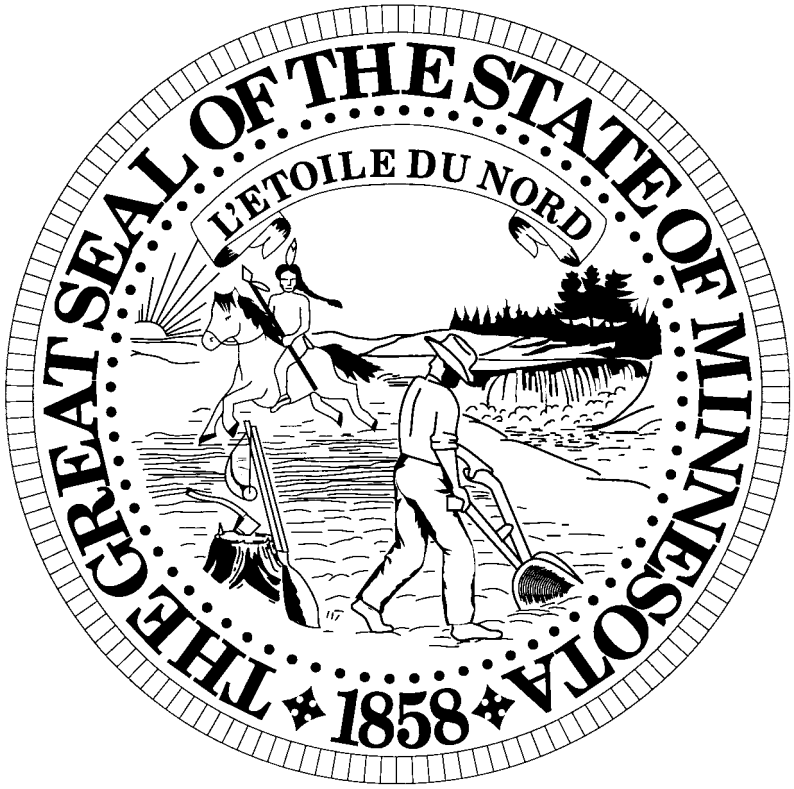
Minnesota

# State Register

**Rules and Official Notices Edition**




Published every Monday (Tuesday when Monday is a holiday) by the
Department of Administration – Communications Media Division

**Monday 6 October 2003**

**Volume 28, Number 14**

**Pages 409 - 494**

# State Register

## Judicial Notice Shall Be Taken of Material Published in the *State Register*

The *State Register* is the official publication of the State of Minnesota, published weekly to fulfill the legislative mandate set forth in *Minnesota Statutes* § 14.46. The *State Register* contains:

- **proposed, adopted, exempt, expedited emergency and withdrawn rules**
- **executive orders of the governor**
- **appointments**
- **proclamations and commendations**
- **commissioners' orders**
- **revenue notices**
- **official notices**
- **state grants and loans**
- **contracts for professional, technical and consulting services**
- **non-state public bids, contracts and grants**
- **certificates of assumed name, registration of insignia and marks**

**PUBLISHING NOTICES IN THE *State Register*:** Submit TWO COPIES of your notice, typed double-spaced. State agency submissions must include a "State Register Printing Order" form, and a "Certification/Internal Contract Negotiation" form with contracts for professional, technical and consulting services. Non-State Agencies should submit TWO COPIES, with a letter on your letterhead stationery requesting publication and date to be published. FAXED submissions to (651) 297-8260 are received to meet deadline requirements, but must be followed by originals and applicable forms or letters to be accepted. The charge is $14.40 per tenth of a page (columns are seven inches wide). About 2-1/2 pages typed double-spaced on 8-1/2"x11" paper equal one typeset page in the ***State Register.*** Contact the editor if you have questions.

**SUBSCRIPTION SERVICES:** Copies are available at Minnesota's Bookstore, 117 University Avenue, St. Paul, MN 55155. Order by phone: Metro area: (651) 297-3000 Toll free (800) 657-3757. TTY relay service phone number: (800) 627-3529. **NO REFUNDS.** Subscribers who do not receive a copy of an issue should notify the ***State Register*** Subscription Office immediately at (651) 297-8774. Copies of back issues may not be available more than two weeks after publication. Both editions are delivered postpaid to points in the United States, Periodicals Postage Paid for the ***State Register*** at St. Paul, MN, first class for the ***Solicitation Announcements.*** See the ***State Register*** and ***Solicitation Announcements*** at **website:** *http://www.comm.media.state.mn.us* Click on "Minnesota's Bookstore."

- ***State Register*** -- Rules and Official Notices Edition (published every Monday, or Tuesday if Monday is a holiday) One year, hard copy, paper subscription: $160.00.
- **On-line subscription** – $180, includes links, index, sidebar table of contents and ***State Register*** SENT TO YOU via Email.
- ***Solicitation Announcements*** -- State Register Supplement (published every Tuesday and Friday) One year subscription: $135.00 via first class mail, $150.00 via fax or through our website. Users agree not to redistribute without authorization.
- **13-week trial subscription** which includes both the ***State Register*** and ***Solicitation Announcements*** $65.00
- **Single issues** are available for a limited time: ***State Register*** $5.00, ***Solicitation Announcements*** $1.00. Shipping is $3.00 per order.

**"Affidavit of Publication"** costs $10.00 and includes a notarized "Affidavit" and a copy of the issue.

### Printing Schedule and Submission Deadlines

| Vol. 28 Issue Number | PUBLISH DATE | Deadline for: Emergency Rules, Executive and Commissioner's Orders, Revenue and Official Notices, State Grants, Professional-Technical-Consulting Contracts, Non-State Bids and Public Contracts | Deadline for Both Adopted and Proposed RULES |
|---|---|---|---|
| #14 | Monday 6 October | Noon Tuesday 30 September | Noon Wednesday 24 September |
| #15 | Monday 13 October | Noon Tuesday 7 October | Noon Wednesday 1 October |
| #16 | Monday 20 October | Noon Tuesday 14 October | Noon Wednesday 8 October |
| #17 | Monday 27 October | Noon Tuesday 21 October | Noon Wednesday 15 October |


**Publication Number: 326630 (ISSN 0146-7751)**

**THE *STATE REGISTER* IS PUBLISHED** by Communications Media Division, Department of Administration, State of Minnesota, pursuant to *Minnesota Statutes* § 14.46 and is available at the main branch of county libraries in Minnesota and all "State Depository Libraries": State University and Community College libraries; the University of Minnesota libraries; St. Paul, Minneapolis and Duluth Public Libraries; the Legislative Reference Library; State Law Library; Minnesota Historical Society Library; and the Library Development Service at the State Department of Children, Families and Learning.



## Legislative Information

Senate Public Information Office (651) 296-0504
State Capitol, Room 231, St. Paul, MN 55155
**Website:** *www.senate.leg.state.mn.us/departments/secretary/seninfo.htm*

House Information Office (651) 296-2146
State Office Building, Room 175, 100 Constitution Ave., St. Paul, MN 55155
**Website:** *www.house.leg.state.mn.us/hinfo/hinfo.htm*

## Federal Register

Office of the Federal Register (202) 512-1530; or (888) 293-6498
U.S. Government Printing Office – Fax: (202) 512-1262
**Website:** *http://www.access.gpo.gov/su_docs/aces/aces140.html*

## Minnesota State Court System

Court Information Office (651) 296-6043
Minnesota Judicial Center, Room 135, 25 Constitution Ave., St. Paul, MN 55155
**Website:** *www.courts.state.mn.us*

# Contents

# *Minnesota Rules:* Amendments and Additions

**NOTICE: How to Follow State Agency Rulemaking in the State Register**

The *State Register* is the official source, and only complete listing, for all state agency rulemaking in its various stages. State agencies are required to publish notice of their rulemaking action in the *State Register*. Published every Monday, the *State Register* makes it easy to follow and participate in the important rulemaking process. Approximately 80 state agencies have the authority to issue rules. Each agency is assigned specific **Minnesota Rule** chapter numbers. Every odd-numbered year the **Minnesota Rules** are published. The current 1999 set is a 13-volume bound collection of all adopted rules in effect at the time. Supplements are published to update this set of rules. Generally speaking, proposed and adopted exempt rules do not appear in this set because of their short-term nature, but are published in the *State Register*.

An agency must first solicit **Comments on Planned Rules** or **Comments on Planned Rule Amendments** from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency (*Minnesota Statutes* §§ 14.101). It does this by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, or within 60 days of the effective date of any new statutory grant of required rulemaking.

When rules are first drafted, state agencies publish them as **Proposed Rules,** along with a notice of hearing, or a notice of intent to adopt rules without a hearing in the case of noncontroversial rules. This notice asks for comment on the rules as proposed. Proposed emergency rules and withdrawn proposed rules are also published in the *State Register*. After proposed rules have gone through the comment period, and have been rewritten into their final form, they again appear in the *State Register* as **Adopted Rules.** These final adopted rules are not printed in their entirety in the *State Register*, only the changes made since their publication as Proposed Rules. To see the full rule, as adopted and in effect, a person simply needs two issues of the *State Register*, the issue the rule appeared in as proposed, and later as adopted. For a more detailed description of the rulemaking process, see the most current edition of the *Minnesota Guidebook to State Agency Services.*

The *State Register* features partial and cumulative listings of rules in this section on the following schedule: issues #1-13 inclusive; issues #14-25 inclusive; issue #26 cumulative for issues #1-26; issues #27-38 inclusive; issue #39, cumulative for issues #1-39; issues #40-51 inclusive; and issues #1-52 (or 53 in some years), cumulative for issues #1-52 (or 53). An annual subject matter index for rules was separately printed usually in August, but starting with Volume 19 now appears in the final issue of each volume. For copies or subscriptions to the *State Register,* contact Minnesota's Bookstore, 117 University Avenue, St. Paul, MN 55155 (612) 297-3000, or toll-free 1-800-657-3757.

