

DHCD – Division of Building and Fire Regulation
2006 Code Change Cycle

COMPILATION DOCUMENT
(of all code changes received with staff evaluations)

PART III

Code changes beginning with a “C” are to the Virginia Construction Code; with an “M” are to the Virginia Maintenance Code; with an “F” are to the Virginia Statewide Fire Prevention Code; with an “I” are to the Virginia Industrialized Building Safety Regulations; with an “A” are to the Virginia Amusement Device Regulations, and with a “CS” are to the Virginia Certifications Standards. The order is as follows: C – M – F – I – A – CS.

PART I contains page numbers 1 – 99 and code changes C-103.1 – C-310.6(R408.1)
PART II contains page numbers 100 – 199 and code changes C-310.6(R602.3) – C-408.8
PART III contains page numbers 200 – 303 and code changes C-503 – C-2803.1(M701.1)
PART IV contains page numbers 304 – 408 and code changes C-2804.1(FG310.1) – C-3501.1-c
PART V contains page numbers 409 – 502 and code changes C-3501.1-d – F110.1
PART VI contains page numbers 503 – 606 and code changes F-111.1 – CS-41

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VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-503**

Nature of Change: (text is on code change form)

To replace the current height and area and sprinkler requirements for Group I-1 in the International Building Code with requirements consistent with the Group I-2 requirements.

Proponent: Mid-Atlantic Fire Safety Construction Advisory Council

Staff Comments:

This proposal has also been submitted to the International Code Council but has not been approved at the national level. It was considered by Workgroup 3 and received some support, but was not considered a consensus proposal. One consideration is that with implementation of Group R-4 in the International Building Code, Group I-1 is now only for larger facilities housing more than 16 persons, so the smaller Group I-1 facilities that traditionally used wood-frame construction under the previous codes will continue to be able to use that type of construction as they are now classified as Group R-4 instead of Group I-1.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):
.....

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

Address to submit to: DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.state.va.us	Document No. <u>C-503</u> Committee Action: _____ BHCD Action: _____
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Submitted by: R. Ronald Jordan Representing: Mid-Atlantic Fire Safety Construction Advisory Council-Virginia Fire Safety Committee
 Address: c/o Virginia Masonry Association, P.O. Box 6783 Richmond, VA 23230 Phone No.: (804) 377-2080 (VMA phone)
(804) 228-4506 (Jordan direct)

Regulation Title: Uniform Statewide Building Code Section No(s): Table 503, Section 504.2 and Section 903.2.5 of 2006 IBC

Proposed Change:

1. Revise Table 503 as follows:

Portion of IBC Table 503
Allowable Height and Building Areas

Group		Type of Construction								
		Type I		Type II		Type III		Type IV	Type V	
		A	B	A	B	A	B	HT	A	B
I-4	S	UL	160	65	55	65	55	65	50	40
	A	UL	9	4	3	4	3	4	3	2
I-1	S	UL	55,000	18,000	10,000	16,500	10,000	18,000	10,500	4,500
	A	UL	4	2	1	1	NP	1	1	NP
I-2	S	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP
	A	UL	4	2	1	1	NP	1	1	NP
I-3	S	UL	4	2	1	2	1	2	2	1
	A	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000

Note: Groups I-2 (hospitals and nursing homes) and I-3 (prisons) shown for informational purposes only.

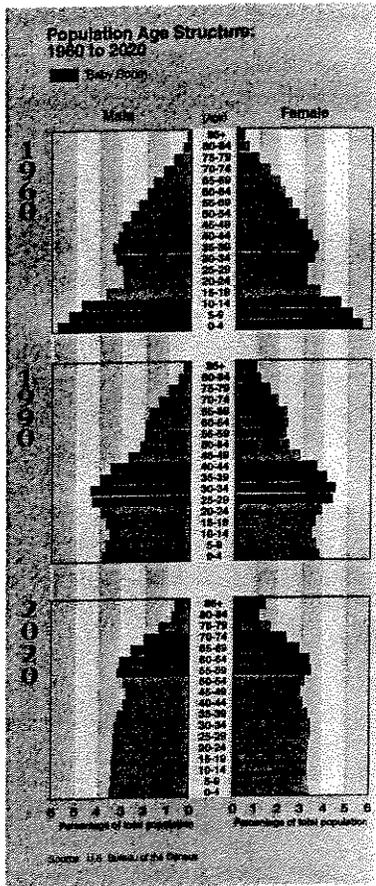
2. In Section 504.2, revise Exception No. 1 to read:

1. Fire areas with an occupancy in Group I-1 or I-2 of Type IIB, III, IV or V construction.

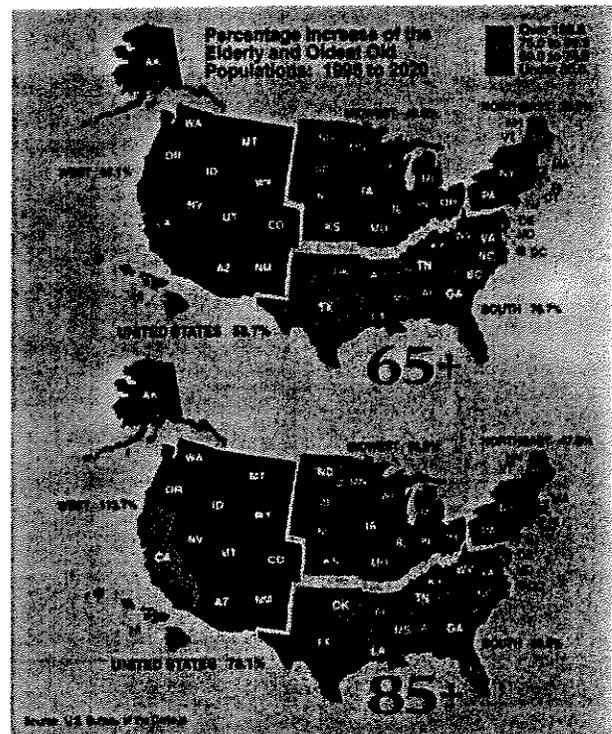
3. Remove exception to Section 903.2.5 which permits NFPA 13R and NFPA 13D sprinkler systems in Group I-1 occupancies.

Supporting Statement: This change will require that assisted living facilities (occupancy Group I-1) be built to the same type of construction standards presently required for hospitals and nursing homes (Group I-2). It will require a balanced approach to fire protection design resulting in the same level of fire safety in facilities housing this growing and fragile segment of the population as currently provided for patients in hospitals and residents of nursing homes. Adoption of the change will combine the benefits of passive and active fire protection for (1) fire containment, using non-combustible construction materials for facilities more than one story in height; (2) smoke detection and alarms; and (3) fire suppression, using sprinklers.

The Aging Population From the U.S. Census¹



- The older population is on the threshold of a boom. According to U.S. Census Bureau projections, a substantial increase in the number of older people will occur during the 2010 to 2030 period, after the first Baby Boomers turn 65 in 2011.
- The older population in 2030 is projected to be twice as large in 2000, growing from 35 million to 72 million and representing nearly 20 percent of the total U.S. population at the latter date.



- In 1995, Virginia's population aged 65 and over totaled 737,000. In 2005, the population had grown to 845,000. The U.S. Census projects that by the year 2025, Virginia's older population will increase by a total of 49% from 1995, up to 1,515,000.
- Between 1990 and 2020, the U.S. population age 65-74 is projected to grow 74%, while the population under age 65 will only increase 24%.
- Within the next five years, the older population will explode. By the middle of the next century, there could be more persons who are elderly (65 or over) than young (14 or younger). During the "baby boom" generation's rapid growth, the older population will grow at a rate of 2.8 percent annually, compared with 1.3 percent during the previous 20 years and .7 percent during the following 20 years.

¹ "65+ in the United States: 2005." U.S. Census Bureau, 2005.
 U.S. Census Bureau.



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**Data Summary:
Annual Average Fires in Apartment Buildings with 20 or More Units
Reported to US Fire Departments 1993-1997**

The data in this table represent the average annual number of reported fires in apartment buildings with twenty or more units in the United States. They are listed per construction type as codified by the International Building Code. Construction types I, IIA and IIB are built entirely with non-combustible materials, whereas Types IIIA and B, IV, and VA and B contain increasing levels of combustible materials. Types VA and B are entirely combustible. "A" types are required to have a one-hour fire resistance rating, whereas "B" types have no required fire resistance rating.

The data show that in buildings of combustible construction (Types III, IV and V), the probabilities of fire spreading beyond the room, fire rated compartment, and floor of origin are 1.34, 1.79 and 2.38, respectively, times that of buildings of noncombustible construction (Types I and II). The superior performance of noncombustible construction is especially noteworthy since most buildings of noncombustible construction are high rise buildings which make fire fighting much more difficult. On the other hand, building codes in use in this country other the past century have generally limited the heights of buildings of combustible construction to four or less stories.

- Construction Types I and II, those made with non-combustible materials, had 170 total reported fire that did not expand beyond their area of origin. There were 1,570 total fires that were confined to the area of origin for construction Types III, IV, and V.
- 220 fires (14%) of the 1,570 blazes confined to the area of origin for Types III-V extended beyond the structure. 20 of the 170 fires (11%) for Types I-II extended beyond the structure.
- Types I and II experienced 9,240 fires. Types III-V experienced 23,610 fires. Of the total number of fires for Types I-II, 1,530 (or 16%) were considered "extended" – or spread beyond the object and area of origin. Of the total number of fires for Types III-V, 6,050 (26%) were extended.
- In Types II-IV, the probability of an extended fire spreading beyond the room, compartment, or floor of origin are 1.34, 1.79 and 2.38, respectively, times that of buildings of noncombustible construction (Types I and II).

**Annual Average Fires in Apartment Buildings with 20 or More Units
Reported to US Fire Departments 1993-1997**

Type of Construction	Fire confined to ... of origin						Fire extended beyond structure	Total number of fires	Total number of "extended" fires ^a	% of "extended fires" that spread beyond ... of origin					Probability of "extended fire" spreading beyond ... of origin		
	object	area	room	comp. ^d	floor	structure				room	comp. ^d	floor	structure	room	comp. ^d	floor	
I	3810	970	610	150	110	110	20	5780	1000	39	24	13	2.0	1.241	1.200	1.517	
IIA	1730	410	240	40	40	30	0	2490	350	31	20	9	0.0	1.000	1.000	1.000	
IIB	580	210	110	20	20	30	0	970	180	39	28	17	0.0	1.237	1.389	1.944	
IIIA	3810	1510	890	130	200	390	50	6980	1660	46	39	27	3.0	1.476	1.928	3.092	
IIIB	2830	1340	760	100	230	420	50	5730	1560	51	45	30	3.2	1.632	2.244	3.515	
IV	140	50	30	10	10	20	0	260	70	57	43	29	0.0	1.818	2.143	3.333	
VA	3570	1940	940	170	200	450	70	7340	1830	49	39	28	3.8	1.547	1.967	3.315	
VB	1540	830	400	70	120	290	50	3300	930	57	49	37	5.4	1.813	2.473	4.265	
unknown	50	20	10	0	0	0	0	80									
Total NC ^c	6120	1590	960	210	170	170	20	9240	1530	37	24	12	1.3	1.000	1.000	1.000	
Total Comb ^e	11890	5670	3020	480	760	1570	220	23610	6050	50	42	30	3.6	1.344	1.791	2.383	

a. "Extended fires" are fires other than those confined to the object of origin and area of origin
 b. Total for Types 1 and 2
 c. Total for Types 3, 4 and 5
 d. Fire-rated compartment



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Fact Sheet:

Haas Architects Engineers of State College Pennsylvania's
Construction Cost Comparison Study

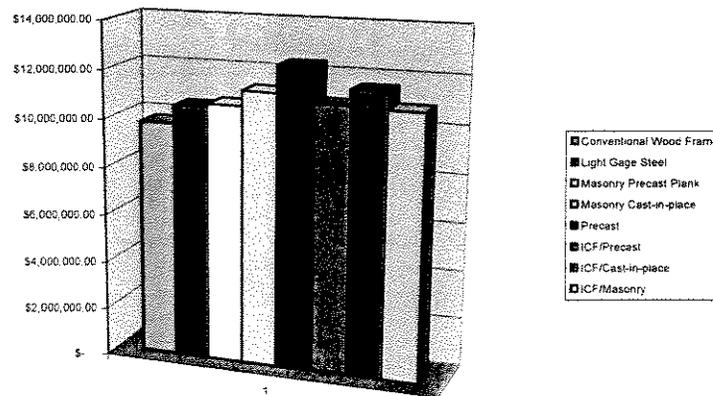
- The Haas study team includes Haas Architects Engineers; Tim E. Kinsley, Code Official; and Poole Anderson Construction, cost estimation.
- The Haas study compared the construction cost of an International Building Code compliant, four story, multi-family residential structure using five different construction types in seven different locations.
- The construction types included conventional wood framing, light gauge steel framing, load-bearing masonry concrete (block), precast concrete, and insulating concrete forms. Construction costs were also compared for seven cities in five different states (including Richmond, Virginia, Washington D.C., Frederick, Maryland and Towson, Maryland) using prevailing labor rates for each location.
- The study, over 800 pages long, is the first independent comparison of its kind and refutes a long held perception by design professionals, code officials and legislators that fire safe, non-combustible concrete construction solutions are more costly than wood frame construction.
- The cost associated with a compartmentalized construction method utilizing a concrete based material was generally less than 5 percent of the overall construction cost, an amount less than the typical contingency budget recommended for building projects.
- The added cost of the building can be paid for during the life of the structure. Materials like concrete masonry (block), precast concrete, and cast-in-place concrete have many other advantages beyond their inherent fire safety performance including resistance to mold growth, resistance to vandalism and minimal damage caused by water and fire in the event of a fire in the building.

For a copy of the Executive Summary, visit:
http://www.pcine.org/pdf/design_tools/fire_study.pdf

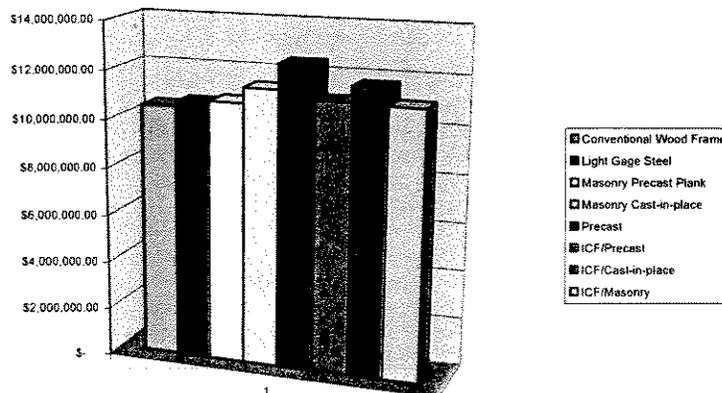
Richmond Virginia

Building System	Cost	Relative Cost
CONVENTIONAL WOOD FRAMING SINGLE BEDROOM SCHE	\$ 9,788,862.00	100
3 STORY ONLY	\$ 7,516,128.00	
CONVENTIONAL WOOD FRAMING MIXED BEDROOM SCH	\$ 10,505,254.00	100
3 STORY ONLY	\$ 8,053,172.00	
LIGHT GAGE STEEL FRAMING SINGLE BEDROOM SCHEM	\$ 10,535,092.00	108
LIGHT GAGE STEEL FRAMING MIXED BEDROOM SCHEM	\$ 10,707,414.00	102
MASONRY & PRECAST SINGLE BEDROOM SCHEME	\$ 10,693,855.00	109
MASONRY & PRECAST MIXED BEDROOM SCHEME	\$ 10,827,256.00	103
FORM IN PLACE CONCRETE FLOOR ALTERNATE (SING	\$ 11,308,119.00	116
FORM IN PLACE CONCRETE FLOOR ALTERNATE (MIX	\$ 11,463,200.00	109
PRECAST CONSTRUCTION SINGLE BEDROOM SCHEME	\$ 12,415,627.00	127
PRECAST CONSTRUCTION MIXED BEDROOM SCHEME	\$ 12,500,179.00	119
ICF WALLS & PRECAST PLANK SINGLE BEDROOM SCHE	\$ 10,955,147.00	112
ICF WALLS & PRECAST PLANK MIXED BEDROOM SCHEM	\$ 11,123,062.00	106
FORM IN PLACE CONCRETE FLOOR ALTERNATE (SING	\$ 11,609,047.00	119
FORM IN PLACE CONCRETE FLOOR ALTERNATE (MIX	\$ 11,770,113.00	112
INTERIOR CMU WALLS ALTERNATE (SINGLE)	\$ 10,903,105.00	111
INTERIOR CMU WALLS ALTERNATE (MIXED)	\$ 11,074,793.00	105

Richmond, VA Single Bedroom



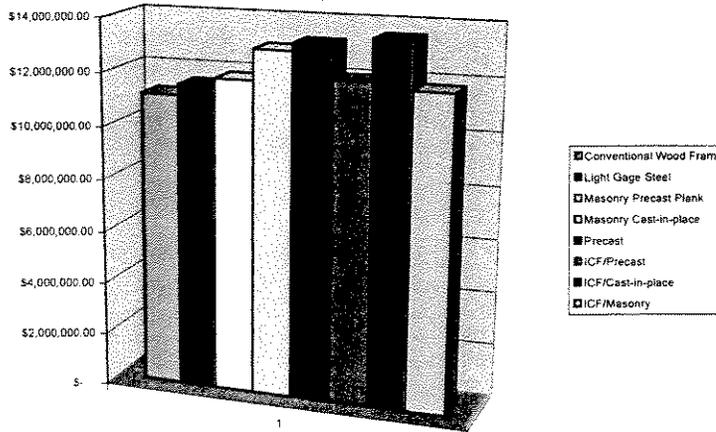
Richmond, VA Mixed Bedroom



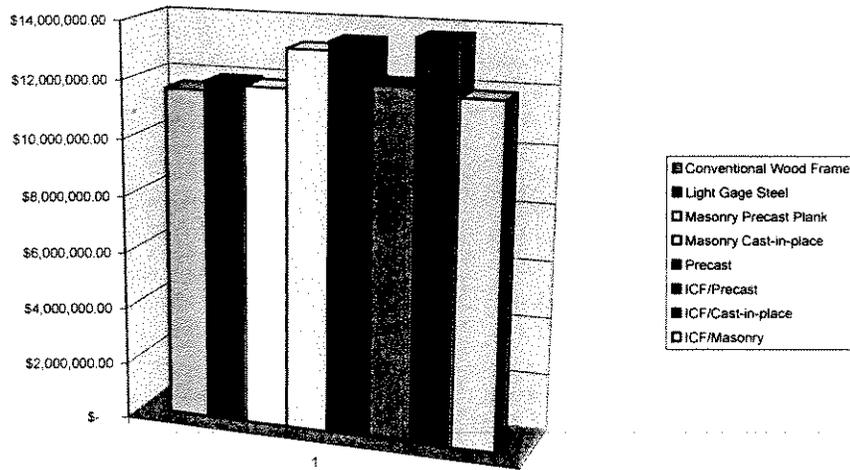
Washington D.C.

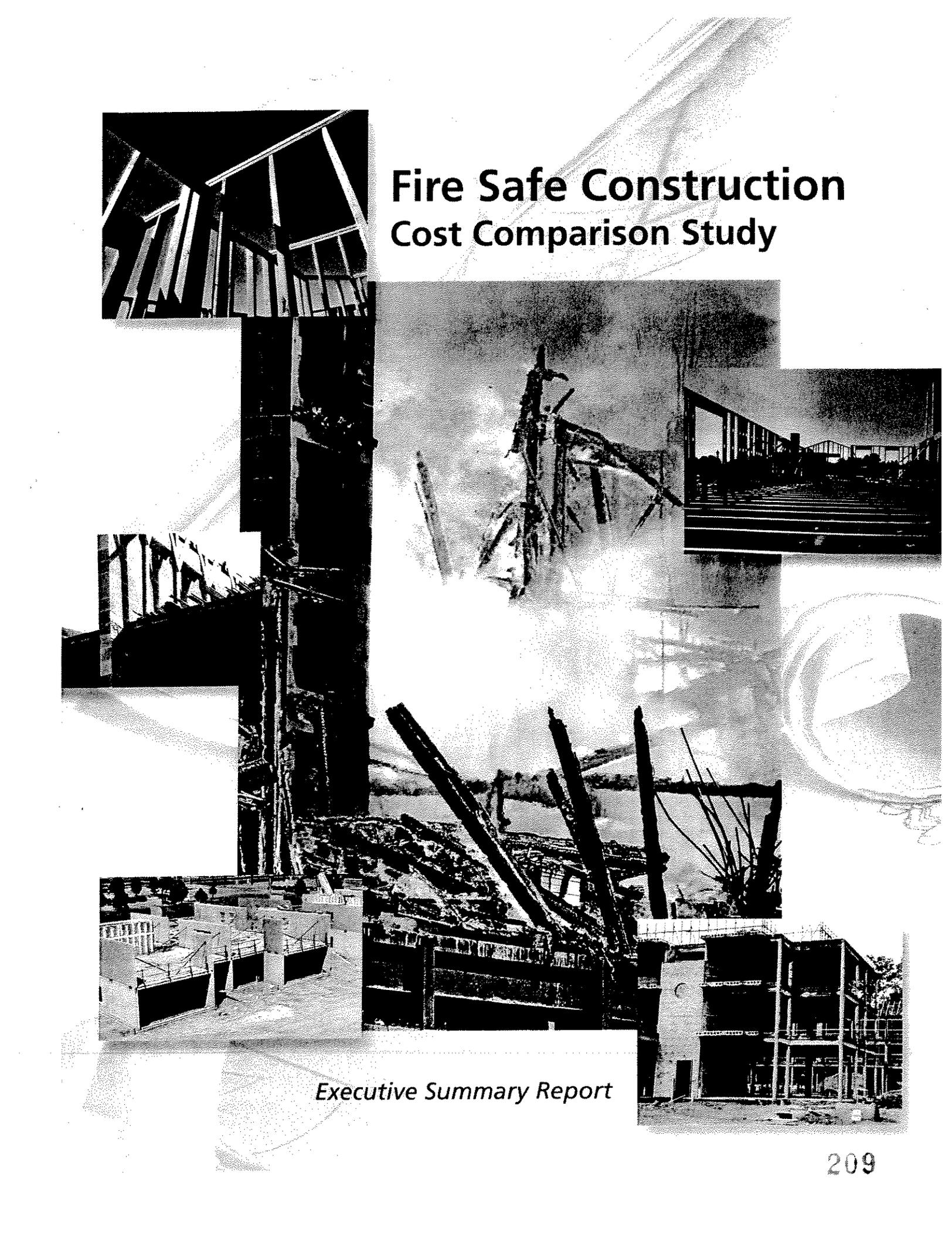
Building System	Cost	Relative Cost
Conventional Wood Framing Single Bedroom Scheme	\$ 11,148,764.00	100
3 Story Only	\$ 8,887,356.00	
Conventional Wood Framing Mixed Bedroom Scheme	\$ 11,630,953.00	100
3 Story Only	\$ 9,153,773.00	
Light Gage Steel Framing Single Bedroom Scheme	\$ 11,552,715.00	104
Light Gage Steel Framing Mixed Bedroom Scheme	\$ 11,943,109.00	103
Masonry & Precast Single Bedroom Scheme	\$ 11,842,165.00	106
Masonry & Precast Mixed Bedroom Scheme	\$ 11,848,285.00	102
Form In Place Concrete Floor Alternate (Single)	\$ 12,982,444.00	116
Form In Place Concrete Floor Alternate (Mixed)	\$ 13,188,759.00	113
Precast Construction Single Bedroom Scheme	\$ 13,254,580.00	119
Precast Construction Mixed Bedroom Scheme	\$ 13,485,270.00	116
ICF Walls & Precast Plank Single Bedroom Scheme	\$ 12,026,767.00	108
ICF Walls & Precast Plank Mixed Bedroom Scheme	\$ 12,140,136.00	104
Form In Place Concrete Floor Alternate (Single)	\$ 13,548,349.00	122
Form In Place Concrete Floor Alternate (Mixed)	\$ 13,754,718.00	118
Interior CMU Walls Alternate (Single)	\$ 11,811,966.00	106
Interior CMU Walls Alternate (Mixed)	\$ 11,889,725.00	102

Washington, DC Single Bedroom



Washington, DC Mixed Bedroom





Fire Safe Construction Cost Comparison Study

Executive Summary Report

Fire Safe Construction Cost Comparison Study

Executive Summary Report

November 2, 2005
Commission Number 05119

Prepared By:

Haas Architects Engineers
1301 North Atherton Street
State College, Pennsylvania

Sponsored By:

New England/New York Fire Safety Construction Advisory Council
Pennsylvania Fire Safe Construction Advisory Council
Mid-Atlantic Fire Safety Construction Advisory Council
Northeast Cement Shippers Association

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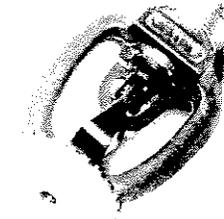


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Introduction

With the phasing out of the three predominate model codes, BOCA National Building Code, Southern Building Code, and Uniform Building Code, and implementation of the new International Building Code and associated family of codes, there has been a shift in the approach to fire safety in the built environment. This shift has been characterized as a shift away from the use of passive construction techniques, such as compartmentalization and the use of fireproof construction materials, in favor of an increased reliance on active fire control techniques such as sprinkler systems, allowing for construction to occur using materials that are more susceptible to fire damage.



