

Exhibit B

Exhibit B

----- Forwarded message -----

From: **Carl Malamud** <carl@media.org>

Date: Fri, Jan 11, 2013 at 12:14 PM

Subject: Re: This is a verified DMCA Removal Request from Attributor

To: remedies@attributor.com

Cc: David Halperin <davidhalperindc@gmail.com>

Dear Mr. Siddiqui:

* * * Sent via Electronic Mail and World Wide Web * * *

I am in receipt of your communication of January 13, 2013 in regards to smaccna.hvac.1985.pdf, the HVAC Air Duct Leakage Test Manual as published by the Sheet Metal and Air Conditioning Contractors National Association.

The HVAC Air Duct Leakage Test Manual has been incorporated by reference and is legally mandated by the United States in Title 10 of the Code of Federal Regulations, Section 434.403.2.9.3. The HVAC Air Duct Leakage Test Manual has also been incorporated by reference and is required by law in Title 19, New York City Rules and Regulations, Part 1240 as well as Chapter 7676 of the Minnesota Energy Code.

As this document has been incorporated into both Federal and State law, long-standing precedent of the United States Supreme Court holds that copyright claims cannot prevent citizens from reading, knowing, and speaking the law. See *Wheaton v. Peters*, 33 U.S. 591 (1834); *Banks v. Manchester*, 128 U.S. 244 (1888).

While the standards drafted by the Sheet Metal and Air Conditioning Contractors National Association were entitled to copyright protection when issued, once incorporated into state or federal law these standards became the law, and thus have entered the public domain. Chief Judge Edith H. Jones of the 5th Circuit expressed this principle clearly in her opinion in *Veeck v. Southern Building Code Congress*, which concerned a model building code incorporated in the law of two Texas towns:

"The issue in this en banc case is the extent to which a private organization may assert copyright protection for its model codes, after the models have been adopted by a legislative body and become 'the law.' Specifically, may a code-writing organization prevent a website operator from posting the text of a model code where the code is identified simply as the building code of a city that enacted the model code as law? Our short answer is that as law, the model codes enter the public domain and are not subject to the copyright holder's exclusive prerogatives. As model codes, however, the organization's works retain their protected status." 293 F.3d 791 (5th Cir. 2002) (en banc).

As you can see by looking at the document in question, a cover sheet has been prepended to clearly spell out the section of the law--in this case the Code of Federal Regulations--that created the incorporation by reference into the law. Incorporation into the Code of Federal Regulations is not a casual affair and requires that the regulator follow a

carefully prescribed procedure and that the incorporation by approved specifically by the Executive Director of the Office of the Federal Register.

The purpose of requiring the HVAC Air Duct Leakage Test Manual is to help promote the public safety. It was incorporated into the law because the of the high quality and integrity of the work and it is the very purpose of the law that the citizens should know and follow the requirements. I'm sure you will agree that our noncommercial posting of these legally mandated regulations helps to inform citizens and promote the public safety.

I would be happy to discuss this matter further if you wish.

Best regards,

Carl Malamud
Public.Resource.Org
1005 Gravenstein Highway North
Sebastopol, CA 95472

On Jan 10, 2013, at 7:23 PM, remedies@attributor.com wrote:

> *** Sent via Email - DMCA Notice of Copyright Infringement ***
>
> Dear Sir/Madam,
>
> I certify under penalty of perjury, that I am an agent authorized to act on behalf of the owner of the intellectual property rights and that the information contained in this notice is accurate.
>
> I have a good faith belief that the page or material listed below is not authorized by law for use by the individual(s) associated with the identified page listed below or their agents and therefore infringes the copyright owner's rights.
>
> I HEREBY DEMAND THAT YOU ACT EXPEDITIOUSLY TO REMOVE OR DISABLE ACCESS TO THE PAGE OR MATERIAL CLAIMED TO BE INFRINGING.
>
> This notice is sent pursuant to the Digital Millennium Copyright Act (DMCA), the European Union's Directive on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society (2001/29/EC), and/or other laws and regulations relevant in European Union member states or other jurisdictions.
>
> My contact information is as follows:
>
> Organization name: Attributor Corporation as agent for Rights Holders listed below
> Email: counter-notice@attributor.com
> Phone: [650-340-9601](tel:650-340-9601)
> Mailing address:
> 119 South B Street
> Suite A,
> San Mateo, CA 94401
>
> My electronic signature follows:
> Sincerely,

> /Eraj Siddiqui/
> Eraj Siddiqui
> Attributor, Inc.

>

>

> *** INFRINGING PAGE OR MATERIAL ***

>

> Infringing page/material that I demand be disabled or removed in consideration of the above:

>

> Rights Holder: Sheet Metal and Air Conditioning Contractors National Association

>

> Original Work: HVAC Air Duct Leakage Test Manual

> Infringing URL: <https://law.resource.org/pub/us/cfr/ibr/005/smaccna.hvac.1985.pdf>

>

>

Exhibit C

Exhibit C

Felhaber Larson Fenlon & Vogt

A Professional Association – Attorneys at Law

MINNEAPOLIS
220 South Sixth Street | Suite 2200
Minneapolis, MN 55402-4504
612 339 6321 | Fax 612 338 0535

Jon L. Farnsworth
651/312-6013

Fax: 651/222-8905

E-mail: jfarnsworth@felhaber.com

Reply to St. Paul Office

ST. PAUL
444 Cedar Street | Suite 2100
St. Paul, MN 55101-2136
651 222 6321 | Fax 651 222 8905

February 5, 2013

Via Certified and First Class U.S. Mail

Public.Resource.org
Carl Malamud
1005 Gravenstein Highway North
Sebastopol, CA 95472

Re: Your DMCA Takedown Notice Response

Dear Mr. Malamud:

Our law firm represents the Sheet Metal and Air Conditioning Contractors National Association ("SMACNA"). SMACNA sent your organization a copyright takedown notice pursuant to the Digital Millennium Copyright Act ("DMCA") on or about January 10, 2013. This takedown notice related to your organization publishing SMACNA's HVAC Air Duct Leakage Test Manual (the "Publication"), which is a federally copyrighted publication, on your organization's website.

We are in receipt of your organization's response where it claims SMACNA is not entitled to copyright protection because the government "incorporated" portions of the Publication into the Code of Federal Regulations ("CFR"). Your organization's legal reliance on, and conclusions relating to, the decision in Veeck v. Southern Building Code Congress Int., Inc., 293 F.3d 791 (5th Cir. 2002) is misplaced for several reasons.

First, even assuming Veeck stands for the proposition that you claim (i.e., a government's reference to a private organization's copyrighted work eviscerates the copyright protection), Veeck is not the applicable law. The Veeck decision came from the Fifth Circuit. California, where your organization is located, is in Ninth Federal Judicial Circuit. Accordingly, the Veeck decision has no precedential value in California.

The applicable law for the Ninth Judicial Circuit confirms that your organization cannot legally copy and distribute the Publication without SMACNA's authorization. Specifically, the Ninth Circuit adheres to the standard set forth in Practice Management Info. Corp. v. American Med. Association, 121 F.3d 516 (9th Cir. 1997), amended by 133 F.3d 1140. In Practice Management, the Ninth Circuit held that the government's adoption of a pre-existing private

numbering system for medical conditions by the American Medical Association did not extinguish the federal copyright protection. In other words, the copyright owner was able to legally enforce and prevent others from copying the copyrighted work. Id. at 519-520 (“we affirm the district court’s conclusion that the AMA’s copyright . . . should be enforced.”).

The same result holds true in this case with respect to SMACNA’s ability to enforce its copyrights. SMACNA does not automatically lose its copyright protection just because the government decided to cite to SMACNA’s work. SMACNA has spent significant resources developing its educational materials over the course of many decades. The idea that the government can simply cite to SMACNA’s copyrighted work and have SMACNA automatically lose its copyright protection, is unsupported by any legal authority and is fundamentally contrary to the Takings Clause in the United States Constitution.

Second, your organization appears to misinterpret the holding for Veeck. Veeck does not stand for the proposition you claim (i.e., that copyrighted standards referenced by a Regulation, become law, and therefore lose its copyright protections because the work enters the public domain). Veeck specifically noted that “copyrighted works **do not** ‘become law’ merely because a statute refers to them.” 293 F. 3d at 805 (emphasis added). As the Veeck decision noted, a work does not enter the public domain if it was authored by a private group “for reasons other than incorporation into law.” Id.; see Nielsen Company (US), LLC v. Truck Ads, LLC, 2011 WL 3857122, *12 (N.D. Ill. 2011).

In this case, SMACNA’s Publication was authored for other reasons than to be incorporated into law. SMACNA’s publication was not intended to be a model code—it was, and is, extrinsic industry standards compiled from decades of SMACNA’s research and work to assist its members for increasing safety and complying with industry best practices. Another important distinguishing factor between SMACNA’s Publication and the facts in Veeck is that SMACNA’s Publication was only *partially* referenced in the CFR, not fully subsumed like the proposed model code at issue in Veeck. Ultimately, the holding in Veeck, if anything, supports SMACNA’s position that it retains its copyright protection for the Publication. Veeck, 293 F. 3d at 805.

Third, the United States’ Solicitor General confirmed that the Veeck decision is in harmony with other established law in the other jurisdictions. Specifically, **copyright owners are able to enforce their copyrights even when the government has incorporated portions of the copyrighted material in the law.** See e.g., Practice Management Info. Corp., 121 F.3d 516 (9th Cir. 1997); CCC Info. Servs., Inc. v. Maclean Hunter Market Reports, Inc., 44 F.3d 61 (2d Cir. 1994) (determining used car valuations used by government did not invalidate copyright and stating that the Takings Clause in the U.S. Constitution could be violated by a contrary conclusion); Nielsen Company (US), LLC v. Truck Ads, LLC, 2011 WL 3857122 (N.D. Ill. 2011) (determining FCC’s reliance on copyrighted maps did not invalidate the copyright protections of the maps).

February 5, 2013

Page 3

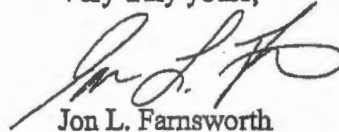
As discussed above, SMACNA's position in enforcing and protecting its copyrights is consistent with applicable law. The very lifeblood of SMACNA is based its established intellectual property rights inherent in the technical and educational materials it produces. If the totality of SMACNA's work is eligible for distribution and re-production without regard to SMACNA's intellectual property rights, SMACNA's funding will evaporate and SMACNA will eventually cease to exist. Accordingly, SMACNA takes a violation of its intellectual property rights seriously.

Please note that if the Publication remains on your organization's webpage after February 14, 2013, SMACNA intends to pursue its legal action against your organization to the full extent permitted by law. SMACNA reaffirms its copyright protection in the Publication and reiterates its demand for your organization to immediately remove the infringing material from your website.

With that being said, your organization should take comfort in knowing that the public may receive copies of the applicable *portions* of SMACNA's Publication referenced by the CFR by requesting them directly from the government at no charge. Alternatively, members of the public may purchase SMACNA's educational materials, guides, and other publications at <http://smacna.org/bookstore/>.

If you have further questions, please feel welcome to contact me.

Very truly yours,



Jon L. Farnsworth

JLF/sjbg

cc: Tom Soles
William Ecklund, Esq.

Exhibit D

Exhibit D



CERTIFICATE

By Authority Of
THE UNITED STATES OF AMERICA
Legally Binding Document

By the Authority Vested By Part 5 of the United States Code § 552(a) and Part 1 of the Code of Regulations § 51 the attached document has been duly INCORPORATED BY REFERENCE and shall be considered legally binding upon all citizens and residents of the United States of America. HEED THIS NOTICE: Criminal penalties may apply for noncompliance.



Document Name: SMACCNA: HVAC Air Duct Leakage Test Manual

CFR Section(s): 10 CFR 434.403.2.9.3

Standards Body: Sheet Metal and Air Conditioning Contractors
National Association



Official Incorporator:

THE EXECUTIVE DIRECTOR
OFFICE OF THE FEDERAL REGISTER
WASHINGTON, D.C.

From: remedies@attributor.com
Subject: This is a verified DMCA Removal Request from Attributor
Date: January 10, 2013 7:23:58 PM PST
To: carl@media.org
Reply-To: remedies@attributor.com

*** Sent via Email - DMCA Notice of Copyright Infringement ***

Dear Sir/Madam,

I certify under penalty of perjury, that I am an agent authorized to act on behalf of the owner of the intellectual property rights and that the information contained in this notice is accurate.

I have a good faith belief that the page or material listed below is not authorized by law for use by the individual(s) associated with the identified page listed below or their agents and therefore infringes the copyright owner's rights.

I HEREBY DEMAND THAT YOU ACT EXPEDITIOUSLY TO REMOVE OR DISABLE ACCESS TO THE PAGE OR MATERIAL CLAIMED TO BE INFRINGING.