## Volume 28, Issues #14

### Administration Department

**1346**.0050; .0060; .0101; .0102; .0103; .0104; .0105; .0106; .0107; .0108; .0109; .0110; .0201; .0202; .0301; .0306; .0309; .0401; .0403; .0404; .0505; .0506; .0507; .0508; .0603; .0604; .0703; .0709; .0801; .0803; .0901; .1001; .1003; .1004; .1006; .1007; .1011; .1204; .1500; .1601; .1602; .1603; .1604; .1605; .1606; .5050; .5201; .5202; .5301; .5303; .5304; .5306; .5402; .5403; .5404; .5406; .5407; .5408; .5409; .5410; .5501; .5503; .5504; .5602; .5620; .5629; .5630; .5700; .5801; .5802; .5803;.5804; .5805; .5806; .5807; .5900 (**proposed**) ..... 414

**1346**.0108; .0203; .0204; .0302; .0304; .0405; .0406; .0407; .0408; .0409; .0410; .0411; .0414; .0418; .0421; .0424; .0504; .0602; .0605; .0606; .0607; .0608; .0707; .0710; .0807; .0808; .0809; .0913; .1002; .1005; .1104; .1107; .1207; .1503; .1505; .1520; .1521; .1906; .2002; .2003; .2101; .2102; .2104; .2106; .2107; .2108; .2109; .2110; .2111; .2113; .2114; .2115; .2120; .2122; .2123; .2124; .2125; .2126; .2127; .2133; .2201; .2202; .2205; .2206; .2211; .2212; .2213; .2215; .2216; .2220; 2226; .2500; .2600 (**proposed repealer**)..... 414

### Education Department

3501.0505; .0510; .0515; .0520; .0525; .0530; .0535; .0540; .0545; .0550; .0560; .0565; .0570; .0575; .0580; .0585; .0590; .0595; .0600; .0605; .0610; .0620; .0625; .0630; .0635 (**Expedited Emergency**) ..... 468

# Proposed Rules

**Comments on Planned Rules or Amendments**

An agency must first solicit **Comments on Planned Rules** or **Comments on Planned Rules Amendments** from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency (*Minnesota Statutes* § § 14.101). It does this by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, and within 60 days of the effective date of any new statutory grant of required rulemaking.

**Rules to be Adopted After a Hearing**

After receiving comments and deciding to hold a public hearing on the rule, an agency drafts its rules. It then publishes its rules with a notice of hearing. All persons wishing to make a statement must register at the hearing. Anyone who wishes to submit written comments may do so at the hearing, or within five working days of the close of the hearing. Administrative law judges may, during the hearing, extend the period for receiving comments up to 20 calendar days. For five business days after the submission period the agency and interested persons may respond to any new information submitted during the written submission period and the record is then closed. The administrative law judge prepares a report within 30 days, stating findings of fact, conclusions and recommendations. After receiving the report, the agency decides whether to adopt, withdraw or modify the proposed rule based on consideration of the comments made during the rule hearing procedure and the report of the administrative law judge. The agency must wait five days after receiving the report before taking any action.

**Rules to be Adopted Without a Hearing**

Pursuant to *Minnesota Statutes* § 14.22, an agency may propose to adopt, amend, suspend or repeal rules without first holding a public hearing. An agency must first solicit **Comments on Planned Rules** or **Comments on Planned Rules Amendments** from the public. The agency then publishes a notice of intent to adopt rules without a public hearing, together with the proposed rules, in the *State Register*. If, during the 30-day comment period, 25 or more persons submit to the agency a written request for a hearing of the proposed rules, the agency must proceed under the provisions of §§ 14.14-14.20, which state that if an agency decides to hold a public hearing, it must publish a notice of intent in the *State Register*.

# Department of Administration

## Building Code and Standards Division

## Proposed Permanent Rules Relating to International Mechanical Code and International Fuel Gas Code

### NOTICE OF HEARING

### Proposed Rules Governing the Adoption of the 2000 International Mechanical Code and the 2000 International Fuel Gas Code, *Minnesota Rules*, chapter 1346

**Public Hearing.** The Department of Administration intends to adopt rules after a public hearing following the procedures set forth in the rules of the Office of Administrative Hearings, *Minnesota Rules*, parts 1400.2200 to 1400.2240, and the Administrative Procedure Act, *Minnesota Statutes*, sections 14.131 to 14.20. The agency will hold a public hearing on the above-entitled rules in conference rooms B and C in the Offices of the Building Codes and Standards Division, 408 Metro Square Building, 121 E. 7th Place, St. Paul, Minnesota 55101, starting at 9:30 a.m. on Thursday, November 13, 2003, and continuing until the hearing is completed. Additional days of hearing will be scheduled if necessary. All interested or affected persons will have an opportunity to participate by submitting either oral or written data, statements, or arguments. Statements may be submitted without appearing at the hearing.

**Administrative Law Judge.** The hearing will be conducted by Administrative Law Judge George A. Beck, who can be reached at the Office of Administrative Hearings, 100 Washington Square, Suite 1700, Minneapolis, Minnesota 55401-2138, telephone (612) 341-7601, and FAX (612) 349-2665. The rule hearing procedure is governed by *Minnesota Statutes*, sections 14.131 to 14.20, and by the rules of the Office of Administrative Hearings, *Minnesota Rules*, parts 1400.2000 to 1400.2240. Questions concerning the rule hearing procedure should be directed to the Administrative Law Judge.

**Subject of Rules, Statutory Authority, and Agency Contact Person.** The proposed rules are about the adoption of the 2000 International Mechanical Code and the 2000 International Fuel Gas Code, *Minnesota Rules*, chapter 1346. The proposed rules are authorized by *Minnesota Statutes*, sections 16B.59, 16B. 61, and 16B.64. A copy of the proposed rules is published in the *State Register* and attached to this notice as mailed. The agency contact person is: Colleen Chirhart at the Department of Administration's Building Codes and Standards Division, 121 E. 7th Place, Suite 408, St. Paul, Minnesota 55101, (651) 296-4329, **FAX** (651) 296-1973, and **email** at *colleen.d.chirhart@state.mn.us*. TTY users may call (651) 297-5353 or 1-800-627-3529.

**Statement of Need and Reasonableness.** A Statement of Need and Reasonableness is now available for review at the agency offices, the Division's web site at *www.buildingcodes.admin.state.mn.us* and at the Office of Administrative Hearings. This statement contains a summary of the justification for the proposed rules, including a description of who will be affected by the proposed rules and an estimate of the probable cost of the proposed rules. The statement may be reviewed and copies obtained at the cost of reproduction from the agency.

**Public Comment.** You and all interested or affected persons, including representatives of associations and other interested groups, will have an opportunity to participate. You may present your views either orally at the hearing or in writing at any time before the close of the hearing record. All evidence presented should relate to the proposed rules. You may also submit written material to the Administrative Law Judge to be recorded in the hearing record for five working days after the public hearing ends. This five-day comment period may be extended for a longer period not to exceed 20 calendar days if ordered by the Administrative Law Judge at the hearing. Following the comment period, there is a five-working-day rebuttal period during which the agency and any interested person may respond in writing to any new information submitted. No additional evidence may be submitted during the five-day rebuttal period. All comments and responses submitted to the Administrative Law Judge must be received at the Office of Administrative Hearings no later than 4:30 p.m. on the due date. All comments or responses received will be available for review at the Office of Administrative Hearings.

The agency requests that any person submitting written views or data to the Administrative Law Judge prior to the hearing or during the comment or rebuttal period also submit a copy of the written views or data to the agency contact person at the address stated above.

**Alternative Format/Accommodation.** Upon request, this Notice can be made available in an alternative format, such as large print, Braille, or cassette tape. To make such a request or if you need an accommodation to make this hearing accessible, please contact the agency contact person at the address or telephone number listed above.

**Modifications.** The proposed rules may be modified as a result of the rule hearing process. Modifications must be supported by data and views presented during the rule hearing process, and the adopted rules may not be substantially different than these proposed rules, unless the procedure under *Minnesota Rules*, part 1400.2110, has been followed. If the proposed rules affect you in any way, you are encouraged to participate.

**Adoption Procedure After The Hearing.** After the close of the hearing record, the Administrative Law Judge will issue a report on the proposed rules. You may ask to be notified of the date when the judge's report will become available, and can make this request at the hearing or in writing to the Administrative Law Judge. You may also ask to be notified of the date on which the agency adopts the rules and the rules are filed with the Secretary of State, or ask to register with the agency to receive notice of future rule proceedings, and can make these requests at the hearing or in writing to the agency contact person stated above.

**Lobbyist Registration.** *Minnesota Statutes*, chapter 10A, requires each lobbyist to register with the State Campaign Finance and Public Disclosure Board. Questions regarding this requirement may be directed to the Campaign Finance and Public Disclosure Board at: Suite 190, Centennial Building, 658 Cedar Street, St. Paul, Minnesota 55155, **telephone** (651) 296-5148 or 1-800-657-3889.

**Order.** I order that the rulemaking hearing be held at the date, time, and location listed above.

Dated: 24 September 2003

Kath Ouska
Assistant Commissioner

**1346.0050 TITLE; INCORPORATION BY REFERENCE.**

This chapter is known and may be cited as the "Minnesota ~~State~~ Mechanical Code." As used in this chapter, "the code" and "this code" refer to this chapter.

Chapters ~~1~~ 2 to ~~20 and appendixes A, B, and C~~ 15 of the ~~1991~~ 2000 edition of the ~~Uniform~~ International Mechanical Code, promulgated by the International ~~Conference of Building Officials~~ Code Council, Inc., ~~5360 South Workman Mill Road, Whittier, California 90601 and the International Association of Plumbing and Mechanical Officials, 20001 South Walnut Drive, Walnut, California 91789~~ 5203 Leesburg Pike, Suite 600, Falls Church, Virginia 22041-3401, are incorporated by reference as part of the Minnesota ~~State~~ Mechanical Code with the amendments in this chapter. As used in this chapter, ~~"UMC"~~ "IMC" means the ~~Uniform~~ *International Mechanical Code* incorporated in this part.

The ~~UMC~~ IMC is not subject to frequent change and a copy of the ~~UMC~~ IMC, with amendments for use in Minnesota, is available in the office of the commissioner of administration.

**1346.0060 REFERENCES TO OTHER INTERNATIONAL CODE COUNCIL (ICC) CODES.**

Subpart 1. **General.** References to other codes and standards promulgated by the International Code Council in the IMC and IFGC are modified in subparts 2 to 11.

Subp. 2. **Building code.** References to the International Building Code in this code mean the Minnesota Building Code, adopted pursuant to this chapter and Minnesota Statutes, section 16B.61, subdivision 1.

Subp. 3. **Residential code.** References to the International Residential Code in this code mean the Minnesota Residential Code, adopted pursuant to chapter 1309 and *Minnesota Statutes*, section 16B.61, subdivision 1.

Subp. 4. **Electrical code.** References to the International Code Council Electrical Code in this code mean the Minnesota Electrical Code, adopted pursuant to chapter 1315 and *Minnesota Statutes*, section 326.243.

Subp. 5. **Fuel gas code.** References to the International Fuel Gas Code in this code mean the Minnesota Mechanical Code, adopted pursuant to chapter 1346 and *Minnesota Statutes*, section 16B.61, subdivision 1.

Subp. 6. **Mechanical code.** References to the International Mechanical Code in this code mean the Minnesota Mechanical Code, adopted pursuant to chapter 1346 and *Minnesota Statutes*, section 16B.61, subdivision 1.

Subp. 7. **Plumbing code.** References to the International Plumbing Code in this code mean the Minnesota Plumbing Code, adopted pursuant to chapter 4715 and *Minnesota Statutes*, section 16B.61, subdivisions 1 and 2.

Subp. 8. **Private sewage disposal code.** References to the International Private Sewage Disposal Code in this code mean the Minnesota Pollution Control Agency's minimum standards and criteria for individual sewage treatment systems adopted pursuant to chapter 7080 and *Minnesota Statutes*, chapters 103F, 103G, 115, and 116.