In conjunction with this shift there are also reservations with the current ASTM (American Society for Testing and Materials) methodology for testing fire assemblies ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials. This test allows for the removal and replacement of the fire tested specimen prior to the initiation of the hose stream test. This test combination is intended to model the effects of the application of a fire suppression stream immediately after the intense heat from a compartment fire. The effect of this provision is that the specimen is a virgin test specimen when the fire suppression stream is applied, theoretically allowing certain materials to artificially perform at a higher level than would be expected in the field.



In addition, it has long been the opinion of legislators, code-officials, and design professionals that non-combustible concrete construction solutions are more costly than other alternatives such as gypsum fire walls with sprinklers.



Due to the perception of elevated cost, and the aforementioned code and testing issues, the acceptance of a balanced design approach incorporating both passive and active protection systems has met with resistance. Passive design incorporates the compartmentalization of the fire, limiting fire spread and protecting both the building occupants and the responding firefighters. This system is in place at all times and is not subject to failure due to the loss of utility service. An example of this is the incorporation of fireproof materials in the construction of floors and walls used for fire control. The active portion of the design uses a combination of detection systems to warn occupants, and sprinklers to control fire spread until the fire department arrives.



Currently, there is no reliable published documentation available to refute the perception regarding the increased building cost associated with this approach. Based on this lack of information, the design of a comparative study was undertaken to accurately document the increased cost associated with the use of balanced design in a common multi-family residential building. It is our pleasure to present the outcomes of this study.

Objectives

The objective of this study was to develop a construction cost model to accurately evaluate the relative construction cost of a multi-family building constructed using five different construction materials. The concept of multi-family would include traditional apartment type buildings, condominium style buildings, student housing, elderly housing, and others.



Methodology

Introduction

To accurately evaluate the relative construction cost between each of the five building systems, it was determined that a multi-family residential structure should be schematically designed meeting all of the requirements of the International Building Code 2003 edition. Once designed, the building would be reviewed for code compliance, and cost estimates would be prepared for the building using each of the different building systems.

The design team assembled included:

ARCHITECT & ENGINEER: *Haas Architects Engineers*

CODE OFFICIAL: *Tim E. Knisely*

COST ESTIMATION: *Poole Anderson Construction*

Haas Architects Engineers is a multi-disciplinary architectural and engineering firm located in State College, Pennsylvania with a thirty year history of client centered service including commercial, single and multi-family residential, retail, and sports based projects. Some projects include the Bryce Jordan Center and 2001 Beaver Stadium Expansion, both at The Pennsylvania State University.

Tim E. Knisely is a senior fire and commercial housing inspector for the Centre Region Code Administration, in State College, Pennsylvania. Mr. Knisely currently holds a certification as a registered Building Code Official in the Commonwealth of Pennsylvania and holds more than eight certifications from the International Code Council. In addition, Mr. Knisely has been involved in the fire service for more than 20 years.

Poole Anderson Construction is one of the largest building contractors in Central Pennsylvania with a 75 year history and an annual construction volume exceeding 60,000,000 dollars.

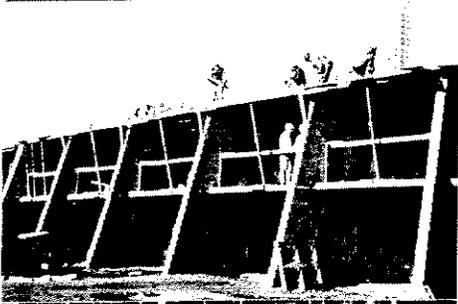
A firm profile for Haas Architects Engineers and Poole Anderson Construction is provided in Appendix A* along with resumes for each of the professionals involved with the project.

Building Model

The building model chosen for the project was a 4 story multi-family residential structure encompassing approximately 25,000 gross square feet of building area per floor. Based on the proposed target building types, it was decided that to better evaluate the relative construction costs, two different floor layouts would be used. The first model is a building comprised exclusively of single bedroom dwelling units. The second model is assembled using a mix of one and two bedroom dwelling units.

The combination of the two different layout considerations would more realistically address the variety of construction configurations commonly found in the multi-family dwelling marketplace. Schematic floor plans, elevations and detailed wall sections for each of the building models are provided. In Appendix B* full size copies of these are provided for additional clarity.

*Appendix is part of a total report of 800 pages.



Construction Types

The following construction types and alternates were evaluated:

- Conventional wood framing with wood floor system (Type 5B Construction)
Alternate: Conventional wood framing with wood floor system (Type 5A Construction)
- Light Gauge Steel Framing with cast-in-place concrete floor system on metal form deck
- Load bearing concrete masonry construction with precast concrete plank floor system
Alternate: Cast-in-place concrete floor system
- Precast concrete walls and precast concrete floor system
- Insulated Concrete Form (ICF) walls and precast concrete plank floor system
Alternate: Cast-in-place concrete floor system
Alternate: Interior bearing walls constructed of concrete masonry units (CMU)

With respect to the conventional wood framing system presented, the primary system is an un-protected construction Type 5B with an alternate of protected construction Type 5A. The additional construction type was presented since the Type 5B construction is not permitted to be used for a building of this type that is four stories tall. For the proposed use and construction height using conventional wood frame Type 5A would need to be used. Both systems are presented since the remaining systems are presented as un-protected framing systems.

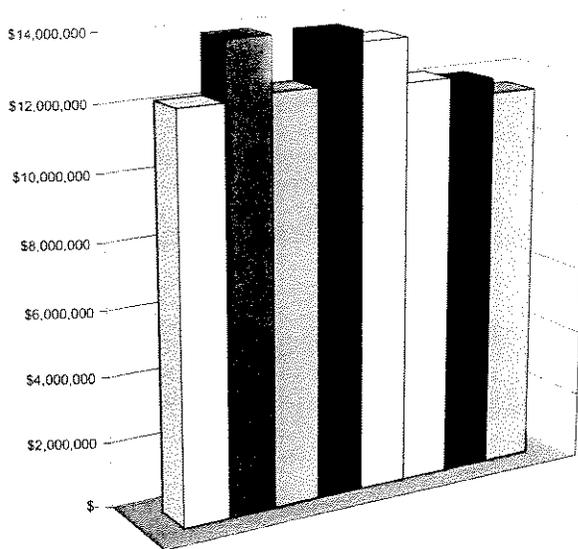
For all systems other than the conventional wood frame systems, it was assumed that the partition walls within the dwelling unit would be constructed using metal stud finish with gypsum board.

Harrisburg, PENNSYLVANIA

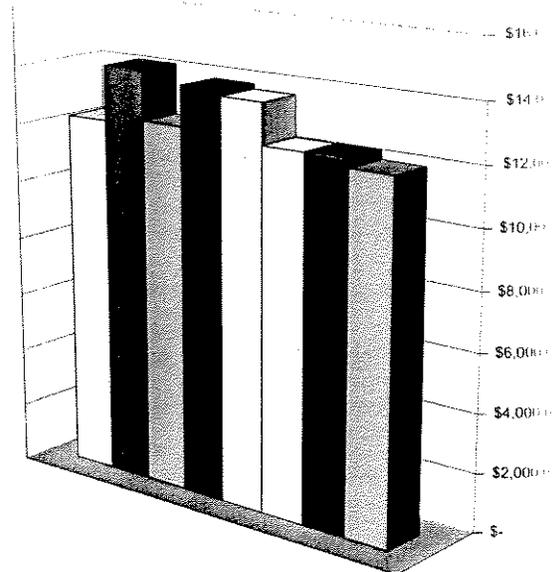
Building System	Cost	Relative Cost
Conventional Wood Framing Single Bedroom Scheme Type 5b 3 Stories Only	\$ 11,536,117.00	100
Conventional Wood Framing Mixed Bedroom Scheme Type 5b 3 Stories Only	\$ 11,993,226.00	100
Light Gauge Steel Framing Single Bedroom Scheme	\$ 11,991,669.00	104
Light Gauge Steel Framing Mixed Bedroom Scheme	\$ 12,297,143.00	103
Masonry & Precast Single Bedroom Scheme	\$ 12,140,211.00	105
Masonry & Precast Mixed Bedroom Scheme	\$ 12,276,406.00	102
Form In Place Concrete Floor Alternate (Single)	\$ 13,463,378.00	117
Form In Place Concrete Floor Alternate (Mixed)	\$ 13,667,826.00	114
Precast Construction Single Bedroom Scheme	\$ 13,780,169.00	120
Precast Construction Mixed Bedroom Scheme	\$ 13,851,510.00	116
ICF Walls & Precast Plank Single Bedroom Scheme	\$ 12,279,484.00	106
ICF Walls & Precast Plank Mixed Bedroom Scheme	\$ 12,445,030.00	104
Form In Place Concrete Floor Alternate (Single)	\$ 13,901,442.00	121
Form In Place Concrete Floor Alternate (Mixed)	\$ 14,154,962.00	118
Interior CMU Walls Alternate (Single)	\$ 12,141,508.00	105
Interior CMU Walls Alternate (Mixed)	\$ 12,262,224.00	102

The least expensive system for both building models is the conventional wood framing system. The relative cost of the most expensive framing was the insulated concrete form system with cast in-place concrete floor is 21 percent and 18 percent higher for the single bedroom model and mixed bedroom model respectively. The load bearing masonry wall system with precast concrete plank floor system and insulated concrete form wall system with precast concrete plank floor system both compare very favorably with but the conventional wood frame system and the light gauge steel frame system, with an increase cost of less than 6 percent over the conventional wood frame system.

Harrisburg, Pennsylvania Single Bedroom



Harrisburg, Pennsylvania Mixed Bedroom



- Conventional Wood Frame
- Masonry/Precast Plank
- Precast
- ICF/Cast-in-place
- Light Gauge Steel
- Masonry/Cast-in-place
- ICF/Precast
- ICF/Masonry

Code Review

Once design was completed on each of the buildings, Mr. Krisely performed a detailed code review following the requirements of the International Building Code 2003 edition. This review was conducted following the plan review forms provided by the International Code Council and these forms are provided for review in Appendix C*. This review was in addition to the review performed internally by the professionals at Haas Architects Engineers. The review forms used by Haas Architects Engineers are also provided for review in Appendix C*.

The reader is alerted to the fact that there are a number of items that are common to all of the buildings that were not addressed in this study and that are missing from the code review forms. These items are typically dealing with site issues, soils information, etc. All of these items are common to each of the buildings and would add identical cost to each project. This was verified with the cost estimation personnel at Poole Anderson Construction.

Cost Estimation

To increase the direct applicability of the cost study a decision was made to complete the study in three different locations. The locations were chosen by each of the contributing groups, feeling that they represented the construction climate in their respective area. The locations chosen are as follows:

- Framingham, Massachusetts
- Harrisburg, Pennsylvania
- Towson, Maryland
- Albany, New York (added after completion of the original study)

To allow for a fair and uniform comparison of the construction costs between trades it was determined that the cost study would use accepted prevailing wage rates published for each of the locations. These labor rates would be typical for a publicly funded project and will allow for a fair labor comparison, eliminating potential undercutting by any of the trades.

The cost estimate for each building model included the complete fit out of each building with the exception of movable appliances and furniture.

The labor rates used for each of the estimates are presented with the detailed cost estimate, located in Appendix D*.

*Appendix is part of a total report of 800 pages.

Results and Discussion

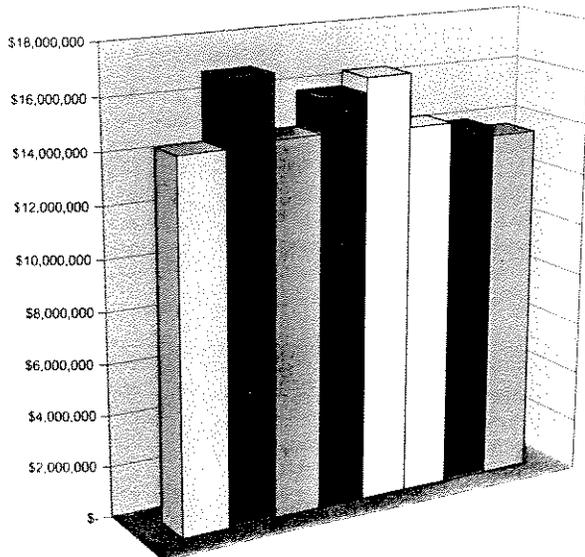
The results of the construction cost study for each geographic location are presented in the following tables. The relative cost presented is a percentage of the minimum cost system presented.

Framingham, MASSACHUSETTS

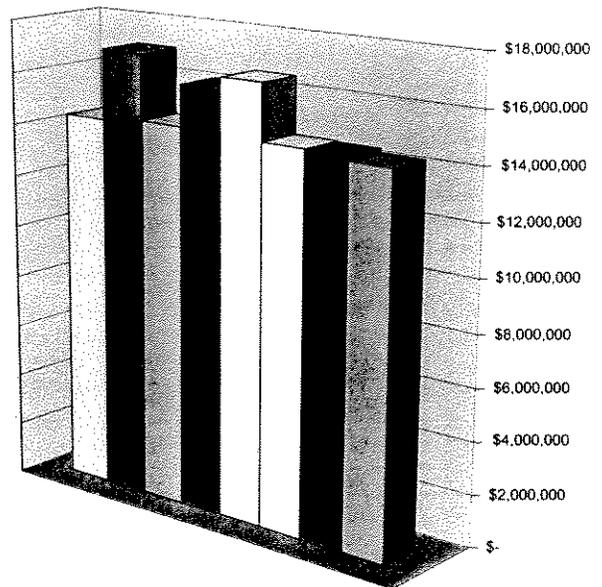
Building System	Cost	Relative Cost
Conventional Wood Framing Single Bedroom SCHEME	\$13,636,238.00	100
Type 5b 3 Stories Only	\$10,976,204.00	
Conventional Wood Framing Mixed Bedroom Scheme	\$14,262,504.00	100
Type 5b 3 Stories Only	\$11,394,511.00	
Light Gauge Steel Framing Single Bedroom Scheme	\$13,996,424.00	103
Light Gauge Steel Framing Mixed Bedroom Scheme	\$14,411,520.00	101
Masonry & Precast Single Bedroom Scheme	\$14,316,223.00	105
Masonry & Precast Mixed Bedroom Scheme	\$14,440,514.00	101
Form In Place Concrete Floor Alternate (Single)	\$16,361,225.00	120
Form In Place Concrete Floor Alternate (Mixed)	\$16,575,134.00	116
Precast Construction Single Bedroom Scheme	\$15,786,386.00	116
Precast Construction Mixed Bedroom Scheme	\$16,112,941.00	113
ICF Walls & Precast Plank Single Bedroom Scheme	\$14,441,088.00	106
ICF Walls & Precast Plank Mixed Bedroom Scheme	\$14,548,965.00	102
Form In Place Concrete Floor Alternate (Single)	\$16,847,965.00	124
Form In Place Concrete Floor Alternate (Mixed)	\$17,045,527.00	120
Interior CMU Walls Alternate (Single)	\$14,299,993.00	105
Interior CMU Walls Alternate (Mixed)	\$14,356,625.00	101

The least expensive system for both building models is the conventional wood framing system. The relative cost of the most expensive framing system, the insulated concrete form system with cast-in-place concrete floor is 24 percent and 20 percent higher for the single bedroom model and mixed bedroom model respectively. The load bearing masonry wall system with precast concrete plank floor system and insulated concrete form wall system with precast concrete plank floor system both compare very favorably with both the conventional wood frame system and the light gauge steel framing system, with an increased cost of less than 6 percent over the conventional wood frame system.

Framingham, Massachusetts Single Bedroom



Framingham, Massachusetts Mixed Bedroom



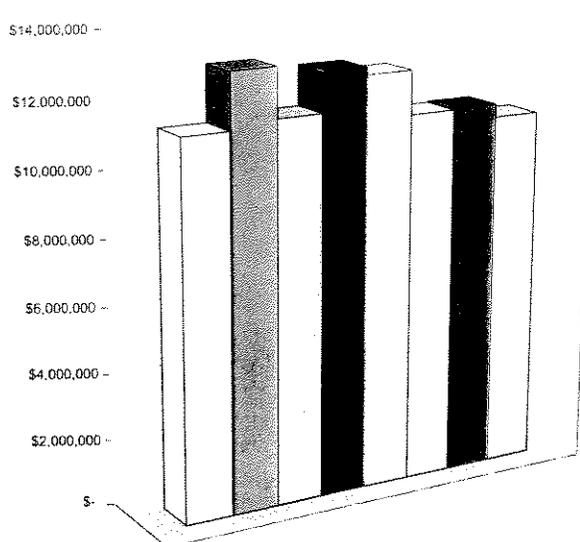
■ Conventional Wood Frame	□ Masonry/Precast Plank	■ Precast	■ ICF/Cast-in-place
■ Light Gauge Steel	□ Masonry/Cast-in-place	■ ICF/Precast	□ ICF/Masonry

Towson, MARYLAND

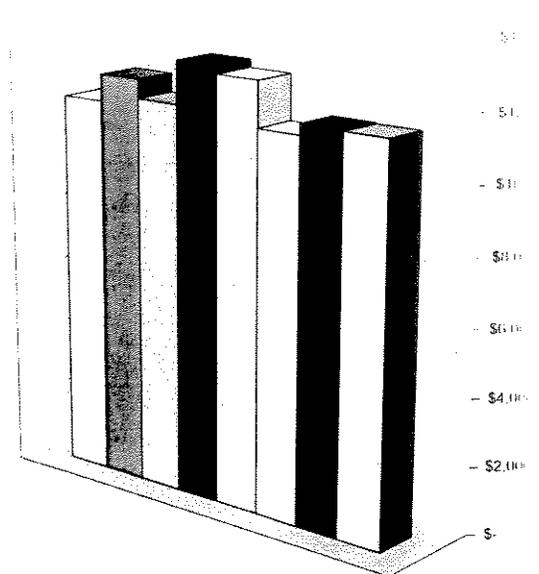
Building System	Cost	Relative Cost
Conventional Wood Framing Single Bedroom Scheme	\$10,779,264.00	100
Type 5b 3 Stories Only	\$ 8,496,437.00	
Conventional Wood Framing Mixed Bedroom Scheme	\$11,540,327.00	100
Type 5b 3 Stories Only	\$ 8,931,852.00	
Light Gauge Steel Framing Single Bedroom Scheme	\$11,183,801.00	104
Light Gauge Steel Framing Mixed Bedroom Scheme	\$11,573,002.00	100
Masonry & Precast Single Bedroom Scheme	\$11,145,966.00	103
Masonry & Precast Mixed Bedroom Scheme	\$11,249,743.00	98
Form In Place Concrete Floor Alternate (Single)	\$12,453,743.00	116
Form In Place Concrete Floor Alternate (Mixed)	\$12,599,629.00	109
Precast Construction Single Bedroom Scheme	\$12,680,336.00	118
Precast Construction Mixed Bedroom Scheme	\$12,850,342.00	111
ICF Walls & Precast Plank Single Bedroom Scheme	\$11,475,947.00	107
ICF Walls & Precast Plank Mixed Bedroom Scheme	\$11,565,232.00	100
Form In Place Concrete Floor Alternate (Single)	\$12,957,185.00	120
Form In Place Concrete Floor Alternate (Mixed)	\$12,129,126.00	105
Interior CMU Walls Alternate (Single)	\$11,273,890.00	105
Interior CMU Walls Alternate (Mixed)	\$11,326,383.00	98

The least expensive system for the single bedroom building was the conventional wood framing system; for the mixed bedroom building the load bearing masonry wall system with in-place concrete floor system was the least expensive system. The most expensive building system was found to be the insulated concrete form wall system with in-place concrete floor an increased cost of 20 percent for the single bedroom system. For the mixed bedroom building the precast concrete wall system with in-place concrete floor system was deemed to be most expensive at an increased cost of 11 percent.

