

**EXPRESS TERMS
FOR
PROPOSED BUILDING STANDARDS
OF THE
CALIFORNIA BUILDING STANDARDS COMMISSION (CBSC)**

**REGARDING PROPOSED ADOPTION OF THE
2009 UNIFORM MECHANICAL CODE (UMC) FOR THE
CALIFORNIA CODE OF REGULATIONS (CCR), TITLE 24, PART 4**

LEGEND FOR EXPRESS TERMS

1. Existing California amendments or code language being modified, as well as selected terms set forth in Chapter 2, Definitions are in *italics* when they appear in the model code text, independent of state amended definitions: All such language appears in *italics*, modified language is underlined.
 2. New California amendments: All such language appears underlined and in italics.
- Repealed text: All such language appears in ~~strikeout~~.

The California Building Standards Code (California Code of Regulations, Title 24, Part 1, 2, 3, 4, 5, 6, 8, 10, 11 & 12) is published in its entirety every three years and is effective to all buildings that submit an application for a building permit during its effective period. Each triennial edition of the California Building Standards Code becomes effective 180 days after its publication and is effective at the time an application for a building permit is submitted.

These proposed regulations will make effective the 2009 edition of the Uniform Mechanical Code (UMC) of the International Association of Plumbing and Mechanical Officials (IAPMO) for state owned buildings, including buildings constructed by the Trustees of the California State University and buildings constructed by the Regents of the University of California that are permitted under the next triennial edition of the California Mechanical Code (CMC). Further, California law makes the UMC standards adopted by the Commission applicable to all occupancies in California.

EXPRESS TERMS:

The California Building Standards Commission proposes to adopt the 2009 edition of the Uniform Mechanical Code (UMC) of the International Association of Plumbing and Mechanical Officials (IAPMO) for codification and effectiveness in the next triennial edition of the California Mechanical Code (CMC) as presented on the following pages. The California Building Standards Commission further proposes to repeal the 2007 California Mechanical Code, the 2006 edition of the Uniform Mechanical Code of the International Conference of Building Officials, as presented on the following pages.

Adopt Chapter 1, Sections 1.1 through 1.2 with amended articles as indicated:

MATRIX ADOPTION TABLE

CHAPTER 1 – DIVISION I & II

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments		
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1,2,3} listed below	X	
101 <u>1.1</u>	X	
102 <u>1.2</u>	X	

**~~CALIFORNIA CHAPTER 1
GENERAL CODE PROVISIONS~~**

CHAPTER 1

CALIFORNIA ADMINISTRATION

DIVISION I

~~401-0~~ 1.1.0 General

~~401-1~~ 1.1.1 Title. *These regulations shall be known as the California Mechanical Code, may be cited as such and will be referred to herein as “this code.” The California Mechanical Code is Part 4 of twelve parts of the official compilation and publication of the adoptions, amendment, and repeal of building regulations to the California Code of Regulations, Title 24, also referred to as the California Building Standards Code. This part incorporates by adoption the ~~2006~~ 2009 Uniform Mechanical Code of the International Association of Plumbing and Mechanical Officials with necessary California amendments.*

~~401-2~~ 1.1.2 Purpose. *The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, access to persons with disabilities, sanitation, adequate lighting and ventilation, and energy conservation; 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.*

~~401-3~~ 1.1.3 Scope. *The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout the State of California.*

~~401-3.1~~ 1.1.3.1 Nonstate-regulated buildings, structures, and applications. *Except as modified by local ordinance pursuant to Section ~~401-8~~ 1.1.8, the following standards in the California Code of Regulations, Title 24, Parts 2, 2.5, 3, 4, 5, 6, 9, ~~and 10 and 11~~ shall apply to all occupancies and applications not regulated by a state agency.*

1.1.3.2 State-regulated buildings, structures, and applications. The model code, state amendments to the model code, and/or state amendments where there are no relevant model code provisions shall apply to the following buildings, structures, and applications regulated by state agencies as referenced in the Matrix Adoption Tables and as specified in Sections 1.2 through 1.14, except where modified by local ordinance pursuant to Section 1.1.8. When adopted by a state agency, the provisions of this code shall be enforced by the appropriate enforcing agency, but only to the extent of authority granted to such agency by the State Legislature.

Note: See Preface to distinguish the model code provisions from the California provisions.