This notice is sent pursuant to the Digital Millennium Copyright Act (DMCA), the European Union's Directive on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society (2001/29/EC), and/or other laws and regulations relevant in European Union member states or other jurisdictions.

My contact information is as follows:

Organization name: Attributor Corporation as agent for Rights Holders listed below
Email: counter-notice@attributor.com
Phone: 650-340-9601
Mailing address:
119 South B Street
Suite A,
San Mateo, CA 94401

My electronic signature follows:

Sincerely,
/Eraj Siddiqui/
Eraj Siddiqui
Attributor, Inc.

*** INFRINGING PAGE OR MATERIAL ***

Infringing page/material that I demand be disabled or removed in consideration of the above:

Rights Holder: Sheet Metal and Air Conditioning Contractors National Association

Original Work: HVAC Air Duct Leakage Test Manual

Infringing URL: <https://law.resource.org/pub/us/cfr/ibr/005/smaccna.hvac.1985.pdf>

From: Carl Malamud <carl@media.org>
Subject: **Re: This is a verified DMCA Removal Request from Contributor**
Date: January 11, 2013 9:14:47 AM PST
To: remedies@contributor.com
Cc: David Halperin <davidhalperindc@gmail.com>

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Phone: 650-340-9601
Mailing address:
119 South B Street
Suite A,
San Mateo, CA 94401

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Sincerely,
/Eraj Siddiqui/
Eraj Siddiqui
Attributor, Inc.

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Felhaber Larson Fenlon & Vogt

A Professional Association – Attorneys at Law

MINNEAPOLIS
220 South Sixth Street | Suite 2200
Minneapolis, MN 55402-4504
612 339 6321 | Fax 612 338 0535

Jon L. Farnsworth
651/312-6013

Fax: 651/222-8905

E-mail: jfarnsworth@felhaber.com

Reply to St. Paul Office

ST. PAUL
444 Cedar Street | Suite 2100
St. Paul, MN 55101-2136
651 222 6321 | Fax 651 222 8905

February 5, 2013

Via Certified and First Class U.S. Mail

Public.Resource.org
Carl Malamud
1005 Gravenstein Highway North
Sebastopol, CA 95472

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February 5, 2013

Page 3

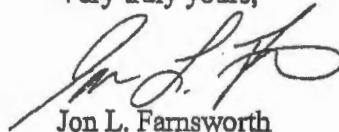
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If you have further questions, please feel welcome to contact me.

Very truly yours,



Jon L. Farnsworth

JLF/sjbg

cc: Tom Soles
William Ecklund, Esq.

Exhibit E

Exhibit E



SMACNA

Membership Benefits*



SMACNA is a trade association and an association is made up of people. Association people join together to concentrate their collective efforts on the needs and problems of an industry, society, or cause. By uniting, they combine their talents and resources to address and satisfy needs and seek resolution to problems that they are unable to satisfactorily address individually. By joining together they are able to consolidate their influence and power to affect change. This collective power can be effective in a variety of ways. The most common application of this collective influence for construction associations is in the area of labor relations, most notably collective bargaining and unity, for the express purpose of achieving equitable employment conditions. But the same unity can be used to affect positive impact in business management educational endeavors; legislative influence; industry regulatory conditions, such as code requirements, project specification development, and installation procedures. The application of this collective influence can be initiated at the local, state, regional, national, and international levels. The potential for positive impact in all of these areas and at all of these levels of influence is awesome.

By coming together to form a local sheet metal contractors association you start down the path of building a power base to influence the environment in which each of you conducts business. In affiliating as a Chapter of SMACNA, you expand your power base to the national level. The flow of power or potential influence runs both ways ... you increase the power base of SMACNA and SMACNA provides you with expanded power influencers.

Membership in SMACNA is by firm and is voluntary. The member firms have one common element, they utilize sheet metal and/or sheet metal products in the services they provide. The firms that comprise the membership of SMACNA are diverse; ranging from contractors that fabricate and install environmental systems in buildings to contractors that manufacture specialty metal products, including specialty operations ranging from food service equipment manufacturers to HVAC testing and balancing contractors.

But, beyond the esoteric benefit of potential industry influence, what more direct benefit does a company derive from affiliation? Are there specific benefits that accrue to a sheet metal contracting firm by joining a chapter and SMACNA? The answer is YES.

Some General Member Benefits

- Direct access to accepted industry technical standards at considerably reduced prices;
- The opportunity to become a contributor to the development and/or revision of such standards;

* U.S. and Canadian Contractors

SMACNA
Membership Benefits
Page 2

- The opportunity to participate in many educational programs directed at business management, industry technical expertise, and personal growth; programming presented by industry-acclaimed professionals;
- A direct link to the Sheet Metal Workers' International Association [SMWIA] leadership through the SMACNA Labor Relations Department;
- Labor issue consultation through the SMACNA Labor Relations Department;
- Contractor advocacy in grievance processing and labor negotiations through the SMACNA Labor Relations Department; and
- The opportunity to meet with and exchange ideas with fellow contractors from around the globe. While SMACNA does not directly implement peer groups, we will assist in putting members in touch with other interested members.

A great deal of these benefits today are available electronically through our Web site at www.smacna.org. We encourage use of our site. The services and information available there are growing daily.

More Benefit Specifics

Many of the valuable member benefits result from the alliance of businessmen and businesswomen joining together to develop and expand their influential power base to improve industry conditions beyond the ability of a single contractor acting alone. As a result, a large number of the achieved benefits are both intangible and communal in nature, impacting the industry as a whole by improving the business environment for all of the participants. For example, SMACNA has been able to develop uniform fabrication and installation standards that are accepted, adopted, and specified by the design community. Professionals, such as architects and engineers, routinely issue specifications for sheet metal products and systems that require conformance with SMACNA technical standards. And **YOU**, the sheet metal contractor through your affiliation and participation in SMACNA, develop those standards. As a member of SMACNA you receive a copy of all of these industry standards *free* of charge; and if you require additional copies as SMACNA members they are available at substantially reduced cost over the non-SMACNA contractor.

SMACNA National is in a variety of ways constantly and continuously promoting the use of these standards with the professional design community, building owners, awarding authorities, enforcement authorities, government officials and agencies, etc. These efforts result in uniformity and standardization within the industry, which ultimately benefit the total industry, but **YOU**, the SMACNA contractor, have an additional advantage not only from an economic standpoint, but you also have the *opportunity to influence* and *participate* in the development and writing of the standards, something your non-member competitor will never achieve.

Such communal benefits exist other than the technical area; they can be found in educational programming, legislative influence, labor relations, and peer communications.

In addition to these broad universal benefits SMACNA members and Chapters have a number of additional and more direct benefits of which they may take advantage. These include:

1. SMACNA Market Sector Councils.

SMACNA's Market Sector Councils are charged with providing high quality programs and services that address specific concerns of SMACNA members. Each Council identifies and responds to issues and trends impacting members' businesses, markets and profitability in distinct market disciplines. Councils are responsible for establishing liaisons with industry groups aimed at increasing Council members' market visibility. These are:

- Architectural Sheet Metal (including Custom Fabricating and Manufacturing)
- Industrial Sheet Metal
- Residential Heating and Cooling
- Commercial HVAC (including Service and Duct Manufacturing)

2. Business Management Services

SMACNA offers a number of services designed to enhance the business management skills and tools of the sheet metal contractor. They include:

Financial Survey – The survey compares the financial performance of sheet metal contractors across the nation. The data and ratios provide benchmarks against which contractors can measure their company in comparison with other companies in similar financial and specialty areas. Contractors that participate in the survey obtain one gratis copy of the report; non-participants may purchase a copy.

Business Management University & Graduate Programs

The Business Management University and Graduate Programs are designed specifically for future managers and owners of SMACNA member companies. The Programs give participants the opportunity to network with their peers while learning the necessary elements of running a sheet metal contracting business.

Chapter Education Programs – SMACNA offers a comprehensive list of training programs for chapters to conduct locally. Current programs are listed on SMACNA's Web site at <http://www.smacna.org/members/courses/>. These programs are instructed by professional speakers and university professors. New programs are added each year.

3. Safety Programs

SMACNA offers a number of products and services to the membership designed to assist the contractor in implementing a successful safety and health program for their employees. Safety and health publications and products include a variety of brochures, manuals, and DVDs on topics related to industry issues including toolbox talks and vehicle safety information cards. Services offered to members include training courses for supervisors and OSHA compliance assistance.

The annual SMACNA Safety Statistics Evaluation and Awards Program (SSEAP) is a great tool to gather industry data and recognize contractors with superior safety programs. The collected data is made available to members through publication of the annual *Safety Profile*. Winners of the safety awards receive trophies and public recognition at the SMACNA Convention.

4. Labor Relations Services

SMACNA's Labor Relations Department provides information, assistance and a number of services to the SMACNA membership. They include:

Labor Report – issued six times per year, this report offers both a national and regional perspective to assist in local labor-management relations by providing information on bargaining trends, court decisions, and legislation affecting the labor relations climate in the sheet metal industry.

Collective Bargaining Orientation – held every February is designed to provide bargainers with advice on preparing for bargaining, and a comprehensive discussion on the legal framework for bargaining. The orientation also includes an update on industry trends and bargaining settlements.

Mutual Gains Bargaining Seminar – a training program designed to increase the ability for labor and management to negotiate more effectively through a problem solving approach as opposed to confrontation. Participation in the seminar requires representation from both the local management and labor negotiating teams.

SMACNA/SMWIA Joint Labor Management Partnership Conference – a conference for representatives from both labor and management to openly discuss current issues confronting the union sheet metal industry. An opportunity for both labor and management to address issues and seek solutions to factors that impact on market share.

Grievance Administration – SMACNA offers assistance in utilizing the provisions of Article X of the SFUA in settling grievances that from time to time arise in the application of the collective bargaining agreement. This procedure is designed to achieve amicable settlement of grievances without a work stoppage.

Annual Bargainer's Mailing – distributed annually to chapters entering negotiations. The mailing includes information on healthcare cost projections, updated wage and fringe information, FMCS information including filing requirements, and information of collective bargaining contract clauses utilized within the industry.

Davis-Bacon Issues – the Labor Department routinely keeps chapters informed of prevailing wage surveys scheduled for their area and stresses the need for contractor participation in the process.

Labor Bulletins – are sent out via e-mail from time-to-time to keep chapters up-to-date on what is happening in the industry, particularly when it pertains to contract negotiations. For example, as we receive new collective bargaining settlements we immediately forward the terms of the contract to all other local chapters that are bargaining.

Wage and Fringe Manual – is updated approximately every three months, tracks wage and fringe information for 101 areas and includes regional and national wage averages. The manual also tracks four topics: classified workers, pre-apprentices, Article 10, Section 8 and the integrity clause.

5. Technical Services

The SMACNA Technical Resources Department provides a wide variety of services to the SMACNA membership, including technical seminars conducted at the local chapter level on the various SMACNA technical standards; professional assistance with interpretations/applications of SMACNA technical standards; updates on new and revised technical standards; industry updates on building codes and technical activities impacting the SMACNA membership; and technical papers issued on matters impacting SMACNA members (these are available on the SMACNA Web site).

SMACNA membership also provides the opportunity to interact on various technical committees and task forces in the development of SMACNA technical standards.

6. SMACNA Annual Convention

SMACNA conducts an annual convention and business meeting. The convention includes a variety of educational sessions, social events, and informational forums. Information on this year's convention can be found on SMACNA's Web site.

7. SMACNA Web Site

SMACNA's Web site address is *www.smacna.org*. SMACNA continues to enhance the information and services available through the Web site. The site is a significant resource for the sheet metal industry. One of the top 50 pages visited is the Convention Sponsorship page.

8. Chapter Visitation

The Board Liaison Program is an opportunity to establish a direct communications link between the SMACNA leadership and local chapters. This program has great potential for the enhancement of information exchange and all participants are encouraged to utilize the program to the fullest extent possible. Each SMACNA officer and director is assigned liaison responsibility for a number of SMACNA chapters. The Board member is encouraged to establish regular communication with the chapters for the purpose of enhancing the exchange of information; identification of trends, problems, and concerns; promotion of SMACNA programs and services; and implementation of SMACNA policies. Chapters are requested to invite Board Liaisons to attend meetings of their organization. SMACNA encourages chapters and state associations to provide time on their meeting agenda for the Board Liaison to address those attending the meeting.

Two additional industry efforts are the **SMACNA Testing & Research Institute** and the **New Horizons Foundation**. While these organizations are independent of SMACNA, they do represent a potential source of information and services for SMACNA members and the sheet metal industry.

SMACNA Testing & Research Institute

Architects, engineers and building owners are more focused and concerned about quality than ever before. With increased reliance by the engineering/design community on industry standards, coupled with the growing impact codes are having on construction installations, the need for an impartial testing and research organization and the verification of product performance is quite evident.