Subp. 9. **Energy conservation code.** References to the International Energy Conservation Code in this code mean the Minnesota Energy Code, adopted pursuant to *Minnesota Statutes*, section 16B.617.

Subp. 10. **Property maintenance code.** References to the International Property Maintenance Code in this code do not apply.

Subp. 11. **Fire code.** References to the International Fire Code in this code mean the Minnesota State Fire Code, adopted pursuant to chapter 7510 and *Minnesota Statutes*, chapter 299F.

**1346.0101 SECTION 101 SCOPE.**

IMC Section 101 is amended to read as follows:

**101 Scope.** This chapter shall regulate the design, installation, maintenance, alteration, and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. For the purposes of this section, the term "mechanical systems" includes fuel gas piping systems, fuel gas utilization equipment, and related accessories. This code shall also regulate those mechanical systems, system components, equipment, and appliances specifically addressed in the IMC and IFGC. This code shall also regulate process piping installed within, or in conjunction with, buildings or structures. For the purposes of this section, the term "process piping" includes piping or tubing which conveys gas, liquid, or fluidized solids and which is used directly in research, laboratory, or production processes. Process piping and tubing shall be installed in accordance with ASME B31.3-1999, Process Piping Code, or ASME B31.9-1996, Building Services Piping Code, as applicable. Refer to chapter 1300 for additional administrative provisions of the Minnesota State Building Code.

**1346.0102 SECTION 102 EXISTING INSTALLATIONS.**

IMC Section 102 is amended to read as follows:

**102 Existing installations.** Except as otherwise provided for in this chapter, a provision in this code shall not require the removal, alteration, or abandonment of, nor prevent the continued utilization and maintenance of, a mechanical system lawfully in existence at the time of the adoption of this code.

**1346.0103 SECTION 103 MAINTENANCE.**

IMC Section 103 is amended to read as follows:

**103 Maintenance.** Mechanical systems, both existing and new, and parts of those systems, shall be maintained in proper operating condition in accordance with the original design and in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in compliance with the code edition under which they were installed. The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems. To determine compliance with this provision, the building official shall have the authority to require a mechanical system to be reinspected.

**1346.0104 SECTION 104 ADDITIONS, ALTERATIONS, RENOVATIONS, OR REPAIRS.**

IMC Section 104 is amended to read as follows:

**104 Additions, alterations, renovations, or repairs.** Additions, alterations, renovations, or repairs to a mechanical system shall conform to that required for a new mechanical system without requiring the existing mechanical system to comply with all of the requirements of this code. Additions, alterations, renovations, or repairs shall not cause an existing mechanical system to become unsafe, hazardous, or overloaded.

Minor additions, alterations, renovations, and repairs to existing mechanical systems shall meet the provisions for new construction, unless that work is done in the same manner and arrangement as was in the existing system, is not hazardous, and is approved.

**1346.0105 SECTION 105 WORK EXEMPT FROM PERMIT.**

IMC Section 105 is amended to read as follows:

**105 Work exempt from permit.** Permits shall not be required for the following:

1. portable heating, cooking, or clothes drying appliances not connected to a permanent fuel supply, excluding a factory power supply cord;

2. portable ventilation appliances and equipment;

3. portable cooling units;

4. steam, hot water, or chilled water piping within any heating or cooling equipment or appliances regulated by this code;

5. replacement of any minor part that does not alter the approval of equipment or an appliance or make such equipment or appliance unsafe;

6. portable evaporative coolers; and

7. self-contained refrigeration systems that contain 10 pounds (4.5 kg) or less of refrigerant, or that are actuated by motors of 1 horsepower (0.75 kW) or less.

**1346.0106 SECTION 106 REQUIRED INSPECTIONS.**

IMC Section 106 is amended to read as follows:

**106 Required inspections.** The building official, upon notification from the permit holder or the permit holder's agent, shall make the following inspections and other such inspections as necessary, and shall either release that portion of the construction or shall notify the permit holder or the permit holder's agent of violations that must be corrected. The holder of the permit shall be responsible for the scheduling of these inspections.

1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place. When excavated soil contains rocks, broken concrete, frozen chunks, and other rubble that would damage or break the piping or cause corrosive action, clean backfill shall be on the job site.

2. Rough-in inspection shall be made after the roof, framing, fireblocking, and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.

3. Final inspection shall be made upon completion of the mechanical system.

**Exception:** Ground-source heat pump loop systemstested in accordance with this code shall be permitted to be backfilled prior to inspection.

**1346.0107 SECTION 107 TESTING.**

IMC Section 107 is amended to read as follows:

**107 Testing.** Mechanical systems shall be tested as required in this code in accordance with IMC Sections 107.1 through 107.3. Tests shall be made by the permit holder and observed by the building official.

**107.1 New, altered, extended, or repaired systems.** New mechanical systems and parts of existing systems, which have been altered, extended, renovated, or repaired, shall be tested as prescribed in this code to disclose leaks and defects.

**107.2 Apparatus, material, and labor for tests.** Apparatus, material, and labor required for testing a mechanical system or part of a system shall be furnished by the permit holder.

**107.3 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the building official for inspection and testing.

**1346.0108 SECTION 108 AUTHORITY TO CONDEMN MECHANICAL SYSTEMS.**

IMC Section 108 is amended to read as follows:

**108 Authority to condemn mechanical systems.** Whenever the building official determines that any mechanical system or portion of a system regulated by this code has become hazardous to life, health, or property, or has become insanitary, the building official shall order in writing that the system either be removed or restored to a safe condition. A time limit for compliance with the building official's order shall be specified in the written order. A person shall not use or maintain a defective mechanical system after receiving a notice under this section.

When a mechanical system is to be disconnected, written notice shall be given. In cases of immediate danger to life or property, the disconnection shall be made immediately without notice.

**1346.0109 SECTION 109 AUTHORITY TO ORDER DISCONNECTION OF ENERGY SOURCES.**

IMC Section 109 is amended to read as follows:

**109 Authority to order disconnection of energy sources.** The building official shall have the authority to order disconnection of energy sources supplied to a building, structure, or mechanical system regulated by this code, when it is determined that the mechanical system or any portion of the system has become hazardous or unsafe. Written notice of an order to disconnect service and the causes of the order shall be given within 24 hours to the owner and occupant of the building, structure, or premises, provided, however, that in cases of immediate danger to life or property, the disconnection shall be made immediately without notice. Where energy sources are provided by a public utility, the building official shall immediately notify the serving utility in writing of the issuance of an order to disconnect.

**1346.0110 SECTION 110 CONNECTION AFTER ORDER TO DISCONNECT.**

IMC Section 110 is amended to read as follows:

**110 Connection after order to disconnect.** A person shall not make energy source connections to mechanical systems regulated by this code which have been disconnected or ordered to be disconnected by the building official, or the use of which has been ordered to be discontinued by the building official until the building official authorizes the reconnection and use of such mechanical systems.

When a mechanical system is maintained in violation of this code, and in violation of a notice issued pursuant to this section, the building official shall institute appropriate action to prevent, restrain, correct, or abate the violation.

**1346.0201 SECTION 201 GENERAL.**

IMC Section 201.4 is amended to read as follows:

**201.4 Terms not defined.** Where terms are not defined through the methods authorized by this chapter, the Merriam-Webster Collegiate Dictionary, available at *www.m-w.com*, shall be considered as providing ordinarily accepted meanings. The dictionary is incorporated by reference, is subject to frequent change, and is available through the Minitex interlibrary loan system.

**1346.0202 SECTION 202 GENERAL DEFINITIONS.**

IMC Section 202 is amended by adding or amending the following definitions:

**ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE.** An appliance, also know as natural draft, that utilizes a venting system designed to remove flue or vent gases under nonpositive static vent pressure entirely by natural draft.

**CLOSED COMBUSTION SOLID FUEL BURNING APPLIANCE.** A heat producing appliance that employs a combustion chamber having no openings other than the flue collar, fuel charging door, and adjustable openings provided to control the amount of combustion air that enters the combustion chamber and includes doors with gaskets or flanges that permit tight closure and glass or ceramic panels which must be tightly sealed or gasketed at their frames.

**COMMERCIAL KITCHEN HOODS.**

**Backshelf hood.** A backshelf hood is also referred to as a low-proximity hood, a pass over hood, a plate shelf hood, or a downdraft hood. Its front lower lip is set back a maximum of 12 inches (305 mm) from the leading edge of the cooking surface, and it is supported from above. Backshelf hoods are sometimes used as island hoods when suspended over conveyor ovens that toast sandwiches or bake convenience foods.

**Double island canopy hood.** A double island canopy hood is placed over back-to-back appliances or appliance lines, and it is supported from above. The hood inlet runs down the center of the hood, not along the outside perimeter. It overhangs both fronts and the sides of the appliances and sometimes has a wall panel between the backs of the appliances. The exhaust air is drawn from both sides of the double canopy and meets in the center, which causes each side of the hood to emulate a wall canopy hood. It functions similarly with or without a wall panel between the backs of the appliances.

**Eyebrow hood.** An eyebrow hood is mounted directly to the face of an appliance, such as an oven and dishwasher, above the opening or door from which effluent is emitted. It extends past the sides and overhangs the front of the opening to capture the effluent.

**Single island canopy hood.** A single island canopy hood is placed over a cooking line that is not installed along a wall. It is open on all sides and overhangs the front, rear, and sides of the appliances. A single island canopy is more susceptible to cross drafts and requires greater exhaust airflow to capture effluent than an equivalent sized wall canopy hood. Filter racks or grease extractor plenums should be mounted in the center of these canopies for optimal capture and containment.

**Wall canopy hood.** A wall canopy exhaust hood is usually mounted against a wall above a cooking line of appliances, but sometimes it is freestanding with a vertical back panel from the rear of the appliances to the hood. It overhangs the front and sides of the appliances on all open sides. The wall acts as a back panel, forcing the makeup air to be drawn across the front of the cooking equipment, which increases the effectiveness of the hood to capture and contain effluent generated by the cooking operation.

**COMMERCIAL KITCHEN COOKING APPLIANCES.**

**Extra-heavy duty cooking appliance.** Extra-heavy duty cooking appliances include appliances using solid fuel such as wood, charcoal, briquettes, and mesquite as the primary source of heat for cooking.

**Heavy duty cooking appliance.** Heavy duty cooking appliances with a minimum average cooking surface temperature of 600°F (316°C) include electric under-fired broilers, electric chain (conveyor) broilers, gas under-fired broilers, gas chain (conveyor) broilers, electric and gas wok ranges, and electric and gas oven-fired upright broilers.

**Light duty cooking appliance.** Light duty cooking appliances include gas and electric ovens (including standard, bake, roasting, revolving, retherm, convection, combination convection/steamer, conveyor, deck or deck-style pizza, and pastry), electric and gas steam-jacketed kettles, electric and gas compartment steamers (both pressure and atmospheric), and electric and gas cheesemelters.

