



# CODEWORD®

THE OFFICIAL NEWSLETTER OF THE BOARD OF BUILDING REGULATIONS & STANDARDS

January 1999~

Kentaro Tsutsumi, P.E.  
Chairman

David A. Rodham  
Secretary

Argeo Paul Cellucci  
Governor

Thomas L. Rogers  
Administrator

## HAPPY NEW YEAR



The BBRs and its staff extend their wishes for a happy, healthy and prosperous new year to all our readers

## GET WELL SOON

The BBRs and Staff extend best wishes for a speedy recovery to Chairman Kentaro Tsutsumi following recent surgery.

## BBRS MEMBER PROFILE

### ALEXANDER (SANDY) MACLEOD A.I.A.

This issue of Codeword profiles Alexander (Sandy) MacLeod, A.I.A. who serves the Board of Building Regulations and Standards as the Registered Architect member.

Sandy graduated from the Boston Architectural Center earning a Bachelor of Arts in Architecture. He currently holds architectural registrations in Massachusetts and the State of New York.

Sandy brings a wealth of over 30 years of architectural and construction experience, together with his regulatory expertise and architectural training to the Board. In addition to his efforts on behalf of the Board as chairman of the State Building Code Appeals Board he also serves as the chairman of the Boston Board of

Examiners and is a member of the Associated General Contractors (AGC) Code Committee.

Sandy is employed by Beacon Skanska Construction Company as senior technical consultant where his primary focus now involves permitting, review of construction documents and monitoring field compliance of the many projects.

Sandy was formerly employed by Skidmore, Owings and Merrill in Chicago where he was lead architect on the prestigious Rowes Wharf project on Boston's Waterfront.

Sandy is currently building a vacation home on the coast and in his spare time enjoys sailing, fly fishing and golf.

## CODE CHANGE UPDATE (CORRECTION)

In the October Codeword it was reported that code changes would become effective "around the middle of October 1998". The effective date of the changes was unavoidably delayed.

The changes actually became effective on **November 28, 1998**. The end user may elect to use the code in effect immediately prior to November 28, 1998 until January 1, 1999 when the amendments become fully effective.

Copies of the changes may be purchased from the State Bookstore, State House, Boston, MA (617) 727-2834



printed on recycled paper



## **BBS STAFF MEMBERS AT "BUILD BOSTON"**

For the fourth consecutive year the BBS gave seminars at Build Boston - an architectural convention. Staffers Robert Anderson, Brian Gore, P.E. and Tom Riley presented technical seminars at "Build Boston" at the World's Trade Center (November 17 through 19, 1998)

Seminars were provided on Chapter 1 - Administration, Chapter 34 - Existing Buildings and Chapter 13 - Energy Conservation provisions. The seminars attracted over 100 attendees.

---

## **FAREWELL AND THANK YOU MAURICE PILETTE**

Maurice Pilette, P.E., the State Fire marshal's designee, has stepped down from the Board of Building Regulations and Standards. Maurice served the BBS for 5 years and was also a member of the State Building Code Appeals Board and of the Fire Prevention Fire Protection Advisory Committee. Maurice is currently the Chairman of the Fire Safety Commission.

Although not in the full time employ of the State, Maurice has spent countless hours of his personal time over the past 5 years working tirelessly to educate on, develop and promote technically correct fire protection systems requirements for the Massachusetts State Building Code.

While representing the State Fire Marshal, Maurice exhibited that rare quality of being able to work with men and women of diverse viewpoints over the entire breadth and depth of the State while always representing the legitimate interests of the Fire Services.

A Massachusetts Registered Fire Protection Engineer, Maurice maintains his fire protection systems technical proficiency by participating in numerous (21 by last count!) professional organizations including Committee Chair activity to several NFPA Standards Committees and such technical proficiency will be sorely missed by those of us who have had the privilege of both "debating with" and being educated by Maurice Pilette.

The BBS and staff extend their heartfelt thanks to Maurice and wish him and his family every continued success for the future (and hope to see him as time and the future permit).

The State Fire Marshal has appointed Chief Keith Hoyle of the Franklin Fire Department as his designee.

---

## **MASSACHUSETTS BUILDING OFFICIAL'S ORGANIZATIONS ELECT NEW OFFICERS**

The BBS and its staff extend congratulations to the State's 3 building official associations and their recently elected presidents and officers.