Towson, Maryland Single Bedroom



Towson, Maryland Mixed Bedroom



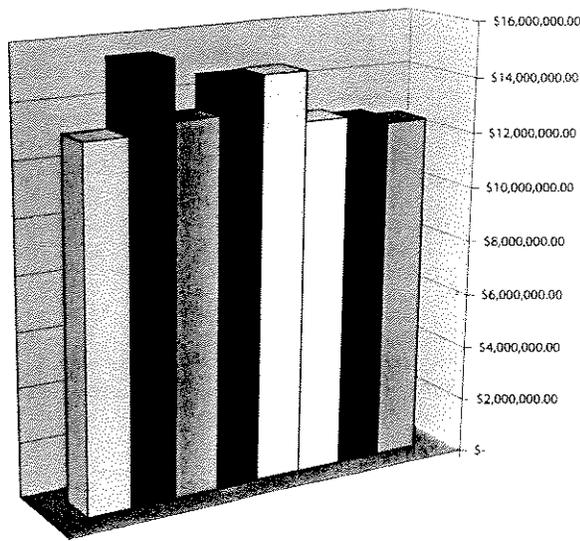
- Conventional Wood Frame
- Masonry/Precast Plank
- Precast
- ICF/Cast-in-place
- Light Gauge Steel
- Masonry/Cast-in-place
- ICF/Precast
- ICF/Masonry

Albany, NEW YORK

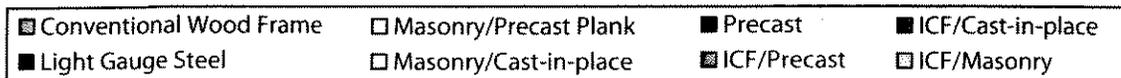
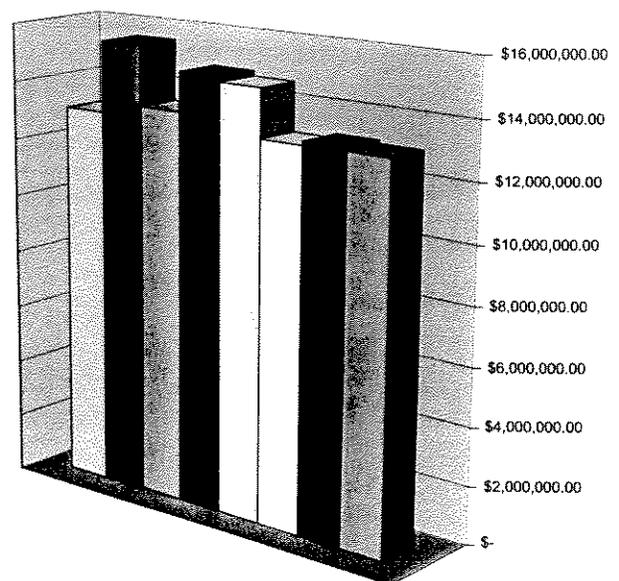
Building System	Cost	Relative Cost
Conventional Wood Framing Single Bedroom Scheme	\$12,452,103.00	100
3 Story Only	\$10,014,770.00	
Conventional Wood Framing Mixed Bedroom Scheme	\$13,046,765.00	100
3 Story Only	\$10,613,839.00	
Light Gauge Steel Framing Single Bedroom Scheme	\$12,666,154.00	102
Light Gauge Steel Framing Mixed Bedroom Scheme	\$13,148,239.00	101
Masonry & Precast Single Bedroom Scheme	\$12,813,503.00	103
Masonry & Precast Mixed Bedroom Scheme	\$13,004,986.00	100
Form In Place Concrete Floor Alternate (Single)	\$14,583,356.00	117
Form In Place Concrete Floor Alternate (Mixed)	\$14,647,415.00	112
Precast Construction Single Bedroom Scheme	\$14,572,692.00	117
Precast Construction Mixed Bedroom Scheme	\$14,832,562.00	114
ICF Walls & Precast Plank Single Bedroom Scheme	\$13,365,117.00	107
ICF Walls & Precast Plank Mixed Bedroom Scheme	\$13,476,170.00	103
Form In Place Concrete Floor Alternate (Single)	\$15,464,431.00	124
Form In Place Concrete Floor Alternate (Mixed)	\$15,530,200.00	119
Interior CMU Walls Alternate (Single)	\$13,010,204.00	105
Interior CMU Walls Alternate (Mixed)	\$13,090,202.00	100

The least expensive system for the single bedroom building is the conventional wood framing system. However, the load bearing masonry wall system with precast concrete plank floor system proved equal in cost to the conventional wood frame system in the mixed bedroom scheme. The most expensive building system was found to be the insulated concrete form wall system with cast-in-place concrete floor with an increased cost of 24% in the single bedroom scheme, and 19% in the mixed bedroom scheme. The insulated concrete form wall system combined with precast plank flooring and interior concrete masonry walls compared very favorably with both the wood framing and light gauge steel alternatives.

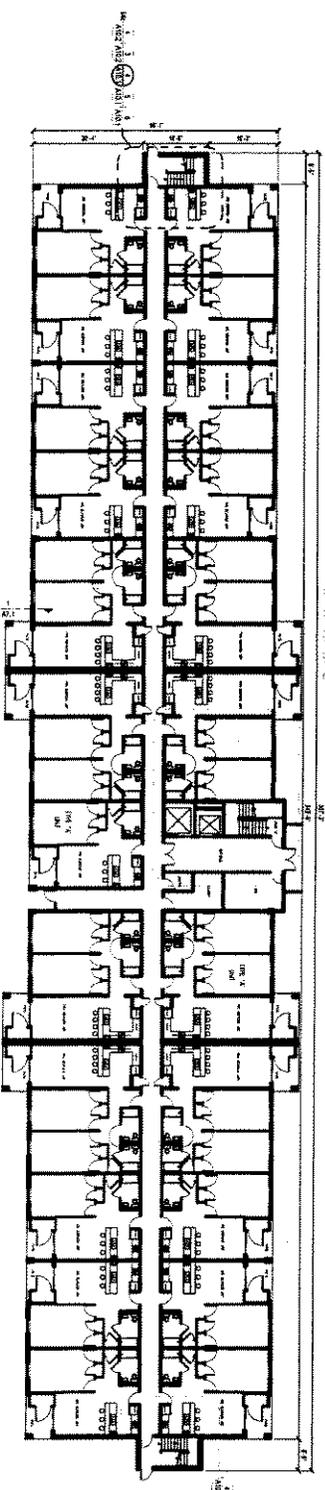
Albany, New York Single Bedroom



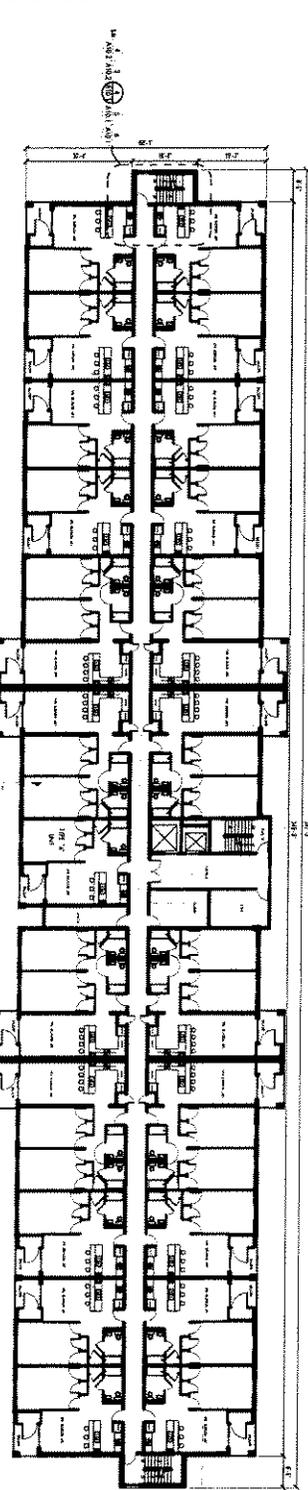
Albany, New York Mixed Bedroom



101 FIRST FLOOR - MIXED BEDROOM SCHEME
SCALE: 1/8" = 1'-0"



102 SECOND THRU FOURTH FLOOR PLANS - MIXED BEDROOM SCHEME
SCALE: 1/16" = 1'-0"



- NOTES**
1. GENERAL NOTES AND SEE SPECIFICATIONS
 2. ALL ROOMS SHALL BE FINISHED TO THE FINISHES SHOWN ON THESE PLANS UNLESS OTHERWISE NOTED.
 3. ALL WALLS SHALL BE 1/2" GYPSUM BOARD ON STUDS.
 4. ALL FLOORS SHALL BE 1/2" GYPSUM BOARD ON JOISTS.
 5. ALL CEILING SHALL BE 1/2" GYPSUM BOARD ON JOISTS.
 6. ALL DOORS SHALL BE 1-3/4" SOLID CORE WITH GLASS.
 7. ALL WINDOWS SHALL BE 1-1/2" ALUMINUM CASING WITH GLASS.
 8. ALL LIGHT FIXTURES SHALL BE AS SHOWN ON THESE PLANS.
 9. ALL ELECTRICAL SHALL BE AS SHOWN ON THESE PLANS.
 10. ALL MECHANICAL SHALL BE AS SHOWN ON THESE PLANS.

NOT FOR CONSTRUCTION

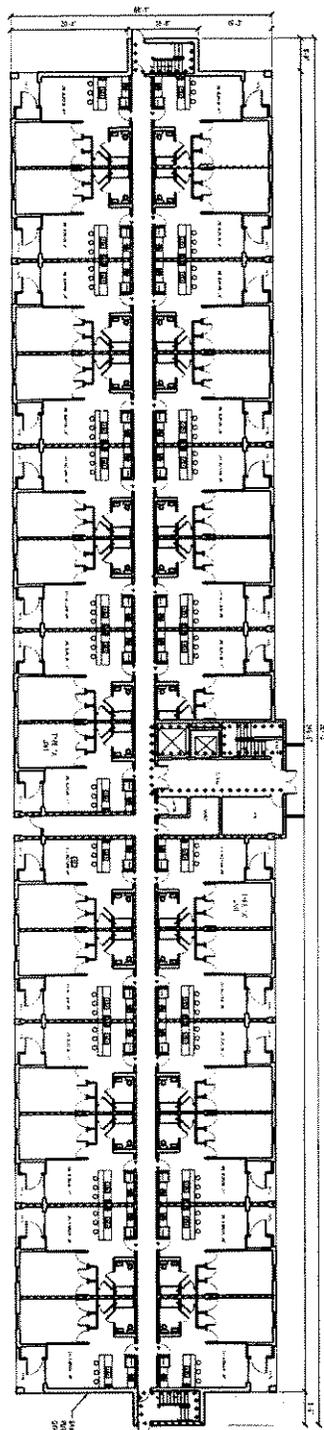
BUILDING COST
COMPARISON STUDY

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PROJECT NAME	RESIDENTIAL
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CLIENT	ABC COMPANY
SCALE	1/16" = 1'-0"
DATE	OCTOBER 10, 2018
BY	ARCHITECT
PROJECT NO.	12345
PROJECT NAME	RESIDENTIAL
PROJECT ADDRESS	123 NORTH AVENUE
CLIENT	ABC COMPANY
SCALE	1/16" = 1'-0"
DATE	OCTOBER 10, 2018
BY	ARCHITECT

A3.2



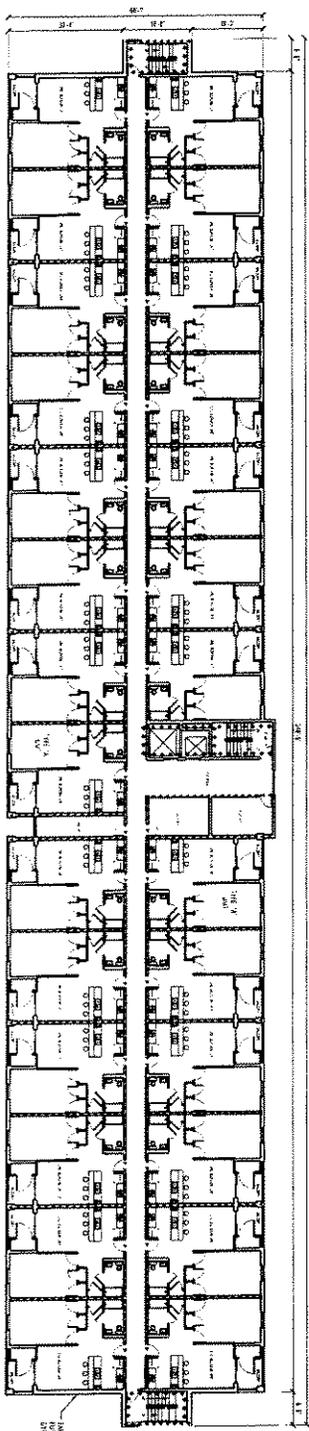
HAAS ARCHITECTS ENGINEERS
123 NORTH AVENUE, SUITE 1000 • STATE COLLEGE, PA 16801 • 814.231.1111
FAX: 814.231.0506 • www.haasae.com • info@haasae.com



1 FIRST FLOOR - ONE BEDROOM SCHEME - METAL, MASONRY, PRECAST
SCALE: 1/8" = 1'-0"

LEGEND

---	CONCRETE
---	BRICK
---	GLASS
---	WOOD
---	MECHANICAL



2 SECOND FLOOR - ONE BEDROOM SCHEME - METAL, MASONRY, PRECAST
SCALE: 1/8" = 1'-0"

LEGEND

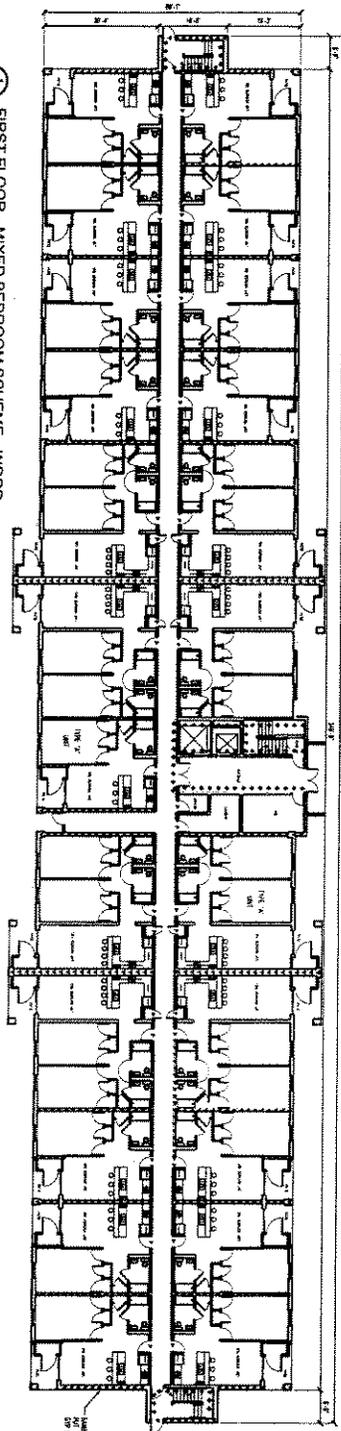
---	CONCRETE
---	BRICK
---	GLASS
---	WOOD
---	MECHANICAL

NOT FOR CONSTRUCTION

BUILDING COST COMPARISON STUDY

DATE	05/11/11
PROJECT	ONE BEDROOM SCHEME
CLIENT	UNIVERSITY OF SHEFFIELD
LOCATION	WOODFORDS, SHEFFIELD
SCALE	1/8" = 1'-0"
DATE	OCTOBER 13, 2005
SCALE	1/8" = 1'-0"
PROJECT	A3.5

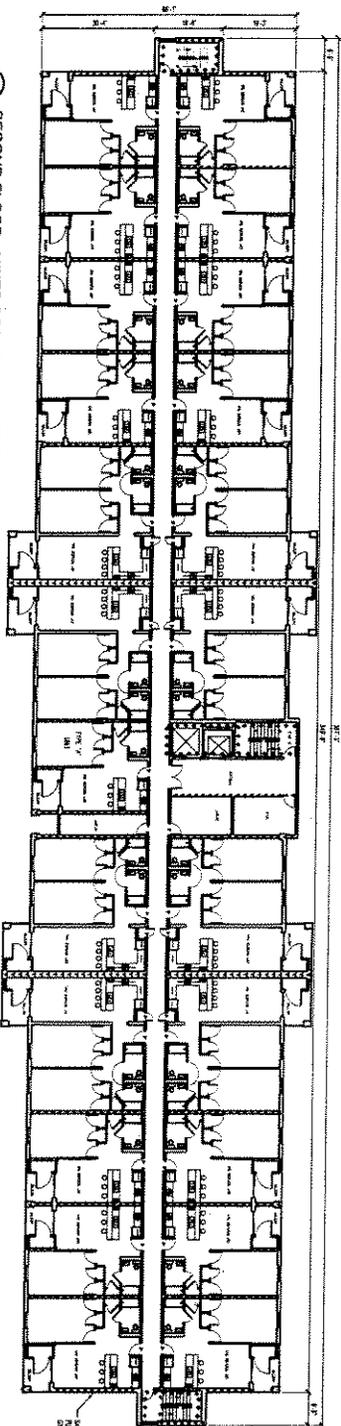
HAAS ARCHITECTS ENGINEERS
 100 NORTH STRENGTH STREET • 5TH FLOOR • PA 19101 • 610-233-6667
 FAX: 610-233-6666 www.haasae.com info@haasae.com



① FIRST FLOOR - MIXED BEDROOM SCHEME - WOOD
SCALE: 1/8" = 1'-0"

LEGEND

---	1:000 SLOPE
----	1:000 SLOPE



② SECOND FLOOR - MIXED BEDROOM SCHEME - WOOD
SCALE: 1/8" = 1'-0"

LEGEND

---	1:000 SLOPE
----	1:000 SLOPE

NOT FOR CONSTRUCTION

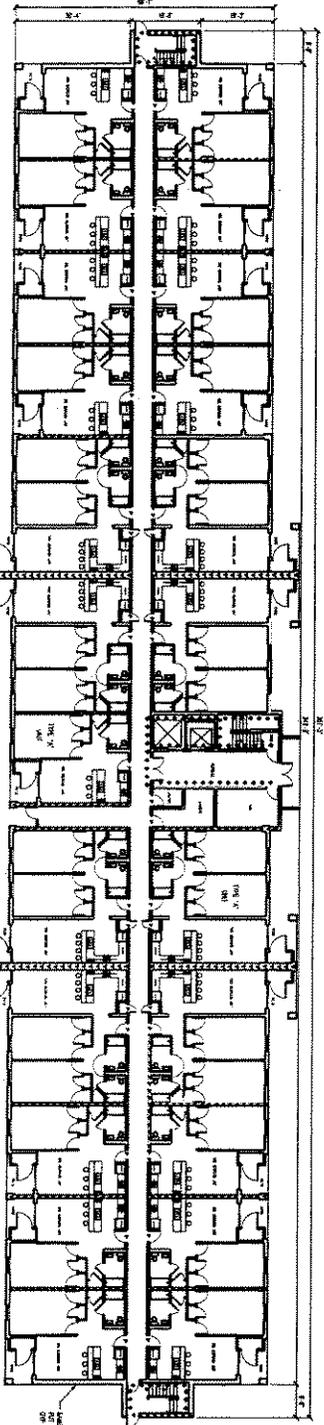
BUILDING COST
COMPARISON STUDY

A3.4

DATE	01/11/18
BY	...
FOR	...
PROJECT	...
CLIENT	...
LOCATION	...
SCALE	...
DATE	01/11/18
BY	...
FOR	...
PROJECT	...
CLIENT	...
LOCATION	...
SCALE	...