The SMACNA Testing & Research Institute meets that industry need by overseeing the creation of valuable test data that can raise the comfort level of engineers, building owners and contractors that the materials being installed are of the highest caliber and meet appropriate specifications.

In addition, the SMACNA Testing & Research Institute permits the testing of proprietary products. Verification of manufacturers' published performance characteristics for proprietary products is something the industry has needed for years.

The Institute was created to educate and assure architects, engineers and building owners as well as the general public that all sheet metal products are manufactured and/or constructed to perform to credible industry standards.

The Institute is also dedicated to introducing and/or transferring new technology from the research phase to real world circumstances. The Institute will also apply new technologies to existing standards to promote a continuing commitment to quality construction.

The focus is on increased applied research and testing, rather than theoretical. The Institute encourages the practical application of new technologies and enables the industry to capitalize on emerging technologies.

New Horizons Foundation

The New Horizon Foundation was established by SMACNA's Board of Directors in 2001. The Foundation's mandate is:

- To encourage career participation in the sheet metal industry;
- To develop key relationships with academic institutions and industry partners to analyze workforce-related trends; and
- To position sheet metal contractors as key participants in the construction process to better shape public perception.

To insure that the Foundation's direction complements SMACNA's goals and objectives, a twelve-person Board of Directors provides guidance.

The Board consists of SMACNA's executive committee and five members of the Summit Challenge Council. These individuals have contributed more than one hundred thousand dollars to the Foundation.

The Foundation is a significant source of new programs for SMACNA members. Such programs include:

- Achieving Greater Project Success and Profitability Through Pre-Construction Planning
- Channel Disruption by the Home Centers
- Creating a Learning Culture for HVAC and Sheet Metal Contractors
- How Listening to the Customer's Voice Can Increase Customer Loyalty
- Implementing Research Results
- Guidelines for the New Horizons Foundation
- Investigating Interoperability Initiatives
- The Impact of an SMWIA Merger or Consolidation
- Attracting the Millennium Generation to the Sheet Metal and HVAC Industries

- Improving Profit Margins Through Comprehensive Identification, Evaluation and Mitigation of Contract Risk Factors
- Lean Production Principles
- Procurement Chain Management in the Construction Industry
- Quantification of the Effects of Schedule Compression on Labor Productivity
- Quantifying the Cumulative Impact of Change Orders on Sheet Metal Contractors
- The Future of Union Sheet Metal Construction
- Tool and Material Control Systems

In conclusion an analogy that one member applies to SMACNA, and I don't know if Forrest Gump influenced this contractor, but he describes SMACNA as a box of candy just loaded with goodies. But if you never pick any of the goodies out and eat them, they simply remain in the box unused. The same is true of the products and services in the "*SMACNA box.*" They only take on value when they are used. The products and services exist and are waiting for you to make use of them. The ultimate value of membership is directly related to involvement. While some benefits accrue to contractors simply by becoming a SMACNA member, the greatest and most rewarding benefit results from the contractor's involvement and participation both locally and nationally.

Exhibit F

Exhibit F

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About SMACNA

SMACNA's mission is to provide products, services, and representation to enhance members' businesses, markets, and profitability.

Located in headquarters outside Washington, D.C., the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), an international association of union contractors, has 1,834 members in 103 chapters throughout the United States, Canada, Australia and Brazil.

Member Profile

SMACNA members perform work in industrial, commercial, institutional and residential markets. They specialize in heating, ventilating and air conditioning; architectural sheet metal; industrial sheet metal; kitchen equipment; specialty stainless steel work; manufacturing; siding and decking; testing and balancing; service; and energy management and maintenance.

Technical Manuals and Standards

The voluntary technical standards and manuals developed by SMACNA Contractors have found worldwide acceptance by the construction community, as well as foreign government agencies. ANSI, the American National Standards Institute, has accredited SMACNA as a standards-setting organization. SMACNA does not seek to enforce its standards or provide accreditation for compliance.

SMACNA standards and manuals address all facets of the sheet metal industry, from duct construction and installation to air pollution control, from energy recovery to roofing. SMACNA's Technical Resources Department fields several thousand technical questions annually from architects, engineers, manufacturers and government personnel.

More than 17,000 orders for SMACNA technical manuals are processed and shipped each year from SMACNA national headquarters. This translates into sales of more than 50,000 technical manuals, generating approximately \$1 million in income for the association.

Member Services

The association offers contractors professional assistance in labor relations, legislative assistance, research and technical standards development, safety, marketing, business management and industry issues.

Member Benefits

A list of SMACNA Membership Benefits are available at: www.smacna.org/pdf/about/membership_benefits.pdf.

SMACNA Partners

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Exhibit G

Exhibit G

BUILDING CODE UPDATE

In December of 1994, the International Code Council (ICC) was established to develop a single set of comprehensive and coordinated national codes. This action followed years of effort to coordinate the codes of the ICC Founders.

The ICC Founders – The Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), and the Southern Building Code Congress International (SBCCI) whose codes dominate in the U.S., created the ICC in response to technical disparities among the three sets of model codes now in use in the U.S. and to the strong national interest for a single set of codes.

The ICC Family of Codes available for adoption include: International Building Code; International Energy Conservation Code; International Electrical Code; International Fuel Code; International Mechanical Code; International Fire Code; International Plumbing Code; International Private Sewage Disposal Code; International Property Maintenance Code; International Residential Code; International Zoning Code. The ICC Family of Codes is expected to be adopted in the jurisdictions based on BOCA, ICBO and SBCCI since those organizations have stopped producing new editions of their separate codes (see attached chart). While they are not perfect, they have removed many of the restrictive provisions found in the previous regional codes.

The ICC Codes benefit SMACNA members & building industry professionals by now assisting them to move into different regions within the U.S. and international environment with a single set of model codes. SMACNA's participation in the ICC code setting process ensured that the SMACNA Standards currently utilized in the HVAC industry would be included as the basis for duct construction. After the three model code organizations united to form the ICC and provided the first and only complete set of building codes for the country, the Department of Defense (DoD) recognized the enormous benefits this simplification could provide to military construction and is working to build its criteria, standards, and guide specifications around commercially developed consensus codes, and bring its design practices more in line with those of the private sector.

The ICC has also been pursuing with the National Fire Protection Association (NFPA) support for and participation in the ICC Family of Codes. However, the NFPA has embarked on development of their own national code family (NFPA 5000 Building Code) with support from the International Association of Plumbing and Mechanical Officials (IAPMO) and the Western Fire Chiefs Association (WFCA).

SMACNA has long been involved on NFPA Technical Committees. As both a standards setting organization and an organization that represents firms that must comply with codes, we have supported the establishment of a single building code for years.

SMACNA's support is for a single set of model codes with all relevant code organizations participating in that effort. We believe that by participating in both the ICC and NFPA 5000 Building Code process that we again see the formation of a final product of standards that will serve to enhance the public's confidence in building code officials and keep this nation's competitive edge in the evolving global market.

While SMACNA continues to work with both code organizations in their efforts to reconcile their standards we will continue to support the ICC Family of Codes.

International Codes - Adoption by State

Revised on 02/11/03

A= Adopted, but may not yet be effective X= Effective Statewide L = Adopted by Local Governments

	IBC	ICCEC	IECC	IFC	IFGC	IMC	IPC	IPMC	IRC	IPSDC	IZC	IPCBF	IUWIC	Comments
Alabama	L	L	L	L	L	A	L	L	L	L	L	L		Effective January 2003
Alaska	X			X	L	X	L		L					
Arizona	X*	L	X	L	L	L	L	L	L					* State Department Health has adopted for Hospitals
Arkansas	X			X					X					
California														
Colorado	L*	L	L	L*	L	L	L	L	L	L	L			* Colorado Division of Fire Safety
Connecticut						X	X							
Delaware	L				L	L	X	L	L					
District of Columbia						X	X							
Florida					X	X	X							
Georgia	X		X	X	X	X	X		X					
Hawaii														
Idaho	X		X	X		X			X					
Illinois	L	L	L	L	L	L	L	L	L	L	L			
Indiana						X			X					
Iowa	L	L	L	L	L	L	L	L	L	L	L			
Kansas	X*		L	L	L	L	L	L	L	L				* IBC acceptable for state except for school construction
Kentucky	X							L	X					
Louisiana														
Maine	L	L	L	L	L	L	L	L	L	L	L			
Maryland	X		L		L	L	L		X					
Massachusetts	A					A			A					
Michigan	X	X	X	L	X	X	X	X	X	X	X			
Minnesota														
Mississippi	L		L	L	L	L	L	L	L	L				
Missouri	L	L	L	L	L	X*	X*	L	L	L				*State buildings only
Montana	X								X					
Nebraska	L	L	L	L	L	L	L	L	L	L	L			
Nevada	L			L	L	L	L	L	L					
New Hampshire	X		X	L	L	X	X		L					
New Jersey					X	X								
New Mexico	L				L	L	L	L	L					
New York	X		X	X	X	X	X	X	X					
North Carolina	X		X	X	X	X	X		X					
North Dakota	X			L	X	X		L	X					
Ohio	X			L	X	X	X	L	L					
Oklahoma	L	L	L	L	X	X	X	X	X*	L	L			*Mechanical provisions only
Oregon						X								
Pennsylvania	A	A	A	L	A	A	A	L	A					
Rhode Island	X*		X		X	X	X		X					*IBC used for Rehab Code
South Carolina	X		X	X	X	X	X	L	X	L				
South Dakota	X*		L		L	L		L	L					Municipalities may adopt either 97 UBC or 2000 IBC
Tennessee	L		L	L	L	L	X	L	L					
Texas	L	L	X*	L	L	X*	X*	L	X	L	L			*IECC, IMC, IPC acceptable for local adoption.
Utah	X		X	X	X	X	X		X					
Vermont														
Virginia					X	X	X							
Washington													L	
West Virginia								L						
Wisconsin	X		X		X	X								
Wyoming	L	L		L	L	L	L	L	L					
Puerto Rico							X							

Notes: Abbreviations stand for the International Building Code (IBC), ICC Electrical Code (ICCEC), International Energy Conservation Code (IECC), International Fire Code (IFC), International Property Maintenance Code (IPMC), International Fuel Gas Code (IFGC), International Mechanical Code (IMC), International Plumbing Code (IPC), International Code (IPMC), International Residential Code (IRC), International Private Sewage Disposal Code (IPSDC), International Zoning Code (IZC), International Performance Code for Buildings and Facilities, and International Urban-Wildland Interface Code (IUWIC).

Exhibit H

Exhibit H

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Technical Papers/Guidelines

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In order to view these documents, the Adobe Acrobat reader needs to be installed on this machine. Click on the logo at left to download a free Adobe Acrobat reader.

Compressed files containing the 570 individual Symbols found in the SMACNA CAD Standard, 2nd edition, are available for download. One contains the full set of Symbols in DWG format, mainly for use by AutoCAD® systems; and the other, in DXF format suitable for use by all other drafting systems.

In addition to the symbol files the SMACNA CAD Standard, located further down on this page, must also be downloaded for a complete description and listing of the symbols package.

[SMACNA CAD Symbols - DWG Format](#)

[SMACNA CAD Symbols - DXF Format](#)

[Air Duct Leakage HVAC 2011 Technical Paper \(PDF file\)](#)

SMACNA published the HVAC Air Duct Leakage Test Manual in conjunction with the SMACNA HVAC Duct Construction Standards. Research proved that duct leakage could be well defined as a function of the static pressure and the surface area of the duct. This allowed for the introduction of leakage classes that could be used to calculate and accurately represent the leakage of air from ducts of various sizes and configurations.

[Architectural Fascia and Coping Wind Tests Report \(PDF file\)](#)

SMACNA's Technical Resources Committee, with the guidance of the Architectural Sheet Metal Council Steering Committee, conducted wind testing of custom-fabricated gravel stop fascia and coping designs shown within the SMACNA Architectural Sheet Metal Manual. This report has been updated with copper results (MAY 2009).

[Building Code Update \(PDF file\)](#)

This technical paper reviews the Model Building Code process of the International Code Council (ICC) and National Fire Protection Association (NFPA) Building 5000 Code and addresses SMACNA National's position with regards to the efforts of the code community to develop a single set of comprehensive and coordinated national codes. SMACNA National has long been involved in the code setting process to ensure that the SMACNA Standards currently utilized by the HVAC industry would be included as the basis for duct construction.

[Custom Fabricated Sheet Metal Test Report \(PDF file\)](#)

Achieving uniqueness in building construction should start at the top. When choosing a roofing style, many architects choose custom fabricated metal roofs. SMACNA's Custom Fabricated Sheet Metal Roof Test Report describes the performance of the double lock standing seam and batten seam metal roof conforming to the SMACNA Architectural Sheet Metal Manual. Members are encouraged to provide copies of this paper to building owners and architects, so

that all parties gain a better understanding as to the performance of custom metal roofing.