- *Building Officials of Western Massachusetts*  
Timothy Neyhart - President  
Inspector of Buildings  
52 Middle Street  
Hadley, MA 01035  
413-586-7274 Fax 413-586-5661
  - *Massachusetts Building Commissioners and Inspectors Association*  
John Clancy - President  
Inspector of Buildings  
Burlington Building Department  
29 Center Street  
Burlington, MA 01803  
781-270-1615 Fax 781-270-1608
  - *South Eastern Massachusetts Building Officials Association*  
Eladio Gore - President  
Inspector of Buildings  
Falmouth Building Department  
59 Town Hall Square  
Falmouth, MA 02540  
508-548-7611 Fax 508-457-2511
- 

## **ENERGY UPDATE**

### **DOOR, WINDOW, & SKYLIGHT U-VALUES**

Appendix J requires builders to document the thermal performance (U-value) of the windows, doors, and skylights that go into the new homes that they build. There are two methods that can be used to determine the U-value of these construction elements.

The first is an NFRC (National Fenestration Rating Council) listing. The NFRC testing process provides U-values based on standard testing methods by independent laboratories. Products that go through the process have temporary labels affixed, and these labels should be left on the product until after inspection by the building official.

The second method applies to products that do not have an NFRC listing. In this case, the builder may use the default values found in Tables J1.5.3a and b. If a builder uses these default tables, the windows do not



need NFRC certification. (Practically speaking, there are few doors that carry the NFRC label, so most builders will need to use the default tables for those at least.)

Finally, only for jobs with permit applications filed prior to January 1, 1999, the builder may use U-value information supplied by the manufacturer, which may be different from NFRC listings.

- **Basement Doors**

Are doors that separate the first floor from an unheated basement required to be exterior insulated doors? No, they do not. A builder may use any type of door they wish at the top of basement stairs, as long as it is accurately reflected in their energy analysis. Table J1.5.3b lists hollow core doors among the choices, and gives the appropriate U-value for such doors. Also, thresholds are not required for these areas, although the door should be sealed with weather stripping and a door sweep.

---

### **BBRS SEMINAR SPONSORS 1998**

The BBRs extends its thanks to the following dedicated building officials and organizations who generously organized and sponsored BBRs seminars in 1998.

#### **Span Table Seminars**

Paul Blanchard - Building Commissioner, Spencer  
Howe Lumber; Lacaire Lumber, ERA Key realty

#### **Residential Energy Code Sponsors**

The following sponsors, along with the US Department of Energy, have allowed the BBRs to conduct more than 100 training sessions, for over 5000 attendees throughout the state.

- **Local Building Departments:**

Andover, Bedford, Eastham, Falmouth, Franklin, Gloucester, Haverhill, Ipswich, Marshfield, Needham, North Adams, Orange, Palmer, Phillipston, Spencer

- **Building Officials Associations:**

Building Officials of Western Massachusetts, District 6 Inspectors, Massachusetts Building Commissioners and Inspectors Association, Metro West Building Officials, South Eastern Massachusetts Building Official Association

- **Building Materials Suppliers:**

All-In-One Insulation, Beacon Lumber, Belletetes Lumber, Brockway Smith, Cape Cod Lumber, Coldwell Lumber,

Cowls Lumber, Dartmouth Building Supply, Falmouth Lumber, Friend Lumber, G.V. Moore Lumber, Harvey Industries, Hingham Lumber, Horner Millworks, Howlett Lumber, Humphrey Bldg Supply, J&T Lumber, Jackson Lumber, Koopman Lumber, Maki Corporation, Mid Cape Lumber, Moynihan Lumber, Rugg Lumber, Shepley Wood Products, Stone & Berg Lumber, Wachusett Lumber, Wickes Lumber.

- **Home Builder Associations:**

Berkshire County Homebuilders Association, Builders Association of Central Mass, Northeast Builders Association of Massachusetts

- **Utilities:**

Bay State Gas, Berkshire Gas, Boston Gas, Colonial Gas, Commonwealth Gas, Fall River Gas, Fitchburg Gas and Electric, Boston Edison, Commonwealth Electric, Eastern Edison, Mass Electric, Western Mass Electric,

- **Other:**

The Energy Star Home Program, Path Finder Votech

---

### **DID YOU KNOW .....?**

In the formulation of the State Building Code, the BBRs is fortunate to have assistance from many professionals, firms and municipalities on its advisory committees. Advisory committees are responsible for providing guidance to the BBRs on issues within the committees expertise. Current advisory committees include;

- Construction Materials Safety Board
- Fire Protection Fire Prevention Advisory Committee
- Geotechnical Advisory Committee
- Seismic Advisory Committee
- Loads Advisory Committee
- Building Official Certification Committee
- Energy Advisory Committee
- Home Improvement Contractor Advisory Committee

The valuable input of these advisory committees ensures that the Commonwealth of Massachusetts maintains the best possible regulations for building design and construction.