1. State-owned buildings, including buildings constructed by the Trustees of the California State University, and to the extent permitted by California laws, buildings designed and constructed by the Regents of the University of California, and regulated by the Building Standards Commission. See Section 1.2 for additional scope provisions.
2. Local detention facilities regulated by the Corrections Standards Authority. See Section 1.3 for additional scope provisions.
3. Barbering, cosmetology or electrolysis establishments, acupuncture offices, pharmacies, veterinary facilities, and structural pest control locations regulated by the Department of Consumer Affairs. See Section 1.4 for additional scope provisions.
4. Reserved for the California Energy Commission. See Section 1.5 for additional scope provisions.
5. Dairies and places of meat inspection regulated by the Department of Food and Agriculture. See Section 1.6 for additional scope provisions.
6. Organized camps, laboratory animal quarters, public swimming pools, radiation protection, commissaries serving mobile food preparation vehicles, and wild animal quarantine facilities regulated by the Department of Public Health Services. See Section 1.7 for additional scope provisions.
7. Hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing, and other types of dwellings containing sleeping accommodations with or without common toilets or cooking facilities. See Section 1.8.2.1 for additional scope provisions.
8. Accommodations for persons with disabilities in buildings containing newly constructed covered multifamily dwellings, new common use spaces serving existing covered multifamily dwellings, additions to existing buildings where the addition alone meets the definition of a ~~Covered multifamily dwelling~~ "COVERED MULTIFAMILY DWELLINGS," and common-use spaces serving covered multifamily dwellings which are regulated by the Department of Housing and Community Development. See Section 1.8.2.1.2 for additional scope provisions.
9. Permanent buildings and permanent accessory buildings or structures constructed within mobilehome parks and special occupancy parks regulated by the Department of Housing and Community Development. See Section 1.8.2.1.3 for additional scope provisions.
10. Accommodations for persons with disabilities regulated by the Division of the State Architect. See Section 1.9.1 for additional scope provisions.
11. Public elementary and secondary schools, community college buildings, and state-owned or state-leased essential service buildings regulated by the Division of the State Architect. See Section 1.9.2 for additional scope provisions.
12. Reserved for the State Historical Building Safety Board with the Division of the State Architect. See Section 1.9.3 for additional scope provisions.
13. General acute care hospitals, acute psychiatric hospitals, skilled nursing and/or intermediate care facilities, clinics licensed by the Department of Public Health Services and correctional treatment

centers regulated by the Office of Statewide Health Planning and Development. See Section 440 1.10 for additional scope provisions.

14. Applications regulated by the Office of State Fire Marshal include but are not limited to the following in accordance with Section 444 1.11:

44.1. Buildings or structures used or intended for use as an:

44.1.1. Asylum, jail, prison.

44.1.2. Mental hospital, hospital, home for the elderly, children's nursery, children's home or institution, school or any similar occupancy of any capacity.

44.1.3. Theater, dancehall, skating rink, auditorium, assembly hall, meeting hall, nightclub, fair building, or similar place of assemblage where 50 or more persons may gather together in a building, room or structure for the purpose of amusement, entertainment, instruction, deliberation, worship, drinking or dining, awaiting transportation, or education.

44.1.4. Small family day care homes, large family day-care homes, residential facilities and residential facilities for the elderly, residential care facilities.

44.1.5. State institutions or other state-owned or state-occupied buildings.

44.1.6. High rise structures.

44.1.7. Motion picture production studios.

44.1.8. Organized camps.

44.1.9. Residential structures.

44.2. Tents, awnings or other fabric enclosures used in connection with any occupancy.

44.3. Fire alarm devices, equipment and systems in connection with any occupancy.

44.4. Hazardous materials, flammable and combustible liquids.

44.5. Public school automatic fire detection, alarm, and sprinkler systems.

44.6. Wildland-urban interface fire areas.

15. Public libraries constructed and renovated using funds from the California Library Construction and Renovation Bond Act of 1988 and regulated by the State Librarian. See Section 442 1.12 for additional scope provisions.

16. Graywater systems regulated by the Department of Water Resources. See Section 443 1.13 for additional scope provisions.

17. For applications listed in Section 409.4 1.9.1 regulated by the Division of the State Architect – Access Compliance, outdoor environments and uses shall be classified according to accessibility uses described in Chapter 11A, 11B and 11C.