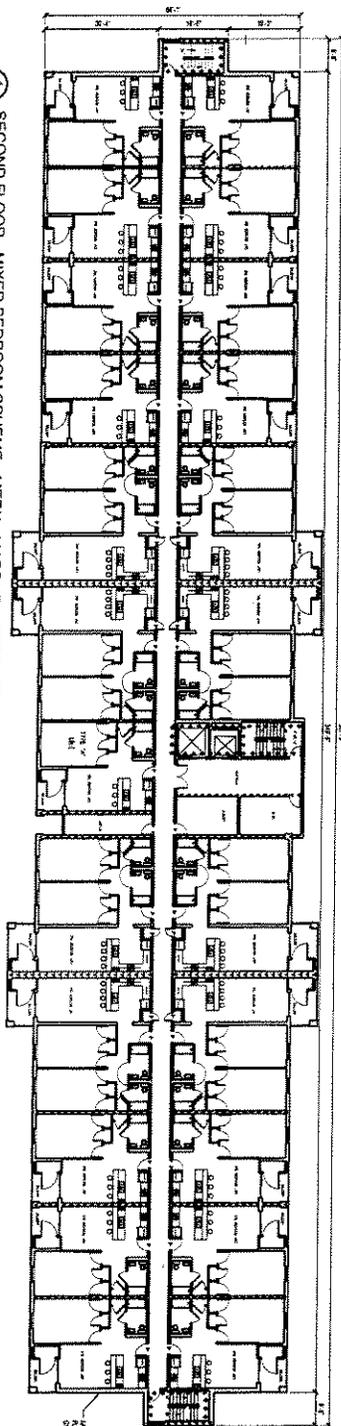
HAAS ARCHITECTS ENGINEERS
120 NORTH ABERDEEN STREET - STATE COLLEGE, PA 16801 - 814 233 1557
610 814 233 8946 www.haasae.com info@haasae.com



1 FIRST FLOOR - MIXED BEDROOM SCHEME - METAL, MASONRY, PRECAST
SCALE: 1/8" = 1'-0"

LEGEND

—————	1'000 SLAB
—————	1'000 SLAB
—————	1'000 SLAB



2 SECOND FLOOR - MIXED BEDROOM SCHEME - METAL, MASONRY, PRECAST
SCALE: 1/8" = 1'-0"

LEGEND

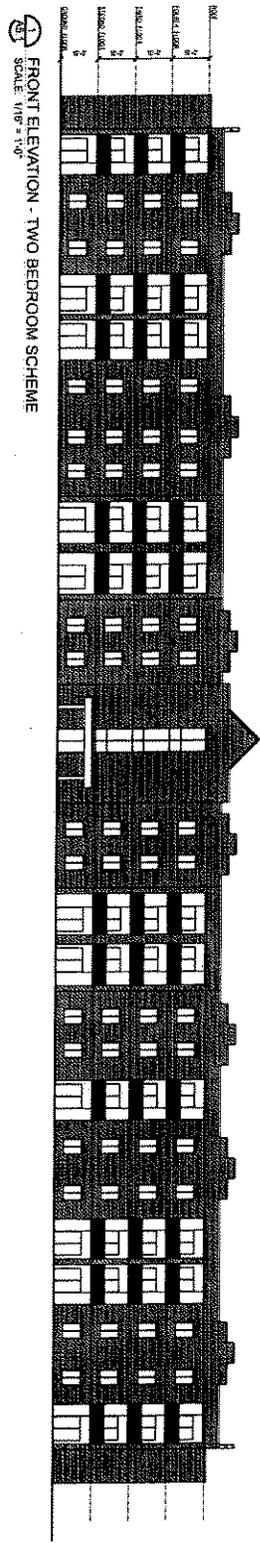
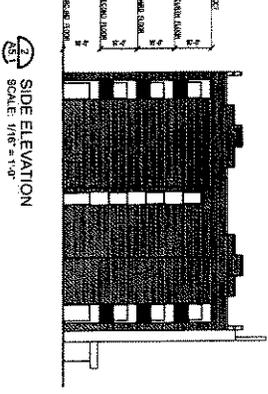
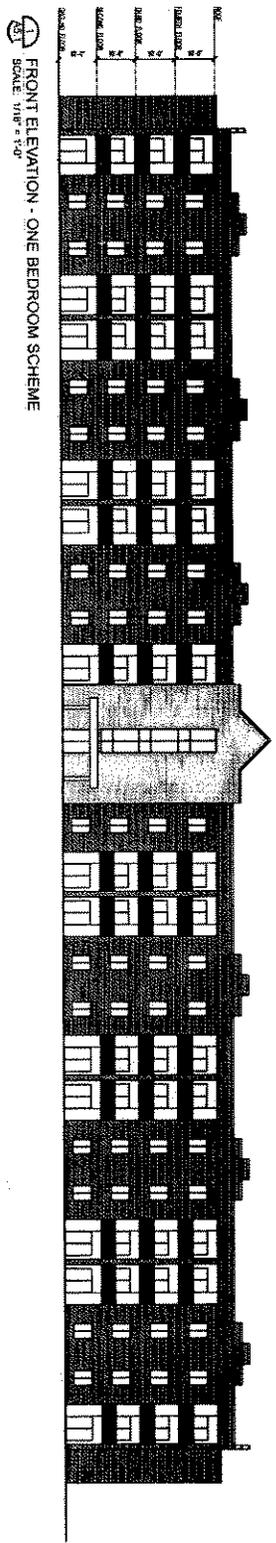
—————	1'000 SLAB
—————	1'000 SLAB
—————	1'000 SLAB

NOT FOR CONSTRUCTION

BUILDING COST COMPARISON STUDY

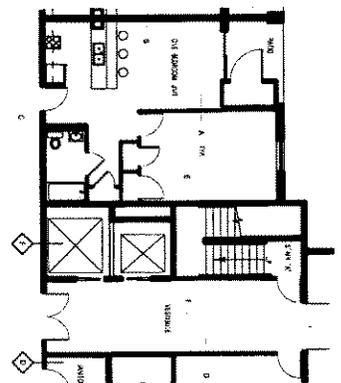
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0013	05/11/2011	ISSUE FOR OCCUPANCY
0014	05/11/2011	ISSUE FOR AS-BUILT
0015	05/11/2011	ISSUE FOR FINAL
0016	05/11/2011	ISSUE FOR ARCHIVE
0017	05/11/2011	ISSUE FOR DESTRUCTION
0018	05/11/2011	ISSUE FOR RECONSTRUCTION
0019	05/11/2011	ISSUE FOR RENOVATION
0020	05/11/2011	ISSUE FOR MAINTENANCE
0021	05/11/2011	ISSUE FOR DEMOLITION
0022	05/11/2011	ISSUE FOR REPAIR
0023	05/11/2011	ISSUE FOR REPLACEMENT
0024	05/11/2011	ISSUE FOR RESTORATION
0025	05/11/2011	ISSUE FOR REPAIR AND MAINTENANCE
0026	05/11/2011	ISSUE FOR REPAIR AND MAINTENANCE
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0100	05/11/2011	ISSUE FOR REPAIR AND MAINTENANCE

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 FAX 814 228-5466 www.haasae.com

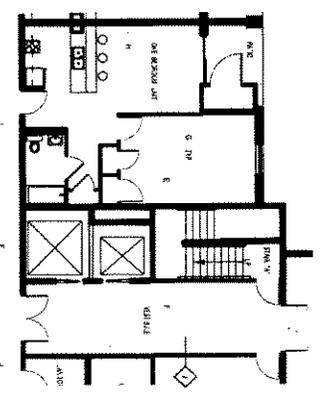


NOT FOR CONSTRUCTION

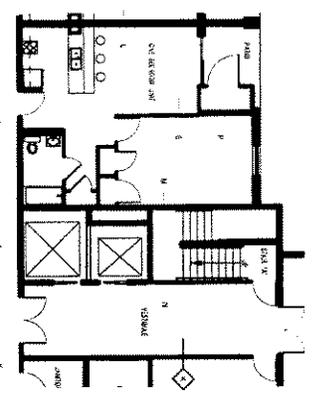
<p>A5.1</p> <p>ENVIRONMENT</p>	<p>BUILDING COST</p> <p>COMPARISON STUDY</p>	 <p>HAAS ARCHITECTS ENGINEERS <small>101 WOOD AVENUE, SUITE 1000 • STATE COLLEGE, PA 16801 • PH: 717.332.1551 FAX: 717.332.1550 • WWW.HAASAE.COM • AIAA 2000-0000</small></p>
	<p>DATE: OCTOBER 19, 2005</p> <p>BY: [Signature]</p> <p>APP: [Signature]</p> <p>SCALE: 1/8" = 1'-0"</p>	



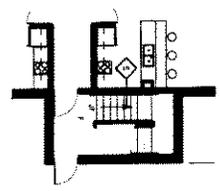
100 ENLARGED WOOD CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



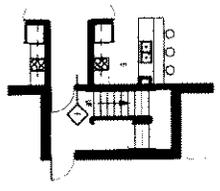
101 ENLARGED METAL STUD CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



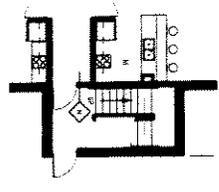
102 ENLARGED MASONRY / PRECAST CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



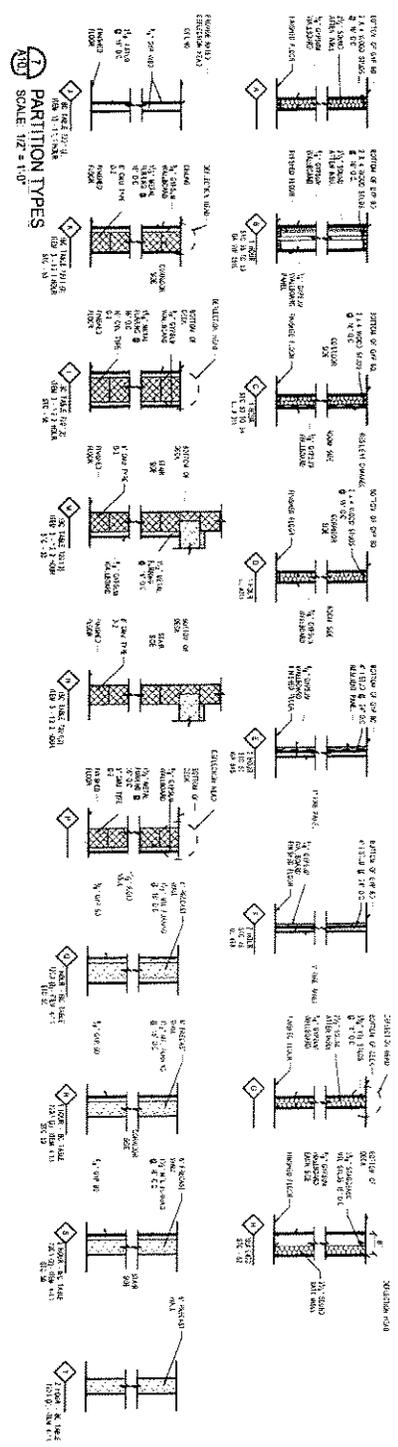
7 ENLARGED WOOD CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



8 ENLARGED METAL STUD CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



9 ENLARGED MASONRY / PRECAST CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



7 PARTITION TYPES
SCALE: 1/2" = 1'-0"

NOT FOR CONSTRUCTION

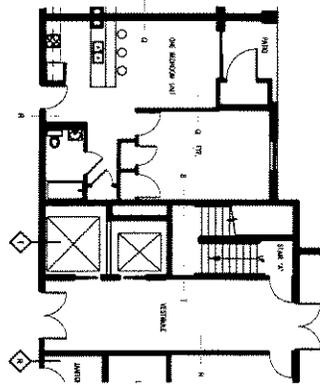
BUILDING COST
COMPARISON STUDY



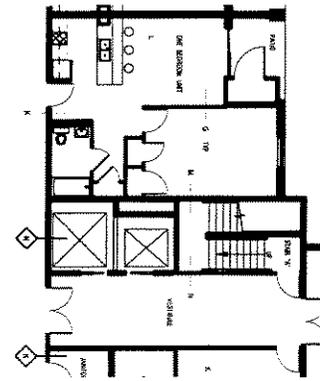
HAAS ARCHITECTS ENGINEERS
120 NORTH AMSTON STREET - STATE COLLEGE, PA 16802 - 814-232-3541
FAX: 814-232-6540 www.haasae.com email: @haasae.com

NO.	DATE	DESCRIPTION
1	10/1/10	ISSUED FOR PERMITS
2	10/1/10	ISSUED FOR PERMITS
3	10/1/10	ISSUED FOR PERMITS
4	10/1/10	ISSUED FOR PERMITS
5	10/1/10	ISSUED FOR PERMITS
6	10/1/10	ISSUED FOR PERMITS
7	10/1/10	ISSUED FOR PERMITS
8	10/1/10	ISSUED FOR PERMITS
9	10/1/10	ISSUED FOR PERMITS
10	10/1/10	ISSUED FOR PERMITS
11	10/1/10	ISSUED FOR PERMITS
12	10/1/10	ISSUED FOR PERMITS
13	10/1/10	ISSUED FOR PERMITS
14	10/1/10	ISSUED FOR PERMITS
15	10/1/10	ISSUED FOR PERMITS
16	10/1/10	ISSUED FOR PERMITS
17	10/1/10	ISSUED FOR PERMITS
18	10/1/10	ISSUED FOR PERMITS
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20	10/1/10	ISSUED FOR PERMITS
21	10/1/10	ISSUED FOR PERMITS

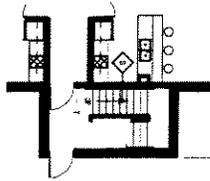
A10.1



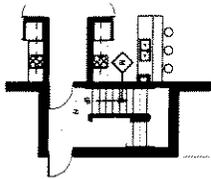
1/10 ENLARGED PRECAST CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



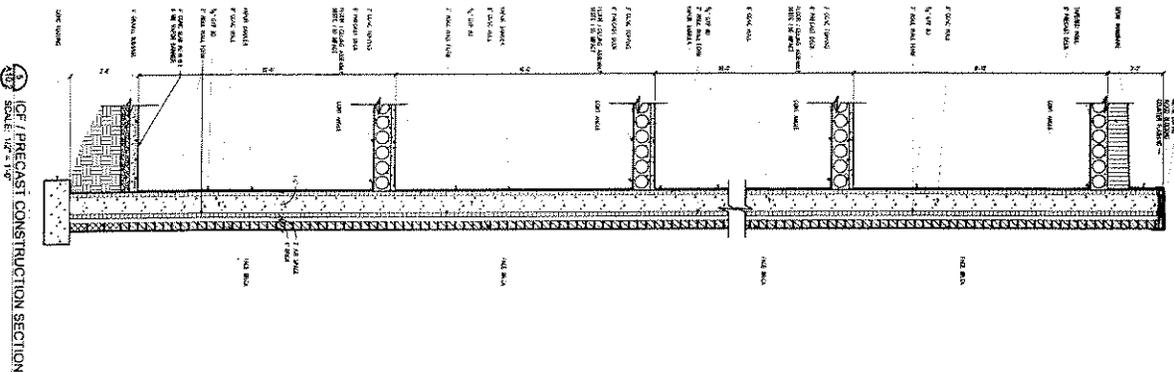
2/10 ENLARGED ICF / PRECAST CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



1/10 ENLARGED PRECAST CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



2/10 ENLARGED ICF / PRECAST CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"



3/10 ICF / PRECAST CONSTRUCTION SECTION
SCALE: 1/2" = 1'-0"

NOT FOR CONSTRUCTION

BUILDING COST
COMPARISON STUDY



HAAS ARCHITECTS ENGINEERS
131 NORTH CHESTER STREET • STATE COLLEGE PA 16802 • 814 232 1931
FAX: 814 232 5246 www.HaasAEP.com

A10.2

DATE: OCTOBER 19 2005

SCALE: 1/8" = 1'-0"

PROJECT: A10.2

NO. OF SHEETS: 10

SHEET NO.: 10

DATE: OCTOBER 19 2005

SCALE: 1/8" = 1'-0"

PROJECT: A10.2

NO. OF SHEETS: 10

SHEET NO.: 10

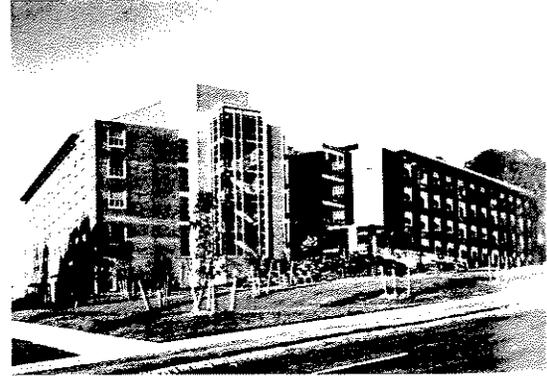
DATE: OCTOBER 19 2005

SCALE: 1/8" = 1'-0"

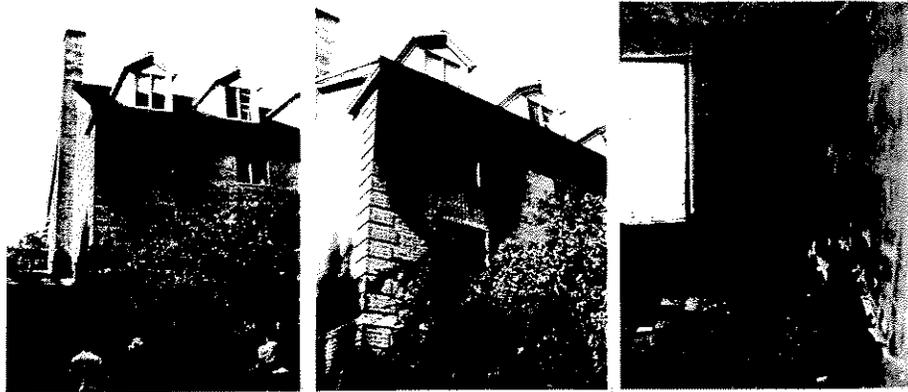
PROJECT: A10.2

Conclusion

Based on the construction cost estimates prepared by Poole Anderson Construction, the cost associated with a compartmentalized construction method utilizing a concrete based material was generally less than 5 percent of the overall construction cost. Comparatively speaking this amount is less than the contingency budget typically recommended for the owner to carry for unanticipated expenditures during the project.



The minimal increase in construction cost can be paid for over the life of the structure. Materials like concrete masonry, precast concrete, and cast-in-place concrete have many other advantages beyond their inherent fire performance including resistance to mold growth, resistance to damage by vandalism, and minimal damage caused by water and fire in the event of a fire in the building. In many cases, with this type of construction the damage outside of the fire compartment is minimal. This provides for reduced cleanup costs and quicker reoccupation of the structure.



DHCD Staff compilation

Group	Calendar year w/ # of incidents	# of injuries	# of deaths	Total amount of prop. damage	
I-2 Hospitals	2004 / 20	1	0	27,502	
	2005 / 14	0	0	6,320	
	2006 / 17	0	0	14,080	
I-2 Hospice	2004 / 2	0	0	0	
	2005 / 1	0	0	0	
	2006 / 1	0	0	9,000	
I-1 Nursing Homes	2004 / 17	0	0	22,505	
	2005 / 22	0	0	45,002	
	2006 / 21	1	0	64,985	
Business	2004	Buildings 4 to 6 stories (inclusive)	0	0	332,350
		Buildings greater than 7 stories in height	0	0	115,120
Business	2005	Buildings 4 to 6 stories (inclusive)	0	0	2,300,600
		Buildings greater than 7 stories in height	1	0	381,403
Business	2006	Buildings 4 to 6 stories (inclusive)	0	0	148,600
		Buildings greater than 7 stories in height	0	0	11,127,328

Group	Calendar year w/ # of incidents	# of injuries	# of deaths	Total amount of prop. damage	Number of buildings where a type of Automatic Extinguishing System was present
A-2	2004 / 138	6	0	4,203,491	4
	2005 / 152	4	0	2,723,719	7
	2006 / 122	4	0	8,957,074	5

NOTE:

These figures were obtained through VFIRS which is structured on NFPA 901 and had to be correlated to the USBC Group classification of buildings. Therefore, the numbers shown above are approximated for Virginia.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-707.14.1**

Nature of Change: (text is on code change form)

To add elevator lobby requirements currently in the International Building Code to the Virginia Construction Code by removing the deletion of the requirements at the state level.

Proponent: Smoke Safety Council

Staff Comments:

When Virginia first began using the International Codes, the elevator lobby provisions contained in the International Building Code (IBC) were deleted as they had not been in the legacy code used in Virginia prior to the International Codes. This was largely due to the fact that most buildings needing elevator lobbies have sprinkler systems and there was an exception to the elevator lobby requirements for buildings with sprinkler systems. The requirements have changed somewhat over the several editions of the IBC, but are still in the 2006 edition of the IBC. A matrix has been provided by the proponent to identify those buildings that would be affected should the state amendment be deleted and the requirements of the IBC used instead. Predominantly, Group B or E buildings less than 55 feet in height, but more than three stories in height would have to have elevator lobbies or an equivalent alternative as they are not required to have sprinklers installed when constructed. Most other buildings are required to be sprinklered anyway and would not have to provide the lobbies or an alternative. The proposal would, however, require elevator lobbies or an alternative in all high-rise buildings, where the current USBC does not.

The proposal was considered by Workgroup 3 and did not achieve consensus.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov	4/9/07	Document No. <u>C-707.14.1</u> Committee Action: _____ BHCD Action: _____
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Submitted by: Frank Hertzog Representing: Smoke Safety Council
 Address: 6775 SW 111th Ave, Ste 10, Beaverton, OR 97008 Phone No. 208 639-7860
 Regulation Title: Executive Director Section No(s): Sections 707.14.1

Proposed Change:

~~Delete Section 707.14.1 of the IBC.~~

By adding this section in the IBC 2006 back into the Virginia Construction Code, the following language would be included:

707.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

707.14.2 Enclosed elevator lobby pressurization alternative.

Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.

707.14.2.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water column and a maximum positive pressure of 0.06 inches of water column with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ground floor level hoistway doors open and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

707.14.2.2 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same fire-resistance rating as required for the elevator shaft enclosure.

707.14.2.3 Fan system. The fan system provided for the pressurization system shall be as required by this section.

707.14.2.3.1 Fire resistance. When located within the building, the fan system that provides the pressurization shall be protected with the same fire-resistance rating required for the elevator shaft enclosure.

707.14.2.3.2 Smoke detection. The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

707.14.2.3.3 Separate systems. A separate fan system shall be used for each bank of elevators.

707.14.2.3.4 Fan capacity. The supply fan shall either be adjustable with a capacity of at least 1,000 cfm (.4719 m³/s) per door, or that specified by a registered design professional to meet the requirements of a designed pressurization system.

707.14.2.4 Standby power. The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.

707.14.2.5 Activation of pressurization system. The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors.

Supporting Statement:

The IBC 2006 states, in **Section 101.3 – Intent**, that the building code establishes “the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.”

Section 707.14.1 is an important element of the fire and life safety plan for construction in that it provides for protection from vertical fire and smoke migration in buildings via the elevator shaft. It does this by prescribing means by which to separate the elevator shaft from the adjoining corridors. By deleting Section 707.14.1, the state of VA in effect has adopted a lower level of fire and life safety than the minimum level established in the IBC 2006. No other state has deleted this section in its entirety.

IBC 2006 provides for four distinct design solutions with which to comply with this section:

1. Enclosed elevator lobby
2. Additional door (mounted at the elevator opening)
3. Use of smoke partitions to provide separation
4. Elevator shaft pressurization

This provides ample design flexibility in meeting the requirements of this code section.

While the charging language states that buildings with elevators connecting more than three stories are affected, sprinkler trade-offs limit the impact of this section to relatively few buildings:

1. A sprinkler trade-off in Exception 1 eliminates the need to provide elevator lobby protection at the street floor level in all buildings with automatic sprinkler systems.
2. Exception 4 limits the requirement to provide elevator lobbies to buildings over 75 feet (high rise), allowing buildings of lower height with automatic sprinkler systems to avoid the use of enclosed elevator lobbies.
3. Exception 4 also recognizes that institutional occupancies, especially confinement facilities (prisons) need added protection. Exception 4 does not apply to confinement facilities of any height. The current VA Building Code does not address how I-3 occupancies are to be protected from vertical fire and smoke migration.
4. All told, this amendment would affect the following occupancies / buildings by requiring the use of any one of the four design solutions described in Section 707.14.1:
 - a. Sprinklered buildings with occupied floors more than 75 feet high (high rise) of all occupancies.
 - b. Institutional occupancies, especially confinement facilities (I-3), of any height.
 - c. Unsprinklered buildings with more than three floors connected by an elevator shaft.

New construction invariably incorporates automatic sprinkler systems, limiting the vast majority of the impact of this amendment to buildings described in 4a and 4b above. Virginia, by adopting this amendment, will align the Virginia Building Code with the minimum fire and life safety standards established in the IBC 2006 for high rise buildings and institutional occupancies.