The BBRs and staff extend their thanks to the individuals, firms and municipalities who provide their expertise and their valuable time *pro bono* to the Commonwealth.

---



## **BBRS APPROVES 2 FORMAL INTERPRETATIONS**

The BBRB is empowered by MGL c 143 § 94e to interpret any provision of the State Building Code. In order to provide clarification of the code to end-users the BBRB, from time to time, provides written interpretations of parts of the building code. Interpretations are published in Appendix B of the building code.

At its regular meeting of December 8, 1998, the BBRB approved 2 formal interpretations of the 6<sup>th</sup> edition of the State Building Code.

The interpretations address the allowable height and area of one and two family dwellings and the construction requirements for separating private garages from dwellings.

The interpretations will be mailed to all building officials in the near future. Check the BBRB Web Page @ [www.state.ma.us/bbrb](http://www.state.ma.us/bbrb) for the full text of the interpretations. Click on "formal interpretations" and then click on number 50-98 and 51-98 for these latest interpretations. Formal Interpretation 51-98 is reprinted below. In the interests of space available Formal Interpretation number 50-98 may be accessed via the BBRB web page and will in due time be inserted into Appendix B of the Code itself.

### **FORMAL INTERPRETATION NUMBER 51-98**

#### **One and Two-Family Dwellings with Passenger Car Garages Located Beneath the Dwelling Area**

SEE ALSO SKETCHES ON PAGE 5 - OPPOSITE

Background: Section 3603.5 of the *One-and Two-Family Dwelling Code* states that a

*"..... garage shall be separated from the residence and its attic by means of minimum 5/8 inch type X gypsum board applied to the garage side".*

However, the code does not address the issue of garages located beneath or partially beneath a dwelling area.

Question: What shall be the correct application of code provisions when separating passenger car garages

from dwelling areas when the garage is located beneath the dwelling?

Answer: When a passenger car garage is located beneath a one- or two-family dwelling or portion thereof, the dwelling shall be separated from the garage by means of minimum 5/8 inch type X gypsum wall board (gwb) applied to all ceilings, all load-bearing and non-load bearing wood-framed walls, all beams and all girders on the garage side of the structure. Interior columns are not required to be wrapped with type X gwb, unless it is required as a function of construction type (i.e.: Type 5A Construction).

Since the barrier created by the installation of type X gwb at these locations is not intended to be a fire separation assembly as defined in Chapter 7 of the code, penetrations through walls and/or ceilings (such as waste drainage pipes) are not required to be encased with type X gwb. Rather, these penetrations should be sufficiently sealed by means of caulking or other approved materials to prevent the passage of smoke from side to side.

Question: Are doors located within the garage space required to bear a fire-resistance rating?

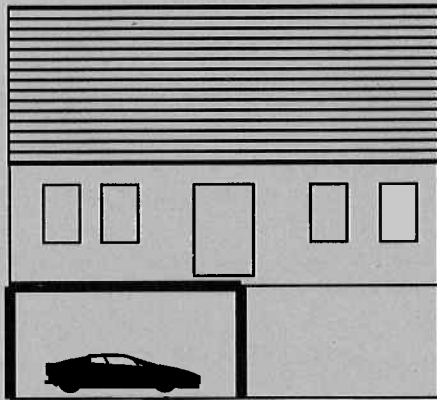
Answer: Overhead garage and/or side hinged passage doors are not required to bear a fire-resistance rating (label) except as required by Section 3603.5.1 of the code.

Question: What about portions of a passenger car garage, which project beyond the exterior face of a single or two-family dwelling?