18. Marine Oil Terminals regulated by the California State Lands Commission. See Section 444 1.14 for additional scope provisions.

401.4 1.1.4 Appendices. Provisions contained in the appendices of this code shall not apply unless specifically adopted by a state agency or adopted by a local enforcing agency in compliance with Health and Safety Code Section ~~18938 (b)~~ 18901 et. seq. for Building Standards Law, Health and Safety Code Section 17950 for State Housing Law and Health and Safety Code Section 13869.7 for Fire Protection Districts. See Section 404.8 1.1.8 of this code.

401.5 1.1.5 Referenced codes. The codes, standards and publications adopted and set forth in this code, including other codes, standards and publications referred to therein are, by title and date of publication, hereby adopted as

standard reference documents of this code. When this code does not specifically cover any subject related to building design and construction, recognized architectural or engineering practices shall be employed. The National Fire Codes, standards, and the Fire Protection Handbook of the National Fire Protection Association are permitted to be used as authoritative guides in determining recognized fire prevention engineering practices.

401.6 1.1.6 NonBuilding standards, orders and regulations. Requirements contained in the Uniform Mechanical Code or in any other referenced standard, code or document, which are not building standards as defined in Health and Safety Code Section 18909, shall not be construed as part of the provisions of this code. For nonbuilding standards, orders, and regulations, see other titles of the California Code of Regulations.

401.7 1.1.7 Order of precedence and use.

401.7.1 1.1.7.1 Differences. In the event of any differences between these building standards and the standard reference documents, the text of these building standards shall govern.

401.7.2 1.1.7.2 Specific provisions. Where a specific provision varies from a general provision, the specific provision shall apply.

401.7.3 1.1.7.3 Conflicts. When the requirements of this code conflict with the requirements of any other part of the California Building Standards Code, Title 24, the most restrictive requirements shall prevail.

401.8 1.1.8 City, county, or city and county amendments, additions or deletions.

The provisions of this code do not limit the authority of city, county, or city and county governments to establish more restrictive and reasonably necessary differences to the provisions contained in this code pursuant to complying with Section ~~401.8.4~~ 1.1.8.1. The effective date of amendments, additions, or deletions to this code ~~by of cities a city, counties county,~~ or city and ~~counties county~~ filed pursuant to Section ~~401.8.4~~ 1.1.8.1 shall be the date filed. However, in no case shall the amendments, additions or deletions to this code be effective any sooner than the effective date of this code.

Local modifications shall comply with Health and Safety Code Section 18941.5 for Building Standards Law, Health and Safety Code Section 17958 for State Housing Law or Health and Safety Code Section 13869.7 for Fire Protection Districts.

401.8.1 1.1.8.1 Findings and filings.

1. The city, county, or city and county shall make express findings for each amendment, addition or deletion based upon climatic, topographical, or geological conditions.

Exception: Hazardous building ordinances and programs mitigating unreinforced masonry buildings.

2. The city, county, or city and county shall file the amendments, additions, or deletions expressly marked and identified as to the applicable findings. Cities, counties, cities and counties, and fire departments shall file the amendments, additions or deletions, and the findings with the California Building Standards Commission at 2525 Natomas Park Drive, Suite 130, Sacramento, CA 95833.
3. Findings prepared by fire protection districts shall be ratified by the local city, county, or city and county and filed with the California Department of Housing and Community Development, Division of Codes and Standards, P.O. Box 1407, Sacramento, CA 95812-1407 or at 1800 3rd Street, Room 260, Sacramento, CA ~~95814~~ 95811.

401.9 1.1.9 Effective date of this code. Only those standards approved by the California Building Standards Commission that are effective at the time an application for building permit is submitted shall apply to the plans and specifications for, and to the construction performed under, that permit. For the effective dates of the provisions contained in this code, see the History Note page of this code.

401.10 1.1.10 Availability of codes. At least one ~~entire~~ complete copy each of Titles 8, 19, 20, 24, and 25 with all revisions shall be maintained in the office of the building official responsible for the administration and enforcement of this code. Each state department concerned and each city, county or city and county shall have an up-to-date copy of the code available for public inspection. See Health and Safety Code Section 18942 (d)(1) and (2).