Impact of Section 707.14.1 on requirement to provide enclosed elevator lobby protection
 equivalent protection from vertical smoke migration

or

Occupancy Classification	Occupancy Definition	Building Height Automatic Sprinklers Present			Building Height Unsprinklered		
		1-3 floors	4-6 floors	7 and more floors	1-3 floors	4-6 floors	7 and more floors
H	Hazardous	No	No	Yes	NP	NP	NP
I	Institutional	Yes	Yes	Yes	NP	NP	NP
R	Residential	No	No	Yes	NP	NP	NP
B	Business	No	No	Yes	No	Yes	Yes
M	Mercantile	No	No	Yes	No	Yes	Yes
A	Assembly	No	No	Yes	No	Yes	Yes
E	Educational	No	No	Yes	No	Yes	Yes
F	Factory	No	No	Yes	No	Yes	Yes
S	Storage	No	No	Yes	No	Yes	Yes
U	Utility	No	No	Yes	No	Yes	Yes

No Not required to provide elevator lobby protection

Yes Required to provide elevator lobby protection

NP Not permitted by IBC 2006

Shaded fields indicate buildings most likely to be built and affected by this requirement.

General automatic sprinkler requirements in IBC 2006

H	Hazardous	All hazardous occupancies must be sprinklered
I	Institutional	All institutional occupancies must be sprinklered
R	Residential	All residential occupancies must be sprinklered
B	Business	High rise required to have automatic sprinkler system
M	Mercantile	High rise required to have automatic sprinkler system
A	Assembly	High rise required to have automatic sprinkler system
E	Educational	High rise required to have automatic sprinkler system
F	Factory	High rise required to have automatic sprinkler system
S	Storage	High rise required to have automatic sprinkler system
U	Utility	High rise required to have automatic sprinkler system

DHCD Staff compilation

Group	Calendar year w/ # of incidents		# of injuries	# of deaths	Total amount of prop. damage
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	2005	/ 14	0	0	6,320
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NOTE:

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VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-901**

Nature of Change: (text is on code change form)

To include NFPA Standard No. 130 as a referenced standard in the code for the construction of those portions of transit and rail systems covered by the code.

Proponent: Washington Metropolitan Area Transit Authority

Staff Comments:

While the Virginia Construction Code and the International Building Code would typically apply to buildings associated with transit and rail systems as well as to structures such as tunnels and trestles, it is not clear whether a reference to the NFPA standard is necessary as the standard addresses many aspects of transit systems not covered by the Virginia Construction Code and could therefore create confusion as to its proper application. This proposal did not receive consensus support in the workgroup process utilized in this code change cycle.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

<p>Address to submit to:</p> <p>DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321</p> <p>Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.state.va.us</p>		<p>Document No. <u>C-901</u></p> <p>Committee Action: _____</p> <p>BHCD Action: _____</p>
<p>Submitted by: M. Nasir Nasim, PE, PMP</p> <p>Address: 600 Fifth St, NW, Washington, DC 20001</p> <p>Regulation Title: Virginia Uniform Statewide Building Code (VUSBC) Section No(s): Chapter 9 of International Building Code (IBC) and Chapter 35 of IBC</p>		<p>Representing: Washington Metropolitan Area Transit Authority (W.M.A.T.A.)</p> <p>Phone No.: (202) 962-1397</p>
<p><u>Proposed Change:</u></p> <p>Chapter 9 – Fire Protection Systems:</p> <p><i>Include:</i></p> <p>Fire protection requirements for the following transit and passenger rail systems shall be in accordance with NFPA 130:</p> <ol style="list-style-type: none">1. New Passenger Rail Systems and extensions to existing passenger rail systems;2. New Underground, Surface, and Elevated Fixed Guideway Transit Systems, including trainways, fixed guideway transit stations, and vehicle maintenance and storage areas and extensions to existing fixed guideway systems;3. Life safety from fire in fixed guideway transit stations, trainways, and outdoor vehicle maintenance and storage areas;4. Emergency procedures for new and existing transit and rail systems as identified in 1, 2 and 3 above <p>Chapter 35 – Referenced Standards</p> <p><i>Include:</i></p> <p>Reference to NFPA 130 – Standard for Fixed Guideway and Passenger Rail Systems, 2003 Edition. (NFPA is acronym for National Fire Protection Association - www.nfpa.org)</p>		
<p><u>Supporting Statement:</u></p> <p>Fire Protection Requirements of the VUSBC and IBC 2003 are not applicable to Fixed Guideway Transit and Passenger Rail Systems. Requirements of the NFPA 130 are more suited too, and more specifically apply to Fixed Guideway Transit and Passenger Rail Systems, reflect industry best practices and results of scientific and engineering testing and analysis.</p>		

Attn: State Building Code Administrator

Dear Sir:

The Washington Metropolitan Area Transit Authority (WMATA), created effective February 20, 1967, is an interstate compact agency and, by the terms of its enabling legislation, is an agency and instrumentality of the District of Columbia, State of Maryland, and Commonwealth of Virginia. WMATA was created by the aforementioned states and the District of Columbia to plan, finance, construct and operate a comprehensive mass transit system for the Washington Metropolitan Area.

WMATA is empowered by the signatory parties to:

1. Plan, Develop, Finance and Cause to be operated improved transit facilities, in coordination with transportation and general development planning for the Zone, as part of a balanced regional system of transportation, utilizing to their best advantage the various modes of transportation
2. To coordinate the operation of the public and privately owned or controlled transit facilities, to the fullest extent practicable, into a unified regional transit system without unnecessary duplicating service
3. To serve such other regional purposes and to perform such other functions as the signatories may authorize by appropriate legislation.

In the State of Virginia, at the present time WMATA is the technical manager and eventual owner and operator of the extension of the Metro system to the Dulles Airport. This project is scheduled in two separate contracts. The first contract is ongoing and consists of the extension of the Metro system from the West Falls Church Station to Wiehle Avenue in Fairfax County. This almost \$2 Billion project currently in design stage, is expected to break ground this year and completion of approximately 12 miles of alignment is expected in 2011. This 12 miles of alignment consists of stations, buildings, tunnels, aerial structures, and at grade structures. More information is available on our website www.wmata.com.

During the design effort for the Dulles Contract, WMATA noticed a deficiency in the building codes promulgated by the State of Virginia. The deficiency arises from the fact that current provision pertaining to FIRE PROTECTION in the 2003 International Building Code (IBC) or the Virginia Uniform Statewide Building Code (VUSBC) are not applicable to transit facilities and in particular underground transit structures. Fire protection requirements for transit and passenger railway facilities are more accurately depicted in the National Fire Protection Association Document # 130, referred to as NFPA 130. Therefore, we are proposing that the VUSBC include an amendment to Chapter 9 of the IBC. The proposed amendment is described in the attached Regulatory Code Change Form.

We were informed by your office that the 2006 edition of the VUSBC is scheduled to publish in 2008, at which time most of the construction on our major project in Virginia would be ongoing or close to completion. Hence, in the interim we request that you notify Building Officials and Inspectors in the County of Fairfax of the pending change and the necessity to maintain compliance with NFPA 130 during this transient period as construction on the Dulles Corridor Metrorail Project (DCMP) is ongoing.

We share your commitment to the citizens of Virginia and the general public at large and request that you support our effort to improve safety and enhance value for our customers.

Very truly yours,

M. Nasir Nasim, PE, PMP
Office of Chief Engineer- Facilities
Department of Planning, Development, Engineering and Construction
WMATA

3/24/2006

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-903.2.1.2**

Nature of Change: (text is on code change form)

To delete a new requirement in the 2006 International Building Code (IBC) for when a sprinkler system needs to be installed in Group A-2 occupancies.

Proponent: Virginia Hospitality and Travel Association

Staff Comments:

The current IBC (2003 Edition) used under the Virginia Construction Code did not require sprinklers to be installed in new single story Group A-2 (restaurants and nightclubs) occupancies unless they had over 300 occupants. The 2006 IBC changed the threshold to 100 occupants. This change would restore the 2003 IBC threshold. The issue was discussed at the April 9, 2007 Stakeholder's meeting, however, the code change was not received in time for consideration by the workgroups used in this code change process. Staff notes the section number given on the code change form should be 903.2.1.2, not 309.2.1.2.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM
(Use this form to submit changes to building and fire codes)

<p>Address to submit to: DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 - 7150 Fax No. (804) 371 - 7092 Email: bhcd@dhcd.state.va.us</p>	<p>8/9/07</p>	<p>Document No. <u>C-903.2.1.2</u> Committee Action: _____ BHCD Action: _____</p>
<p>Submitted by: <u>Barrett Hardiman</u> Representing: <u>Virginia Hospitality and Travel Association</u> Address: <u>2101 Libbie Avenue, Richmond, Virginia 23230</u> Phone No.: <u>(804) 288-3065</u> Regulation Title: <u>2006 USBC</u> Section No(s): <u>903.2.1.2</u></p>		
<p>Proposed Change:</p> <p>[F] 309.2.1.2 Group A-2. An automatic sprinkler system shall be provided for Group A-2 occupancies where one of the following conditions exists:</p> <ol style="list-style-type: none">1. The fire area exceeds 500 square feet (465 m²);2. The fire area has an occupant load of 400<u>300</u> or more; or3. The fire area is located on a floor other than the level of exit discharge.		

Supporting Statement:

Based upon what little evidence is available with regard to restaurant fires and the ability to evacuate in such an event, the changes suggested simply maintain the current occupancy loads for automatic sprinkler systems. Given the approximate numbers provided by VFIRS¹, there were few incidents in the Commonwealth in the last three years resulting in zero fatalities. The drastic reduction from an occupancy load of 300 to 100 before tripping the automatic sprinkler threshold seems to be based neither on evidence or any form of scientific evaluation. This is evident in the fact that while occupancy load triggers were changed, square footage requirements were not.

In an establishment with an occupancy load of 100, the requisite floor space is only 1500 ft². Whereas, an establishment with an occupancy load of 300 would require floor space of 4500 ft². There is no evidence to support that a change in the occupancy trigger of 903.2.1.2 would either prevent injury or reduce property damage.

1. Excerpted from Stakeholder's Meeting Agenda Package provided by DHCD staff, April 9, 2007.

Group	Calendar year w/ # of incidents	# of injuries	# of deaths	Total amount of prop. damage	Number of buildings where a type of Automatic Extinguishing System was present
A-2	2004 / 138	6	0	4,203,491	4
	2005 / 152	4	0	2,723,719	7
	2006 / 122	4	0	8,957,074	5

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change Nos. C-903.3.3.1.2.2-a and C-903.3.3.1.2.2-b

Nature of Changes: (text is on code change form)

To clarify an existing requirement for sprinklers to be installed in the attics of newly constructed Group R-2 buildings designed and marketed for senior citizens and in Group I-1 facilities.

Proponent: Virginia Building and Code Officials Association and DHCD Staff

Staff Comments:

Two changes have been submitted for this issue. The first change (C-903.3.3.1.2.2-a) was to clarify that the NFPA 13 sprinkler standard must be used for the installation of the attic sprinklers. This proposal prompted staff to reestablish an ad hoc committee that had initially proposed the change, which was during the 2003 code change cycle and was a result of legislation. The ad hoc committee met several times and no consensus was reached on whether a lesser standard could be used for the installation of attic sprinklers. There were indications that the use of the NFPA 13 standard was increasing the cost of installations mainly because of the larger water supply requirements and the tap fees associated with those water supplies. Staff's concern with the first proposal, aside from the issue of whether the NFPA 13 standard must be used, was that it was inappropriate to reference the NFPA 13 standard in a section which was for NFPA 13R, which is the residential sprinkler standard. The second proposal (C-903.3.3.1.2.2-b) is a staff proposal which requires the use of the NFPA 13 standard, however, it does it in a way that is compatible with the requirement being in the NFPA 13R section; by referencing the appropriate section of NFPA 13R, which in turn sends you to the NFPA 13 standard for the actual requirements. While staff was hopeful that the ad hoc committee might reach an agreement on the use of a lesser standard, several proposals put forward did not receive support and the staff change was offered as a way to fix the current provision. The ad hoc committee is continuing to meet and if a proposal for using a lesser standard, or an alternative to attic sprinklers is found, then that will be brought forward for consideration.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM
(Use this form to submit changes to building and fire codes)

<p>Address to submit to:</p> <p>DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321</p> <p>Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.state.va.us</p>		<p>Document No. <u>C-903.3.1.2.2-a</u></p> <p>Committee Action: _____</p> <p>BHCD Action: _____</p> <p><i>10/24/06</i></p>
<p>Submitted by: <u>William J. Hall</u> Representing: <u>VA Building and Code Officials Association</u></p> <p>Address: <u>P.O. Box 12164 Richmond VA 23241</u> Phone No.: <u>804-649-8471</u></p> <p>Regulation Title: <u>Uniform Statewide Building Code</u> Section No(s): <u>903.3.1.2.2</u></p>		
<p>Proposed Change: <u>revise to read</u></p> <p>903.3.1.2.2 Attics. Sprinkler protection <u>in accordance with 903.3.1.1</u> shall be provided for attics in buildings of Type III, IV or V construction in the following occupancies.</p> <ol style="list-style-type: none">1. Group R-2 which are designed, or developed and marketed to senior citizens, 55 years of age or older.2. Group I-1.		

Supporting Statement:

As written, this section does not give any guidance on which standard the sprinkler protection in the attic is designed to. It is assumed to be in accordance with NFPA 13. This added language will provide a clear intent of design. In addition, an attic which is built with non-combustible material would be allowed to take advantage of exception #4 in **903.3.1.1.1 Exempt locations.**

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov	Document No. <u>C-903.3.1.2.2-b</u> Committee Action: _____ BHCD Action: _____
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Submitted by: Technical Assistance Services Office, Div. of Bldg. and Fire Regulation, DHCD

Regulation Title: USBC, Va. Const. Code Section No(s): 903.3.1.2.2

Proposed Change:

Change the USBC amendment creating IBC subsection 903.3.1.2.2 to read as follows:

903.3.1.2.2 Attics. Sprinkler protection shall be provided for attics in buildings of Type III, IV or V construction in the following occupancies:

- 1. Group R-2 occupancies which are designed, or developed and marketed to senior citizens, 55 years of age or older ;
- 2. and in Group I-1 occupancies in accordance with Section 6.7.2 of NFPA 13R.

Supporting Statement:

This change provides clarification of the requirements for protecting the attics in senior R-2 and Group I-1 buildings. Section 6.7.2 of NFPA 13R is basically a reference to the use of NFPA 13 for attic areas.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-903.4.2**

Nature of Change: (text is on code change form)

To clarify an existing requirement for a manual alarm system in Group R-2 buildings more than two stories in height.

Proponent: Fairfax County

Staff Comments:

This proposal stems from discussions at the April 9, 2007 Stakeholder's meeting and from Workgroup 3 meetings. The code provision in question was approved by the Board during the 2003 Code Change Cycle at the request of Fairfax County. The discussions at the time and the supporting statement for the original code change indicate that the intent was simply to require one manual fire alarm box (a pull station). However, the wording of the provision can be read to require a full alarm system in all dwelling units and common areas in addition to the one manual pull station. This proposal adds language to make it clear that only one manual pull station is required and the full alarm system is not. These buildings are sprinklered buildings and single or multiple-station smoke alarms (smoke detectors) are still required.

The actual code change was not received in time for review by the workgroups used in this code change cycle.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

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Submitted by: Ray Pylant Representing: Fairfax County

Address: 12055 Government Center Pkwy., Suite 448 Fairfax, VA 22030 Phone No.: 703-324-1910

Regulation Title: Virginia Construction Code Section No(s): IBC Sections 903.4.2 and 907.2.9

Proposed Change:

Add new language to IBC(2006) Section 930.4.2:

[F] 903.4.2 Alarms. Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an approved location. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system. Group R-2 occupancies that contain 16 or more dwelling units or sleeping units; or any dwelling unit or sleeping unit two or more stories above the lowest level of exit discharge; or any dwelling unit or sleeping unit more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit, shall provide a manual fire alarm box at an approved location to activate the suppression system alarm.

Delete Exception 2.3 of VUSBC(2006) Section 907.2.9 (remainder of Section remains unchanged):

[F] 907.2.9 Group R-2. A manual fire alarm system shall be installed in Group R-2 occupancies.

Exceptions:

1. A fire alarm system is not required in buildings not over two stories in height where all dwelling units or sleeping rooms and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each dwelling unit or sleeping room has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
 - 2.2. The notification appliances will activate upon sprinkler flow, and
 - 2.3. ~~At least one manual fire alarm box is installed at an approved location.~~

Supporting Statement:

This code change proposal maintains consistency with the current VUSBC(2003) edition applying to buildings two or more stories in height. During some of the preliminary work group client meetings this section was discussed, and someone indicated a need for clarification, in that the language did not clearly state what exactly is required for this application, simply a manual pull station with audible signal, or the inclusion of lights and strobes. This proposal is intended to clarify any perceived confusion with the current USBC regulations.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-906.1**

Nature of Change: (text is on code change form)

To permit fire extinguishers in jail or prison facilities to be placed at staff locations and to be contained in a locked compartment.

Proponent: Virginia Department of Corrections (DOC)

Staff Comments:

This proposal was not received in time to be considered by the workgroups used in this code change cycle, however, staff did meet with DOC and the Virginia Department of General Services, the state agency responsible for the oversight of construction of state prison facilities, and the change was considered and determined to be appropriate. DOC has submitted this change to the International Code Council for the 2009 IBC.

Staff notes that the USBC already contains an exception to IBC Section 906.1 in the text of the section for Group R-2 occupancies, therefore if this change is approved, the section should be rewritten as follows (final language shown):

906.1 General. Portable fire extinguishers shall be provided in occupancies and locations as required by the International Fire Code.

Exceptions:

1. Group R-2 occupancies.

2. In Group I-3 occupancies, portable fire extinguishers shall be permitted to be located at staff locations and the access to such extinguishers shall be permitted to be locked.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov		Document No. <u>C-906.1</u> Committee Action: _____ BHCD Action: _____
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Submitted by: A. Brooks Ballard Representing: Va. Dept. of Corrections

Address: A&D Unit, 6900 Atmore Drive, Richmond, VA 23225 Phone No. (804) 674-3102 ext.1221

Regulation Title: VUSBC, International Building Code 2006 Section No(s): 906.1

Proposed Change:

906.1 General . Portable fire extinguishers shall be provided in occupancies and locations as required by the *International Fire Code*.

Exception: In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations. Access to extinguishers shall be permitted to be locked.

Supporting Statement:

This change brings ICC in line with 1996 BOCA Section 921.2 for I-3 and associated occupancies. The change is necessary to keep extinguishers from being vandalized or used as weapons while still being available to staff and employees for use in an emergency situation.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-907.6.2.1.1**

Nature of Change: (text is on code change form)

To modify the alarm signal requirements in the International Building Code (IBC) to apply only within a smoke compartment in jail or prison facilities.

Proponent: Virginia Department of Corrections (DOC)

Staff Comments:

This proposal was not received in time to be considered by the workgroups used in this code change cycle, however, staff did meet with DOC and the Virginia Department of General Services, the state agency responsible for the oversight of construction of state prison facilities. This change was not considered at the meeting. DOC has submitted this change to the International Code Council for the 2009 IBC.

Staff notes that the change is modifying the 2007 Supplement to the IBC and to be implemented in the 2006 IBC, the proposed exception would have to be added to Section 907.9.2 instead of the section shown in the proposal.

Codes and Standards Committee Action:

Approve as presented.

Disapprove.

Approve as modified (specify):

Carry over to next cycle.

Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to:	Document No. <u>C-907.6.2.1.1</u>
DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321	Committee Action: _____ BHCD Action: _____
Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov	

Submitted by: A. Brooks Ballard Representing: Va. Dept. of Corrections

Address: A&D Unit, 6900 Atmore Drive, Richmond, VA 23225 Phone No. (804) 674-3102 ext.1221

Regulation Title: VUSBC, International Building Code 2006 Section No(s): 907.6.2.1.1

Proposed Change:

[F] 907.6.2.1.1 Average sound pressure. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupied space within the building. The minimum sound pressure levels shall be: 75 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms; and 60 dBA in other occupancies.

Exception: Sound pressure levels in Group I-3 occupancies shall be permitted to be limited to only the notification of occupants and staff in the affected smoke compartment.

Supporting Statement:

Inmates in Group I-3 occupancies are dependent on administration to leave the occupied areas. Notification of the supervisory personnel in the zone and central control (a 24/7 post) triggers a response for evacuating the affected occupants. Inmates frequently tamper with detectors and sprinklers to create false alarms to disrupt the operation of the whole facility; I-3 occupancies are required to be sprinklered, are non-combustible construction and have minimal decorations or fuel loading.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-912.1**

Nature of Change: (text is on code change form)

To provide the basic infrastructure capable of supporting emergency communication equipment in the construction of certain new buildings.

Proponent: City of Virginia Beach (and In-Building Emergency Communications Task Group)

Staff Comments:

This proposal was developed cooperatively through the In-Building Communications Task Group and Workgroups 2 and 3. While the current proposal is not as extensive as former proposals, the groups determined that it would provide a good first step in enhancing the ability of firefighters and emergency responders to effectively communicate where building feature impediments are present. It was recognized that the technology utilized in emergency communications is still in a state of change, which plays a factor in developing a more comprehensive proposal. All groups recommend this change to move forward as consensus.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov		Document No. <u>C-912.1</u> Committee Action: _____ BHCD Action: _____
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Submitted by: Cheri Hainer Representing: City of Virginia Beach

Address: 2405 Courthouse Drive, Bldg. 2, Room 100, Virginia Beach, VA 23456

Phone No. (757) 385-4211

Regulation Title: 2003 USBC and SFPC Section No(s): USBC 902, 912 and SFPC 511

Proposed Change:

(1) In the USBC, add new definitions to Section 902 of the IBC as follows:

Emergency Communication Equipment. Emergency communication equipment, includes, but is not limited to, two-way radio communications, signal booster, bi-directional amplifiers, radiating cable systems or internal multiple antenna, or a combination of the foregoing.

Emergency Public Safety Personnel. Emergency public safety personnel includes firefighters, emergency medical personnel, law-enforcement officers and other emergency public safety personnel routinely called upon to provide emergency assistance to members of the public in a wide variety of emergency situations, including, but not limited to, fires, medical emergencies, violent crimes and terrorist attacks.

(2) In the USBC, add Section 912 to the IBC as follows:

Section 912. In-Building Emergency Communications Coverage.

912.1 General. In-building emergency communication equipment to allow emergency public safety personnel to send and receive emergency communications shall be provided in new buildings and structures in accordance with this section.

Exceptions:

1. Buildings of Use Groups A-5, I-4, within dwelling units of R-2, R-3, R-4, R-5, and U.
2. Buildings of Type IV and V construction without basements.
3. Above grade single story buildings of less than 20,000 square feet.

4. Buildings or leased spaces occupied by federal, state, or local governments, or the contractors thereof, with security requirements where the building official has approved an alternative method to provide emergency communication equipment for emergency public safety personnel.

5. Where the owner provides technological documentation from a qualified individual that the structure or portion thereof does not impede emergency communication signals.