**Medium duty cooking appliance.** Medium duty cooking appliances with a minimum average cooking surface temperature of 400°F (204°C) include electric and gas open-burner ranges (with or without oven), electric and gas hot-top ranges, electric and gas

griddles, electric and gas double-sided griddles, electric and gas fryers (including open deep fat fryers, donut fryers, kettle fryers, and pressure fryers), electric and gas pasta cookers, electric and gas conveyor pizza ovens, electric and gas tilting skillets (braising pans), electric and gas rotisseries, and electric and gas salamander broilers.

**DECORATIVE SOLID FUEL BURNING APPLIANCE.** An atmospherically vented appliance, usually a fireplace, intended primarily for viewing of the fire and which may or may not incorporate doors that substantially close off the firebox opening when the appliance is in operation.

**DIRECT VENT APPLIANCE.** An appliance that is constructed and installed so that all air for combustion is derived from the outside atmosphere and all flue gases are discharged to the outside atmosphere.

**EXHAUST SYSTEM.** An assembly of connected ducts, plenums, fittings, registers, grilles and hoods, including domestic kitchen exhaust hoods, domestic kitchen and bathroom exhaust fans, clothes dryers, central vacuums, and radon exhaust systems through which air is conducted from the space or spaces and exhausted to the outside atmosphere or an attached residential garage.

**FAN-ASSISTED APPLIANCE.** An appliance equipped with an integral mechanical means to either draw or force products of combustion through the combustion chamber or heat exchanger. A fan-assisted appliance is a type of atmospherically vented gas or oil appliance.

**POWER VENT APPLIANCE.** An appliance with a venting system which uses a fan or other mechanical means to cause the removal of flue or vent gases under positive static vent pressure.

**POWERED MAKEUP AIR.** Air which must be brought in from the outdoors by means of a fan to replenish the air expelled by a mechanical exhausting device.

**READY ACCESS (TO).** That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction, and without requiring the use of portable access equipment (see "Access").

**SOLID FUEL APPLIANCE.** An atmospherically vented appliance that is either a closed combustion solid fuel burning appliance or a decorative wood burning appliance.

**1346.0301 SECTION 301 GENERAL.**

IMC Section 301.4 is amended to read as follows:

**301.4 Listed and labeled.** Appliances regulated by this code shall be listed and labeled to an appropriate standard by a nationally recognized testing laboratory which is qualified to evaluate the appliance, unless otherwise approved in accordance with the administrative provisions of the Minnesota State Building Code, *Minnesota Rules*, chapter 1300. The approval of unlisted appliances shall be based upon engineering evaluation. Unlisted appliances shall be installed with clearances to combustibles in accordance with IMC Chapter 8. Unlisted appliances with a fuel input rating of less than 12,500,000 Btu/hr (3,660 kW) shall have fuel trains, controls, and safety devices installed in accordance with Part CF, Combustion Side Control, of ASME CSD-1. Unlisted appliances with a fuel input rating of 12,500,000 Btu/hr (3,660 kW) or greater shall have fuel trains, controls, and safety devices installed in accordance with NFPA 85-2001.

**1346.0306 SECTION 306 ACCESS AND SERVICE SPACE.**

IMC Section 306.5 is amended to read as follows:

**306.5 Mechanical equipment and appliances on roofs or elevated structures.** Where mechanical equipment or appliances requiring periodic inspection, service, or maintenance are installed on roofs or elevated structures, a permanent stair shall be provided for access.

> **Exception:** A portable ladder may be used for dwellings, replacement equipment on existing buildings, and exterior roof access points not exceeding 16 feet (4.9 m) above grade, unless the building official determines that the unique shape of the roof does not allow safe access with a portable ladder.

The permanent stair shall be as required by relevant safety regulations, but shall not be less than the following:

1. The stair shall be installed at an angle of not more than 60 degrees measured from the horizontal plane.

2. The stair shall have flat treads at least 6 inches (152 mm) deep and a clear width of at least 18 inches (457 mm) with equally spaced risers at least 10.5 inches (267 mm) high and not exceeding 14 inches (356 mm).

3. The stair shall have intermediate landings not exceeding 18 feet (5.5 m) vertically.

4. Continuous handrails shall be installed on both sides of the stair.

5. Interior stairs shall terminate at the under side of the roof at a hatch or scuttle of at least 8 square feet ($0.74 m^2$) with a minimum dimension of 20 inches (508 mm).

6. When a roof access hatch or scuttle is located within 10 feet (3.0 m) of a roof edge, a guard shall be installed in accordance with IMC Section 304.9.

7. Exterior stairs shall terminate at the roof access point or at a level landing of at least 8 square feet (0.74 $m^2$) with a minimum dimension of 20 inches (508 mm). The landing shall have a guard installed in accordance with IMC Section 304.9.

**306.5.1 Permanent ladders.** Where a change in roof elevation greater than 30 inches (762 mm) but not exceeding 16 feet (4.9 m) exists, a permanent ladder shall be provided. The ladder may be vertical and shall be as required by relevant safety regulations, but shall not be less than the following:

1. Width shall be at least 16 inches (406 mm).

2. Rung spacing shall be a maximum of 14 inches (356 mm).

3. Toe space shall be at least 6 inches (152 mm).

4. Side railings shall extend at least 30 inches (762 mm) above the roof or parapet wall.

**1346.0309 ~~TABLE 3-A.~~ SECTION 309 TEMPERATURE CONTROL.**

~~UMC Table No. 3-A, Mechanical Permit Fees, is deleted in its entirety.~~

IMC Section 309 is amended by adding a section to read as follows:

**309.2 Balancing.** All mechanical ventilation and hydronic systems shall be capable of being balanced in accordance with this section.

**309.2.1 Mechanical ventilation system balancing.** Mechanical ventilation systems shall provide airflow rates within +/-10 percent of design capacities and fan speed shall be adjusted to meet design airflow conditions.

**Exceptions:**

1. Speed adjustment is not required for fan motorsrated at one horsepower (0.746 kW) or less.

2. Residential exhaust-only ventilation systems shall be capable of exhausting the minimum ventilation raterequired in the Minnesota Energy Code, MinnesotaRules, chapter 7670 or 7672.

**309.2.2 Hydronic system balancing.** Hydronic systems shall provide flow rates within +/-10 percent of design capacities and pump impellers shall be trimmed or pump speed shall be adjusted to meet design flow conditions.

**Exception:** Impeller trimming or speed adjustment is not required for pump motors rated at five horsepower (3.73 kW) or less.

**309.2.3 Systems balancing reports.** Systems balancing reports shall verify system performance and shall specify that the minimum amount of outdoor air required in amended Chapter 4 is provided to the ventilation system. Systems balancing reports shall be submitted to the building official upon request.

**1346.0401 SECTION 401 GENERAL.**

IMC Section 401.5 is amended to read as follows:

**401.5 Opening location.** Outside air exhaust and intake openings, in buildings other than dwellings and Group R-3 occupancies, shall be located a minimum of 10 feet (3048 mm) from lot lines or buildings on the same lot. Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way.

**401.5.1 Intake openings.** Mechanical outside air intake openings shall be located a minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, such as chimneys, plumbing vents, streets, alleys, parking lots, and loading docks, except as otherwise specified in this code. Where a source of contaminant is located within 10 feet (3048 mm) of an intake opening, the intake opening shall be located a minimum of 3 feet (914 mm) below the contaminant source, unless the intake opening is a combustion air intake of a direct-vent appliance.

**401.5.2 Exhaust openings.** Outside exhaust openings, including bathroom exhaust, toilet exhaust, domestic kitchen range exhaust, and domestic clothes dryer exhaust, shall be located at least 3 feet (914 mm) from doors, operable windows, and nonmechanical intake openings. Exhaust air shall not be directed onto public walkways.

**401.5.3 Venting system terminations.** Venting system terminations shall comply with IMC Section 804 and IFGC Section 503.8.

**1346.0403 SECTION 403 MECHANICAL VENTILATION.**

Subpart 1. **Section 403.1.** IMC Section 403.1 is amended to read as follows:

**403.1 Ventilation system.** Mechanical ventilation shall be provided by a method of supply air and return or exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system to convey ventilation air shall be designed and installed in accordance with IMC Chapter 6.

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

Subp. 2. **Section 403.2.** IMC Section 403.2 is amended to read as follows:

**403.2 Outdoor air required.** The minimum ventilation rate of required outdoor air shall be determined in accordance with the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001.

**Exceptions:**

1. Enclosed parking garages shall comply with amended Section 404.

2. Dwellings shall comply with the Minnesota Energy Code, *Minnesota Rules*, chapter 7670 or 7672, as applicable.

3. Buildings or portions of buildings that are not intended for normal human occupancy, or where the primary purpose is not associated with human comfort.

**403.2.1 Recirculation of air.** The air required by the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001, shall not be recirculated. Air in excess of that required shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling unit to another or to dissimilar occupancies.

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless the air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces.

3. Where mechanical exhaust is required by the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required.

**403.2.2 Transfer air.** Except where recirculation from such spaces is prohibited by the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001, air transferred from occupied spaces is not prohibited from serving as makeup air for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators, and smoking lounges. The amount of transfer air and exhaust air shall be sufficient to provide the flow rates as specified in the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001. The required outdoor air rates shall be introduced directly into such spaces or into the occupied spaces from which air is transferred, or a combination of both.

Subp. 3. **Section 403.3.** IMC Section 403.3 is amended to read as follows:

**403.3 Ventilation rate.** Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001, based on the occupancy of the space and the occupant load or other parameters as stated therein. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001. Ventilation rates for occupancies not represented shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

**Exception:** The occupant load is not required to be based on the estimated maximum occupant load rate where approved statistical data document the accuracy of an alternate anticipated occupant density.

Subp. 4. **Section 403.3.1.** IMC Section 403.3.1 is amended to read as follows:

**403.3.1 System operation.** The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001, and the actual number of occupants present.

Subp. 5. **Section 403.3.4.** IMC Section 403.3.4 is amended to read as follows:

**403.3.4 Balancing.** Ventilation systems shall be balanced in accordance with amended IMC Section 309.2.

**1346.0404 SECTION 404 ENCLOSED PARKING GARAGES.**

~~UMC Section 404 is amended by adding the following definitions:~~

~~"Boiler, high pressure" means a boiler furnishing steam at pressures in excess of 15 pounds per square inch or hot water at temperatures in excess of 250 degrees Fahrenheit, or at pressures in excess of 30 pounds per square inch.~~

~~"Boiler, low-pressure hot water" or "boiler, low pressure steam" means a boiler furnishing hot water at pressures not exceeding 30 pounds per square inch and at temperatures not more than 250 degrees Fahrenheit, or steam at pressures not more than 15 pounds per square inch.~~

~~"Btu" or "British thermal unit" means the amount of energy required to raise the temperature of one pound of water one degree Fahrenheit.~~

~~"Btu/h" means the number of Btu's used in an hour.~~

Subpart 1. **Section 404.1.** IMC Section 404.1 is amended to read as follows:

**404.1 Enclosed parking garages.** Mechanical ventilation systems for enclosed parking garages shall provide a minimum ventilation rate of 0.75 cfm per square foot (0.0038 $m^3/s$) of floor area. Mechanical ventilation systems are not required to operate continuously where the system is arranged to operate automatically upon detection of a concentration of carbon monoxide of 25 parts per million (ppm) by approved automatic detection devices.