401.11 1.1.11 Format. This part fundamentally adopts the Uniform Mechanical Code by reference on a chapter-by-

chapter basis. Such adoption is reflected in the Matrix Adoption Table of each chapter of this part. When the Matrix Adoption Tables make no reference to a specific chapter of the International Building Code such chapter of the International Building Code is not adopted as a portion of this code.

401-12 1.1.12 Validity. If any chapter, section, subsection, sentence, clause or phrase of this code is for any reason held to be unconstitutional, contrary to statute, exceeding the authority of the state as stipulated by statutes or otherwise inoperative, such decision shall not affect the validity of the remaining portion of this code.

SECTION ~~402~~ 1.2 BUILDING STANDARDS COMMISSION

~~402.1~~ 1.2.1 Specific scope of application of the agency responsible for enforcement, the enforcement agency, and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

1.2.2 Alternate Materials and Methods of Construction Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent

1. State Buildings for all occupancies.

Application – State buildings (all occupancies), including buildings constructed by the Trustees of the California State University and the Regents of the University of California where no state agency has the authority to adopt building standards applicable to such buildings.

Enforcing Agency – State or local agency specified by the applicable provisions of law.

Authority Cited – Health and Safety Code section 18934.5.

Reference – Health and Safety Code, Division 13, Part 2.5, commencing with section 18901.

2. University of California, California State Universities, and California Community Colleges.

Application – Standards for lighting for parking lots and primary campus walkways at the University of California, California State Universities, and California Community Colleges.

Enforcing Agency – State or local agency specified by the applicable provisions of law.

Authority Cited – Government Code section 14617.

Reference – Government Code section 14617.

3. Existing State-Owned Buildings, including those owned by the University of California and by the California State University–

Building seismic retrofit standards including abating falling hazards of structural and nonstructural components and strengthening of building structures. See also Division of the State Architect.

Enforcing Agency – State or local agency specified by the applicable provisions of law.

Authority Cited – Government Code section 16600

Reference – Government Code sections 16600 through 16604

4. Unreinforced Masonry Bearing Wall Buildings.

Application – Minimum seismic strengthening standards for buildings specified in Appendix Chapter 1 of the California Code for Building Conservation, except for buildings subject to building standards adopted pursuant to Part 1.5 (commencing with Section 17910)

Enforcing Agency – State or local agency specified by the applicable provisions of law.

Authority Cited – Health and Safety Code section 18934.6

Reference – Health and Safety Code sections 18901 through 18949

1.2.3 Alternative Materials, Design And Methods Of Construction And Equipment.

The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has

been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions

of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

1.2.3.1 Research Reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

1.2.3.2 Tests. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

~~APPENDIX CHAPTER 1~~

ADMINISTRATION

DIVISION II

(Chapter 1, Administration has been relocated from Appendix Chapter 1 and renamed Division II)

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Notation

Authority: Health and Safety Code §18934.5

References: Health and Safety Code §18934.5

Adopt Chapter 2 of the 2009 UMC:

MATRIX ADOPTION TABLE

Adopt Chapter 2

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)	X	Adopt amendment for def. of GALVANIZED STEEL
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
209 - G	X	Amend def. for GALVANIZED STEEL

CHAPTERS 2

209 -G-

GALVANIZED STEEL – Any steel conforming to the requirements of ~~UMC Standard No. 2-2~~ *ASTM A653/A653M-03 Standard Specification for Steel Sheet, Zinc-Coat (Galvanized) or Zinc-Iron Alloy-Coat (Galvanized) by the Hot Dip Process.*

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 3 of the 2009 UMC:

**MATRIX ADOPTION TABLE
Adopt Chapter 3**

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1,2,3} listed below		

CHAPTER 3

CBSC is proposing to adopt chapter 3 without amendments.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 4 of the 2009 UMC as amended:

**MATRIX ADOPTION TABLE
Adopt Chapter 4
VENTILATION AIR SUPPLY**

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments		
Adopt Entire Chapter as amended (amended sections listed below)	X	
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
402.1	X	Existing amendment to remain unchanged
Table 4-1, <i>Note</i>	X	Existing amendment to remain unchanged
<u>403.8</u>	X	New amendment for parking gar. ventilation
<u>403.8.1</u>	X	New amendment for parking gar. ventilation
<u>403.8.2</u>	X	New amendment for parking gar. ventilation
<u>403.8.2.1</u>	X	New amendment for parking gar. ventilation
<u>403.8.2.2</u>	X	New amendment for parking gar. ventilation

CHAPTERS 4

CBSC is proposing to adopt chapter 4 with amendments.