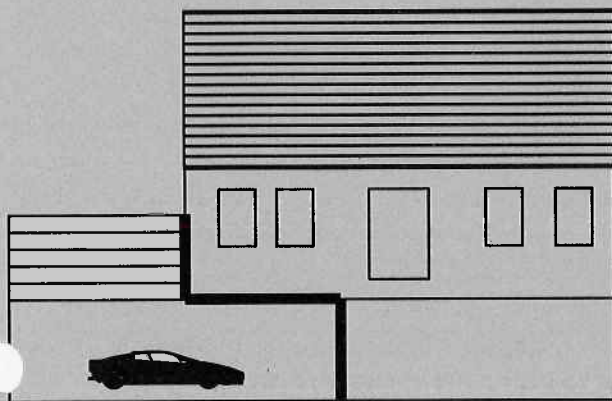
Answer: Only load-bearing and non-load bearing wood-framed walls, beams and girders which are located within the garage space, shall be separated by means of minimum 5/8 inch type X gypsum wall board. Portions of the garage which project beyond the face of the building are not required to be protected with 5/8 inch type X gypsum wall board.

**REFER TO SKETCHES ON PAGE 5 - OPPOSITE**

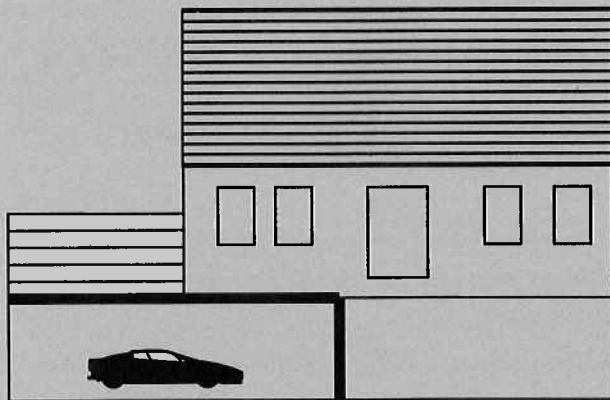




Garage Under Dwelling  
5/8" type X gypsum



Garage Under Dwelling  
5/8" type X gypsum



Garage Under Dwelling  
5/8" type X gypsum

## ENCLOSURES FOR PRIVATE SWIMMING POOLS, SPAS & HOT TUBS

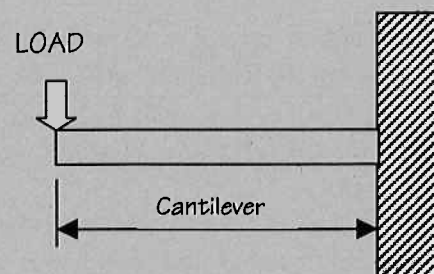
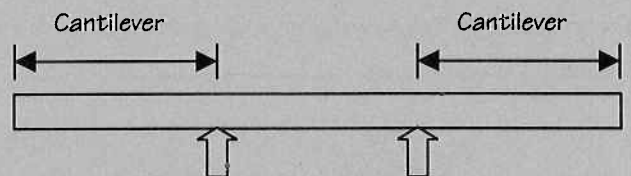
Section 421.10 of the Sixth Edition of the building code sets prescriptive requirements for enclosures around private swimming pools, spas and hot tubs. This is the first time the code has established criterion for these structures. Previously, it was the prerogative of each municipality to set appropriate standards in local zoning ordinances and/or by-laws to address this issue. Since this is a new code requirement which may conflict with certain established zoning and/or bylaw language, the question has been posed as to which language should be enforced by municipal building officials.

Consumer Product Safety Commission statistics indicate that approximately 350 children under age five drown each year in residential swimming pools, spas and hot tubs<sup>1</sup>, which prompted national code organizations to take a more rigorous stand relative to pool enclosure requirements. In that the Sixth Edition of the building code is based upon the BOCA national code, Massachusetts has also adopted this more restrictive enclosure requirement. Since local ordinances pertaining to building design and construction may not conflict with requirements of the building code, Section 421.10 is the standard that sets minimum requirements for the enclosure of private swimming pools, spas and hot tubs (not requirements set by local zoning ordinances and/or by-laws) and is the language which is to be enforced by municipal building officials.

<sup>1</sup> Source: 1993 BOCA National Building Code Commentary.

### CODEWORD - "CANTILEVER" BEAM

Is a beam having one end fixed and the other end free or extending a simple beam beyond either support.



## DEFLECTION OF SAWN LUMBER FLOOR JOISTS

In the October 1998 edition of *Codeword* the strength of a rectangular visually graded sawn lumber member was investigated. In this issue of *Codeword*, the live load deflection of a visually graded sawn lumber floor joist is calculated.