912.2 Where required. For localities utilizing public safety wireless communications, new buildings and structures shall be equipped throughout with dedicated infrastructure to accommodate and perpetuate continuous emergency communication.

912.2.1 Installation. Radiating cable systems, such as coaxial cable or equivalent shall be installed in dedicated conduits, raceways, plenums, attics, or roofs, compatible for these specific installations as well as other applicable provisions of this code.

912.2.2 Operations. The locality will assume all responsibilities for the installation and maintenance of additional emergency communication equipment. To allow the locality access to and the ability to operate such equipment, sufficient space within the building shall be provided.

912.2.3 Inspection. In accordance with Section 113.3, all installations shall be inspected prior to concealment.

912.3 Acceptance test. Upon completion of installation, after providing reasonable notice to the owner or their representative, emergency public safety personnel shall have the right during normal business hours, or other mutually agreed upon time, to enter onto the property to conduct field tests to verify that the required level of radio coverage is present at no cost to the owner. Any noted deficiencies shall be provided in an inspection report to the owner to the owner or the owner's representative.

(3) In the SFPC, add Section 511 to the IFC as follows:

Section 511. Maintenance of In-Building Emergency Communication Equipment.

511.1 General. In-building emergency communication equipment shall be maintained in accordance with the USBC and the provisions of this section.

511.2 Additional in-building emergency communications installations. If it is determined by the locality that increased amplification of their emergency communication system is needed, the building owner shall allow the locality access as well as provide appropriate space within the building to install and maintain necessary additional communication equipment by the locality. If the building owner denies the locality access or appropriate space, or both, the building owner shall be responsible for the installation and maintenance of these additional systems.

511.3 Field tests. After providing reasonable notice to the owner or their representative, the fire official, police chief, or their agents, shall have the right during normal business hours, or other mutually agreed upon time, to enter onto the property to conduct field tests to verify that the required level of radio coverage is present at no cost to the owner.

Supporting Statement:

In 2002, on behalf of my locality, I made a proposal to require the pre-wiring of buildings to supplement and enhance the locality's emergency communication system. Other localities were experiencing similar issues and several joined in the effort to codify the issue. In 2003, General Assembly Joint Bill 588 required the State Fire Marshall's office (Fire Programs) to study the necessity for appropriate code provisions. A task group representing all affected parties, such as Building and Fire Officials, Building Owners, Contractors, and Radio Systems Technical Advisors meet to discuss this issue and determined there was a need for this to be referenced in the Uniform Statewide Building Code. Based on the outcome of that study as well as the language in House Bill 2529 2003, several versions of this code provision were developed and presented to the Board of Housing. However, there were numerous undetermined construction and cost factors involved and no

consensus could be reached among the code, construction and building owners communities and consequently no codes were adopted. But the concern for and by the emergency public safety personnel is still prevalent, prompting the introduction of House Bill 2554 2007. Accordingly, the interested parties have come back to the table and as the In-Building Communications Work Group, have arrived at this compromise as a first step to addressing this issue. The installation and maintenance costs and responsibilities of the building owner have been greatly reduced as they now need only provide basic and generic infrastructure capable of enhancing any supplemental emergency communication equipment, which will be provided and maintained by the locality.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-1004.3**

Nature of Change: (text is on code change form)

To delete the requirement in the International Building Code (IBC) that small assembly rooms need to have an occupant load sign.

Proponent: Virginia Society of the American Institute of Architects (VSAIA)

Staff Comments:

While the requirement for posting all assembly occupancies has been in the IBC since its inception, the treatment of small assembly occupancies has undergone a number of changes. In the 2003 IBC, assembly occupancies used by less than 50 persons and accessory to another occupancy were classified as the occupancy they were accessory to and assembly occupancies accessory to Group E of any size were classified as Group E. In the 2006 IBC, buildings used for assembly purposes by less than 50 persons are classified as Group B as well as rooms or spaces with less than 50 persons if accessory to another occupancy. Therefore, as the proponent points out, it is hard to distinguish when an occupant load sign needs to be installed in these small assembly rooms or spaces and the proposal would bring some uniformity to the application of the code. The proposal was considered by Workgroup 3 and recommended to be moved forward as consensus.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to:

DHCD, The Jackson Center
501 North Second Street
Richmond, VA 23219-1321

Tel. No. (804) 371 – 7150
Fax No. (804) 371 – 7092
Email: bhcd@dhcd.virginia.gov

6/12/07

Document No. C-1004.3

Committee Action: _____

BHCD Action: _____

Submitted by: J. Kenneth Payne, Jr., AIA

Representing: VSAIA

Address: 780 Lynnhaven Parkway, Suite 200; Virginia Beach, VA 23452 Phone No. 757.368.2800

Regulation Title: 2006 Virginia Construction Code Section No(s): 1004.3

Proposed Change:

1004.3 Posting of occupant load. Every room or space that is an assembly occupancy and where the occupant load of that room or space is 50 or more, shall have the occupant load of the room or space posted in a conspicuous place, near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or authorized agent.

Supporting Statement:

Section 1004.3, as written, and is oftentimes interpreted, does not differentiate between an auditorium or a small conference room....a gymnasium or a small teacher's dining area...a library or a small lunchroom...because the code identifies all of these spaces as assembly. If the intent of posting these signs is to avoid overcrowding and to ensure proper exiting is provided for *large* groups of people, then it appears a capacity limit could be added without affecting the life, safety, and welfare of those occupants.

Throughout the code, there are various caps for determining "assembly-related" requirements: 50, 100, 300, 1000, and so on. A single 3'-0" door can accommodate a minimum of 165 people (not sprinkled) and 220 occupants (fully sprinkled), but where there are 50 or more people, the code requires a *second* egress door with both swinging out...thus increasing your minimum number of egress capacity to 330 and 440, respectively. It would appear that requiring the posting of a sign for those spaces with an occupant load of 50 or more (and thus, two doors) would serve the intent of the code. The proposed change would clearly identify when a sign would be required, and not leave it up to interpretation or intent.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change Nos. C-1007.3, C-1007.4 and C-1007.6.2**

Nature of Changes: (text is on code change form)

To reestablish exceptions for areas of refuge in sprinklered buildings which were deleted at the national level in the 2006 International Building Code (IBC).

Proponent: Virginia Society of the American Institute of Architects

Staff Comments:

Code Change No. C-1007.3 would reestablish the sprinkler exception to permit an exit stairway to be considered an accessible means of egress without an area of refuge. This longstanding exception in the IBC originated from the ADA Accessibility Guidelines and recognizes the higher level of protection of occupants in sprinklered buildings. Code Change No. C-1007.4 reestablishes a sprinkler exception to not require an accessible route from an elevator to an area of refuge. This correlates with the previous change since areas of refuge would not be required in sprinklered buildings. Code Change No. C-1007.6.2 reestablishes the sprinkler exception for rated separation between an area of refuge and the rest of the story in which it is located. All three of these changes are intended to keep the sprinkler exceptions which are present in the current USBC.

The actual code changes were not received in time for consideration by the workgroups used in this code change cycle.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

Address to submit to:

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501 North Second Street
Richmond, VA 23219-1321

Tel. No. (804) 371 – 7150
Fax No. (804) 371 – 7092
Email: bhcd@dhcd.state.va.us

Document No. C-1007.3

Committee Action: _____

BHCD Action: _____

Submitted by: Kenny Payne

Representing: VSAIA

Address: 780 Lynnhaven PKWY, VA Beach 23452 Phone No.: (757)368-2800
Regulation Title: Virginia Construction Code (VUSBC) section 1007.3

Proposed Change:

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway, shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Open exit stairways as permitted by Section 1019.1 are permitted to be considered part of an accessible means of egress.
2. The area of refuge is not required at open stairways that are permitted by Section 1019.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
3. The clear width of 48 inches (1219 mm) between handrails and the area of refuge is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.

REMAINDER of the section is unchanged.



Supporting Statement: reinstatement of an area of refuge exception based on sprinkler protection.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM

Address to submit to:

DHCD, The Jackson Center
501 North Second Street
Richmond, VA 23219-1321

Tel. No. (804) 371 - 7150
Fax No. (804) 371 - 7092
Email: bhcd@dhcd.virginia.gov

6/25/07

Document No. C-1007.4

Committee Action: _____

BHCD Action: _____

Submitted by: J. Kenneth Payne, Jr., AIA

Representing: VSAIA

Address: 780 Lynnhaven Parkway, Suite 200; Virginia Beach, VA 23452 Phone No. 757.368.2800

Regulation Title: 2006 Virginia Construction Code Section No(s): 1007.4

Proposed Change:

Add the following exception to 1007.4 Elevators:

- Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Supporting Statement:

This exception was included in both the 2000 and 2003 editions of the IBC and USBC, as the building code did not require areas of refuge, when buildings were fully sprinklered. Without this exception, and assuming a building is already fully sprinklered, the *additional* building costs associated with all exit vertical enclosures needing to be larger; or horizontal exits with the associated standpipes, fire-rated wall construction, increased capacity of refuge area and door assemblies; or smoke barriers and "vestibules", could be substantial.

Please note: The sprinkler exceptions (#2, #3, and #5) all still remain for Section 1007.3 Exit stairways.

The "sprinkler" exception was used by designers, building officials, and fire marshals to help justify the expense to building owners of providing a sprinkler system, and if this exception is *not* allowed, then one more "trade-off" is lost, and the potential of an owner considering *not* providing a sprinkler system is increased.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM

Address to submit to:

DHCD, The Jackson Center
501 North Second Street
Richmond, VA 23219-1321

Tel. No. (804) 371 - 7150
Fax No. (804) 371 - 7092
Email: bhcd@dhcd.virginia.gov

Document No. C-1007.6.2

Committee Action: _____

BHCD Action: _____

4/25/07

Submitted by: J. Kenneth Payne, Jr., AIA

Representing: VSAIA

Address: 780 Lynnhaven Parkway, Suite 200, Virginia Beach, VA 23452 Phone No. 757.368.2800

Regulation Title: 2006 Virginia Construction Code Section No(s): 1007.6.2

Proposed Change:

Add the following exception to 1007.6.2 Separation, and re-number the current exception:

Exceptions:

1. Areas of refuge located within a vertical exit enclosure.
2. Areas of refuge where the area of refuge and areas served by the area of refuge are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Supporting Statement:

This exception was included in both the 2000 and 2003 editions of the IBC and USBC, as the building code did not require areas of refuge, when buildings were fully sprinklered. Without this exception, and assuming a building is already fully sprinklered, the *additional* building costs associated with all exit vertical enclosures needing to be larger; or horizontal exits with the associated standpipes, fire-rated wall construction, increased capacity of refuge area and door assemblies; or smoke barriers and "vestibules", could be substantial.

Please note: The sprinkler exceptions (#2, #3, and #5) all still remain for Section 1007.3 Exit stairways.

The "sprinkler" exception was used by designers, building officials, and fire marshals to help justify the expense to building owners of providing a sprinkler system, and if this exception is *not* allowed, then one more "trade-off" is lost, and the potential of an owner considering *not* providing a sprinkler system is increased.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-1009.3.3**

Nature of Change: (text is on code change form)

To clarify the application of the stairway provisions in the International Building Code (IBC) for jail or prison facilities.

Proponent: Virginia Department of Corrections (DOC)

Staff Comments:

This proposal was not received in time to be considered by the workgroups used in this code change cycle, however, staff did meet with DOC and the Virginia Department of General Services, the state agency responsible for the oversight of construction of state prison facilities, and the change was considered and determined to be appropriate. DOC has submitted this change to the International Code Council for the 2009 IBC.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov		Document No. <u>C-1009.3.3</u> Committee Action: _____ BHCD Action: _____
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Submitted by: A. Brooks Ballard Representing: Va. Dept of Corrections

Address: A&D Unit, 6900 Atmore Drive, Richmond, VA 23225 Phone No. (804) 674-3102 ext.1221

Regulation Title: VUSBC, International Building Code 2006 Section No(s): 1009.3.3

Proposed Change:

1009.3.3 Profile.

Exceptions:

1. Solid risers ...with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in F, H and S occupancies other than areas accessible to the public. There are no restrictions on size of the opening in the riser.

Supporting Statement:

Exception 2 recognizes that open risers are commonly used for stairs in occupancies such as detention facilities for practical reasons. Open risers provide a greater degree of security and supervision due to the fact that people cannot effectively conceal themselves behind the stair. There is no opening size limitation. These risers can be completely open with no restrictions.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-1011.1**

Nature of Change: (text is on code change form)

To clarify the application of the exit sign provisions in the International Building Code (IBC) for jail or prison facilities.

Proponent: Virginia Department of Corrections (DOC)

Staff Comments:

This proposal was not received in time to be considered by the workgroups used in this code change cycle, however, staff did meet with DOC and the Virginia Department of General Services, the state agency responsible for the oversight of construction of state prison facilities, and the change was considered and determined to be appropriate. DOC has submitted this change to the International Code Council for the 2009 IBC.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov		Document No. <u>C-1011.1</u> Committee Action: _____ BHCD Action: _____
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Submitted by: A. Brooks Ballard Representing: Va. Dept of Corrections

Address: A&D Unit, 6900 Atmore Drive, Richmond, VA 23225 Phone No. (804) 674-3102 ext.1221

Regulation Title: VUSBC, International Building Code 2006 Section No(s): 1011.1

Proposed Change:

(revise existing language)

1011.1 Where required. Exits... sign.

Exceptions:

- 1...
- 2...
- 3...
4. Exit signs are not required in dayrooms, sleeping areas rooms, or dormitory spaces in occupancies in Group I-3.

Supporting Statement:

This change clarifies the intent of this section that exit signs are not required in cells or contiguous housing dayrooms or sleeping dormitories in I-3 occupancies.

Most occupants in such buildings are long-time residents who become familiar with the locations of all exits outside their sleeping areas, whether they are marked or unmarked. In cases of emergency, occupants in Use Group I-3 are escorted by staff to the exits and to safety. The exit signs also represent potential for vandalism and use as weapons when they are accessible to the residents.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-1015.1**

Nature of Change: (text is on code change form)

To retain the occupant number of “50” in two tables under in the International Building Code (IBC) which were changed to “49” in the 2006 IBC.

Proponent: Virginia Society of the American Institute of Architects (VSAIA)

Staff Comments:

While the supporting statement in the code change submittals at the national level indicate that changing the numbers from “50” to “49” were to achieve consistency in the IBC, there are still provisions in the 2006 IBC which use “50 or more” as the threshold for application of the code. As the proponent of this change states, while adjusting the thresholds may have made the IBC somewhat more consistent, it does have a negative impact on design. This change was considered by Workgroup 3 and was recommended for moving forward as a consensus change.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 - 7150 Fax No. (804) 371 - 7092 Email: bhcd@dhcd.virginia.gov	<u>6/12/07</u>	Document No. <u>C-1015.1</u> Committee Action: _____ BHCD Action: _____
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Submitted by: J. Kenneth Payne, Jr., AIA

Representing: VSAIA

Address: 780 Lynnhaven Parkway, Suite 200; Virginia Beach, VA 23452 Phone No. 757.368.2800

Regulation Title: 2006 Virginia Construction Code Section No(s): 1015.0 and 1019.0

Proposed Change:

Refer to Table 1015.1, under "Maximum Occupant Load", delete "49" and substitute "50".

Refer to Table 1019.2, under "Maximum Occupants", delete "49" and substitute "50".

Supporting Statement:

Virginia, as well as all other model codes, has had "50" for many years, and empirical data has not been submitted to support the lower number. The change in Code could also add *significant* dollars to the construction cost of almost every building type.

If one considers that a 3'-0" wide door provides egress capacity for approximately 220 people (if sprinkled) and 165 people (non-sprinkled), one door could handle a great number of occupants. The addition of one more person (49 vs. 50) would require another door and frame assembly, another set of hardware, and both doors swinging out (which could require recessed areas so doors do not swing into exit passageways or exit accessways - thus taking away from the available net SF of each space); all for just one more person.

If an owner needs to provide a particular net SF (classroom, tenant space, office space, etc.), we could end up adding numerous doors, frames, and hardware, as well as recessed walls or wider corridors...all of which would contribute to larger buildings and more cost with no demonstrable improvement in safety.

Another potential concern: If a LAHJ sees *two* doors swinging out...they may now interpret that the spaces could accommodate more than the 50 people intended...thus potentially requiring an increase in egress elements (corridor width, number of stairs and/or width, door widths, etc.); an increase in plumbing fixtures (to accommodate the perceived additional occupant load of these affected spaces); and a subsequent increase in HVAC requirements, throughout the entire building.

This code change does not seem to be warranted for life safety.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-1612.1.1**

Nature of Change: (text is on code change form)

To delete a current exception in the USBC for elevating replacement manufactured homes in manufactured home parks.

Proponent: Virginia Department of Emergency Management

Staff Comments:

The existing exception as been in the USBC for a number of editions and was added at the request of Federal Emergency Management Agency (FEMA) representatives to match the exception in the regulations of FEMA's (now Homeland Security's) National Flood Insurance Program (NFIP). In discussions with representatives of the Virginia Department of Conservation and Recreation, it was realized that the existing language could be minimally changed to better match the NFIP regulations by adding clarification for where the 36 inch height measurement would be taken on the manufactured home. Staff supports the minor clarification.

The code change was not submitted in time to be considered by the workgroup process used in this code change cycle.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

<p>Address to submit to: DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.state.va.us</p>	<p style="text-align: center;">8/10/07</p>	<p>Document No. <u>0-1612.1.1</u> Committee Action: _____ BHCD Action: _____</p>
<p>Submitted by: <u>Deborah G. Mills</u> Representing: <u>Virginia Department of Emergency Management</u> Address: <u>10501 Trade Ct; Richmond VA 23236</u> Phone No.: <u>804-897-6500 ext 6563</u> Regulation Title: <u>1612.1.1 Elevation of manufactured homes</u>. Section No(s): <u>1612.1.1 and Exception</u></p>		
<p>Proposed Change:</p> <p>1612.1.1 Elevation of manufactured homes. New or replacement manufactured homes to be located in any flood hazard zone shall be placed in accordance with the applicable elevations requirements of this code <i>local flood plain management ordinance consistent with Section 102.2 Scope of the VIRGINIA CONSTRUCTION CODE (PART I OF THE USBC – 2006 EDITION)</i>.</p> <p>Exception: Manufactured homes installed on sites in an existing manufactured home park or subdivision shall be permitted to be placed no less than 36 inches (914 mm) above grade in lieu of being elevated at or above the base flood elevation provided no manufactured home at the same site has sustained flood damage exceeding 50% of the market value of the home before the damage occurred.</p>		
<p>Supporting Statement:</p> <p>Through the National Flood Insurance Program, flood hazards are mapped and participating communities (local governments) manage the program through an adopted flood plain management ordinance, which can be a stand-alone ordinance or an ordinance incorporated into zoning ordinances. A provision of the program established that elevation certificates completed by a RDP or licensed surveyor are required for new construction. Construction/repair that represents >50% of the cumulative repairs or improvements to the property must comply with the local floodplain ordinance, thus the first floor elevation must be at or above the base flood elevation, certified with the elevation certificate. Should the manufactured structure be used for non-residential purposes, such as an office, etc., the structure must be flood-proofed to one foot or greater above base flood elevation. Flood-proofing must be certified by a RDP.</p> <p>The USBC refers to use of the elevation certificate in section 103.10.5. The required elevation certificate (by local flood plain ordinances) certifies that structures, including manufactured homes, are installed at or above the regulated base flood elevation. As written, this exception compromises that requirement. Finally, residents will pay more for national flood insurance coverage, which is required by federally backed mortgage lenders for residential and non-residential structures within the regulated flood hazard area.</p>		

Hodge, Vernon

From: McIver, Curtis
Sent: Wednesday, August 15, 2007 12:01 PM
To: Rodgers, Emory; Hodge, Vernon
Subject: FW: Building Code Changes

David Gunn has provided some very accurate and persuasive comments regarding the two proposed code changes submitted by Deborah Mills of VDEM. I would agree with Mr. Gunn that it would be a mistake to delete the exemption as proposed by Ms. Mills. His proposal for a modification of the wording of the current exemption would be more appropriate in my opinion and would bring the USBC more in line with the FEMA provisions than deleting the exception as proposed by Ms. Mills.

Curtis L. McIver
State Building Code Administrator
Dept. of Housing & Community Development
501 North Second Street
Richmond, VA 23219
Telephone (804) 371-7160
Fax (804) 371-7092

-----Original Message-----

From: David Gunn [mailto:David.Gunn@dcr.virginia.gov]
Sent: Wednesday, August 15, 2007 11:17 AM
To: McIver, Curtis
Cc: Banks, Charley (DCR); Dyer, Lorenzo
Subject: Building Code Changes

I have reviewed the proposals made by Deborah Mills of the VDEM for changes in the VUSBC and have the following comments:

First, I know of no floodplain issues with Lynn Underwood's proposal (seconded here by Ms. Mills) to keep the R301.2.1.1 requirement for design certification at 110 mph instead of going with the 2006 IRC requirement of 100 mph. This change should have no affect on NFIP insurance premiums or community compliance with floodplain management/development requirements.

Second, removing the elevation exception on manufacturing housing in IBC 1612.1.1 appears to be a back-door approach to implementing a state-wide higher standard for manufacturing homes installed in a FEMA identified floodplain. While I agree that many portions of the NFIP should be stricter than they currently are, I do not feel that deleting the exception in the VUSBC is the correct way to achieve this.

The exception proposed for deletion is almost the same as part of the Federal regulations governing the National Flood Insurance Program 44 CFR 60.3), although the exception states it more concisely.

44 CFR 60.3.c.6 states " (6) Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites (i) Outside of a manufactured home park or subdivision, (ii) In a new manufactured home park or subdivision, (iii) In an expansion to an existing manufactured home park or subdivision, or (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred 'substantial damage' as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist floatation collapse and lateral movement."

44 CFR 60.3.c.12 states "(12) Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A-1-30, AH, and AE on the community's FIRM that are not subject to the provisions of paragraph (c)(6) of this section be elevated so that either (i) The lowest

floor of the manufactured home is at or above the base flood elevation, or (ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement."

Deleting the 1612.1.1 exception would cause inconsistencies in enforcement of the NFIP requirements. Some communities have this provision in their floodplain management ordinances, others have relied on it's presence in the building code. Taking this exception out of the code could cause confusion among the communities on the exact requirements for installation of manufactured housing.