403.8 Exhaust Ventilation for Enclosed Parking Garages. *Exhaust airflow for enclosed parking garages shall be provided in accordance with the requirements in Table 4-4 and this Section. Exhaust makeup air shall be permitted to be any combination of outdoor air or transfer air.*

403.8.1 Exhaust Inlet Distribution. *To ensure proper exhaust of contaminated air and fumes from parking garages, exhaust systems utilizing multiple exhaust inlets shall be designed so that exhaust inlets are distributed in such a manner that no portion of the parking garage is more than 50 feet (15 240 mm) from an exhaust inlet. Such exhaust inlets shall be installed so that the highest elevation of the exhaust inlet is no greater than 12 inches (305 mm) below the lowest ceiling level.*

Exception: *Garage exhaust systems designed without distributed exhaust inlets shall have their exhaust inlets designed based on the principles of engineering and mechanics and shall provide the minimum required exhaust rate in Table 4-4.*

403.8.2 Alternative Exhaust Ventilation for Enclosed Parking Garages. *Mechanical ventilation systems used for enclosed parking garages shall be permitted to operate intermittently where the system is arranged to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.*

403.8.2.1 Minimum Exhaust Rate. *Ventilation system shall be capable of providing 14,000 CFM of exhaust air for each operating vehicle. Number of operating vehicles shall be determined based on 2.5% of all parking spaces.*

403.8.2.2 Automatic Carbon Monoxide Sensing Devices. *Automatic carbon monoxide sensing devices may be employed to modulate the ventilation system to maintain a maximum average concentration of carbon monoxide of 50 parts per million during any eight-hour period, with a maximum concentration not greater than 200 parts per million for a period not exceeding one hour. Automatic carbon monoxide sensing devices employed to modulate parking garage ventilation systems shall be approved pursuant to the requirements in Section 302.1.*

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 5 of the 2009 UMC:

MATRIX ADOPTION TABLE Adopt Chapter 5

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)	X	Adopt amendment for SMACNA/ANSI Ref
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
506.2	X	

CHAPTER 5

506.2 Construction. Ducts used for conveying products shall be of substantial airtight construction and shall not have openings other than those required for operation and maintenance of the system. Ducts constructed of steel shall comply with Table 5-5 or 5-6.

Exceptions:

(1) Class 1 product-conveying ducts that operate at less than four (4) inches (102 mm) water column (995.6 Pa) negative pressure and convey noncorrosive, nonflammable, and nonexplosive materials at temperatures not exceeding 250°F (121°C) may be constructed in accordance with Tables 6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8, or, with prior approval, UMC Standard No. 6-2 SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard.

(2) Ducts used in central vacuuming systems within a dwelling unit shall be constructed of materials in compliance with the applicable standards referenced in Chapter 17. Penetrations of fire-resistive walls, or floor-ceiling or roof-ceiling assemblies shall comply with the Building Code. Copper or ferrous pipes or conduit extending from within the separation between a garage and dwelling unit to the central vacuum unit may be used.

The use of rectangular ducts conveying particulates shall be subject to approval of the building official. The design of rectangular ducts shall consider the adhesiveness and buildup of products being conveyed within the duct.

Aluminum construction may be used in Class 1 duct systems only. The thickness of aluminum ducts shall be at least two Brown and Sharpe gauges thicker than the gauges required for steel ducts set forth in Tables 5-5 and 5-6.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 6 of the 2009 UMC:

MATRIX ADOPTION TABLE Adopt Chapter 6

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)	X	
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
601.3	X	
602.1	X	
602.3	X	
602.4	X	
602.5	X	
602.6	X	
603.0	X	
604.2	X	
605.0	X	

CHAPTER 6

601.3 *The performance criteria and requirements herein contemplate a duct that is a structural assembly having the capacity to support occupant health and safety while minimizing its own contribution to property damage under emergency conditions. Ducts can supply fresh or treated air in support of life and health, can convey products of combustion away from a fire zone, can maintain a pressure differential that facilitates evacuation and reduces the spread of fire and smoke, and can facilitate firefighter access to a fire source.*