SMACNA

Partners

Duct Cleanliness for New Construction Guidelines (PDF file)

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This guideline is intended to help the commercial duct installation contractor, design engineers and building owners to become more familiar with guidelines to control and reduce contamination during duct installation, and to provide reasonable installation recommendations that can be implemented to meet these goals.

Created by **Matrix Group International, Inc.** ©

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Effects of Imposing A Universal Requirement of G-60 and/or G-90 Coating For A (PDF file)

This technical paper reviews the HVAC Duct Construction Standards, 2nd edition, 1995, specifications and requirements for zinc coating on galvanized steel ducts. Paragraph and page references from the HVAC-DCS manual are provided along with the text. Commentary in the form of italicized text has been added to clarify the meaning, scope or intent of the manual. In addition the paper reviews zinc coating thickness variations, as commonly used in trade practice, for sheet, reinforcements, tie rods and fasteners. Also included in the paper are the burdensome effects of imposing a universal requirement of G-60 and/or G-90 coating for all components. Wide distribution of this technical paper in the construction community is encouraged.

ERRATA for HVAC Duct Construction Standards, 3rd Edition 2005 (PDF file)

This technical paper contains ERRATA for the HVAC Duct Construction Standards, Third Edition 2005. The corrections are noted in shading for those cells in the tables affected. Please download and include this listing of corrections with your copy of the manual and reference it as needed.

ERRATA for the Task Force Page in HVAC Duct Construction Standards, 3rd Edition 2005 (PDF file)

This file replaces the current Task Force page in the HVAC Duct Construction Standards – Metal and Flexible, Third Edition. Due to a printing error some of the former committee members were incorrectly identified.

ERRATA, Guide for Steel Stack Construction, 2nd Edition 1996 (PDF file)

This technical paper contains ERRATA for the Guide for Steel Stack Construction, Second Edition 1996. Please download and include this listing of changes/corrections with your copy of the manual and reference it as needed.

ERRATA, Rectangular Industrial Duct Construction Standards (PDF file)

This technical paper contains ERRATA for the Rectangular Industrial Duct Construction Standards, Second Edition 2004. Please download and include this listing of changes with your copy of the manual and reference it as needed.

HVAC Duct Sealant Usage Requirements on USGBC LEED® Projects - UPDATE (PDF file)

The following bulletin is an update to TRB #4-09 issued March 27, 2009 with the Subject: HVAC Duct Sealant Usage Requirements on USGBC LEED® Projects. In response to the following Credit Interpretation Request (CIR): "How does a project team classify duct sealants for application under EQc4.1?" the USGBC issued the following ruling: "Project teams may classify duct sealants under "Other", as listed in the SCAQMD VOC Limits table."

ICC/International Code Adoption (PDF file)

This file is an updated (2012) International Code Council (ICC) State Adoption of the I-Codes. SMACNA National has long been involved in the code setting process to ensure that the SMACNA Standards currently being utilized would be included into the Model Building Codes. SMACNA will continue our work with the Model Building Codes and provide future updates concerning code adoptions.

Improper Fire Damper Installation (PDF file)

SMACNA is being increasingly advised that contractors are being required to provide elements of fire damper and combination fire/smoke damper installations which are both unnecessary and not allowed. Specifically we refer to requirements to seal the retaining angles to the wall/floor fire rated assembly and to other directives to fill the expansion space with materials such as mineral wool, ceramic fiber or firestopping caulks. This paper will address these issues individually and clarify these requirements in light of standard installation procedures as required by damper manufacturers. Contractors are encouraged to provide copies of this paper to building owners, architects, engineers and code officials so that all parties gain a better understanding as to the proper and approved methods of fire damper installation.

New Test Standards for Fire, Smoke and Combination Fire/Smoke Dampers (PDF file)

On July 1, 2002, damper manufacturers will be required to provide fire, smoke and combination fire/smoke dampers that are tested to new Underwriters Laboratories (UL) testing requirements. A description and summary of these new test standards and some possible issues resulting from these standards is given in this paper.

SMACNA CAD Standard (PDF file)

As an organization with contributing members on the National CAD Standard (NCS) Committee, SMACNA is committed to improving electronic communication between members of the architect/engineer/contractor (AEC) community, and the overall quality of construction. The "SMACNA CAD Standard," second edition, 2001, articulates in greater detail the CAD standards that will enable SMACNA Contractors, and other members of the AEC community to apply CAD effectively to mechanical, fire protection, and plumbing design and construction. Additionally, the CAD Project Protocol and checklist included as appendices help contractors work in greater harmony with all members of the construction project team and avoid some of the pitfalls that can surprise even the experienced CAD user.

SMACNA Master Index of Technical Publications (PDF file)

The Master Index provides contractors, design professionals, and code officials with a centralized resource of SMACNA technical documents. The index includes key words or phrases from all SMACNA technical standards, manuals and guides.

Technical Guideline on Through Penetration Firestopping (PDF file)

This paper was prepared in response to increasing concerns and lack of understanding of this issue by designers, code officials and contractors. The requirements of the Model Code groups have been identified and the responsibilities of architects, engineers/designers, code officials and contractors have been outlined. The use of this paper will assist contractors in those situations where they are being forced to provide products, which are not adequately specified and detailed on the project plans and specifications and, which were not included in contractors' estimates for the project. This guideline is intended to be a generic educational tool for use by all parties to the construction process. We encourage all members to provide copies of this paper to building owners, architects, engineers and code officials so that all parties gain an understanding as to the requirements of the codes, their respective responsibilities and the technical complexity and costs associated with this issue.

Exhibit I

Exhibit I

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ANSI Approves SMACNA's Round Industrial Duct Construction Standards as a National Standard

For more information, contact:
Rosalind P. Raymond
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703/803-2998

[Send to a friend](#)

CHANTILLY, Va. – The American National Standards Institute (ANSI) announced that the Sheet Metal and Air Conditioning Contractors' National Association's (SMACNA) "Round Industrial Duct Construction Standards," second edition, has been approved as an American National Standard.

ANSI recognition increases the potential that SMACNA's standards are internationally adopted for industry and regulatory use. The approval will also encourage wider domestic use of SMACNA's standard by state- and local-code governing bodies as well as the design and engineering community. The new ANSI status will also enhance SMACNA's overall credibility as a standards-developing organization, both domestically and internationally.

The 642-page "Round Industrial Duct Construction Standards" offers a standardized, engineered basis for design and construction of industrial ducts of Classes 1 to 5. It includes a spiral duct chapter for Classes 1 and 2 and covers design pressures ranging from 30 inch water gauge negative to 50 inch water gauge positive, plus carbon and galvanized steel tables. Also included are expanded tables for stainless steel and aluminum, plus expanded tables for duct sizes up to 96 inches in diameter, introduction of a new Duct Class 5 for systems handling corrosives, and spiral lockseam pipe. As alternatives to using tables, the publication has a manual calculation procedure using equations and fully developed examples, and offers optional calculation software.

Architects and engineers may purchase the publication at the discounted price of \$177 for the book, \$212 for the CD-ROM and \$177 for the PDF download. The list price for the book is \$246, \$295 for the CD-ROM and \$246 for the PDF download.

To order, visit www.smacna.org/bookstore/ or call SMACNA's Publications Department at (703) 803-2989.

ANSI does not develop American National Standards. It facilitates standard development by assuring that consensus is established among qualified and affected interest groups. The Institute ensures that the guiding principles of consensus, due process and openness are adhered to by organizations developing standards under its review to provide a coherent U.S. standards strategy.

SMACNA, an international trade association representing 4,500 contributing contractor firms, is dedicated to promoting quality and excellence in the sheet metal and air conditioning industry. SMACNA has national offices in Chantilly, Va., outside of Washington, D.C., as well as on Capitol Hill.

SMACNA Partners

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Exhibit J

Exhibit J

DEPARTMENT OF ENERGY

Office of Energy Efficiency and
Renewable Energy

10 CFR Parts 434 and 435

[Docket No. EE-RM-79-112-C]

RIN 1904-AA69

Energy Code for New Federal
Commercial and Multi-Family High
Rise Residential BuildingsAGENCY: Office of Energy Efficiency and
Renewable Energy, DOE.

ACTION: Final rule.

SUMMARY: The Department of Energy today issues a rule that establishes building energy efficiency standards for new Federal commercial and multi-family high rise residential buildings pursuant to the requirements of the Energy Conservation and Production Act (ECPA). The final rule revises the current interim Federal standards to conform generally with the format of the current voluntary building energy codes. The final rule contains substantive changes from the interim rule in the areas of lighting, mechanical ventilation, motors, building envelopes, fenestration rating test procedures, and test procedures for heating and cooling equipment.

DATES: Effective Date: This regulation is effective October 8, 2001. The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of October 8, 2001.

FOR FURTHER INFORMATION CONTACT:

Ronald B. Majette, Office of Codes and Standards, EE-43, U.S. Department of Energy, Room 1J-018, 1000 Independence Avenue, SW., Washington, DC 20585-0121, Tel: 202-586-0517

Francine B. Pinto, Office of General Counsel, GC-72, U.S. Department of Energy, Room 6E-042, 1000 Independence Avenue, SW., Washington, DC 20585-0103, Tel: 202-586-7432

SUPPLEMENTARY INFORMATION:

I. Introduction

- A. Authority
- B. Background
- C. Description of the Final Rule

II. Discussion of Comments and Changes to the Proposed Rule

- A. General Comments
 - 1. Incorporation by reference
 - 2. Metric Units of Measurement
- B. Section-by-Section Comments
 - 1. Compliance, Subpart A, Section 102

- 2. Default Values for Unlabeled Fenestration Products, Subpart D, Section 402
- 3. Solar Heat Gain and Shading Coefficients, Subpart D, Section 201 and 402
- 4. Interior Lighting Power Allowances, Subpart D, Section 401
- 5. Task Lighting Footnote, Subpart D, Section 401
- 6. Ventilation Requirements for Enclosed Parking Garages, Subpart D, Section 403
- 7. Thermal Efficiency Requirements for Furnaces and Boilers, Subpart D, Section 403
- 8. Integrated Part Load Values for Cooling Equipment Efficiency, Subpart D, Section 403
- 9. Two-Tiered Code, Subpart D, Section 403
- 10. Equipment Absorption Cooling Requirements, Subpart D, Section 403
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- K. National Technology Transfer and Advancement Act

I. Introduction

A. Authority

Section 305(a)(1) of the Energy Conservation and Production Act, as amended (ECPA), 42 U.S.C. 6834(a)(1), requires the Department of Energy ("Department" or "DOE") to establish by rule energy standards for new Federal buildings. In developing this final rule, the Department is directed to consult with other Federal agencies as well as

private and State associations and other appropriate persons.

Section 305(a)(1) requires that the rule contain energy efficiency measures that are technologically feasible and economically justified. Since ECPA establishes that the new standards meet, at a minimum, the requirements of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)/Illuminating Engineering Society of North America (IESNA) Standard 90.1-1989 (hereinafter Standard 90.1-1989) (Section 305(a)(2)(A), the Department is not required to establish the technological feasibility and economic justification for these minimum statutorily prescribed requirements (otherwise referred to as the "statutory baseline"). The Department is interpreting this minimum requirement to include those addenda to Standard 90.1-1989 which were in effect at the time the Energy Policy Act of 1992 (EPACT), which amended ECPA, was enacted. Since these addenda were part of Standard 90.1-1989 at the time EPACT was enacted, they are part of the baseline against which the final rule is compared for the purposes of assessing its energy and economic impacts.

Section 305(a)(2)(A) requires that the rule contain energy saving and renewable energy specifications that meet or exceed the energy saving and renewable energy specifications of Standard 90.1-1989 for commercial buildings and of the Model Energy Code (MEC), 1992, for residential buildings. MEC 1992 exempts multi-family high-rise residential buildings (over three stories in height above ground) which comply with Standard 90.1-1989. As a result, Standard 90.1-1989 is the applicable standard under section 305 of ECPA for high-rise residential buildings. The final rule complies with section 305(a)(2)(A).

The rule issued today is required to become effective no later than one year after it is issued. (Section 305(a)(1)). The effective date is October 8, 2001.

Section 305(a)(2)(B) requires that to the extent practicable, the new Federal building energy standards use the same format as the appropriate voluntary building energy code. The final rule revises the current interim Federal standards to conform generally with the format and language of the codified version of Standard 90.1-1989. The addenda to Standard 90.1-1989 included in the final rule are also generally incorporated in their codified form.