Deleting the 1612.1.1 exception could greatly increase the cost of manufactured housing. The three foot high reinforced foundation requirement can only be used in FEMA identified floodplain areas where no manufactured housing has been substantially damaged by flood. In areas where any housing has been substantially damaged, the requirement to elevate to BFE is already established. The elevation requirement can be severe. In one area of Giles County near the New River where no damage to manufactured housing has occurred, new manufactured housing would be required to be installed around sixteen feet above grade. The Giles County building official has implemented higher elevation standards, but not the point of eliminating the exception altogether.

I don't think keeping the 1612.1.1 exception will increase flood damages significantly. I believe most flood damages to manufactured housing occur to structures that do not comply with the current requirements.

I would like to propose a minor change in the wording of the 1612.1.1 exception (I believe Kenny Lewis of Chincoteague may have already made this proposal or would support it). The exception currently requires the home to "be placed no less than 36 inches above grade". As you can see from the CFR wording, the NFIP requires "manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade." The wording in the exception should be changed to require a "minimum of 36 inch reinforced piers" or "the bottom of the chassis should be no less than 36 inches above grade", or something similar. This would ensure consistency between the VUSBC and FEMA's NFIP requirements and reduce potential confusion within Virginia's development community.

Please keep me informed about the progress of this request. I would be glad to discuss this further at your convenience.

David M. Gunn, PE, CFM
Division of Dam Safety and Floodplain Management Department of Conservation and Recreation

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-1703.1**

Nature of Change: (text is on code change form)

To clarify the requirements for special inspections and reference new criteria. This is a companion change for Code Change No. C-111.2.

Proponent: Virginia Building and Code Officials Association (VBCOA)

Staff Comments:

VBCOA's Administrative Provisions Committee worked with special inspection industry representatives and other client groups to facilitate this proposal, the final version of which was considered by Workgroup 2 and recommended to move forward as a consensus change.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

<p>Address to submit to:</p> <p>DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321</p> <p>Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.state.va.us</p>	<p>6/4/07</p>	<p>Document No. <u>C-1703.1</u></p> <p>Committee Action: _____</p> <p>BHCD Action: _____</p>
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Submitted by: John Catlett Representing: VBCOA (Revised 1/3/2007)

Address: 401 Lafayette Street; Williamsburg VA 23185 Phone No.: (757) 220-6135

Regulation Title: Virginia New Construction Code Section No(s): IBC Sections 1703.1.1.1, 1.2, 1.3; 1704.1

Proposed Change:

1703.1 Approved agency. ~~An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements.~~ responsible for laboratory testing and/or special inspections must comply with the qualification, certification and experience requirements of ASTM E329 or the alternatives listed therein.

1703.1.1 Independent. An approved agency shall be objective and competent. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed. The Special Inspector and their agents shall be independent from the person(s) or contractor responsible for the physical construction of the project requiring special inspections.

1703.1.2 Equipment. An approved agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

1703.1.3 Personnel. An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and/or inspections. Upon request by the building official, documentation shall be provided demonstrating the applicable agency's accreditation as noted in ASTM E329 and individual resumes' indicating pertinent training, certifications and other qualifications for special inspection personnel associated with the proposed construction requiring special inspections. The building official may prescribe the manner of qualification documentation and frequency of updating information regarding agency or individual inspector approval.

Firms providing special inspection services or individual inspectors seeking approval of alternative certifications and/or qualifications listed in ASTM E329 may submit documentation demonstrating equivalency. This documentation may include evidence of meeting other recognized standards or alternative certifications to demonstrate that the minimum qualifications, certification and experience intended by ASTM E329 have been met. The building official may, if satisfied that equivalency has been demonstrated, approve the credentials of the firm or individual.

1704.1 General. ~~Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 109. All individuals or agents performing special inspection functions shall operate under the direct supervision of an RDP in responsible charge of special inspection activities; also known as the Special Inspector. The Special Inspector shall ensure that the individuals under their charge are performing only those special inspections or laboratory testing that are consistent with their knowledge, training and certification for the specified inspection or laboratory testing.~~

Supporting Statement:

The proposed code change is a companion to proposed changes to USBC Section 111.2. The code has lacked clarity as to the function and role of special inspections to critical elements of a building or structure. This code change, by referring to ASTM E329, simplifies and standardizes the qualification and approval process for special inspection providers. It also recognizes that there is considerable diversity of the availability of qualified special inspection providers across the state and allows the local building official the flexibility to consider alternative qualifications. This proposal moves all of the qualification and agency approval requirements from Section 111.2 to IBC Chapter 17 provisions that already address these requirements.

The current USBC code language in Section 111.2 contains a reference to ASTM E329 when evaluating the certification or accreditation of an individual or laboratory conducting special inspection services. It also provides that the building official can approve alternatives to those specifically listed in ASTM E329. In actuality, ASTM E329 already contains language that allows for this alternative approval negating the need for specific code language allowing this practice. The proposed language allows the building official to accept alternatives to the laundry list of certifications contained in ASTM E329 as long as the intended qualifications are met.

The proposed code change also establishes that there shall be an RDP in responsible charge of special inspection activities and that special inspectors must be independent from contractor performing the physical construction activities. This would not preclude the RDP of record from performing SI functions.

Typically known as the "agent 1", the RDP in responsible charge is the person or firm that is responsible for the coordination of special inspection activities and reports. Other agents or laboratories may be hired to carry out the SI function, but the RDP in responsible charge of SI shall be responsible for their coordination. This would not preclude having a single entity serve as the RDP in Responsible Charge and each special inspection function.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-2701.1.3**

Nature of Change: (text is on code change form)

To add exceptions to the National Electrical Code (NEC) to permit generators to be installed in certain assisted living facilities licensed by the Virginia Department of Social Services without full compliance with the NEC's requirements for legally-required standby power systems.

Proponent: Virginia Department of Social Services (DSS) and DHCD Staff

Staff Comments:

This proposal is the result of meetings with DSS concerning the implementation of a state law requiring assisted living facilities with six or more residents to be able to connect to emergency power. As these systems are not designed to supply power to the entire facility, it should not be necessary to require the facilities to completely rewire their electrical systems to facilitate the connection. These minimal changes should lessen the impact and cost to existing facilities to comply with the DSS regulations.

The code change was not received in time for review by the workgroups used in this code change cycle.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

**VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM**

Address to submit to: DHCD, The Jackson Center 501 North Second Street Richmond, VA 23219-1321 Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.virginia.gov		Document No. <u>C-2701.1.3</u> Committee Action: _____ BHCD Action: _____
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Submitted by: Virginia Department of Social Services and DHCD, DBFR Staff

Regulation Title: USBC, Virginia Construction Code Section No(s): 2701.1.3

Date: August 7, 2007

Proposed Change:

Add new Section 2701.1.3 as follows:

2701.1.3 Assisted living facility generator requirements. Generators installed to comply with regulations for assisted living facilities licensed by the Virginia Department of Social Services shall be permitted to be considered as optional standby systems and automatic or manual transfer switches for such generators shall be permitted to be connected to the supply side of the service disconnecting means without requiring the panelboard to be considered as a subpanel. The transfer switch shall be rated as suitable for use as service equipment.

Supporting Statement:

The Virginia Department of Social Service's assisted living facility regulations, pursuant to recent legislation, require assisted living facilities with six or more residents to be able to connect to a temporary emergency electrical power source during an interruption of the normal electric power supply. This change to the electrical requirements of the USBC will facilitate the connection of a generator to the facility at the least possible cost while assuring a safe installation.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-2803.1(M403.1)**

Nature of Change: (text is on code change form)

To change the ventilation rates in the International Mechanical Code (IMC) to be consistent with the latest ASHRAE standards.

Proponent: Virginia Building and Code Officials Association (VBCOA) and Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

Staff Comments:

This proposal by VBCOA and VPMIA is based on a proposal for the 2009 IMC which was approved through the ICC process. It will reduce the outdoor air rates in Groups A and E as well as standardize design and installation practice. The proposal was considered by Workgroup 3 and is recommended to move forward as a consensus proposal based on the approval at the national level.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

<p>Address to submit to:</p> <p>DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321</p> <p>Tel. No. (804) 371 – 7150 Fax No. (804) 371 – 7092 Email: bhcd@dhcd.state.va.us</p>	<p>1/16/07</p>	<p>Document No. <u>C-2803.1(m403.1)</u></p> <p>Committee Action: _____</p> <p>BHCD Action: _____</p>
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<p>Submitted by: Guy Tomberlin, Fairfax County Representing: VA Building and Code Officials Association (VBCOA) and VA Plumbing and Mechanical Inspectors Association (VPMIA)</p>	
<p>Address: 12055 Government Center Pkwy., Suite 630 Fairfax, VA 22030 Phone No.: 703-324-1611</p>	
<p>Regulation Title: Part I Construction USBC</p>	<p>Section No(s): Mechanical Code (IMC) Technical Amendments</p>

Proposed Change:

Submit ICC code change proposal M-44 06/07.

M44-06/07

403.1, 403.2, 403.2.1, 403.2.2, 403.3, 403.3.1, 403.3.1.1 (New), 403.3.2.3.1 (New), 403.3.2.3.2 (New), 403.3.2.3.3 (New), 403.3.2.3.4 (New) 403.3.1.2 (New), Table 403.1 (New), 403.3.1.3 (New), 403.3.2.1 (New), 403.3.2.2 (New), 403.3.2.3 (New), 403.3.3, Table 403.3, 403.3.4, 403.4 (New), 403.5 (New), 403.6 (New), 403.7 (New), 404.2, 202 (New)

Proponent: Steven Ferguson, ASHRAE

1. Revise as follows:

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

~~Ventilation supply systems shall be designed to deliver the required rate of supply air to the occupied zone within an occupied space. The occupied zone shall have boundaries measured at 3 inches (76 mm) and 72 inches (1829 mm) above the floor and 24 inches (610 mm) from the enclosing walls.~~

403.2 Outdoor air required. ~~The minimum ventilation rate of required outdoor airflow rate shall be determined in accordance with Section 403.3. Ventilation supply systems shall be designed to deliver the required rate of outdoor airflow to the breathing zone within each occupiable space.~~

Exception: Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

403.2.1 Recirculation of air. The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling unit to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where 10 percent or more of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.
4. Where mechanical exhaust is required by Note h in Table 403.3, mechanical exhaust is required and recirculation is prohibited where 10% or more of the resulting supply airstream consists of air recirculated from these spaces.

403.2.2 Transfer air. Except where recirculation from such spaces is prohibited by Table 403.3, air transferred from occupiable occupied spaces is not prohibited from serving as makeup air for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators and smoking lounges. The amount of transfer air and exhaust air shall be sufficient to provide the flow rates as specified in Sections 403.3 and 403.3.1. The required outdoor airflow rates specified in Table 403.3 shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

403.3 Ventilation Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. ~~Table 403.3 based on the occupancy of the space and the occupant load or other parameter as stated therein.~~ The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or, shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

$$Vbz = RpPz + RaAz \quad (\text{Equation 4-1})$$

Where:

Az = zone floor area: the net occupiable floor area of the space or spaces in the zone.

Pz = zone population: the number of people in the space or spaces in the zone.

Rp = people outdoor air rate: the outdoor airflow rate required per person from Table 403.3

Ra = area outdoor air rate: the outdoor airflow rate required per unit area from Table 403.3

403.3.1.2 Zone air distribution effectiveness. The zone air distribution effectiveness (Ez) shall be determined using Table 403.1.

**TABLE 403.1
ZONE AIR DISTRIBUTION EFFECTIVENESS**

Air Distribution Configuration	Ez
Ceiling or floor supply of cool air	1.0 ^f
Ceiling or floor supply of warm air and floor return	1.0
Ceiling supply of warm air and ceiling return	0.8 ^g
Floor supply of warm air and ceiling return	0.7
Makeup air drawn in on the opposite side of the room from the exhaust and/or return	0.8
Makeup air drawn in near to the exhaust and/or return location	0.5
<p>a. "Cool air" is air cooler than space temperature.</p> <p>b. "Warm air" is air warmer than space temperature.</p> <p>c. "Ceiling" includes any point above the breathing zone.</p> <p>d. "Floor" includes any point below the breathing zone.</p> <p>e. "Makeup air" is air supplied or transferred to a zone to replace air removed from the zone by exhaust or return systems.</p> <p>f. Zone air distribution effectiveness of 1.2 shall be permitted for systems with floor supply of cool air and ceiling return, provided low-velocity displacement ventilation achieves unidirectional flow and thermal stratification.</p> <p>g. Zone air distribution effectiveness of 1.0 shall be permitted for systems with ceiling supply of warm air, provided supply air is less than 15°F (8°C) above space temperature and provided that the 150 fpm (0.8 m/s) supply air jet reaches to within 4.5 ft (1.4 m) of floor level.</p>	

403.3.1.3 Zone outdoor airflow. The zone outdoor airflow rate (Voz) shall be determined in accordance with Equation 4-2.

$$Voz = Vbz/Ez \quad (\text{Equation 4-2})$$

4. Delete and substitute as follows:

403.3.2 Common ventilation system. Where spaces having different ventilation rate requirements are served by a common ventilation system, the ratio of outdoor air to total supply air for the system shall be determined based on the space having the largest outdoor air requirement or shall be determined in accordance with the following formula:
 $Y = X/(1 + X - Z)$ (Equation 4-1)

Where

$Y = Vot/Vst$ = Corrected fraction of outdoor air in system supply.

$X = Von/Vst$ = Uncorrected fraction of outdoor air in system supply

$Z = Vcc/Vcc$ = Fraction of outdoor air in critical space. The critical space is that space with the greatest required fraction of outdoor air in the supply to this space.

Vot = Corrected total outdoor airflow rate.

Vst = Total supply flow rate, i.e., the sum of all supply for all branches of the system.

Von = Sum of outdoor airflow rates for all branches on system.

Vcc = Outdoor airflow rate required in critical spaces.

Vsc = Supply flow rate in critical space.

403.3.2 System outdoor airflow. The outdoor air required to be supplied by each ventilation system shall be determined in accordance with Section 403.3.2.1 through 403.2.3 as a function of system type and zone outdoor airflow rates.

403.3.2 System outdoor airflow. The outdoor air required to be supplied by each ventilation system shall be determined in accordance with Section 403.3.2.1 through 403.2.3 as a function of system type and zone outdoor airflow rates.

5. Add new text as follows:

403.3.2.1 Single zone systems. When one air handler supplies a mixture of outdoor air and recirculated return air to only one zone, the system outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Equation 4-3.

$$V_{ot} = V_{oz} \quad \text{(Equation 4-3)}$$

403.3.2.2 100% outdoor air systems. When one air handler supplies only outdoor air to one or more zones, the system outdoor air intake flow rate (V_{ot}) shall be determined using Equation 4-4.

$$V_{ot} = \sum_{\text{all zones}} V_{oz} \quad \text{(Equation 4-4)}$$

403.3.2.3 Multiple zone recirculating systems. When one air handler supplies a mixture of outdoor air and recirculated return air to more than one zone, the system outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Sections 403.3.2.3.1 through 403.3.2.3.5.

403.3.2.3.1 Primary outdoor air fraction. The primary outdoor air fraction (Z_p) shall be determined for each zone in accordance with Equation 4-5.

$$Z_p = V_{oz}/V_{pz} \quad \text{(Equation 4-5)}$$

Where:

V_{pz} = primary airflow: The airflow rate supplied to the zone from the air-handling unit at which the outdoor air intake is located. It includes outdoor intake air and recirculated air from that air-handling unit but does not include air transferred or air recirculated to the zone by other means. For design purposes, V_{pz} shall be the zone design primary airflow rate, except for zones with variable air volume supply V_{pz} shall be the lowest expected primary airflow rate to the zone when it is fully occupied.

403.3.2.3.2 System ventilation efficiency. The system ventilation efficiency (E_v) shall be determined using Table 403-2 or Appendix A of ASHRAE Standard 62.1.

TABLE 403.2
SYSTEM VENTILATION EFFICIENCY

<u>Max(Zp)</u>	<u>Ev</u>
<u>≤ 0.15</u>	<u>1.0</u>
<u>≤ 0.25</u>	<u>0.9</u>
<u>≤ 0.35</u>	<u>0.8</u>
<u>≤ 0.45</u>	<u>0.7</u>
<u>≤ 0.55</u>	<u>0.6</u>
<u>≤ 0.65</u>	<u>0.5</u>
<u>≤ 0.75</u>	<u>0.4</u>
<u>> 0.75</u>	<u>0.3</u>

Notes for Table 8
 1. Max(Zp) is the largest value of Zp calculated using Equation 4-5 among all the zones served by the system.
 2. Interpolating between table values shall be permitted.

403.3.2.3.3 Uncorrected outdoor air intake. The *uncorrected outdoor air intake* flow rate (V_{ou}) shall be determined in accordance with Equation 4-7.

$$V_{ou} = D \sum_{\text{all zones}} R_p P_z + \sum_{\text{all zones}} R_a A_z \quad (\text{Equation 4-7})$$

Where:

D = occupant diversity: the ratio of the system population to the sum of the zone populations, determined in accordance with Equation 4-8.

$$D = P_s / \sum_{\text{all zones}} P_z \quad (\text{Equation 4-8})$$

Where:

P_s = system population: The total number of occupants in the area served by the system. For design purposes, P_s shall be the maximum number of occupants expected to be concurrently in all zones served by the system.

403.3.2.3.4 Outdoor air intake flow rate. The outdoor air intake flow rate (Vot) shall be determined in accordance with Equation 4-9.

$$V_{ot} = V_{ou}/E_v \quad (\text{Equation 4-9})$$

6. Revise table as follows:

TABLE 403.3
REQUIRED OUTDOOR VENTILATION AIR
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	ESTIMATED MAXIMUM OCCUPANT LOAD, PERSONS PER 1,000 SQUARE FEET a	OUTDOOR AIR (Cubic feet per Minute (cfm) Per person) UNLESS NOTED-e	People Outdoor Airflow Rate in Breathing Zone Rp cfm/person	Area Outdoor Airflow Rate in Breathing Zone Ra cfm/ft ²	Default Occupant Density #/1000 ft ²	Exhaust Airflow Rate cfm/ft ²
Correctional facilities						
Cells						
without plumbing fixtures	20	20	5	0.12	25	-
with plumbing fixtures ^{a,c,d}	20	20	15	0.12	25	1.00
Dining halls (See Food and Beverage Service)	400	45	-	-	-	-
Guard stations	40	45	5	0.06	15	-
Day room	-	-	5	0.06	30	-
Booking/waiting	-	-	7.5	0.06	50	-
Dry Cleaners, laundries						
Coin-operated dry cleaner	20	-	15	-	20	-
Coin-operated laundries	20	45	7.5	0.06	20	-
Commercial dry cleaner	30	30	30	-	30	-
Commercial laundry	40	25	25	-	10	-
Storage, pick up	30	35	7.5	.12	30	-
Education						
Auditoriums	450	45	5	0.06	150	-
Classrooms	50	45	below	below	below	-
Corridors (See Public Spaces)	-	0.40 #/ft ²	-	-	-	-
Laboratories	30	20	below	below	below	-
Libraries-Media center	20	45	10	0.12	25	-
Sports locker rooms ^{a,c}	-	0.60 #/ft ²	-	-	-	0.50
Music rooms-Music/theater/dance	50	45	10	0.06	35	-
Smoking lounges ^{a,c}	70	50	20	-	70	-
Training shops	30	20	-	-	-	-
Daycare (through age 4)	-	-	10	0.18	25	-
Classrooms (ages 5-8)	-	-	10	0.12	25	-
Classrooms (age 9 plus)	-	-	10	0.12	35	-
Lecture classroom	-	-	7.5	0.06	65	-
Lecture hall (fixed seats)	-	-	7.5	0.06	150	-
Art classroom ^{a,c}	-	-	10	0.18	20	0.70
Science laboratories ^{a,c}	-	-	10	0.18	25	1.00
Wood/metal shops ^{a,c}	-	-	10	0.18	20	0.50
Computer lab	-	-	10	0.12	25	-
Multi-use assembly	-	-	7.5	0.06	100	-
Locker/dressing rooms ^{a,c}	-	-	-	-	-	0.25
Food and beverage service						
Bars, cocktail lounges	400	30	7.5	0.18	100	-
Cafeteria, fast food	400	30	7.5	0.18	100	-
Dining rooms	20	20	7.5	0.18	70	-
Kitchens (cooking) ^{a,c}	20	45	-	-	-	0.70
Hospitals, nursing and convalescent homes						
Autopsy rooms ^a	-	0.60 #/ft ²	-	-	-	0.50
Medical procedure rooms	20	45	15	-	20	-
Operating rooms	20	30	30	-	20	-
Patient rooms	40	25	25	-	10	-
Physical therapy	20	45	15	-	20	-
Recovery and ICU	20	45	15	-	20	-
Hotels, motels, resorts and dormitories						
Assembly rooms-Multi-purpose assembly	420	45	5	0.06	5	-
Bathrooms/Toilet - private ^{a,c}	-	35-room	-	-	-	25/50'
	-	30-room	5	0.06	10	-
Bedroom/living room	50	20	5	0.06	50	-
Conference/meeting rooms	20	45	5	0.06	20	-
Dormitory sleeping areas	420	30	7.5	0.18	120	-
Gambling casinos	-	30-room	-	-	-	-
Living rooms	30	45	7.5	0.06	30	-
Lobbies/pre-function	-	-	-	-	-	-