Subp. 2. **Section 404.2.** IMC Section 404.2 is deleted.

Subp. 3. **Section 404.3.** IMC Section 404.3 is amended to read as follows:

**404.3 Occupied spaces accessory to public garages.** Connecting offices, waiting rooms, ticket booths, and similar uses that are accessory to a public garage shall be maintained at a positive pressure and shall be provided with ventilation in accordance with the Ventilation Rate Procedure, Section 6.1 of ASHRAE 62-2001, or the Indoor Air Quality Procedure, Section 6.2 of ASHRAE 62-2001.

Subp. 4. **Section 404.4.** IMC Section 404.4 is amended by adding a section to read as follows:

**404.4 Prohibition of heated commercial parking garages.** Commercial parking garages shall comply with the Minnesota Energy Code, *Minnesota Rules*, part 7676.1100, subpart 2.

**1346.0501 SECTION 501 GENERAL.**

Subpart 1. **Section 501.3.** IMC Section 501.3 is amended to read as follows:

**501.3 Outdoor discharge.** The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and from which it cannot again be readily drawn in by a ventilating system. Exhaust ducts shall terminate outside of the building in accordance with amended IMC Section 401.5.2 and shall be equipped with a backdraft damper at the point of termination. Air shall not be exhausted into an attic or crawl space.

Subp. 2. **Section 501.4.** IMC Section 501.4 is amended to read as follows:

**501.4 Pressure equalization.** Mechanical exhaust systems shall be sized and operated to remove the quantity of air required by this chapter. If a greater quantity of air is supplied by a mechanical ventilating supply system than is removed by a mechanical exhaust system for a room, adequate means shall be provided for the natural exit of the excess air supplied.

**501.4.1 Makeup air in new dwellings.** Makeup air quantity for new dwellings shall be determined by using Table 501.4.1 and shall be supplied in accordance with IMC Section 501.4.2.

**Exception.** Makeup air provisions of IMC Section 501.4.1 are not required when any of the following are demonstrated:

1. A dwelling is constructed under the Minnesota Energy Code, *Minnesota Rules*, chapter 7672.

2. A test is performed according to ASTM Standard E1998-99, *Standard Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances*, and documentation is provided that the vented combustion appliances continue to operate within established parameters of the test.

3. A test approved by the building official verifies proper operation of vented combustion appliances.

**501.4.1.1 Carbon monoxide detector.** When any atmospherically vented appliance is installed in a new dwelling, a carbon monoxide detector complying with UL Standard 2034 shall be installed in accordance with the manufacturer's installation instructions.

**501.4.2 Makeup air supply.** Makeup air shall be provided by one of the following methods:

1. Passive makeup air shall be provided by passive openings according to the following:

1.1 Passive makeup air openings from the outdoors shall be sized according to Table 501.4.2.

1.2 Barometric dampers are prohibited in passive makeup air openings when any atmospherically vented appliance is installed.

1.3 Single passive openings larger than 8 inches (204 mm) diameter, or equivalent, shall be provided with a motorized damper that is electrically interlocked with the largest exhaust system.

2. Powered makeup air shall be provided if the size of a single opening or multiple openings exceeds 11 inches (280 mm) diameter, or equivalent, when sized according to Table 501.4.2. Powered makeup air shall comply with the following:

2.1 Powered makeup air shall be electrically interlocked with the largest exhaust system.

2.2 Powered makeup air shall be matched to the airflow of the largest exhaust system.

3. Makeup air shall be provided by a combination of passive openings and powered means according to Table 501.4.2 and the following:

3.1 Passive makeup air openings shall comply with Item 1.

3.2 Powered makeup air shall be supplied for the quantity of airflow in excess of the passive makeup air opening provided, and it shall be electrically interlocked with the exhaust system.

**501.4.2.1 Makeup air ducts.** Makeup air ducts shall be constructed and installed according to IMC Chapter 6 and Section 501.4.2.

**501.4.2.2 Makeup air intake.** Makeup air intake openings shall be located to avoid intake of exhaust air in accordance with IMC Section 401.5.2 and IFGC Section 503.8, and shall be covered with corrosion resistant screen of not less than 1/4 inch (6.4 mm) mesh. Makeup air intake openings shall be located at least 12 inches (305 mm) above adjoining grade level.

**501.4.2.3 Makeup air location.** Makeup air requirements of 175 cubic feet per minute (cfm) ($0.084 m^3/s$) and greater shall be introduced to the dwelling in one of the following locations:

1. In the space containing the vented combustion appliances.

2. In the space containing the exhaust system.

3. In a space that is freely communicating with the exhaust system and is approved by the building official.

**501.4.2.4 Makeup air termination restriction.** A makeup air opening shall not terminate in the return air plenum of a forced air heating system unless it is installed according to the heating equipment manufacturer's installation instructions.

**501.4.2.5 Separate makeup air and combustion air openings.** When both makeup air and combustion air openings are required, they shall be provided through separate openings to the outdoors. Refer to IFGC Section 304, to determine requirements for air for combustion and ventilation.

**Exception:** Combination makeup air and combustion air systems may be approved by the building official.

**501.4.2.6 Makeup air effectiveness.** The makeup air shall not reduce the effectiveness of exhaust systems or performance of vented combustion appliances, and makeup air shall not adversely affect the heating or cooling capability of the mechanical equipment.

**501.4.3 Additions, alterations, or installations of mechanical systems in existing dwellings.** Makeup air shall be supplied to existing dwellings when any of the following conditions occur:

1. If a dwelling was constructed after 2002 using the makeup air provisions of IMC Section 501.4.1, makeup air quantity shall be determined by using Table 501.4.1 and shall be supplied according to IMC Section 501.4.2 when any of the following conditions occur:

1.1 A vented combustion appliance, including a solid fuel appliance, is installed or replaced.

1.2 An exhaust system is installed or replaced.

**Exception:** If powered makeup air is electrically interlocked and matched to the airflow of the exhaust system, additional makeup air is not required.

2. If a dwelling was constructed after 1999 using the provisions of the Minnesota Energy Code, *Minnesota Rules*, chapter 7672, makeup air quantity shall be determined by using IMC Table 501.4.1 and shall be supplied in accordance with IMC Section 501.4.2 when any of the following conditions occur:

2.1 A vented combustion appliance, including a solid fuel appliance, is installed or replaced.

2.2 An exhaust system is installed or replaced.

**Exception:** If powered makeup air is electrically interlocked and matched to the airflow of the exhaust system, additional makeup air is not required.

3. When a solid fuel burning appliance is installed in a dwelling constructed during or after 1994 under the Minnesota Energy Code, *Minnesota Rules*, chapter 7670, makeup air quantity shall be determined by using IMC Table 501.4.1 and shall be supplied according to IMC Section 501.4.2.

**Exception.** If a closed combustion solid fuel burning appliance is installed with combustion air in accordance with the manufacturer's installation instructions, additional makeup air is not required.

4. When an exhaust system with a rated capacity greater than 300 cfm ($0.144 m^3/s$) is installed in a dwelling constructed during or after 1994 under the Minnesota Energy Code, *Minnesota Rules*, chapter 7670, makeup air quantity shall be determined by using IMC Table 501.4.3(1) and shall be supplied according to IMC Section 501.4.2.

**Exception:** If powered makeup air is electrically interlocked and matched to the airflow of the exhaust system additional makeup air is not required.

5. When an exhaust system with a rated capacity greater than 300 cfm ($0.144 m^3/s$) is installed in a dwelling constructed prior to 1994, makeup air quantity shall be determined by using IMC Table 501.4.3(2) and shall be supplied according to IMC Section 501.4.2.

**Exception:** If powered makeup air is electrically interlocked and matched to the airflow of the exhaust system, additional makeup air is not required.

6. When a solid fuel burning appliance is installed in a dwelling constructed prior to 1994, makeup air quantity shall be determined by using IMC Table 501.4.3(3) and shall be supplied according to IMC Section 501.4.2.

**Exception:** If a closed combustion solid fuel burning appliance is installed with combustion air in accordance with the manufacturer's installation instructions, additional makeup air is not required.

**Exception:** Makeup air is not required in Items 1 to 6 when any of the following are demonstrated:

1. A test is performed according to ASTM Standard E1998-99, *Standard Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances*, and documentation is provided that the vented combustion appliances continue to operate within established parameters of the test.

2. A test approved by the building official verifies proper operation of vented combustion appliances.

[The following table is all new language]

Table 501.4.1

Procedure to Determine Makeup Air Quantity
for Exhaust Equipment in Dwellings

| | One or multiple power vent or direct vent appliances or no combustion appliances[A] | One or multiple fan-assisted appliances and power vent or direct vent appliances[B] | One atmospherically vented gas or oil appliance or one solid fuel appliance[C] | Multiple atmospherically vented gas or oil appliances or solid fuel appliances[D] |
|---|---|---|---|---|
| 1. Use the Appropriate Column to Estimate House Infiltration | | | | |
| a) pressure factor (cfm/sf) | 0.15 | 0.09 | 0.06 | 0.03 |
| b) conditioned floor area (sf) (including unfinished basements) | _____ | _____ | _____ | _____ |
| Estimated House Infiltration (cfm): [1a x 1b] | _____ | _____ | _____ | _____ |
| 2. Exhaust Capacity | | | | |
| a) continuous exhaust-only ventilation system (cfm): (not applicable to balanced ventilation systems such as HRV) | _____ | _____ | _____ | _____ |

| | | | | |
|---|---|---|---|---|
| b) clothes dryer | 135 | 135 | 135 | 135 |
| c) 80% of largest exhaust rating (cfm): | _____ | _____ | _____ | _____ |

(not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)

| | | | | |
|---|---|---|---|---|
| d) 80% of largest exhaust rating (cfm): | not applicable | _____ | _____ | _____ |

(not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)

| | | | | |
|---|---|---|---|---|
| Total Exhaust Capacity (cfm): [2a+2b+2c+2d] | _____ | _____ | _____ | _____ |

3. Makeup Air Requirement

| | | | | |
|---|---|---|---|---|
| a) Total Exhaust Capacity (from above) | _____ | _____ | _____ | _____ |
| b) Estimated House Infiltration (from above) | _____ | _____ | _____ | _____ |
| Makeup Air Quantity (cfm): [3a - 3b] | _____ | _____ | _____ | _____ |

(if value is negative, no makeup air is needed)

4. For Makeup Air Opening Sizing, refer to Table 501.4.2

[A] Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances.