Section 305(a)(2)(C) further requires that the final rule be established in consultation with the Environmental

TABLE 403.2.9.1.—MINIMUM PIPE INSULATION (IN.)^a

Fluid Design Operating Temp. Range (F)	Insulation conductivity ^a		Nominal pipe diameter (in.)				
	Conductivity Range Btu in./ (h ft ² F)	Mean Temp. F	<1.0	1.0 to 1.25	1.5 to 3.0	4.0 to 6.0	8.0
Heating systems (Steam, Steam Condensate, and Hot Water)^{b, c}							
>350	0.32–0.34	250	1.0	1.5	1.5	2.0	2.5
251–350	0.29–0.32	200	1.0	1.0	1.5	2.0	2.0
201–250	0.27–0.30	150	1.0	1.0	1.0	1.5	1.5
141–200	0.25–0.29	125	1.0	1.0	1.0	1.5	1.5
105–140	0.22–0.28	100	0.5	0.5	0.75	1.0	1.0
Domestic and Service Hot Water Systems							
105 and Greater	0.22–0.28	100	0.5	0.5	0.75	1.0	1.0
Cooling Systems (Chilled Water, Brine, and Refrigerant)^d							
40–55	0.22–0.28	100	0.5	0.5	0.5	0.5	0.5
Below 40	0.22–0.28	100	0.5	0.5	0.5	0.5	0.5

^aFor insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows: $T=r\{1+t/r\}^{k/k-1}$
 Where T = minimum insulation thickness (in), r = actual outside radius of pipe (in), t = insulation thickness listed in this table for applicable fluid temperature and pipe size, K = conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu in/ h ft² F); and k = the upper value of the conductivity range listed in this table for the applicable fluid temperature.
^bThese thicknesses are based on energy efficiency considerations only. Safety issues, such as insulation surface temperatures, have not been considered.
^cPiping insulation is not required between the control valve and coil on run-outs when the control valve is located within four feet of the coil and the pipe diameter is 1 inch or less.
^dNote that the required minimum thickness does not take water vapor transmission and possible surface condensation into account.

TABLE 403.2.9.2.—MINIMUM DUCT INSULATION R-VALUE^a

Duct location	Cooling supply ducts				Heating supply ducts				Return ducts
	CDD65 ≤500	500< CDD65 ≤1,000	1,000< CDD65 ≤2,000	CDD65 ≥2,000	HDD65 ≤1,500	1,500< HDD65 ≤4,500	4,500< HDD65 ≤7,500	HDD65 ≥7,500	
Exterior of Building	R-3.3 ..	R-5.0 ..	R-6.5	R-8.0 ..	R-3.3 ..	R-5.0	R-6.5	R-8.0 ..	R-5.0
Ventilated Attic	R-3.3 ..	R-3.3 ..	R-3.3	R-5.0 ..	R-5.0 ..	R-5.0	R-5.0	R-5.0 ..	R-3.3
Unvented Attic	R-5.0 ..	R-5.0 ..	R-5.0	R-5.0 ..	R-5.0 ..	R-5.0	R-5.0	R-5.0 ..	R-3.3
Other Conditioned Spaces ^b	R-3.3 ..	R-3.3 ..	R-3.3	R-3.3 ..	R-3.3 ..	R-3.3	R-3.3	R-3.3 ..	R-3.3
Indirectly Conditioned Spaces ^c	none ...	R-3.3 ..	R-3.3	R-3.3 ..	R-3.3 ..	R-3.3	R-3.3	R-3.3 ..	none
Buried	none ...	none ...	none ...	none ...	R-5.0 ..	R-5.0	R-5.0	R-5.0 ..	R-3.3

^aInsulation R-values, measured in (h.ft².°F)/Btu, are for the insulation as installed and do not include film resistance. The required minimum thickness do not consider water vapor transmission and possible surface condensation. The required minimum thicknesses do not consider water vapor transmission and condensation. For ducts that are designed to convey both heated and cooled air, duct insulation shall be as required by the most restrictive condition. Where exterior walls are used as plenum walls, wall insulation shall be as required by the most restrictive condition of this section or subsection 402. Insulation resistance measured on a horizontal plane in accordance with RS-6 (incorporated by reference, see § 434.701) at a mean temperature of 75 °F. RS-6 is incorporated by reference at § 434.701.
^bIncludes crawl spaces, both ventilated and non-ventilated.
^cIncludes return air plenums, with and without exposed roofs above.

403.2.9.2 Duct and Plenum Insulation. All supply and return air ducts and plenums installed as part of an HVAC air distribution system shall be thermally insulated in accordance with Table 403.2.9.1. Exceptions are as follows:

- (a) Factory-installed plenums, casings, or ductwork furnished as a part of the HVAC equipment tested and rated in accordance with subsection 403.1
- (b) Ducts within the conditioned space that they serve. (incorporated by reference, see § 434.701)ca a06oc0.186

403.2.9.3 Duct and Plenum Construction. All air-handling ductwork and plenums shall be constructed and

erected in accordance with RS-34, RS-35, and RS-36 (incorporated by reference, see § 434.701). Where supply ductwork and plenums designed to operate at static pressures from 0.25 in. wc to 2 in. wc, inclusive, are located outside of the conditioned space or in return plenums, joints shall be sealed in accordance with Seal Class C as defined in RS-34 (incorporated by reference, see § 434.701). Pressure sensitive tape shall not be used as the primary sealant where such ducts are designed to operate at static pressures of 1 in. wc, or greater.

403.2.9.3.1 Ductwork designed to operate at static pressures in excess of

3 in. wc shall be leak-tested in accordance with Section 5 of RS-35, (incorporated by reference, see § 434.701), or equivalent. Test reports shall be provided in accordance with Section 6 of RS-35, (incorporated by reference, see § 434.701)m or equivalent. The tested duct leakage class at a test pressure equal to the design duct pressure class rating shall be equal to or less than leakage Class 6 as defined in Section 4.1 of RS-35 (incorporated by reference, see § 434.701). Representative sections totaling at least 25% of the total installed duct area for the designated pressure class shall be tested.

403.2.10 Completion.

Exhibit K

Exhibit K

**DEPARTMENT OF ENERGY****Office of Energy Efficiency and Renewable Energy**

10 CFR Parts 434 and 435

[Docket No. EE-RM-79-112-C]

RIN 1904-AA69

Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings

AGENCY: Office of Energy Efficiency and Renewable Energy, DOE.

ACTION: Final rule.

SUMMARY: The Department of Energy today issues a rule that establishes building energy efficiency standards for new Federal commercial and multi-family high rise residential buildings pursuant to the requirements of the Energy Conservation and Production Act (ECPA). The final rule revises the current interim Federal standards to conform generally with the format of the current voluntary building energy codes. The final rule contains substantive changes from the interim rule in the areas of lighting, mechanical ventilation, motors, building envelopes, fenestration rating test procedures, and test procedures for heating and cooling equipment.

DATES: *Effective Date:* This regulation is effective October 8, 2001. The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of October 8, 2001.

FOR FURTHER INFORMATION CONTACT:

Ronald B. Majette, Office of Codes and Standards, EE-43, U.S. Department of Energy, Room 1J-018, 1000 Independence Avenue, SW., Washington, DC 20585-0121, Tel: 202-586-0517

Francine B. Pinto, Office of General Counsel, GC-72, U.S. Department of Energy, Room 6E-042, 1000 Independence Avenue, SW., Washington, DC 20585-0103, Tel: 202-586-7432

SUPPLEMENTARY INFORMATION:

- I. Introduction
 - A. Authority
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 - C. Description of the Final Rule
- II. Discussion of Comments and Changes to the Proposed Rule
 - A. General Comments
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 2. Metric Units of Measurement
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2. Default Values for Unlabeled Fenestration Products, Subpart D, Section 402
3. Solar Heat Gain and Shading Coefficients, Subpart D, Section 201 and 402
4. Interior Lighting Power Allowances, Subpart D, Section 401
5. Task Lighting Footnote, Subpart D, Section 401
6. Ventilation Requirements for Enclosed Parking Garages, Subpart D, Section 403
7. Thermal Efficiency Requirements for Furnaces and Boilers, Subpart D, Section 403
8. Integrated Part Load Values for Cooling Equipment Efficiency, Subpart D, Section 403
9. Two-Tiered Code, Subpart D, Section 403
10. Equipment Absorption Cooling Requirements, Subpart D, Section 403
11. Heat Pump Supplementary Heat Operation, Subpart D, Section 403
12. Combined Water and Space Heating, Subpart D, Section 404
13. Lavatory Water Temperature, Subpart D, Section 404
14. Shower Heads and Lavatory Faucets, Subpart D, Section 404
15. Equipment for Prototype or Reference Buildings, Subpart E, Section 518
16. Determination of Energy Cost Budget (ECB), Subpart E, Section 501
17. Conversion Factors for Electricity, Subpart F, Section 601, 602
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 - A. Review Under Executive Order 13132, Federalism
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 - F. Paperwork Reduction Act Review
 - G. Review Under the Unfunded Mandates Reform Act of 1995
 - H. Review Under Section 32 of the Federal Energy Administration Act of 1974
 - I. "Takings" Assessment Review
 - J. Congressional Notification
 - K. National Technology Transfer and Advancement Act

I. Introduction**A. Authority**

Section 305(a)(1) of the Energy Conservation and Production Act, as amended (ECPA), 42 U.S.C. 6834(a)(1), requires the Department of Energy ("Department" or "DOE") to establish by rule energy standards for new Federal buildings. In developing this final rule, the Department is directed to consult with other Federal agencies as well as

private and State associations and other appropriate persons.

Section 305(a)(1) requires that the rule contain energy efficiency measures that are technologically feasible and economically justified. Since ECPA establishes that the new standards meet, at a minimum, the requirements of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)/Illuminating Engineering Society of North America (IESNA) Standard 90.1-1989 (hereinafter Standard 90.1-1989) (Section 305(a)(2)(A)), the Department is not required to establish the technological feasibility and economic justification for these minimum statutorily prescribed requirements (otherwise referred to as the "statutory baseline"). The Department is interpreting this minimum requirement to include those addenda to Standard 90.1-1989 which were in effect at the time the Energy Policy Act of 1992 (EPACT), which amended ECPA, was enacted. Since these addenda were part of Standard 90.1-1989 at the time EPACT was enacted, they are part of the baseline against which the final rule is compared for the purposes of assessing its energy and economic impacts.

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The rule issued today is required to become effective no later than one year after it is issued. (Section 305(a)(1)). The effective date is October 8, 2001.

Section 305(a)(2)(B) requires that to the extent practicable, the new Federal building energy standards use the same format as the appropriate voluntary building energy code. The final rule revises the current interim Federal standards to conform generally with the format and language of the codified version of Standard 90.1-1989. The addenda to Standard 90.1-1989 included in the final rule are also generally incorporated in their codified form.

Section 305(a)(2)(C) further requires that the final rule be established in consultation with the Environmental

by considering the energy cost and other costs and cost savings that occur during the expected economic life of the alternative.

603.2.2 The designer shall use the procedures set forth in subpart A of 10 CFR part 436 to make this determination. The fuel selection life cycle cost analysis shall include the following steps:

603.2.2.1 Determine the feasible alternatives for energy sources of the Proposed Design's HVAC systems, service hot water, and process loads.

603.2.2.2 Model the Proposed Design including the alternative HVAC and service water systems and conduct an annual energy analysis for each fuel source alternative using the simulation tool specified in this section. The annual energy analysis shall be computed on a monthly basis in

conformance with subpart E with the exception that all process loads shall be included in the calculation. Separate the output of the analysis by fuel type.

603.2.2.3 Determine the unit price of each fuel using information from the utility or other reliable local source. During rapid changes in fuel prices it is recommended that an average fuel price for the previous twelve months be used in lieu of the current price. Calculate the annual energy cost of each energy source alternative in accordance with procedures in subpart E for the Design Energy Cost. Estimate the initial cost of the HVAC and service water systems and other initial costs such as energy distribution lines and service connection fees associated with each fuel source alternative. Estimate other costs and benefits for each alternative including, but not necessarily limited

to, annual maintenance and repair, periodic and one time major repairs and replacements and salvage of the energy and service water systems. Cost estimates shall be prepared using professionally recognized cost estimating tools, guides and techniques.

603.2.2.4 Perform a life cycle cost analysis using the procedure specified in subsection 603.2.

603.2.2.5 Compare the total life cycle cost of each energy source alternative. The alternative with the lowest total life cycle cost shall be chosen as the energy source for the proposed design.

§ 434.604 Compliance.

604.1 Compliance with this section is demonstrated if the Design Energy Use is equal to or less than the Energy Use Budget.

$$DEU < EUB \quad \text{Equation 604.1}$$

604.2 The energy consumption shall be measured at the building five foot line for all fuels. Energy consumed from non-depletable energy sources and heat recovery systems shall not be included in the Design Energy Use calculations. The thermal efficiency of fixtures, equipment, systems or plants in the proposed design shall be simulated by the selected calculation tool.

§ 434.605 Standard Calculation Procedure.