602.1 General. Supply air, return air, and outside air for heating, cooling, or evaporative cooling systems shall be conducted through duct systems constructed of metal as set forth in the ~~Tables 6-1, 6-2, 6-3, 6-4, 6-7, 6-8, 6-9, and 6-10, or metal ducts complying with UMC Standard No. 6-2 or the referenced HVAC duct construction standard 2 or the referenced HVAC duct construction standard in Chapter 17.~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard. Rectangular ducts in excess of two (2) inches w.g. shall comply with ~~UMC Standard No. 6-2 or the referenced HVAC duct construction standard in Chapter 17.~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard. Ducts, plenums, and fittings may be constructed of concrete, clay, or ceramics when installed in the ground or in a concrete slab, provided the joints are tightly sealed.

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602.3 Factory-Made Air Ducts. Factory-made air ducts shall be approved for the use intended or shall conform to the requirements of the referenced standard for air ducts in Chapter 17. Each portion of a factory-made air duct system shall be identified by the manufacturer with a label or other suitable identification indicating compliance with the referenced standard for air ducts in Chapter 17 and its class designation. These ducts shall be listed and shall be installed in accordance with the terms of their listing ~~and the requirements of UMC Standard No. 6-5.~~ Flexible air connectors are not permitted

602.4 Joints and Seams of Ducts. Joints of duct systems shall be made substantially air-tight by means of tapes, mastics, gasketing, or other means.

Crimp joints for round ducts shall have a contact lap of at least 1-1/2 inch (38 mm) and shall be mechanically fastened by means of at least three (3) sheet-metal screws equally spaced around the joint, or an equivalent fastening method.

Joints and seams for 0.016 inch (0.41 mm) (No. 28 gauge) and 0.013 inch (0.33 mm) (No. 30 gauge) residential rectangular ducts shall be as specified in ~~Table 6-4~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard for 0.019 inch (0.48 mm) (No. 26 gauge) material.

Joints and seams for rectangular duct systems shall be as specified in ~~Table 6-4~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard.

Joints and seams for flat oval ducts and round ducts in other than single-dwelling units shall be as specified in ~~Table 6-8~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard. Joints and seams and all reinforcements for factory-made air ducts and plenums shall meet with the conditions of prior approval in accordance with the installation instructions that shall accompany the product. Closure systems for rigid air ducts and plenums shall be listed in accordance with UL 181A, *Standard for Closure Systems for Use with Rigid Air Ducts and Air Connectors*. Closure systems for flexible air ducts shall be listed in accordance with UL 181B, *Standard for Closure Systems for Use with Flexible Air Ducts and Air Connectors*.

602.5 Metal. Every duct, plenum, or fitting of metal shall comply with ~~Table 6-4 or 6-8~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard.

Exceptions:

- (1) Ducts, plenums, and fittings for systems serving single-dwelling units may comply with ~~Table 6-9.~~
- (2) Duct systems complying with UMC Standard No. 6-2 or the referenced HVAC duct construction standard in Chapter 17, with prior approval, or duct systems complying with UL 181, *Standard for Factory-Made Air Ducts and Air Connectors*.
- (3) Duct systems complying with the UMC Standard No. 6-2 or the referenced HVAC duct construction standard in Chapter 17, with prior approval.

602.6 Tin. Existing tin ducts may be used when cooling coils are added to a heating system, provided the first ten (10) feet (3,048 mm) of the duct or plenum measured from the cooling coil discharge are constructed of metal of the gauge thickness set forth in ~~Tables 6-1, 6-8, or 6-9 of this chapter~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard or are of approved material and construction. Tin ducts completely enclosed in inaccessible concealed areas need not be replaced. All accessible ducts shall be insulated to comply with ~~Table 6-6 of this chapter~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard. For the purpose of this subsection, ducts shall be considered accessible where the access space is thirty (30) inches (762 mm) or greater in height.

603.0 Quality of Material. Galvanized steel shall be of lock-forming quality with a minimum coating of 1.25 ounces of zinc per square foot (0.04 kg/m³) conforming to the requirements of ~~UMC Standard No. 2-2~~ ASTM A653/A653M-03 Standard Specification for Steel Sheet, Zinc-Coat (Galvanized) or Zinc-Iron Alloy-Coat (Galvanized) by the Hot Dip Process.