[B] Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

[C] Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting system or one solid fuel appliance.

[D] Use this column if there are multiple atmospherically vented gas or oil appliances using a common vent or if there are atmospherically vented gas or oil appliances and solid fuel appliances.

(The following table is all new language)

Table 501.4.2
Makeup Air Opening Sizing Table for
New and Existing Dwellings

| Type of opening or system | One or multiple power vent or direct vent appliances *or* no combustion appliances[A] (cfm) | One or multiple fan-assisted appliances *and* power vent or direct vent appliances[B] (cfm) | One atmospherically vented gas or oil appliance *or* one solid fuel appliance[C] (cfm) | Multiple atmospherically vented gas or oil appliances *or* solid fuel appliances[D] (cfm) | Passive makeup air opening duct diameter[E,F,G] (inches) |
|---|---|---|---|---|---|
| Passive Opening | 1-36 | 1-22 | 1-15 | 1-9 | 3 |
| Passive Opening | 37-66 | 23-41 | 16-28 | 10-17 | 4 |
| Passive Opening | 67-109 | 42-66 | 29-46 | 18-28 | 5 |
| Passive Opening | 110-163 | 67-100 | 47-69 | 29-42 | 6 |
| Passive Opening | 164-232 | 101-143 | 70-99 | 43-61 | 7 |
| Passive Opening | 233-317 | 144-195 | 100-135 | 62-83 | 8 |
| Passive Opening with Motorized Damper | 318-419 | 196-258 | 136-179 | 84-110 | 9 |
| Passive Opening with Motorized Damper | 420-539 | 259-332 | 180-230 | 111-142 | 10 |
| Passive Opening with Motorized Damper | 540-679 | 333-419 | 231-290 | 143-179 | 11 |
| Powered Makeup Air[H] | >679 | >419 | >290 | >179 | Not Applicable |

[A] Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances *or* if there are no combustion appliances.

[B] Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

[C] Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting system *or* one solid fuel appliance.

[D] Use this column if there are multiple atmospherically vented gas or oil appliances using a common vent *or* if there are atmospherically vented gas or oil appliances *and* solid fuel appliance(s).

[E] An equivalent length of 100 feet of round smooth metal duct is assumed. Subtract 40 feet for the exterior hood and ten feet for each 90-degree elbow to determine the remaining length of straight duct allowable.

[F] If flexible duct is used, increase the duct diameter by one inch. Flexible duct shall be stretched with minimal sags.

[G] Barometric dampers are prohibited in passive makeup air openings when any atmospherically vented appliance is installed.

[H] Powered makeup air shall be electrically interlocked with the largest exhaust system.

(The following table is all new language)

Table 501.4.3(1)

Procedure to Determine Makeup Air Quantity
for Exhaust Equipment in Existing Dwellings
(Refer to Item 4 in Section 501.4.3 to
determine applicability of this table)

| | One or multiple power vent or direct vent appliances or no combustion appliances[A] | One or multiple fan-assisted appliances and power vent or direct vent appliances[B] | One atmospherically vented gas or oil appliance or one solid fuel appliance[C] | Multiple atmospherically vented gas or oil appliances or solid fuel appliances[D] |
|---|---|---|---|---|
| 1. Use the Appropriate Column to Estimate House Infiltration | | | | |
| a) pressure factor (cfm/sf) | 0.15 | 0.09 | 0.06 | 0.03 |
| b) conditioned floor area (sf) | _____ | _____ | _____ | _____ |
| Estimated House Infiltration (cfm): [1a x 1b] | _____ | _____ | _____ | _____ |
| 2. Exhaust Capacity 80% of exhaust rating = Exhaust Capacity (cfm): | _____ | _____ | _____ | _____ |
| (not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust) | | | | |
| 3. Makeup Air Requirement | | | | |
| a) Exhaust Capacity (from above) | _____ | _____ | _____ | _____ |

| | | | | |
|---|---|---|---|---|
| b) Estimated House Infiltration (from above) | _____ | _____ | _____ | _____ |
| Makeup Air Quantity (cfm): [3a - 3b] | _____ | _____ | _____ | _____ |

(if value is negative, no makeup air is needed)

4. For Makeup Air Opening Sizing, refer to Table 501.4.2

[A] Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances.

[B] Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

[C] Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting system or one solid fuel appliance.

[D] Use this column if there are multiple atmospherically vented gas or oil appliances using a common vent or if there are atmospherically vented gas or oil appliances and solid fuel appliances.

(The following table is all new language)

Table 501.4.3(2)

Procedure to Determine Makeup Air Quantity for Exhaust Equipment in Existing Dwellings

(Refer to Item 5 in Section 501.4.3 to determine applicability of this table)

| | One or multiple power vent or direct vent appliances or no combustion appliances[A] | One or multiple fan-assisted appliances and power vent or direct vent appliances[B] | One atmospherically vented gas or oil appliance or one solid fuel appliance[C] | Multiple atmospherically vented gas or oil appliances or solid fuel appliances[D] |
|---|---|---|---|---|
| 1. Use the Appropriate Column to Estimate House Infiltration | | | | |
| a) pressure factor cfm/sf) | 0.25 | 0.15 | 0.10 | 0.05 |
| b) conditioned floor area (sf) | _____ | _____ | _____ | _____ |

(including unfinished basements)

| | | | | |
|---|---|---|---|---|
| Estimated House Infiltration (cfm): [1a x 1b] | _____ | _____ | _____ | _____ |

or

| | | | | |
|---|---|---|---|---|
| Alternative Calculation (by using blower door test)[E] | | | | |
| c) conversion factor | 0.75 | 0.45 | 0.30 | 0.15 |
| d) CFM50 value (from blower door test) | _____ | _____ | _____ | _____ |
| Estimated House Infiltration (cfm): [1c x 1d] | _____ | _____ | _____ | _____ |

2. Exhaust Capacity

| | | | | |
|---|---|---|---|---|
| 80% of exhaust rating = Exhaust Capacity (cfm): | _____ | _____ | _____ | _____ |

(not applicable if recirculating system or if powered makeup air is electrically interlocked with exhaust)

3. Makeup Air Requirement

| | | | | |
|---|---|---|---|---|
| a) Exhaust Capacity (from above) | _____ | _____ | _____ | _____ |
| b) Estimated House Infiltration (from above) | _____ | _____ | _____ | _____ |
| Makeup Air Quantity (cfm): [3a - 3b] | _____ | _____ | _____ | _____ |

(if value is negative, no makeup air is needed)

4. For Makeup Air Opening Sizing, refer to Table M501.4.2

[A] Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances.

[B] Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

[C] Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting system or one solid fuel appliance.

[D] Use this column if there are multiple atmospherically vented gas or oil appliances using a common vent or if there are atmospherically vented gas or oil appliances and solid fuel appliances.

[E] As an alternative, the Estimated House Infiltration may be calculated by performing a blower door test and multiplying the conversion factor by the CFM50 value.

(The following table is all new language)

Table 501.4.3(3)
Procedure to Determine Makeup Air Quantity
for Exhaust Equipment in Existing Dwellings
(Refer to Item 6 in Section 501.4.3 to
determine applicability of this table)

| | One or multiple power vent or direct vent appliances or no combustion appliances[A] | One or multiple fan-assisted appliances and power vent or direct vent appliances[B] | One atmospherically vented gas or oil appliance or one solid fuel appliance[C] | Multiple atmospherically vented gas or oil appliances or solid fuel appliances[D] |
|---|---|---|---|---|
| 1. Use the Appropriate Column to Estimate House Infiltration | | | | |
| a) pressure factor (cfm/sf) | 0.25 | 0.15 | 0.10 | 0.05 |
| b) conditioned floor area (sf) (including unfinished basements) | _____ | _____ | _____ | _____ |
| Estimated House Infiltration (cfm): [1a x 1b] | _____ | _____ | _____ | _____ |
| or | | | | |
| Alternative Calculation (by using blower door test)[E] | | | | |

| | | | | |
|---|---|---|---|---|
| c) conversion factor | 0.75 | 0.45 | 0.30 | 0.15 |
| d) CFM50 value (from blower door test) | _____ | _____ | _____ | _____ |
| Estimated House Infiltration (cfm): [1c x 1d] | _____ | _____ | _____ | _____ |

2. Exhaust Capacity

| | | | | |
|---|---|---|---|---|
| a) continuous exhaust-only ventilation system (cfm) | _____ | _____ | _____ | _____ |

(not applicable to balanced ventilation systems)

| | | | | |
|---|---|---|---|---|
| b) clothes dryer (cfm) | 135 | 135 | 135 | 135 |
| c) 80% of largest exhaust rating (cfm): | _____ | _____ | _____ | _____ |

(not applicable if recirculating system or if powered makeup air is electrically interlocked and with exhaust)

| | | | | |
|---|---|---|---|---|
| d) 80% of next largest exhaust rating (cfm) | Not appli-cable | _____ | _____ | _____ |

(not applicable if recirculating system or if powered makeup air is electrically interlocked with exhaust)

| | | | | |
|---|---|---|---|---|
| Total Exhaust Capacity (cfm): [2a+2b+2c+2d] | _____ | _____ | _____ | _____ |

3. Makeup Air Requirement

| | | | | |
|---|---|---|---|---|
| a) Total Exhaust Capacity (from above) | _____ | _____ | _____ | _____ |

| | | | | |
|---|---|---|---|---|
| b) Estimated House Infiltration (from above) | _____ | _____ | _____ | _____ |
| Makeup Air Quantity (cfm): [3a - 3b] (if value is negative, no makeup air is needed) | _____ | _____ | _____ | _____ |

4. For Makeup Air Opening Sizing, refer to Table 501.4.2

[A] Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances.

[B] Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

[C] Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting system or one solid fuel appliance.

[D] Use this column if there are multiple atmospherically vented gas or oil appliances using a common vent or if there are atmospherically vented gas or oil appliances and solid fuel appliances.

[E] As an alternative, the Estimated House Infiltration may be calculated by performing a blower door test and multiplying the conversion factor by the CFM50 value.

**1346.0505 SECTION 505 DOMESTIC KITCHEN EXHAUST EQUIPMENT.**

IMC Section 505.1 is amended to read as follows:

**505.1 Domestic systems.** Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwellings, the hoods and appliances shall discharge to the outdoors through ducts constructed of galvanized steel, stainless steel, aluminum, or copper. The ducts shall have smooth inner walls and shall be air tight and equipped with a backdraft damper. Domestic kitchen exhaust hoods ducted to the outdoors shall have makeup air provided according to IMC Section 501.4. Refer to Appendix C for Table C-1, "Recommended Capacities for Domestic Kitchen Exhaust Hoods."

**Exceptions:**

1. Where installed according to the manufacturer's installation instructions and where mechanical or natural ventilation is otherwise provided according to IMC Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:

2.1. The duct shall be installed under a concrete slab poured on grade.

2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.