605.1 The Standard Calculation Procedure consists of methods and assumptions for calculating the Energy Use Budgets for Prototype and Reference Buildings and the Energy Use for the Proposed Design. In order to maintain consistency between the Energy Use Budgets and the Design Energy Use, the input assumptions stated in subsection 510.2 are to be used.

605.2 The terms Energy Cost Budget and Design Energy Cost or Design Energy Consumption used in subpart E of this part correlate to Energy Use Budget and Design Energy Use, respectively, in subpart F of this part.

§ 434.606 Simulation tool.

606.1 The criteria established in subsection 521 for the selection of a simulation tool shall be followed when using the compliance path prescribed in subpart F of this part.

§ 434.607 Life cycle cost analysis criteria.

607.1 The following life cycle cost criteria applies to the fuel selection

requirements of this subpart and to option life cycle cost analyses performed to evaluate energy conservation design alternatives. The fuel source(s) selection shall be made in accordance with the requirements of subpart A of 10 CFR part 436. When performing optional life cycle cost analyses of energy conservation opportunities the designer may use the life cycle cost procedures of subpart A of 10 CFR part 436 or OMB Circular 1-94 or an equivalent procedure that meets the assumptions listed below:

607.1.1 The economic life of the Prototype Building and Proposed Design shall be 25 years. Anticipated replacements or renovations of energy related features and systems in the Prototype or Reference Building and Proposed Design during this period shall be included in their respective life cycle cost calculations.

607.1.2 The designer shall follow established professional cost estimating practices when determining the costs and benefits associated with the energy related features of the Prototype or Reference Building and Proposed Design.

607.1.3 All costs shall be expressed in current dollars. General inflation shall be disregarded. Differential escalation of prices (prices estimated to rise faster or slower than general inflation) for energy used in the life cycle cost calculations shall be those in effect at the time of the latest "Annual Energy Outlook" (DOE/EIA-0383) as

published by the Department of Energy's Energy Information Administration.

607.1.4 The economic effects of taxes, depreciation and other factors not consistent with the practices of subpart A of 10 CFR part 436 shall not be included in the life cycle cost calculation.

Subpart G—Reference Standards

§ 434.701 General.

701.1 *General.* The standards, technical handbooks, papers, regulations, and portions thereof, that are referred to in the sections and subsections in the following list are hereby incorporated by reference into this part 434. The following standards have been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 522(a) and 1 CFR part 51. A notice of any change in these materials will be published in the Federal Register. The standards incorporated by reference are available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC and the U.S. Department of Energy, Office of Energy Efficiency, Hearings and Dockets, Forrestal Building, 1000 Independence Avenue SW, Washington, DC 20585. The standards may be purchased at the addresses listed at the end of each standard. The following standards are incorporated by reference in this part:

Ref. No.	Standard designation	CFR section
RS-1	ANSI/ASHRAE/IESNA 90.1-1989, Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings, and Addenda 90.1b-1992, 90.1c-1993, 90.1d-1992, 90.1e-1992, 90.1f-1995, 90.1g-1993, 90.1i-1993, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ASHRAE 1791 Tullie Circle NE, Atlanta, GA 30329.	434.301.1; 434.402.1.2.4; 434.402.4.2; 434.403.2.1.
RS-2	ANSI/ASHRAE 55-1992 including addenda 55a-1995, Thermal Environmental Conditions for Human Occupancy, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1791 Tullie Circle NE, Atlanta, GA 30329.	434.301.2; 434.519.1.1.
RS-3	NEMA MG1-1993, "Motors and Generators," Revision No. 1, December 7, 1993, National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.	434.401.2.1.
RS-4	ASHRAE, Handbook, 1993 Fundamentals Volume, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., 1791 Tullie Circle NE, Atlanta, GA 30329.	434.402.1.1; 434.402.1.2.1; 434.402.1.2.2; 434.402.1.2.4; 434.402.2.2.5.
RS-5	ASTM C 177-85 (Reapproved 1993), Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.	434.402.1.1; 434.402.1.2.1; 434.402.1.2.2.
RS-6	ASTM C 518-91, Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.	434.402.1.1; 434.402.1.2.1; Table 402.1.2.2; Table 403.2.9.2.
RS-7	ASTM C 236-89 (Reapproved 1993), Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.	434.402.1.1; 434.402.1.2.1; 434.402.1.2.2.
RS-8	ASTM C 976-90, Test Method for Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.	434.402.1.1; 434.402.1.2.1; 434.402.1.2.2.
RS-9	Report TVAHB-3007, 1981, "Thermal Bridges in Sheet Metal Construction" by Gudni Johannesson. Lund Institute of Technology, Lund, Sweden.	434.402.1.2.3.
RS-10	ASTM E 283-91, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Difference Across the Specimen, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.	434.402.2; 434.402.2.1.
RS-11	ANSI/AAMA/NWDA 101/I.S.2-97, Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors, American Architectural Manufacturers Association, 1827 Walden Office Square, Suite 104, Schaumburg, IL 60173-4628.	434.402.2.1; 434.402.2.2.4.
RS-12	ASTM D 4099-95, Standard Specification for Poly (Vinyl Chloride) (PVC) Prime Windows/Sliding Glass Doors, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.	434.402.2.1.
RS-13	ANSI/AAMA/NWDA 101/I.S.2-97, Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors, National Wood Window and Door Association (formerly the National Woodwork Manufacturers Association), 1400 East Toughy Avenue, Suite 470, Des Plaines, IL 60018.	434.402.2.1.
RS-14	ANSI/NWDA I.S.3-95, Wood Sliding Patio Doors, National Wood Window and Door Association (formerly the National Woodwork Manufacturers Association), 1400 East Toughy Avenue, Suite 470, Des Plaines, IL 60018.	434.402.2.2.1.
RS-15	ARI Standard 210/240-94, Unitary Air-Conditioning and Air-Source Heat Pump Equipment 1994. Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203.	434.403.1.
RS-16	ARI Standard 340/360-93, Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment 1993 edition. Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203.	434.403.1.
RS-17	ARI 310/380-93, Packaged Terminal Air-Conditioners and Heat Pumps, 1993 edition. Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203.	434.403.1.
RS-18	NFRC 100-97, Procedure for Determining Fenestration Product Thermal Properties, National Fenestration Rating Council, Inc., 1300 Spring Street, Suite 500, Silver Spring, MD 20910.	434.402.1.2.4.
RS-19	NFRC 200-Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence (1995) National Fenestration Rating Council, Inc., 1300 Spring Street, Suite 500, Silver Spring, MD 20910.	434.402.1.2.4.

Ref. No.	Standard designation	CFR section
RS-20	RESERVED.	
RS-21	Z21.47-1993, Gas-Fired Central Furnaces, including addenda Z21.47a-1995, American Gas Association, 400 North Capitol Street, N.W. Washington, DC 20001.	434.403.1.
RS-22	U.L. 727, including addendum dated January 30, 1996, Oil-Fired Central Furnaces (Eighth Edition) 1994, available from: Global Documents, 15 Inverness Way East, Englewood, CO 80112-5704, Underwriters Laboratories, Northbrook, IL 60062, 1994..	434.403.1.
RS-23	ANSI Z83.9-90, including addenda Z83.9a-1992, Gas-Fired Duct Furnaces, 1990. (Addendum 90.1b) available from: Global Documents, 15 Inverness Way East, Englewood, CO 80112-5704.	434.403.1.
RS-24	ANSI Z83.8-96, Gas Unit Heater and Gas-Fired Duct Furnaces, American National Standards Institute, 11 West 42nd Street, New York, NY 10036.	434.403.1.
RS-25	U.L. 731, Oil-Fired Unit Heaters (Fifth Edition) 1995 available from: Global Documents, 15 Inverness Way East, Englewood, CO 80112-5704, Underwriters Laboratories, Northbrook, IL 60062.	434.403.1.
RS-26	CTI Standard-201, Standard for the Certification of Water-Cooling Towers Thermal Performance, November 1996, Cooling Tower Institute, P.O. Box 73383, Houston, TX 77273.	434.403.1.
RS-27	ARI Standard 320-93, Water-Source Heat Pumps, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22203.	434.403.1.
RS-28	ARI Standard 325-93, Ground Water-Source Heat Pumps, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22203.	434.403.1.
RS-29	ARI Standard 365-94, Commercial and Industrial Unitary Air-Conditioning Condensing Units, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22203.	434.403.1.
RS-30	ARI Standard 550-92, Centrifugal and Rotary Screw Water-Chilling Packages, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22203.	434.403.1.
RS-31	ARI Standard 590-92, Positive Displacement Compressor Water-Chilling Packages, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22203.	434.403.1.
RS-32	ANSI Z21.13-1991, including addenda Gas-Fired Low-Pressure Steam and Hot Water Boilers, Addenda Z21.13a-1993 and Z21-13b-1994, American National Standards Institute, 11 West 42nd Street, New York, NY 10036.	434.403.1.
RS-33	ANSI/U.L. 726 (7th edition, 1995), Oil-Fired Boiler Assemblies, available from: Global Documents, 15 Inverness Way East, Englewood, CO 80112-5704, Underwriters Laboratories, Northbrook, IL 60062.	434.403.1.
RS-34	HVAC Duct Construction Standards—Metal and Flexible, 2nd edition, 1995, Sheet Metal and Air-Conditioning Contractors' National Association, Inc., 4201 Lafayette Center Drive, Chantilly, VA 20151.	434.403.2.9.3.
RS-35	HVAC Air Duct Leakage Test Manual, 1st edition, 1985, Sheet Metal and Air-Conditioning Contractors' National Association, Inc., 4201 Lafayette Center Drive, Chantilly, VA 20151.	434.403.2.9.3; 434.403.1.
RS-36	Fibrous Glass Duct Construction Standards, 8th edition, 1992, Sheet Metal and Air-Conditioning Contractors National Association, Inc., 4201 Lafayette Center Drive, Chantilly, VA 20151.	434.403.2.9.3.
RS-37	RESERVED.	
RS-38	ANSI Z21.56-1994, Gas-Fired Pool Heaters; Addenda Z21.56a-1996, American National Standards Institute, 11 West 42nd Street, New York, NY 10036; American Gas Association, 1515 Wilson Boulevard, Arlington, VA 22209.	Table 404.1.
RS-39	ANSI Z21.10.3-1993, Gas Water Heaters, Volume III, Storage with Input Ratings above 75,000 Btu's per Hour, Circulating and Instantaneous Water Heaters, American National Standards Institute, 11 West 42nd Street, New York, NY 10036; American Gas Association, 1515 Wilson Boulevard, Arlington, VA 22209.	Table 404.1; 434.404.1.1.
RS-40	ANSI/AHAM RAC-1-1992, Room Air Conditioners, Association of Home Appliance Manufacturers, 20 North Wacker Drive, Chicago, IL 60606.	434.403.1.
RS-41	ASHRAE Standard 62-1989, Ventilation for Acceptable Indoor Air Quality, American Society of Heating, Refrigerating and Air-Conditioning Engineers, 1791 Tulle Circle, Atlanta, GA 30329.	434.403.2.4; 434.403.2.8; 434.519.3.
RS-42	ANSI Z21.86-1996, Automatic Vent Damper Devices for Use with Gas-Fired Appliances, available from: Global Documents, 15 Inverness Way East, Englewood, CO 80112-5704..	434.404.1.
RS-43	NEMA MG 10-1994, Energy Management Guide for Selection and Use of Polyphase Motors, National Electric Manufacturers Association, National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.	434.401.2.1.

Ref. No.	Standard designation	CFR section
RS-44	NEMA MG 11-1977 (Revised 1982, 1987, Energy Management Guide for Selection and Use of Single-Phase Motors, National Electrical Manufacturers Association, National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.	434.401.2.1.
RS-45	ARI Standard 330-83, Ground-Source Closed-Loop Heat Pumps, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22209.	434.403.1.
RS-46	ARI Standard 560-82, Absorption Water Chilling and Water Heating Packages, Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Arlington, VA 22209.	434.403.1.
RS-47	ASHRAE, Handbook, HVAC Applications; I-P Edition, 1995, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., 1791 Tullie Circle NE, Atlanta, GA 30329.	434.518.2.

[FR Doc. 00-17120 Filed 10-5-00; 8:45 am]

BILLING CODE 6450-01-P

Exhibit L

Exhibit L

Compilation of Codes, Rules and Regulations of the State of New York Currentness
Title 19. Department of State
Chapter XXXIII. State Fire Prevention and Building Code Council
Subchapter B. State Energy Conservation Construction Code
Part 1240. Energy Code (Refs & Annos)

19 NYCRR 1240.1

Section 1240.1. Energy code

(a) 2010 ECCCNYS. Requirements for the design of building envelopes for adequate thermal resistance and low air leakage and for the design and selection of mechanical, electrical, service water-heating and illumination systems and equipment which enables effective use of energy in new building construction are set forth in a publication entitled Energy Conservation Construction Code of New York State, publication date: August 2010, published by the International Code Council, Inc. Said publication (hereinafter referred to as the 2010 ECCCNYS) is incorporated herein by reference. Copies of the 2010 ECCCNYS may be obtained from the publisher at the following address:

International Code Council, Inc.