604.2 Metal Ducts. Ducts shall be securely fastened in place at each change of direction and as set forth in ~~Table 6-7~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard. Vertical rectangular ducts and vertical round ducts shall be supported as set forth in ~~Table 6-7, Part A~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard. Riser ducts shall be held in place by means of metal straps or angles and channels to secure the riser to the structure.

Metal ducts shall be installed with at least four (4) inches (102 mm) separation from earth. Metal ducts when installed in or under a concrete slab shall be encased in at least two (2) inches (51 mm) of concrete.

Ducts shall be installed in a building with adequate clearance so as to permit retaining the full thickness of fireproofing on structural members.

Supports for rectangular ducts as set forth in ~~Table 6-7~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard, when suspended from above, shall be installed on two opposite sides of each duct and shall be riveted, bolted, or metal screwed to each side of the duct at not more than the intervals specified.

Horizontal round ducts forty (40) inches (1,016 mm) or less in diameter when suspended from above shall be supported at intervals not more than as set forth in ~~Table 6-7~~ SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard with one hanger installed to comply with the requirements listed below:

604.5 Support of Ducts. Installers shall provide the manufacturer's field fabrication and installation instructions.

In the absence of specific supporting materials and spacing, approved factory-made air ducts may be installed as set forth in Table 6-10 SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard.

605.0 Insulation of Ducts.

Supply-, return-air ducts and plenums of a heating or cooling system shall be insulated to achieve the minimum thermal (R) value as set forth in Tables 6-6 A and B SMACNA/ANSI 006-2006 HVAC Duct Construction Standards - Metal and Flexible or another approved duct construction standard.

Exceptions:

- (A) Factory-installed plenums, casings, or ductwork furnished as a part of HVAC equipment tested and rated in accordance with approved energy efficiency standards.
- (B) Ducts or plenums located in conditioned spaces.
- (C) For runouts less than ten (10) feet (3,048 mm) in length to air terminals or air outlets, the rated R value of insulation need not exceed R-3.5 (R-0.6).
- (D) Backs of air outlets and outlet plenums exposed to unconditioned or indirectly conditioned spaces with face areas exceeding five (5) square feet (0.5 m²) need not exceed R-2 (R-0.4); those five (5) square feet (0.5 m²) or smaller need not be insulated.
- (E) Ducts and plenums used exclusively for evaporative cooling systems.

Approved materials shall be installed within ducts and plenums for insulating, sound deadening, or other purposes. Materials shall have a mold, humidity, and erosion-resistant surface that meets the requirements of the referenced standard for air ducts in Chapter 17. Duct liners in systems operating with air velocities exceeding 2,000 feet per minute (10.16 m/s) shall be fastened with both adhesive and mechanical fasteners, and exposed edges shall have adequate treatment to withstand the operating velocity.

Insulation applied to the surface of ducts, including duct coverings, linings, tapes, and adhesives, located in buildings shall have a flame-spread index not greater than twenty-five (25) and a smoke developed index not greater than fifty (50), when tested in accordance with NFPA 255, *Method of Test of Burning Characteristics of Building Materials*, or in accordance with ASTM E 84, *Surface Burning Characteristics of Building Materials*, or in accordance with the provisions of UL 723, *Test for Surface Burning Characteristics of Building Materials*. The specimen preparation and mounting procedures of ASTM E 2231, *Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics*, shall be used. Air duct coverings and linings shall not flame, glow, smolder, or smoke when tested in accordance with ASTM C 411, *Hot-Surface Performance of High-Temperature Thermal Insulation*, at the temperature to which they are exposed in service. In no case shall the test temperature be below 250°F (121°C).

Factory-made air ducts and faced insulations intended for installation on the exterior of ducts shall be legibly printed with the name of the manufacturer, the thermal resistance (R) value at installed thickness, and the flame-spread index and smoke developed index of the composite material.