2.3. The PVC duct shall extend not greater than 1 inch (25 mm) above the indoor concrete floor surface.

2.4. The PVC duct shall extend not greater than 1 inch (25 mm) above grade outside of the building.

2.5. The PVC ducts shall be solvent cemented.

**1346.0506 SECTION 506 COMMERCIAL KITCHEN GREASE DUCTS AND EXHAUST EQUIPMENT.**

Subpart 1. **Section 506.3.** IMC Section 506.3 is amended to read as follows:

**506.3 Ducts serving Type I hoods.** Commercial kitchen exhaust systems serving Type I hoods shall be designed, constructed and installed in accordance with NFPA 96-2001, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*.

Subp. 2. **Sections 506.3.1 to 506.3.7 and 506.3.9 to 506.3.13.3.** IMC Sections 506.3.1 through 506.3.7 and 506.3.9 through 506.3.13.3 are deleted and replaced with NFPA 96-2001 with the following amendments:

**5.1.1** The hood or that portion of a primary collection means designed for collecting cooking vapors and residues shall be constructed of stainless steel not less than 0.94 mm (0.037 in.) (No. 20 MSG) in thickness or other approved material of equivalent strength and fire and corrosion resistance. Refer to the Minnesota Food Code, *Minnesota Rules*, chapter 4626, for additional requirements for commercial kitchen hoods licensed and inspected by the Department of Agriculture, Department of Health, or local authorities that conduct inspections of food establishments.

**7.5.2.1** All seams, joints, penetrations, and duct-to-hood collar connections shall have a liquid tight continuous external weld. Listed grease ducts and ducts complying with 7.5.1 through 7.5.5.5 that are installed within a concealed enclosure shall maintain an air pressure test of 0.10 inches water column positive pressure for a minimum of 20 minutes, unless an equivalent alternate test is specified by the building official.

**8.1.2.3** Flexible connectors shall not be used without prior approval from the building official.

**8.1.3.5** Flexible connectors shall not be used without prior approval from the building official.

**8.2.1.1** The air velocity through any duct shall be not less than 152.4 m/min (500 ft/min).

Subp. 3. **Section 506.4.2.** IMC Section 506.4.2 is amended to read as follows:

**506.4.2 Ducts.** Ducts and plenums serving Type II hoods shall be constructed of rigid metallic materials. Duct construction, installation, bracing, and supports shall comply with IMC Chapter 6. Ducts subject to positive pressure and ducts conveying moisture-laden or waste heat-laden air shall comply with the following requirements:

1. Ducts shall be constructed, joined, and sealed to prevent drips and leaking.

2. Ducts shall slope not less than one-fourth unit vertical in 12 units horizontal (2 percent slope) toward the hood or toward an approved reservoir.

3. Horizontal ducts exceeding 75 feet (22 860 mm) in length shall slope not less than one unit vertical in 12 units horizontal (8.3 percent slope).

4. Ducts shall maintain an air pressure test of 0.10 inches water column positive pressure for a minimum of 20 minutes, unless an equivalent alternate test is specified by the building official.

**1346.0507 SECTION 507 COMMERCIAL KITCHEN HOODS.**

Subpart 1. **Section 507.1.** IMC Section 507.1 is amended to read as follows:

**507.1 General.** Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues.

> **Exception:** Factory-built commercial exhaust hoods which are listed, labeled, and installed in accordance with UL 710 and installed in accordance with IMC Section 304.1 shall not be required to comply with IMC Sections 507.5, 507.7, 507.12, amended IMC Section 507.13, and Chapter 5 of NFPA 96-2001.

Subp. 2. **Section 507.2.** IMC Section 507.2 is amended to read as follows:

**507.2 Where required.** A Type I hood shall be installed above all commercial food heat-processing appliances that produce grease-laden vapors or smoke. A Type I or Type II hood shall be installed at or above all commercial food heat-processing appliances that produce fumes, steam, odor, or heat. A Type II hood shall be installed above commercial dishwashing machines.

> **Exceptions:**
>
> 1. Food heat-processing appliances installed within a dwelling unit.
>
> 2. Under-counter-type commercial dishwashing machines.
>
> 3. Electric countertop appliances with a heat input less than 3.7 kW used for heating food with limited grease emissions including warming ovens, microwave ovens, toasters, soup warmers, hotdog rollers, pretzel warmers, coffee makers, heated display cases, and hot air popcorn poppers.
>
> 4. Integral recirculating (ductless) hoods listed, labeled, and installed in accordance with UL 197 and Chapter 13 of NFPA 96-2001.

Subp. 3. **Section 507.2.1.** IMC Section 507.2.1 is deleted.

Subp. 4. **Section 507.2.2.** IMC Section 507.2.2 is amended to read as follows:

**507.2.2 Domestic cooking appliances used for commercial purposes.** Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or II hoods as required for the type of appliances and processes in accordance with amended IMC Section 507.2. Refer to the Minnesota Food Code, *Minnesota Rules*, chapter 4626, for additional requirements for commercial kitchen hoods licensed and inspected by the Department of Agriculture, Department of Health, or local authorities that conduct inspections of food establishments.

Subp. 5. **Section 507.2.3.** IMC Section 507.2.3 is deleted.

Subp. 6. **Section 507.4.** IMC Section 507.4 is deleted.

Subp. 7. **Section 507.5.** IMC Section 507.5 is amended to read as follows:

**507.5 Type II hood materials.** Type II hood materials shall be constructed of stainless steel not less than 0.024 inch (0.61 mm) (No. 24 Gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/$m^2$), or of other approved material and gage. Refer to the Minnesota Food Code, *Minnesota Rules*, chapter 4626, for additional requirements for commercial kitchen hoods licensed and inspected by the Department of Agriculture, Department of Health, or local authorities that conduct inspections of food establishments.

Subp. 8. **Section 507.7.** IMC Section 507.7 is amended to read as follows:

**507.7 Hood joints, seams, and penetrations.** Hood joints, seams, and penetrations shall comply with amended IMC Section 507.7.1 and IMC Section 507.7.2.

Subp. 9. **Section 507.7.1.** IMC Section 507.7.1 is amended by adding a section to read as follows:

**507.7.1 Type I hoods.** Type I hoods shall be designed, constructed and installed in accordance with Chapter 5 of NFPA 96-2001.

Subp. 10. **Sections 507.8 to 507.11.2.** IMC Sections 507.8 through 507.11.2 are deleted.

Subp. 11. **Section 507.13.** IMC Section 507.13 is amended to read as follows:

**507.13 Capacity of hoods.** Commercial kitchen hoods shall exhaust a minimum net quantity of air determined in accordance with IMC Sections 507.13.1 through 507.13.4. The net quantity of exhaust air shall be calculated by subtracting any air flow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of extra-heavy duty, heavy duty, medium duty, or light duty cooking appliances are utilized under a single section of hood, the highest exhaust rate required by this section shall be used for the entire hood, unless it can be demonstrated that the hood is specifically designed for that application.

**507.13.1 Extra-heavy duty cooking appliances.** The minimum net airflow for hoods used for extra-heavy duty cooking appliances shall be determined as follows:

| Type of Hood | CFM per linear foot of hood |
|---|---|
| Wall canopy | 550 |
| Single island canopy | 700 |
| Double island canopy (per side) | 550 |
| Backshelf/pass-over | Not allowed |
| Eyebrow | Not allowed |

**507.13.2 Heavy duty cooking appliances.** The minimum net airflow for hoods used for heavy duty cooking appliances shall be determined as follows:

| Type of Hood | CFM per linear foot of hood |
|---|---|
| Wall canopy | 400 |
| Single island canopy | 600 |
| Double island canopy (per side) | 400 |
| Backshelf/pass-over | 400 |
| Eyebrow | Not allowed |

**507.13.3 Medium duty cooking appliances.** The minimum net airflow for hoods used for medium duty cooking appliances shall be determined as follows:

| Type of Hood | CFM per linear foot of hood |
|---|---|
| Wall canopy | 300 |
| Single island canopy | 500 |
| Double island canopy (per side) | 300 |
| Backshelf/pass-over | 300 |
| Eyebrow | 250 |

**507.13.4 Light duty cooking appliances.** The minimum net airflow for hoods used for light duty cooking appliances shall be determined as follows:

| Type of Hood | CFM per linear foot of hood |
|---|---|
| Wall canopy | 200 |
| Single island canopy | 400 |
| Double island canopy (per side) | 250 |
| Backshelf/pass-over | 250 |
| Eyebrow | 250 |

Subp. 12. **Sections 507.15 and 507.16.** IMC Sections 507.15 and 507.16 are deleted.

Subp. 13. **Section 507.17.** IMC Section 507.17 is amended by adding a section to read as follows:

**507.17.1 Capture and containment test.** The performance of the exhaust system shall be verified by a capture and containment test. This test shall be conducted with all appliances under the hood at operating temperatures. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as with smoke candles or smoke puffers, etc.

**1346.0508 SECTION 508 COMMERCIAL KITCHEN MAKEUP AIR.**

Subpart 1. **Section 508.1.** IMC Section 508.1 is amended to read as follows:

**508.1 Makeup air.** Makeup air shall be supplied during the operation of commercial kitchen exhaust systems that are provided for commercial food heat-processing appliances. The amount of makeup air supplied shall be approximately equal to the exhaust air. A minimum of 80 percent of the makeup air shall be supplied into the space where the exhaust hood is located. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air shall be provided by mechanical means and the exhaust and makeup air systems shall be electrically interlocked to insure that makeup air is provided whenever the exhaust system is in operation. Makeup air intake openings shall comply with IMC Section 401.5 and amended IMC Section 401.5.1.

**Exception:** This section shall not apply to dwelling units.

**508.1.1 Makeup air temperature.** Makeup air shall be not less than 50°F (10°C), measured at the flow of air from the supply diffuser into the space.

**508.1.2 Makeup and ventilation air distribution.** Makeup and ventilation air supply diffusers located within 12 feet (3.7 m) of an exhaust hood shall be directed away from the hood.

Subp. 2. **Section 508.2.** IMC Section 508.2 is amended to read as follows:

**508.2 Compensating hoods.** Manufacturers of compensating hoods shall provide a label indicating minimum exhaust flow and maximum makeup airflow that provides capture and containment of the exhaust effluent. Short-circuit compensating hoods are prohibited.

**1346.0603 SECTION 603 DUCT CONSTRUCTION AND INSTALLATION.**

Subpart 1. **Section 603.2.** ~~UMC~~ IMC Section ~~603~~ 603.2 is amended to read as follows:

~~Section 603. (a) Air from outside. Combustion air must be obtained from outside the building through continuous ducts of the required cross-section area, complying with Section 607, extending from the appliance area to the outside of the building. Caution must be taken in the installation of the combustion air ducts so that equipment located in the room will not be subjected to freezing temperatures.~~

~~(b) Prohibited sources. Openings and ducts must not connect appliance enclosures with attic spaces~~

**603.2 Duct sizing.** Ducts installed within a single dwelling unit shall be sized in accordance with ACCA Manual D, *Residential Duct Systems*, or other approved methods. Ducts installed within all other buildings shall be sized in accordance with Chapter 34 of the *2001 ASHRAE Handbook - Fundamentals* or other equivalent computation procedures.