500 New Jersey Avenue, NW, 6th Floor

Washington, DC 20001

Such publication is available for public inspection and copying at:

New York State Department of State

One Commerce Plaza, 99 Washington Avenue

Albany, NY 12231-0001

(b) Referenced standards. Certain published standards are denoted in the 2010 ECCCNYS as incorporated by reference into this Part. Such standards are incorporated by reference into this Part. Such standards are identified in the 2010 ECCCNYS, and the names and addresses of the publishers of such standards from which copies of such standards may be obtained are specified in the 2010 ECCCNYS. Such standards are available for public inspection and copying at the office of the New York State Department of State specified in subdivision (a) of this section.

Credits

Sec. filed June 18, 2002 eff. July 3, 2002; Filed Sept. 14, 2007 eff. Jan. 1, 2008; emergency rulemaking eff. Mar. 7, 2008, expired June 4, 2008; adpdt. eff. Apr. 9, 2008; amd. filed May 21, 2008 eff. June 4, 2008; amds. filed Sept. 14, 2010 eff. Dec. 28, 2010; amds. filed Dec. 3, 2010 eff. Dec. 28, 2010.

Current through amendments included in the New York State Register, Volume XXXV, Issue 8, dated February 20, 2013.

19 NYCRR 1240.1, 19 NY ADC 1240.1

End of Document

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Exhibit M

Exhibit M



- [State](#)
- [\[2010 Energy Conservation Construction Code of New York State \]](#)
- [Chapter 6 - Referenced Standards](#)

Chapter 6 - Referenced Standards

Top Previous Section

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in [Section 107](#).

* Denotes standards that are incorporated by reference into 19 NYCRR part 1240.

Margin markings have not been made in this chapter. The date of the referenced standards denotes new standards from the 2007 code.

AAMA		American Architectural Manufacturers Association 1827 Walden Office Square, Suite 550 Schaumburg, IL 60173-4268
Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440-08	Specifications for Windows, Doors and Unit Skylights	402.4.4, 502.4.1

ACCA		Air Conditioning Contractors of America 2800 Shirlington Road, Suite 300 Arlington, VA 22206
Standard reference number	Title	Referenced in code section number
Manual J-87	Residential Load Calculation Seventh Edition	403.6, 405.6.1

AFPA		American Forest & Paper Association 1111 19th St, NW, Suite 800 Washington, DC 20036
Standard reference number	Title	Referenced in code section number
*NDS-05	National Design Specification (NDS) for Wood Construction with 2005 Supplement.	Table 402.1.5.1, Table 402.1.5.2

AHRI		Air Conditioning, Heating and Refrigeration Institute 4301 North Fairfax Drive Suite 200 Arlington, VA 22203
Standard reference number	Title	Referenced in code section number
210/240-03	Unitary Air-Conditioning and Air-Source Heat Pump Equipment	Table 503.2.3(1), Table 503.2.3(2)

310/380—93	Standard for Packaged Terminal Air-conditioners and Heat Pumps	Table 503.2.3(3)
340/360—2000	Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment	Table 503.2.3(1), Table 503.2.3(2)
365—02	Commercial and Industrial Unitary Air-conditioning Condensing Units	Table 503.2.3(6)
*440—05	Performance Rating of Room Fan-Coils	503.2.8
550/590—98	Water Chilling Packages Using the Vapor Compression Cycle with Addenda	Table 503.2.3(7)
560—00	Absorption Water Chilling and Water Heating Packages	Table 503.2.3(7)
*840—98	Unit Ventilators	503.2.8
13256—1 (2005)	Water-source Heat Pumps—Testing and Rating for Performance— Part 1: Water-to-air and Brine-to-air Heat Pumps (ANSI/AHRI/ASHRAE/ISO 13256-1)	Table 503.2.3(2)
1160—2004	Performance Rating of Heat Pump Pool Heaters	Table 504.2

AISI

American Iron and Steel Institute
1140 Connecticut Avenue, Suite 705
Washington, DC 20036

Standard reference number	Title	Referenced in code section number
S230—07	Standard for Cold-Formed Steel Framing-Prescriptive Method for One- and Two-Family Dwellings	Table 402.1.5.1, Table 402.1.5.2, Table 502.2.8.1, Table 502.2.8.2

AMCA

Air Movement and Control Association International
30 West University Drive
Arlington Heights, IL 60004-1806

Standard reference number	Title	Referenced in code section number
500D—98	Laboratory Methods for Testing Dampers for Rating	502.4.4

ANSI

American National Standards Institute
25 West 43rd Street, Fourth Floor
New York, NY 10036

Standard reference number	Title	Referenced in code section number
Z21.10.3—01	Gas Water Heaters, Volume III - Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour, Circulating Tank and Instantaneous—with Addenda Z21.10.3a-2003 and Z21.10.3b 2004	Table 504.2
Z21.13—04	Gas-fired Low Pressure Steam and Hot Water Boilers	Table 503.2.3(5)
Z21.47—03	Gas-fired Central Furnaces	Table 503.2.3(4)
Z21.50—07	Vented Gas Fireplace (CSA ANSI Z21.50 / CSA 2.22)	303.1.5
Z21.60—03	Decorative Gas Burning Appliances for Installation in Solid-Fuel Burning Fireplaces with addenda Z21.60a—2003 (CSA)	303.1.5

Z21.50/CSA 2.22—07	ANSI Z21.50 / CSA 2.26)	303.1.5
Z21.60/CSA 2.26—03	Vented Gas Fireplaces (ANSI Z21.50/CSA 2.22)	
	Decorative Gas Burning Appliances for Installation in Solid Fuel Burning Fireplaces with Addendum Z21.60a—2003 (ANSI Z21.60/CSA 2.26)	303.1.5
*Z65—96	Method for Measuring Floor Area in Office Buildings	402.4.2.1, 403.2.2
Z83.8—02	Gas Unit Heaters and Gas-fired Duct Furnaces— with Addendum Z83.8a-2003	Table 503.2.3(4)

ASHRAE		
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1791 Tullie Circle, NE Atlanta, GA 30329-2305		
Standard reference number	Title	Referenced in code section number
*90.1—2007	Energy Standard for Buildings Except Low-rise Residential Buildings (ANSI/ASHRAE/IESNA 90.1-2007)	101.3.1, 101.4.7, 101.5.1, 501.1, 501.2, 502.1.1, Table 502.2(2)
*119—88 (RA 2004)	Air Leakage Performance for Detached Single-family Residential Buildings	Table 405.5.2(1)
140—2007	Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs	506.6.1
183—2007	Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings	503.2.1
*13256—1 (2005)	Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and Brine-to-air Heat Pumps (ANSI/ARI/ASHRAE/ISO 13256-1)	Table 503.2.3(2)
*ASHRAE-152—2004	Method of Test for Determining the Design and Seasonal Efficiencies of Residential Thermal Distribution Systems	403.2.2
*ASHRAE—2005	ASHRAE Handbook of Fundamentals—2005	402.1.4, Table 405.5.2(1)
*ASHRAE—2004	ASHRAE HVAC Systems and Equipment Handbook—2004	503.2.1

ASME		
American Society of Mechanical Engineers Three Park Avenue New York, NY 10016-5990		
Standard reference number	Title	Referenced in code section number
PTC 4.1 - 1964	Steam Generating Units	Table 503.2.3(5)

ASTM		
ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2959		

Standard reference number	Title	Referenced in code section number
C 90—03	Specification for Load-bearing Concrete Masonry Units	Table 502.2(1)
E 84—04	Standard Test Method for Surface Buring Characteristics of Building Materials	402.4.1(12)(c)
*E 96—00	Standard Test Methods for Water Vapor Transmission of Materials (Vapor Retarder)	202
E 283—04	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen	202, 402.4.3, 502.4.2, 502.4.7
*E 779—99	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	402.4.2.1, 502.4.3.1
*E 1554—03	Standard Test Methods for Determining Air Leakage of Air Distribution Systems by Fan Pressurization	403.2.2
E 1677—95	Standard Specification for an Air Retarder (AR) Material or System for Systems Low-Rise Framed Building Walls	Table 402.1.5.1, Table 402.1.5.2, Table 502.2.8.1, Table 502.2.8.2, 502.4.3.1
E 2178—03	Standard Test Method for Air Permeance of Building Materials	.202, 502.4.3.1
E 2357—05	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies	502.4.3.1
F1667-03	Standard Specification for Driven Fasteners: Nails, Spikes, and Staples	402.1.5.1, 402.1.5.2, Table 502.2.8.1, Table 502.2.8.2, 502.4.3.1

CSA

Canadian Standards Association
5060 Spectrum Way, Suite 100
Mississauga, Ontario, L4W 5N6 Canada

Standard reference number	Title	Referenced in code section number
*AAMA/WDMA/CSA 101/I.S.2/A440—08	Specifications for Windows, Doors and Unit Skylights	402.4.4, 502.4.1

DOE

U.S. Department of Energy
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

Standard reference number	Title	Referenced in code section number
10 CFR Part 430, Subpart B, Appendix E (2009)	Uniform Test Method for Measuring the Energy Consumption of Water Heaters	Table 503.2.3(4), Table 504.2
10 CFR Part 430, Subpart B, Appendix N (2009)	Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers	Table 503.2.3(4), Table 503.2.3(5)

*10 CFR Part 430, Subpart B, Test Procedures (2009)	Energy Conservation Program for Consumer Products: Test Procedures for Furnaces/Boilers, Vented Home Heating Equipment and Pool Heaters	202
10 CFR Part 431, Subpart E (2010) DOE/EIA-0376 (Current Edition)	Test Procedures and Efficiency Standards for Commercial Packaged Boilers	Table 503.2.3(5)
	State Energy Prices and Expenditure Report	405.3, 506.3

ICC

International Code Council, Inc.
500 New Jersey Avenue, NW
6th Floor
Washington, D.C. 20001

Standard reference number	Title	Referenced in code section number
BCNYS—10	Building Code of New York State	201.3, 303.1.4, 303.2, T402.1.1, 502.2.8, 502.2.8.1, 502.2.8.2, Table 502.2.8.2
FCNYS—10	Fire Code of New York State	201.3
FGNYS—10	Fuel Gas Code of New York State	201.3
MCNYS—10	Mechanical Code of New York State	201.3, 503.2.5, 503.2.5.1, 503.2.6, 503.2.7, 503.2.7.1, 503.2.7.1.1, 503.2.7.1.2, 503.2.9.1, 503.3.1, 503.4.5
PCNYS—10	Plumbing Code of New York State	102.2, 201.3
RCNYS—10	Residential Code of New York State	201.3, 503.2.5, 503.2.5.1, 503.2.6, 503.2.7, 402.1.5.2, 402.2.1.1, 402.4.1(12), 403.2.2, T405.5.2(1)
NYCCC—08	New York City Constructon Codes (including title 28 of the Administrative Code of the City of New York—08)	101.1.2, 101.2.1, 103.2.3, 104.2, 104.8.1, 201.3, 303.1.5, 303.2, 403.2.2, 503.2.5, 503.2.5.1, 503.2.6, 503.2.7, 503.2.7.1, 503.2.7.1.1, 503.2.7.1.2, 503.2.9.1, 503.3.1, 503.4.5

IESNA

Illuminating Engineering Society of North America
120 Wall Street, 17th Floor
New York, NY 10005-4001

Standard reference number	Title	Referenced in code section number
*90.1—2007	Energy Standard for Buildings Except Low-rise Residential Buildings (ANSI/ASHRAE/IESNA 90.1—2007)	101.3.1, 101.4.3, 101.5.1, 501.1; 501.2, Table 502.2(2)

NFRC

National Fenestration Rating Council, Inc.
8484 Georgia Avenue, Suite 320
Silver Spring, MD 20910

Standard reference number	Title	Referenced in code section number
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100—01	Procedure for Determining Fenestration Product U-Factors Second Edition.	303.1.3
200—01	Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence Second Edition	303.1.3
400—01	Procedure for Determining Fenestration Product Air Leakage Second Edition	402.4.4, 502.4.1

SMACNA

Sheet Metal and Air Conditioning Contractors National
Association, Inc.
4201 Lafayette Center Drive
Chantilly, VA 20151-1209

Standard reference number	Title	Referenced in code section number
*SMACNA 1143—85	HVAC Air Duct Leakage Test Manual	503.2.7.1.3

UL

Underwriters Laboratories
333 Pfingsten Road
Northbrook, IL 60062-2098

Standard reference number	Title	Referenced in code section number
*727—06	Oil-Fired Central Furnaces— with Revisions through January 2001	Table 503.2.3(4)
*731—08	Oil-Fired Unit Heaters	Table 503.2.3(4)

US FTC

United States Federal Trade Commission
600 Pennsylvania Avenue, NW
Washington, D.C. 20580

Standard reference number	Title	Referenced in code section number
16 CFR 460	Labeling and Advertising of Home Insulation	303.1.4

WDMA

Window and Door Manufacturers Association
1400 East Touhy Avenue, Suite 470
Des Plaines, IL 60018

Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440—08	Specifications for Windows, Doors and Unit Skylights	402.4.4, 502.4.1

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Exhibit N

Exhibit N

**MINNESOTA ENERGY CODE
CHAPTER 7676
ALL BUILDINGS EXCEPT LOW-RISE RESIDENTIAL**

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4	7676.0600 Minimum Envelope Criteria
6	7676.0700 Methods for Compliance
12	7676.0800 Compliance Criteria for Semiconditioned Buildings or Portions of Buildings
12	7676.0900 Compliance Criteria for Greenhouses, Inflated Structures, and Processes Requiring Heat for Cold Weather Protection
12	7676.1000 Compliance Criteria for Metal Buildings
13	7676.1100 Building Mechanical Systems
18	7676.1200 Service Water Heating
19	7676.1300 Electrical Power and Lighting
30	7676.1400 Additions, Alterations, And Repairs To Existing Buildings
31	7676.1500 Effective Date

7676.0100 AUTHORITY AND PURPOSE.

This chapter is adopted pursuant to Minnesota Statutes, section 216C.19, subdivision 8. The purpose of this chapter is to establish the minimum energy code criteria necessary to construct new and remodeled elements of all buildings except one- and two-family residential and multifamily buildings of three stories or less, as well as to provide alternatives for demonstrating compliance with those minimum criteria. The intent of these criteria is to provide a means for assuring building durability, and permitting energy efficient operation.