[DELETE TABLES 6-1 through 6-10]

TABLE 6-1 Duct Construction for 4 Feet Duct Lengths
[SMACNA HVAC Duct Construction Standards; Second Edition – 1995]

TABLE 6-2 Duct Construction for 5 Feet Duct Lengths
[SMACNA HVAC Duct Construction Standards; Second Edition – 1995]

TABLE 6-3
THICKNESS ADJUSTMENTS

TABLE 6-4
DIMENSION ADJUSTMENTS

TABLE 6-5
REINFORCEMENTS

TABLE 6-6 A (I-P Units)

~~Minimum Duct Insulation R Valuea Cooling and Heating Only Supply Ducts and Return Ductsd, e~~

~~TABLE 6-6-B (I-P Units)~~

~~Minimum Duct Insulation R Valuea Combined Heating and Cooling Ductsd, e~~

~~TABLE 6-7~~

~~Duct Support~~

~~TABLE 6-8~~

~~Construction Details for Round and Flat-Oval Ducts~~

~~TABLE 6-9~~

~~Thickness of Metal Ducts and Plenums Used for Heating or Cooling for a Single Dwelling Unit~~

~~TABLE 6-10~~

~~Alternate Supports for Factory-Made Air Ducts~~

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapters 7 through 10 of the 2009 UMC:

MATRIX ADOPTION TABLE Adopt Chapters 7 - 10

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		

CHAPTERS 7 - 10

CBSC is proposing to adopt chapters 7 through 10 without amendments.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 11 of the 2009 UMC as amended:

MATRIX ADOPTION TABLE Adopt Chapter 11

REFRIGERATION

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)	<u>X</u>	
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
<u>1106.3.1</u>	<u>X</u>	Add amendment to limit unauthorized access to refrigerant and decrease accessibility of refrigerants by children

CHAPTER 11

1106.3.1 Refrigerant Service Ports. [BSC] *Refrigerant service ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be protected from unauthorized access by a means acceptable to the Enforcing Agency.*

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapters 12 through 14 of the 2009 UMC:

MATRIX ADOPTION TABLE Adopt Chapters 12 - 14

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		

CHAPTERS 12 - 14

CBSC is proposing to adopt chapters 12 through 14 without amendments.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Chapter 15 of the 2009 UMC NOT ADOPTED:

MATRIX ADOPTION TABLE Chapter 15 – Not Adopted

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments		
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1,2,3} listed below		

CHAPTER 15 SOLAR SYSTEMS

CBSC is proposing not to adopt chapters 15

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 16 of the 2009 UMC:

MATRIX ADOPTION TABLE Adopt Chapter 16

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1,2,3} listed below		

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CHAPTER 16

CBSC is proposing to adopt chapter 16 without amendments.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Chapter 17 of the 2009 UMC:

**MATRIX ADOPTION TABLE
Adopt Chapter 17**

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)	X	
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
UMC Standards 2-2, 6-2, 6-5	X	
SMACNA/ANSI	X	(006-2006 referenced standard)

CHAPTER 17

(Chapter 17 UMC Standards 2-2, 6-2 and 6-5)

(Chapter 17 SMACNA/ANSI 006–2006 referenced Standard)

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Appendix A of the 2009 UMC:

**MATRIX ADOPTION TABLE
Adopt Appendix A:**

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as	X	

amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		
UMC Standard No. 2-2	†	Not adopted by BSC
UMC Standard No. 6-2	†	Not adopted by BSC
UMC Standard No. 6-2	†	Not adopted by BSC

This state agency does not adopt sections identified with the following symbol: †

Appendix A

APPENDIX A UNIFORM MECHANICAL CODE STANDARD NO. 2-2

APPENDIX A UNIFORM MECHANICAL CODE STANDARD NO. 6-2

APPENDIX A UNIFORM MECHANICAL CODE STANDARD NO. 6-5

The BSC proposes to not adopt Appendix A Standards 2-2, 6-2 and 6-5 and remove from the CMC pursuant to Health and Safety Code Sections 18928, 18928.1 and 18934.5. See purpose and rationale for Section 601.3.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5

Adopt Appendices B, C and D of the 2009 UMC:

MATRIX ADOPTION TABLE Adopt Appendices B, C and D:

Adopting Agency	BSC	COMMENTS
Adopt entire Chapter without amendments	X	
Adopt Entire Chapter as amended (amended sections listed below)		
Adopt Only those sections that are listed below and/or Adopt Only those California promulgated sections ^{1, 2, 3} listed below		

Appendices B, C and D

CBSC is proposing to adopt appendices B, C and D with no new amendments.

Notation

Authority: Health & Safety Code Sections 18928 and 18934.5

Reference(s): Health & Safety Code Sections 18928, 18928.1 and 18934.5