OCCUPANCY CLASSIFICATION	ESTIMATED MAXIMUM OCCUPANT LOAD, PERSONS PER 1,000 SQUARE FEET ^a	OUTDOOR AIR (Cubic feet per Minute (cfm) Per person) UNLESS NOTED ^e	People Outdoor Airflow Rate in Breathing Zone Rp cfm/person	Area Outdoor Airflow Rate in Breathing Zone Ra cfm/ft ²	Default Occupant Density #/1000 ft ²	Exhaust Airflow Rate cfm/ft ²
Offices						
Conference rooms	50	20	5	0.06	50	=
Office spaces	2	20	5	0.06	5	=
Reception areas	60	15	5	0.06	30	=
Telecommunication centers and data entry	50	20	=	=	=	=
Telephone/data entry	=	=	=	0.06	60	=
Main entry lobbies	=	=	5	0.06	10	=
Private dwellings, single and Multiple						
Garages, common for multiple units ^b	=	4.5 cfm/ft ²	=	=	=	0.75
Garages, separate for each dwelling ^b	=	100 cfm per car	=	=	=	100 cfm per car
Kitchens ^{2c}	=	400 cfm intermittent or 25 cfm contin.	=	=	=	25/100 ^d
Living areas ^c	Based upon number of bedrooms, first bedrm: 2; each additional bedrm: 4	0.35 air changes per hour or 45 cfm per person, whichever is greater	0.35 ACH but not less than 15 cfm/p	=	Based upon number of bedrooms, first bedrm: 2; each additional bedrm: 1	=
Toilet rooms and bathrooms ^{2-c}	=	mech. exhaust capacity of 50 cfm intermittent or 20 cfm contin.	=	=	=	20/50 ^d
Public spaces						
Corridors and utilities	=	0.05 /ft ²	=	0.06	=	=
Elevator car ²	=	4.00 /ft ²	=	=	=	1.0
Locker rooms ^{2-c}	=	0.5 /ft ²	=	=	=	=
Shower room (per shower head) ^{2-c}	=	50 cfm intermittent or 20 cfm contin. 60	=	=	=	50/20 ^d
Smoking lounges ^{2-c}	70	60	60	=	70	=
Toilet rooms - public ^{2-c}	=	75 l.w.u. or-urinal	=	=	=	50/70 ^d
Places of religious worship						
Courtrooms			5	0.06	120	
Legislative chambers			5	0.06	70	
Libraries			5	0.06	50	
Museums (children's)			5	0.12	10	
Museums/galleries			7.5	0.12	40	
			7.5	0.06	40	
Retail stores, sales floors and Showroom floors						
Exterior and street Sales (except as below)	=	0.30 /ft ²	7.5	0.12	15	=
Dressing rooms	=	0.20 /ft ²	=	=	=	0.25
Malls and arcades-Mall common areas	=	0.20 /ft ²	7.5	0.06	40	=
Shipping and receiving	=	0.15 /ft ²	=	0.12	70	=
Smoking lounges ^{2-c}	20	60	60	=	70	=
Storage rooms	=	0.15 /ft ²	=	0.12	=	=
Upper floors	=	0.20 /ft ²	=	=	=	=
Warehouses (See Storage)	=	0.05 /ft ²	=	=	=	=
Specialty shops						
Automotive motor-fuel dispensing stations ²	=	4.5 /ft ²	=	=	=	1.50
	25	45	7.5	0.06	25	0.50

OCCUPANCY CLASSIFICATION	ESTIMATED MAXIMUM OCCUPANT LOAD, PERSONS PER 1,000 SQUARE FEET	OUTDOOR AIR (Cubic feet per Minute (cfm) Per person) UNLESS NOTED	People Outdoor Airflow Rate in Breathing Zone Rp cfm/person	Area Outdoor Airflow Rate in Breathing Zone Ra cfm/ft ²	Default Occupant Density #/1000 ft ²	Exhaust Airflow Rate cfm/ft ²
Barber	25	25	20	0.12	25	0.60
Beauty and nail salons ^{b,1}	—	0.30 #/ft ²				
Clothing, furniture	—	2.0 #/ft ²				2.0
Embalming room ²	3	45				
Florists	3	45				
Hardware, drugs, fabrics	—	50 cfm				
Nail salon ^{2a}	—	intermediate or 20 cfm				
		station per station				
		1.0 #/ft ²				
		45	7.5	0.18	10	0.90
Pet shops (animal areas) ¹	20					
Reducing salons	3		7.5	0.06	3	—
Supermarkets						
Sports and amusement						
Eat rooms and disco/dance floors	400	25	20	0.06	100	—
Bowling alleys (seating areas)	70	25	10	0.12	40	—
Game rooms/arcades	20	25	7.5	0.18	20	—
Ice arenas without combustion engines	—	0.50 #/ft ²	—	0.30	—	0.50
Playing floors (gymnasiums) Gym, stadium, arena (play area)	20	20	—	0.30	—	—
Spectator areas	450	45	7.5	0.06	150	—
Swimming pools (pool and deck area)	—	0.50 #/ft ²	—	0.48	—	—
Health club/aerobics room			20	0.06	40	—
Health club/weight room			20	0.06	10	—
Storage						
Repair garages, enclosed parking garages ²	—	4.5 #/ft ²	—	—	—	0.75
Warehouses	—	0.05 #/ft ²	—	0.06	—	—
Theaters						
Auditoriums (See Education)	450	45				
Lobbies	450	20	5	0.06	150	—
Stages, studios	70	45	10	0.06	70	—
Ticket booths	60	20	5	0.06	60	—
Transportation						
Platforms	400	45	7.5	0.06	100	—
Vehicles	450	45				—
Waiting rooms Transportation waiting	400	45	7.5	0.06	100	—
Workrooms						
Bank vaults/safe deposit	5	45	5	0.06	5	—
Darkrooms	—	0.50 #/ft ²	—	—	—	1.00
Duplicating/ Copy, printing rooms	—	0.50 #/ft ²	—	0.06	4	0.50
Meal processing ²	40	45	15	—	10	—
Pharmacy (prep. area)	20	45	5	0.18	10	—
Photo studios	40	45	5	0.12	10	—
Computer (without printing)	—	—	5	0.06	4	—

For SI: 1 cubic foot per minute = 0.0004719 m³/s, 1 ton = 908 kg,

1 cubic foot per minute per square foot = 0.00508 m³/(s · m²),

□C = [(□F) - 32]/1.8, 1 square foot = 0.0929 m².

- Based upon net occupiable floor area
- Mechanical exhaust required and the recirculation of air from such spaces as permitted by Section 403.2.4 is prohibited (see Section 403.2.1, Items 4 and 3).
- Spaces unheated or maintained below 50 °F are not covered by these requirements unless the occupancy is continuous.
- Ventilation systems in enclosed parking garages shall comply with Section 404.
- Where the ventilation rate is expressed in cfm/ft², such rate is based upon cubic feet per minute per square foot of the floor area being ventilated.
- The sum of the outdoor and transfer air from adjacent spaces shall be sufficient to provide an exhaust rate of not less than 4.5 cfm/ft².
- Transfer air permitted in accordance with Section 403.2.2.
- Rates are per water closet or urinal. The higher rate shall be provided where periods of heavy use are expected to occur, e.g., toilets in theaters, schools, and sports facilities. The lower rate shall be permitted where periods of heavy use are not expected.

- f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted where the exhaust system is designed to operate continuously during normal hours of use.
- hg. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces (see Section 403.2.1, Items 2 and 4).
- i. For nail salons, the required exhaust shall include ventilation tables or other systems that shall capture the contaminants and odors at their source and are capable of exhausting a minimum of 50 cfm per station.

7. Add new text as follows:

403.4 Exhaust Ventilation. Exhaust airflow rate shall be provided in accordance with the requirements in Table 403.3. Exhaust makeup air shall be permitted to be any combination of outdoor air, recirculated air, and transfer air, except as limited in accordance with Section 403.2.

8. Revise as follows:

~~403.3.4~~ 403.5 System operation. The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3 and the actual number of occupants present.

~~403.3.3~~ 403.6 Variable air volume system control. Variable air volume air distribution systems, other than those designed to supply only 100-percent outdoor air, shall be provided with controls to regulate the flow of outdoor air. Such control system shall be designed to maintain the flow rate of outdoor air at a rate of not less than that required by Section 403.3 over the entire range of supply air operating rates.

~~403.3.4~~ 403.7 Balancing. The ventilation air distribution system shall be provided with means to adjust the system to achieve at least the minimum ventilation airflow rate as required by Sections 403.3 and 403.4. Ventilation systems shall be balanced by an approved method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.4.

404.2 Minimum ventilation. Automatic operation of the system shall not reduce the ventilation airflow rate below 0.05 cfm per square foot (0.00025m³/s • m²) of the floor area and the system shall be capable of producing a ventilation airflow rate of ~~4.5~~ 0.75 cfm per square foot (0.0076m³/s • m²) of floor area.

9. Add new text as follows:

SECTION 202 GENERAL DEFINITIONS

BREATHING ZONE. The region within an occupied space between planes 3 and 72 in. (75 and 1800 mm) above the floor and more than 2 ft (600 mm) from the walls of the space or from fixed air-conditioning equipment.

NET OCCUPIABLE FLOOR AREA. The floor area of an occupiable space defined by the inside surfaces of its walls but excluding shafts, column enclosures, and other permanently enclosed, inaccessible, and unoccupiable areas. Obstructions in the space such as furnishings, display or storage racks, and other obstructions, whether temporary or permanent, are not deducted from the space area.

OCCUPIABLE SPACE. An enclosed space intended for human activities, excluding those spaces intended primarily for other purposes, such as storage rooms and equipment rooms, that are only intended to be occupied occasionally and for short periods of time.

ZONE. One occupiable space or several occupiable spaces with similar occupancy classification (see Table 403.3), occupant density, zone air distribution effectiveness, and zone primary airflow rate per unit area.

Reason: To bring the IMC more in line with contemporary ventilation and air quality criteria that are based on research conducted since the ventilation provisions of the IMC were revised and the consensus achieved under the ANSI Standards process.

The current ventilation criteria in the IMC are essentially based on ASHRAE Standard 62-1989. Research has been conducted since then our knowledge of indoor air quality and ventilation has evolved. In response to these actions ASHRAE has enhanced Standard 62, upon which the IMC is based. This code change would make the IMC consistent with ventilation rate procedures defined in ANSI/ASHRAE Standard 62.1-2004 and consistent with the 2006 Uniform Mechanical Code.

ANSI/ASHRAE Standard 62.1-2004 is a consensus national standard. Standard 62.1 ventilation rate calculation procedure has been substantially updated in the 2004 version to reflect the latest research on building indoor air quality. The procedure now requires designers to account for pollutant sources other than occupants, such as building materials and furnishings, and to account for the efficiency of the ventilation system to deliver outdoor air to the breathing zone. Ventilation systems designed using the new procedures will result in slightly lower outdoor rates for most occupancies compared to the current code, reducing first costs and energy costs.

Bibliography:

ANSI/ASHRAE Standard 62.1-2004 Ventilation for Acceptable Indoor Air Quality, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, GA

Cost Impact: The code change proposal will not increase the cost of construction, and in some instances will reduce the first cost of construction. Engineering design effort and jurisdictional plan review processes will not be materially affected due to the availability and greater specificity of compliance tools.

Supporting Statement: Currently industry has indicated outdoor air rates are too excessive, mainly in two occupancies, A and E. This proposal incorporates all the necessary criteria from the newly developed ASHRAE 62 Standard, 2004 Edition for updated outdoor air rates. The net effect is that the new Standard has reduced outdoor airflow rates almost 50% for these two occupancies. This proposal contains a new method to assure that the air is actually delivered to the spaces as intended. This is the format currently utilized by the IMC. All the pertinent material has been extracted from the ASHRAE Standard in relation to outdoor air. This proposal was approved as submitted during the Public Comment Hearings in FL.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-2803.1(M504.6.1)**

Nature of Change: (text is on code change form)

To permit the maximum length of clothes dryer exhaust ducts to extend from 25 feet to 35 feet.

Proponent: County of Henrico

Staff Comments:

This change to the International Residential Code, the International Mechanical Code and the International Fuel Gas Code is to codify common practice already permitted through an exception in the codes when the manufacturer's installation instructions permit an extension of the dryer vent length. The proposal has not been submitted to the national level for the 2009 I-Codes and was not received in time for review by the workgroups used in this code change cycle.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

(Use this form to submit changes to building and fire codes)

<p>Address to submit to:</p> <p>DHCD, the Jackson Center 501 North Second Street Richmond, VA 23219-1321</p> <p>Tel. No. (804) 371 - 7150 Fax No. (804) 371 - 7092 Email: bhcd@dhcd.state.va.us</p>	<p>Document No. <u>C-2703.1 (M504.6.1)</u></p> <p>Committee Action: _____</p> <p>BHCD Action: _____</p>
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Submitted by: Charles E. Geber Representing: County of Henrico

Address: P.O. Box 27032 Richmond, Va. 23273 Phone No.: (804) 501-4369

Regulation Title: IMC/IRC Section No(s): 504.6.1, M1502.6

Proposed Change:

(See attached)

Supporting Statement:

(See attached)

IMC

504.6.1 (IFGC [M] 614.6.1) Maximum length. The maximum length of a clothes dryer exhaust duct shall not exceed ~~25 feet (7620 mm)~~ 35 feet (10668 mm) from the dryer location to the outlet terminal.

The rest of the section remains the same with no change.

IRC

M1502.6 Duct length. The maximum length of a clothes dryer exhaust duct shall not exceed ~~25 feet (7620 mm)~~ 35 feet (10668 mm) from the dryer location to the wall or roof termination.

The rest of the section remains the same with no changes.

Reason: The modern day dryer can far exceed this old length of 25 feet, depending on how many elbows are installed in the run. Attached you will find a current list of eight manufactures with the limitations for their respective dryers. The current language of 25 feet is overly restrictive for the modern day dryer and needs to be increased to 35 feet to allow the installer more flexibility for the dryer location in larger houses.

Maytag dryers:

65 feet with 0 elbows
54 feet with 1 elbow
44 feet with 2 elbows
36 feet with 3 elbows
28 feet with 4 elbows

Whirlpool dryers:

64 feet with 0 elbow
54 feet with 1 elbow
44 feet with 2 elbows
34 feet with 3 elbows
27 feet with 4 elbows

Kenmore dryers:

64 feet with 0 elbow
54 feet with 1 elbow
44 feet with 2 elbows
44 feet with 3 elbows
35 feet with 4 elbows

General Electric dryers:

90 feet with 0 elbow
60 feet with 1 elbow
45 feet with 2 elbows
35 feet with 3 elbows
35 feet with 4 elbows

Amana/Speed Queen domestic:

44 feet with 0 elbow
34 feet with 1 elbow
26 feet with 2 elbows
20 feet with 3 elbows

Frigidare/Westinghouse/Tappen/Gibson:

60 feet with 0 elbow
52 feet with 1 elbow
44 feet with 2 elbows
32 feet with 3 elbows

Magic Chef/Admiral/Norge:

45 feet with 0 elbow
35 feet with 2 elbows
25 feet with 3 elbows

Camco/Moffat/McClary:

45 feet with 0 elbow
35 feet with 1 elbow
25 feet with 2 elbows

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change Nos. C-2803.1(M507.2.2)-a and C-2803.1(M507.2.2)-b

Nature of Changes: (text is on code change form)

To clarify that a Type II hood is not needed for small electric appliances installed on countertops.

Proponent: Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and the Virginia Hospitality and Travel Association (VHTA)

Staff Comments:

These proposals are identical with the exception that VHTA's proposal adds steamers to the list of appliances which may be installed without a hood. The VPMIA proposal was considered by the Board during the proposed phase of this code change cycle. There was some discussion concerning the use of steamers. The VHTA proposal is to address that concern.

Both code changes were conceptually considered by Workgroup 3 and determined to be moved forward as consensus. The actual VHTA proposal was not received in time for the workgroup to review the language. Staff notes that the VPMIA proposal was submitted to the International Codes and was not approved for the 2007 International Mechanical Code (IMC) Supplement. The current text of the IMC is actually less restrictive than the proposals from the standpoint of permitting small appliances that are not designed for countertop use to be installed without a hood, however the existing IMC language does not reference steamers.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

DEPT. OF HOUSING AND COMMUNITY DEVELOPMENT REGULATORY CHANGE FORM

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<p>Submitted by: Guy Tomberlin, Fairfax County Representing: VA Building and Code Officials Association (VBCOA) and VA Plumbing and Mechanical Inspectors Association (VPMIA) Address: 12055 Government Center Pkwy., Suite 630 Fairfax, VA 22030 Phone No.: 703-324-1611 Regulation Title: Part I Construction USBC Section No(s): Mechanical Code (IMC) Technical Amendments</p>		
<p>507.2.2. Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.</p> <p>Exceptions:</p> <ol style="list-style-type: none">1. Under-counter-type commercial dishwashing machines.2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.3. A single light-duty electric convection, bread, retherm or microwave oven <u>designed for counter top installation</u>. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming/<u>retherm</u> ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.		

Supporting Information

This is a clarification of this exceptions original intent. The existing item number 3 was added a two code cycles ago with the intent to only cover counter mounted equipment. However the IMC committee deleted the language "counter mounted" because of the lack of a clear definition as to what exactly is counter mounted. Designers and installers are abusing this section to promote the installation of large cabinet floor mounted bread and convection ovens without any type of hood. That was never the intent of item number 3. You not only have to consider the heat and moisture of these appliances generate but you must also take into account the heat that these food emit into the kitchen environment after they are removed from the appliance. Depending on the appliance size an additional load of 3 or 4 tons of cooling may be necessary for an average size kitchen utilizing this exception for a free standing or floor mounted appliance. Unfortunately, the designers who are taking advantage of this exception are not adding the required additional AC loads. The intent of number 3 was more to the effect what the new number 4 reflects. You will notice all of the items listed are typically small in size and low heat producing equipment. A five feet tall bread or convection oven is not any where near the same application as a toaster or a hot dog cooker.

In the ROH the committee stated that appliance size need not be an issue. Are Type II hoods needed or not, that is the question that needs to be answered? This proposal answers that important question, yes! If the HVAC system can always be sized to eliminate the Type II hood requirements than the code should say so. It's just not the case, Type II hoods are necessary in some applications. VA submitted this code text to the IMC more than two cycles ago to add the exception number 2. The proposal was and is intended to give small type embellishments relief from type II hood requirements when a small adjustment is preformed on the HVAC calculation. Unfortunately the committee removed the term "counter" before appliances (because lack of definition) and this section is now being abused and used as justification for huge heat and steam producing equipment to not require hoods. The unfortunate reality is HVAC systems are not being adjusted and these small establishments are not suitable for the employce or customer comfort. Heat, steam, and particulate matter are being recirculated throughout these spaces and creates the potential for unhealthy condition for anyone who occupies the space.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CODE CHANGE FORM

Address to submit to:

DHCD, The Jackson Center
501 North Second Street
Richmond, VA 23219-1321

Tel. No. (804) 371 – 7150
Fax No. (804) 371 – 7092
Email: bhcd@dhcd.virginia.gov

8/9/07

Document No. C-2803.1(m507.2.2)-b

Committee Action: _____

BHCD Action: _____

Submitted by: Barrett Hardiman Representing: Virginia Hospitality and Travel Association

Address: 2101 Libbie Avenue, Richmond, VA 23230 Phone No. (804) 288-3065

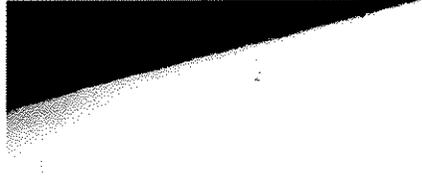
Regulation Title: USBC 2006 Section No(s): 507.2.2

Proposed Change:

507.2.2 Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.

Exceptions:

1. Under-counter-type commercial dishwashing machines.
2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.
3. A single light-duty electric convection, bread, retherm, steamer or microwave oven designed for counter top installation. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
4. A Type II hood is not required for the following electrically heated appliances; toasters, steam tables, popcorn poppers, hot dog cookers, egg cookers, holding/warming//retherm ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.



Supporting Statement:

Small table mounted steamers generate a similar amount of heat and moisture to the other appliances listed in Exception 3. That heat can be compensated for using the HVAC system.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2006 Code Change Cycle – Code Change Evaluation Form

**USBC – Virginia Construction Code
Code Change No. C-2803.1(M701.1)**

Nature of Change: (text is on code change form)

To eliminate unneeded provisions in the International Mechanical Code (IMC) for the installation of liquid- and solid-fuel-burning appliances.

Proponent: Virginia Building and Code Officials Association (VBCOA) and Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

Staff Comments:

This proposal by VBCOA and VPMIA is to clarify that the National Fire Protection Association (NFPA)'s Standard No. 31 is to be used for the installation of liquid- and solid-fuel-burning appliances thereby enabling the deletion of existing IMC text for such appliances. In addition, the proposal removes definitions which are no longer necessary since the applicable text has been deleted. The proposal was considered by Workgroup 3 and is recommended to move forward as a consensus proposal as it was approved at the national level and is contained in the 2007 Supplement to the IMC.

Codes and Standards Committee Action:

_____ Approve as presented.

_____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle.

_____ Other (specify):

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<p>Submitted by: Guy Tomberlin, Fairfax County Representing: VA Building and Code Officials Association (VBCOA) and VA Plumbing and Mechanical Inspectors Association (VPMIA)</p> <p>Address: 12055 Government Center Pkwy., Suite 630 Fairfax, VA 22030 Phone No.: 703-324-1611</p> <p>Regulation Title: _____ Section No(s): _____</p>		

Proposed Change:

Proposal:

Delete these definitions and terms with out substitution:

CONFINED SPACES. A space having a volume less than 50 cubic feet per 1,000 British thermal units per hour (Btu/h) (4.8 m³/kW) of the aggregate input rating of all appliances installed in that space.

UNCONFINED SPACE. A space having a volume not less than 50 cubic feet per 1,000 Btu/h (4.8m³/kW) of the aggregate input rating of all appliances installed in that space. Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space.

UNUSUALLY TIGHT CONSTRUCTION. Construction meeting the following requirements:

1. Walls exposed to the outdoor atmosphere having a continuous water vapor retarder with a rating of 1 perm [57 ng/(s · m² · Pa)] or less with openings gasketed or sealed;
2. Openable windows and doors meeting the air leakage requirements of the *International Energy Conservation Code*, Section 402.4.2; and
3. Caulking or sealants are applied to areas, such as joints around window and door frames, between sole plates and floors, between wall ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines and at other openings.

SECTION 701

GENERAL

701.1 Scope. The provisions of this chapter shall govern the requirements for combustion and dilution air for fuel burning appliances other than gas fired appliances. The requirements for combustion and dilution air for gas fired appliances shall be in accordance with the *International Fuel Gas Code*.

Liquid- and solid-fuel-burning appliances shall be provided with a supply of air for fuel combustion, draft hood dilution and ventilation of the space in which the appliance is installed, in accordance with the appliance manufactures installation instructions and NFPA 31. The methods of providing combustion air in this chapter do not apply to fireplaces, fireplace stoves and direct-vent appliances. This chapter shall not apply to natural gas or liquefied petroleum applications, the requirements for combustion and dilution air for gas-fired appliances shall be in accordance with the *International Fuel Gas Code*.

DELETE THE REMAINING TEXT OF THE ENTIRE CHAPTER 7

Supporting Statement:

This proposal was approved as submitted at the Public Hearings in FL.

These definitions have been deleted from the IFGC. They were used to determine if a structure needed the addition of outdoor air for combustion air.

Testing from the fuel gas industry has determined that "unusually tight", "unconfined space", and "confined space", are not factors of any relevance when determining if combustion air needs to be obtained from outdoors.

The provisions found in Chapter 7 are based on fuel gas provisions which are not germane to liquid or solid fuel appliances. NFPA 31 is a maintained document that contains the relevant information for liquid and solid fuel appliances. NFPA 31 is already a reference document in the IRC so there is not an increased cost to construction. As always the manufactures installation instructions are part of code requirements.