## In This Issue of *Codeword*:

- BBRB Holds Statutory Public Hearing
- Professional Engineer Disciplined by Board of Registration
- Is Your Code Up To Date?
- The Energy Corner- Residential Boiler & Furnace Efficiency
- BBRB Member Profile - Robert Banks
- Chapter 34 Field Survey for Existing Buildings
- Chapter 34- Compliance Alternatives in Existing Buildings
- Recent Appeals Board Decision
- Welcome Heather
- Recent Appointments
- Department of Public Safety District Inspectors
- Construction Supervisor License Examination Schedule
- Mount Wachusett Building Officials

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