Deflection of a sawn wood floor joist depends upon,

- o Moment of Inertia,  $I$
- o Modulus of Elasticity,  $E$ , of the material
- o Load,  $w$  and;
- o Span,  $L$

The Moment of Inertia,  $I$ , depends upon the shape and size of the member.

Modulus of Elasticity is a measure of how much a material will extend (or be compressed) under direct load. Modulus of Elasticity  $E$ , for visually graded sawn lumber is expressed in pounds per square inch (psi). For values of  $E$  for all species groups and grades of lumber refer to table 3605.2.3.1d in the Massachusetts State Building Code

The load,  $w$ , affects deflection of a given structural member - the larger the load the larger the resulting deflection. In the deflection equation below the load is measured in pounds per inch (of span).

The span of the member,  $L$ , affects deflection of a given structural member under a given load - the larger the span the larger the resulting deflection. In the deflection equation below the span is measured in inches.

For a uniformly distributed load the mid-span deflection of a rectangular bending member is given by the following equation;

$$\delta = \frac{5wL^4}{384EI}$$

### Examples

Calculate the deflection of a 2 x 10 floor joist @ 16 inches on center with a live load of 40 psi.

- o Joists are Northern Red Oak #1 grade
- o Span is 12'-0"

### Solutions

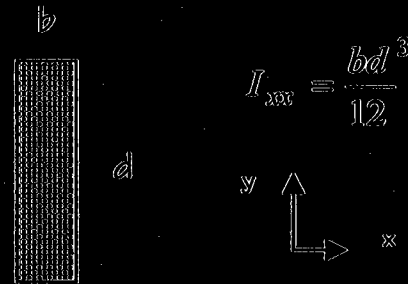
1. Calculate the LIVE load,  $w$  in pounds per inch

$$w = \frac{40 \text{ psf} \times 16''}{12} = 4.44 \text{ pounds/inch}$$

2. Calculate the Span,  $L$  in inches;

$$L = 12' \times 12'' = 144''$$

3. Calculate the Moment of Inertia,  $I$



Section through member

Member Size	b (in) <sup>a</sup>	d (in) <sup>a</sup>	I (in <sup>4</sup> )
2 x 10	1.5	9.25	98.93

Notes: <sup>a</sup> Actual (not) dimensions

4. Determine the Modulus of Elasticity,  $E$

For Northern Red Oak #1 grade from table 3605.2.3.1d

$$E = 1,400,000 \text{ psi}$$

5. Calculate the mid span deflection,  $\delta$ , in inches;

$$\delta = \frac{5wL^4}{384EI} = \frac{5 \times 4.44 \times 144^4}{384(1,400,000)(98.93)} = 0.1 \text{ inches}$$

$$\approx 1/8''$$

6. Compare calculated deflection with allowable deflection

For a floor joist, the live load deflection is limited to;

$$L / 360 \text{ (table 3603.1.6)}$$

and in the case of the example the actual deflection is;

$$144'' \div 360 = 0.4'' > 0.11''$$

which is less than the maximum deflection permitted.



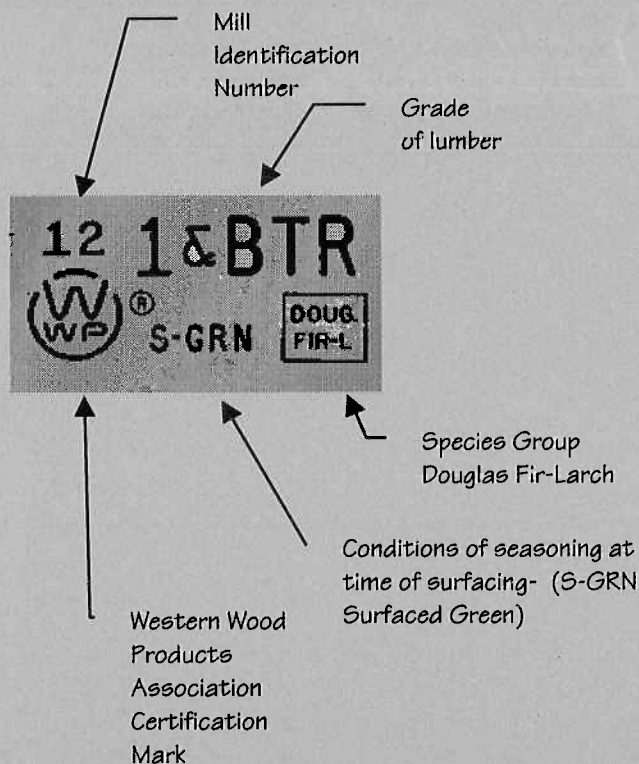
## SAWN LUMBER GRADE STAMPS

For structural applications visually graded lumber is grouped into species groups. The species groups are comprised of species of lumber, which have similar structural properties.