7676.0200 APPLICATION.

Subpart 1. **General.** This chapter is a part of the Minnesota State Building Code, adopted according to Minnesota Statutes, sections 16B.59 to 16B.73. Enforcement of this chapter must not abridge safety, health, or environmental requirements under other applicable codes or ordinances.

Subp. 2. **New and remodeled elements of buildings.** This chapter applies to all new and remodeled elements of commercial and all other buildings.

Subp. 3. **Existing buildings.** Additions, alterations, and repairs to existing buildings or structures must comply with part 7676.1400.

Subp. 4. **Mixed occupancy.** If a building houses more than one occupancy, each portion of the building must conform to the requirements for the occupancy housed in that portion. If minor accessory uses occupy no more than ten percent of the

area of any floor of the building, the major use is considered the building occupancy.

Subp. 5. **Historic buildings.** Alterations to historic buildings and changes of occupancy are regulated by the Minnesota State Building Code, part 1305.0010.

Subp. 6. **Exempt buildings.** This chapter does not cover buildings, structures, or portions of buildings or structures whose peak design rate of energy usage is less than 3.4 Btu per hour per square foot or 1.0 watt per square foot of floor area for all purposes.

Subp. 7. **Application to greenhouses, inflated structures, and processes requiring heat for cold weather protection.** Requirements for greenhouses, inflated structures, and processes requiring heat for cold weather protection are provided in part 7676.0900.

Subp. 8. **Other.** This chapter also applies to driveways, walkways, entrances, parking lots, and grounds.

7676.0300 MATERIALS, EQUIPMENT, AND SPECIFICATIONS.

Subpart 1. **Identification.** Materials and equipment must be identified in order to show compliance with this chapter.

Subp. 2. **Plans and Specifications.** Plans, specifications, and either calculations or compliance forms must demonstrate compliance with all requirements of this chapter including:

- A. design criteria;
- B. exterior envelope component materials;
- C. U-values of windows, doors, skylights, and opaque envelope components;
- D. R-values of insulating materials;
- E. location of *interior air barrier, vapor retarder, and wind wash barrier*;
- F. *air sealing* requirements;
- G. size and type of apparatus and equipment;
- H. equipment and systems controls; and
- I. other data needed to indicate conformance with the requirements of this chapter.

Subp. 3. **Maintenance information.** Required regular maintenance actions must be clearly stated and incorporated on a *readily accessible* label. The label may be limited to identifying, by title or publication number, the operation and

maintenance *manual* for that particular model and type of product. Maintenance instructions must be furnished for equipment that requires preventive maintenance for efficient operation.

Subp. 4. **Thermal insulation.** Thermal insulation used must conform to chapter 7640, Minnesota Thermal Insulation Standards, adopted by the Department of Public Service. All thermal insulation must achieve stated performance at 75 degrees Fahrenheit mean temperature and no less than stated performance at winter design conditions.

EXCEPTION: Thermal insulation designed to reduce summer cooling load only is not required to achieve stated performance at winter design conditions.

7676.0400 INCORPORATIONS BY REFERENCE.

Subpart 1. **Incorporated items.** The following standards and references are incorporated by reference:

A. ASHRAE Standard 90.1-1989, Section 13, Building Energy Cost Budget Method;"

B. ASHRAE, 1997 Handbook of Fundamentals, Chapter 28;

C. ASHRAE Standard 84-1991, Method of Testing Air-to-Air Heat Exchangers;

D. ASTM E1677-95 Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls

E. Children, Families and Learning Worst Case Draft Test, as published in the State of Minnesota Plan for Weatherization Assistance for Low-Income Persons, March 10, 1997

F. COMcheck-MN program, a computer program for energy analysis of medium to small nonresidential buildings developed by Battelle Pacific Northwest Laboratories;

G. ENVSTD, Envelope System Performance Compliance Calculation program, a computer program developed by Battelle Pacific Northwest Laboratories;

H. HVAC Air Duct Leakage Test Manual, Section 4, 1985 edition, as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc., Vienna, Virginia;

I. Lighting Efficiency Program Input Wattage Guide," Northern States Power Company, Minneapolis, MN;

J. Energy Policy of Act of 1992, section 122(d), Nominal Full Load Efficiency Requirements for Motors;

K. National Electrical Manufacturers Association Standards Publication X TP 1-1996, Guide for Determining Energy Efficiency for Distribution Transformers; and

L. UL181A, Factory Made Air Ducts and Duct Connectors, Underwriters Laboratories, Inc.

Subp. 2. **Availability.** All standards and documents incorporated by reference are available for public inspection at

the Minnesota State Law Library and through the Minitex interlibrary loan system.

7676.0500 DEFINITIONS.

Subpart 1. **Definitions.** The terms in this part apply to this chapter. Additional terms relating to lighting requirements of this chapter are contained in part 7676.1300, Subpart 2.

Subp. 2. **Accessible.** *Accessible*"means having access to but which first may require the removal of an access panel, door or similar obstruction covering the item described.

Subp. 3. **Attic bypass.** *Attic bypass*"means a passageway where air may pass from a *conditioned space* to the unconditioned side of a roof or attic. *Attic bypasses* include utility penetrations, interior soffits, openings in top plates, fan penetrations and light fixture penetrations.

Subp. 4. **Automatic.** *Automatic*"means self-acting, operating by its own mechanism when actuated by some impersonal influence, for example, a change in current strength, pressure, temperature, or mechanical configuration.

Subp. 5. **Building envelope.** *Building envelope*"means the elements of a building which enclose *conditioned spaces* through which thermal energy may be transferred to or from the exterior or semiconditioned spaces.

Subp. 6. **Cfm.** *Cfm*"means cubic feet per minute.

Subp. 7. **Conditioned space.** *Conditioned space*"means space within a building which is conditioned either directly or indirectly by an energy-using system and is capable of maintaining at least 65 degrees Fahrenheit at winter design conditions or less than 78 degrees Fahrenheit at summer design conditions identified in part 7676.1100.

Subp. 8. **Commercial parking facility.** "*Commercial parking facility*" means a parking garage or ramp except those used exclusively to house vehicles for public emergency, ambulance, public transit, or public utility emergency response.

Subp. 9. **Deadband.** *Deadband*"means the temperature range in which no heating or cooling is used.

Subp. 10. **Fenestration (window, door or skylight) area.** *Fenestration (window, door or skylight) area*"means the area of a window, door or skylight equal to the rough opening of the window, door or skylight, respectively, less installation clearances.

Subp. 11. **Gross wall area.** *Gross wall area*"means the *building envelope* wall area bounding interior space from grade to the roof/ceiling assembly enclosing conditioned or semiconditioned space, including opaque wall, window, and door area.

For basement walls with an average below-grade area less than 50 percent of the total wall area, including openings, all

Exhibit O

Exhibit O

**WASHINGTON STATE
ENERGY CODE
2006 EDITION**

CHAPTER 51-11 WAC



**WASHINGTON STATE BUILDING CODE COUNCIL
EFFECTIVE JULY 1, 2007**

1. When the heat gain or loss of the ducts, without insulation, will not increase the energy requirements of the building.
2. Within the HVAC equipment.
3. Exhaust air ducts.
4. Supply or return air ducts installed in unvented crawl spaces with insulated walls, basements or cellars in one- and two-family dwellings.

503.10 Ducts

503.10.1 Leakage Testing: High-pressure and medium-pressure ducts shall be leak tested in accordance with the 1985 Edition of the SMACNA HVAC Air Duct Leakage Test Manual with the rate of air leakage not to exceed the maximum rate specified in that standard.

503.10.2 Seams and Joints: All low-pressure supply and return duct transverse joints, and enclosed stud bays or joist cavities/space used to transport air, shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), or mastic-plus-embedded-fabric systems installed in accordance with the manufacturer's installation instructions.

EXCEPTIONS: 1. Ducts or building cavities used for air distribution that are located entirely within the conditioned space of the building are exempt from this section.

2. UL 181A listed tapes used with listed rigid fibrous glass ducts may be used as the primary sealant, when installed in accordance with the listing.

3. UL 181B listed tapes used with listed flexible air ducts may be used as the primary sealant, when installed in accordance with the listing.

4. Where enclosed stud bays or joist cavities/spaces are used to transport air sealing may be accomplished using drywall, drywall tape plus joint compound.

5. Tapes installed in accordance with the manufacturer's installation instructions, providing detailed information specific to application on ducts, including approved duct materials and required duct surface cleaning.

503.10.3 Dampers: Requirements for automatic or manual dampers are found in the Washington State Ventilation and Indoor Air Quality Code.

503.11 Pipe Insulation: All piping shall be thermally insulated in accordance with Table 5-12.

EXCEPTION: Piping installed within unitary HVAC equipment.

Cold water pipes outside the conditioned space shall be insulated in accordance with the Washington State Plumbing Code (Chapter 51-56 WAC).

SECTION 504 — SERVICE WATER HEATING

504.1 Scope: The purpose of this section is to provide criteria for design and equipment selection that will produce energy savings when applied to service water heating.

504.2 Water Heaters, Storage Tanks and Boilers

504.2.1 Performance Efficiency: All storage water heaters shall meet the requirements of the National Appliance Energy Conservation Act and be so labeled. All electric water heaters in unheated spaces or on concrete floors shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10.

For combination space and service water heaters with a principal function of providing space heat, the Combined Annual Efficiency (CAE) may be calculated by using ASHRAE Standard 124-1991. Storage water heaters used in combination space heat and water heat applications shall have either an Energy Factor (EF) or a Combined Annual Efficiency (CAE) of not less than the following:

	Energy Factor (EF)	Combined Annual Efficiency (CAE)
< 50 gallon storage	0.58	0.71
50 to 70 gallon storage	0.57	0.71
> 70 gallon storage	0.55	0.70

504.2.2 Insulation: Heat loss from unfired hot-water storage tanks shall be limited to a maximum of 9.6 Btu/h/ft² of external tank surface area. The design ambient temperature shall be no higher than 65°F.

504.2.3 Combination Service Water Heating/Space Heating Boilers: Service water heating equipment shall not be dependent on year round operation of space heating boilers.

EXCEPTIONS: 1. Systems with service/space heating boilers having a standby loss Btu/h less than:

$$(13.3 \text{ pmd} + 400)/n$$

determined by the fixture count method where:
 pmd = probable maximum demand in gallons/hour as determined in accordance with Chapter 49 of Standard RS-11.

n = fraction of year when outdoor daily mean temperature exceeds 64.9°F.

The standby loss is to be determined for a test period of 24 hours duration while maintaining a boiler water temperature of 90°F above an ambient of 60°F and a five foot stack on appliance.

2. For systems where the use of a single heating unit will lead to energy savings, such unit shall be utilized.

504.3 Automatic Controls: Service water heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. Temperature setting range shall be set to 120°F or 49°C.

504.4 Shutdown: A separate switch shall be provided to permit turning off the energy supplied to electric service water heating systems. A separate valve shall be provided to permit turning off the energy supplied to the main burner(s) of all other types of service water heater systems.