When visually graded lumber is inspected at a lumber mill a grade stamp is applied which indicates the species and grade of lumber, the grading agency certification mark, the conditions of lumber at the time it was surfaced and the mill identification number.

The grade stamp is used by contractors and inspectors in the field to check whether the species and grade of lumber used in the field is the same as specified on the design plans.

An example of a grade stamp under the Western Wood Products Association Certification and grading program is shown below.



Grade Stamp Facsimile Reproduced by kind permission of the Western Wood Products Association

## SCHEDULE OF BBRS MEETINGS FOR 1999

January, 5	Wellesley
February, 9	Wellesley
March, 9	Boston
April, 13	Wellesley
May, 11	Boston - PUBLIC HEARING
June, 8	Wellesley
July, 13	Boston
August, 19	Wellesley
September, 14	Boston
October, 12	Wellesley
November, 9	Boston - PUBLIC HEARING
December, 14	Wellesley

Wellesley- National Guard Armory, Minuteman Lane  
Boston - One Ashburton Place

## CONSTRUCTION SUPERVISOR LICENSE DISCIPLINARY ACTIONS

On November 10, 1998, hearings were held before the License Review Committee to determine appropriate actions against Construction Supervisors for violations of the Massachusetts State Building Code.

The License Review Committee issued the following decisions:

NAME & ADDRESS	CSL NUMBER	ACTION TAKEN
James Cooley 132 W. Main Street PO Box 411 Northborough, MA 01532	16357	License on probation for a period of six months effective November 23, 1998.
Peter Anderson 815 Depot Road Boxborough MA 01719	17314	License on probation for a period of one year effective November 10, 1998.
Michael McManus 167 Sandy Valley Rd Dedham, MA 02026	4374	License revoked effective November 10, 1998.
William Jewett 89 Pond Street Rehoboth MA 02769	61535	License suspended for a period of six months effective November 25 1998.*
Robert Homer 22 Shawmut Lane Marlborough MA 01752	61017	License suspended for a period of ninety (90) days effective December 11, 1998.*

\*These contractors had not surrendered their licenses at time of print.



## BBRS STATISTICS

### BBRS Web Page

The BBRS Web Page was accessed 10,500 times during the month of November, 1998.

[www.state.ma.us/bbbs](http://www.state.ma.us/bbbs)

### Codeword

Codeword is mailed free of charge to all 700 (+) certified building officials and to over 2200 subscribers (current at time of print).

## CONSTRUCTION SUPERVISOR LICENSE EXAMINATION DATES

Registration and examination dates for the Construction Supervisor License Examination are;

Registration Deadline	Examination Date
February 12, 1999	March 13, 1999
May 14, 1999	June 12, 1999

If you need information or an application and candidate information package call the BBRS at;

(617)- 727-7532 x 696

### Codeword

Board of Building Regulations and Standards  
One Ashburton Place, Room 1301  
Boston, MA: 02108



## In This Issue of *Codeword:*

- Happy New Year
- Get Well Soon
- BBRS Member Profile - Alexander MacLeod, A.I.A.
- Code Change Update
- BBRS Staff Members give seminars at "Build Boston"
- Farewell and thank you - Maurice Pilette, P.E.
- Massachusetts Building Official Organizations Elect New Officers
- Energy Update
- BBRS Seminar Sponsors, 1998
- Did You Know?
- BBRS Approves 2 Formal Interpretations?
- Formal Interpretation Number 51-98
- Swimming Pool, Spa and Hot Tub Enclosures
- Codeword - Cantilever Beam
- Deflection of Sawn Lumber Floor Joists
- Sawn Lumber Grade Stamps
- Schedule of BBRS Meetings for 1999
- Construction Supervisor License Disciplinary Actions
- BBRS Statistics

Editor in Chief:

Thomas L. Rogers

Supervising Editor:

Brian Gore, P.E.

Graphic Design & Layout:

Brian Gore, P.E.

Subscriptions Accountant:

Anne Marie Rose

AS A PUBLIC SERVICE, CODEWORD IS PROVIDED FREE OF  
CHARGE TO ALL MUNICIPAL BUILDING DEPARTMENTS