**603.2.1 Duct classification.** Ducts shall be classified based on the maximum operating pressure of the duct at pressures of positive or negative 0.5, 1.0, 2.0, 3.0, 4.0, 6.0, or 10.0 inches of water column. The pressure classification of ducts shall equal or exceed the design pressure of the air distribution in which the ducts are utilized.

Subp. 2. **Section 603.3.** IMC Section 603.3 is amended to read as follows:

**603.3 Metallic ducts.** All metallic ducts shall be constructed as specified in the *SMACNA HVAC Duct Construction Standards - Metal and Flexible.*

**Exception:** Ducts installed within a single dwelling unit shall have a minimum thickness as specified in Table 603.3.

**603.3.1 Elbows.** Radius elbows with velocities exceeding 1,000 feet per minute (fpm) (76.2 m/min) shall have an inside radius not less than the width of the duct or shall have turning vanes. Square throat elbows with velocities exceeding 1,000 feet per minute (fpm) (76.2 m/min) shall have turning vanes.

**Exception:** Ducts installed within a single dwelling unit.

**603.3.2 Transition fittings.** Transition fittings shall be constructed with a maximum slope of 45 degrees.

**603.3.3 Obstructions.** Where a pipe or other obstruction passes through a duct, a streamlined sleeve must be constructed equal in type and gage to the duct. The area of the duct, at the point of obstruction, must be increased by an amount equal to the area of the streamlined sleeve.

Subp. 3. **Section 603.6.** IMC Section 603.6 is amended to read as follows:

**603.6 Rigid duct penetrations.** Duct system penetrations of walls, floors, ceilings, and roofs and air transfer openings in any of those building components shall be protected as required by IMC Section 607. Ducts in a private garage and ducts penetrating the walls or ceilings separating a dwelling from a private garage shall be continuous and constructed of minimum 26 gage (0.48 mm) galvanized sheet metal and shall have no openings into the garage. Fire and smoke dampers are not required in such ducts passing through the wall or ceiling separating a dwelling from a private garage, unless required by International Building Code Chapter 7.

Subp. 4. **Section 603.7.** IMC Section 603.7 is amended to read as follows:

**603.7 Underground ducts.** Ducts shall be approved for underground installation. Metallic ducts not having an approved protective coating shall be completely encased in a minimum of 2 inches (51 mm) of concrete.

Subp. 5. **Section 603.7.1.** IMC Section 603.7.1 is amended to read as follows:

**603.7.1 Slope.** Ducts shall slope to allow drainage to a point provided with access for inspection and cleaning at each low point of the duct system.

Subp. 6. **Section 603.7.2.** IMC Section 603.7.2 is amended to read as follows:

**603.7.2 Sealing.** Ducts shall have a polyethylene vapor retarder of at least 4 mils (0.102 mm) thickness installed around the outside. Where encased in concrete, the ducts shall be sealed and secured prior to pouring the concrete encasement.

Subp. 7. **Section 603.7.5.** IMC Section 603.7 is amended by adding a section to read as follows:

**603.7.5 Drainage.** Underground ducts shall be provided with drain tile around the perimeter of the duct system to prevent water intrusion. The top of the drain tile shall be installed at an elevation lower than the bottom of the underground duct system. The building official may approve an alternate drainage system if soil conditions are adequate.

Subp. 8. **Section 603.7.6.** IMC Section 603.7 is amended by adding a section to read as follows:

**603.7.6 Insulation.** Underground ducts shall be insulated in accordance with amended IMC Section 604.1.

Subp. 9. **Section 603.8.** IMC Section 603.8 is amended to read as follows:

**603.8 Joints, seams and connections.** All transverse joints, longitudinal seams, and connections shall be securely fastened and sealed in accordance with this section. Pressure sensitive tape shall not be used as the primary sealant for ducts designed to operate at static pressure of one inch water gauge or greater.

| **Location** | **Design Static Pressure** | **Minimum Required Sealing** |
|---|---|---|
| All locations | Greater than 3.0 inches (750 Pa) water gauge | All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed. Ductwork shall be equal to or less than Leakage Class 6 as defined in Section 4 of the *SMACNA HVAC Duct Leakage Test Manual**. |
| Portions of ducts not completely inside the vapor retarder/air barrier enclosing conditioned space | 3.0 inches (750 Pa) water gauge and less | All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed with a product meeting UL181 or equivalent. |

| | | |
|---|---|---|
| Portions of return air ducts in the same space as an atmospherically vented or fan-assisted appliance. | 3.0 inches (750 Pa) water gauge and less | All transverse joints, longitudinal seams, and duct wall penetrations shall be sealed. |
| All locations | Greater than 0.50 to 3.0 inches (125 to 750 Pa) water gauge | All transverse joints and duct wall penetrations shall be sealed. |
| All locations | 0.50 inches (125 Pa) water gauge and less | All transverse joints, longitudinal seams, and duct wall penetrations shall have no visible gaps and shall be sufficiently airtight in accordance with Section 1.7 of the *SMACNA HVAC Duct Construction Standards - Metal & Flexible*. |

*Leakage testing may be limited to representative sections of the duct system, but in no case shall such tested sections include less than 25 percent of the total installed duct area for the design pressure class.

Subp. 10. **Section 603.15.** IMC Section 603.15 is amended to read as follows:

**603.15 Registers, grilles and diffusers.** Duct registers, grilles, and diffusers shall be installed in accordance with the manufacturer's installation instructions. Balancing dampers or other means of supply air adjustment shall be provided in the branch ducts. Volume dampers shall be provided for all supply ducts, and they shall be adjusted according to the required air measurement of the system and locked in place. In finished or inaccessible locations, a friction-type register box may be used.

**1346.0604 SECTION 604 INSULATION.**

~~UMC~~ IMC Section ~~604~~ 604.1 is amended to read as follows:

~~Section 604. (a) General. Combustion air ducts must:~~

~~1. be of galvanized steel complying with chapter 10 or equivalent corrosion resistant material approved for this use.~~

~~2. have a minimum cross sectional area at least equal to the required flue serving the equipment requiring combustion air, and discharge the air at a point not more than one foot above the floor of the equipment area;~~

~~3. have the same cross sectional area as the free area of the opening to which it is connected; and~~

~~4. serve a single appliance enclosure.~~

~~(b) Dampers. Dampers may be installed as required in UMC Section 602(b).~~

~~(c) Other installations. A manufacturer's installation instructions that require combustion air supply and distribution different than what is provided for in this section may be approved by the building official.~~

**604.1 General.** Duct insulation shall conform to the thickness required by this section.

**Minimum Required Duct Installation** (see notes for explanations)

| **Duct Location** | **Requirements** |
|---|---|
| Attics, garages, and ventilated crawl spaces | R-8 and V |
| Exterior of building | R-8, V and W |
| Inside of building and in unconditioned spaces TD less than or equal to 15°F | None required |

| | |
|---|---|
| TD greater than 15°F and less than or equal to 40°F | R-3.3 and V |
| TD greater than 40°F | R-5 and V |
| Within conditioned spaces, in basements with insulated walls, and in plenums within conditioned spaces | None required |
| Intake and exhaust ducts within conditioned spaces* | R-3.3 and V |
| Within cement slab or within ground (also see IMC Section 603.7) | R-5 |

Notes:

*Insulation required for a distance of 3 feet (914 mm) from the exterior.

TD = Design temperature differential between the air in the duct and the ambient temperature outside of the duct.

V = Vapor retarder required in accordance with IMC Section 604.11. When a vapor retarder is required, duct insulation required by this section shall be installed without respect to other building envelope insulation.

W = Approved weatherproof barrier.

**1346.0701 SECTION 701 GENERAL.**

Subpart 1. **Section 701.4.** IMC Section 701.4 is amended to read as follows:

**701.4 Engineered installations.** Engineered combustion air installations shall provide adequate supply of combustion, ventilation, and dilution air, and shall be approved by the building official.

Subp. 2. **Sections 701.4.1 and 701.4.2.** IMC Sections 701.4.1 and 701.4.2 are deleted.

**1346.0703 SECTION 703 OUTDOOR AIR.**

IMC Sections 703.1 through 703.1.2.2 are amended to read as follows:

**703.1 All air from the outdoors.** Where all combustion and dilution air is to be provided by outdoor air, the required combustion and dilution air shall be obtained by opening the room to the outdoors. Openings connecting the room to the outdoor air shall comply with IMC Sections 703.1.1 through 703.1.2.2.

**703.1.1 One permanent opening method.** When any natural draft equipment is installed, one permanent opening, commencing within 12 inches (300 mm) of the bottom of the enclosure, shall be provided. When other than natural draft equipment is installed, one permanent opening, commencing within 12 inches (300 mm) of the top of the enclosure, shall be provided. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces that freely communicate with the outdoors and shall have a minimum free area of 1 inch$^2$/3,000 Btu/hr (700 mm$^2$/kW) of the total input rating of all equipment located in the enclosure.

**703.1.2 Two permanent openings method.** Two openings shall be provided, one within 1 foot (305 mm) of the ceiling of the room and one within 1 foot (305 mm) of the floor.

**703.1.2.1 Size of horizontal openings.** The net free area of each opening, calculated in accordance with IMC Chapter 709 and connected to the outdoors through a horizontal duct, shall be a minimum of 1 square inch per 2,000 Btu/h (1,100 mm$^2$/kW) of combined input rating of the fuel-burning appliances drawing combustion and dilution air from the room. The cross-sectional area of the duct shall be equal to or greater than the required size of the opening.

**703.1.2.2 Size of vertical openings.** The net free area of each opening, calculated in accordance with IMC Chapter 709 and connected to the outdoors through a vertical duct, shall be a minimum of 1 square inch per 4,000 Btu/h (550 mm$^2$/kW) of combined input rating of the fuel-burning appliances drawing combustion and dilution air from the room. The cross-sectional area of the duct shall be equal to or greater than the required size of the opening.

**1346.0709 SECTION 709 OPENING OBSTRUCTIONS.**

Subpart 1. **Section 709.1.** IMC Section 709.1 is amended to read as follows:

**709.1 General.** The required size of openings for combustion and dilution air shall be based on the net free area of each opening. The net free area of an opening shall be that specified by the manufacturer of the opening covering. In the absence of such information, openings covered with metal louvers shall be deemed to have a maximum net free area of 75 percent of the area of the opening, and openings covered with wood louvers shall be deemed to have a maximum net free area of 25 percent of the area of the opening. The building official may require the maximum net free area to be calculated based on the actual opening size. Nonmotorized louvers and grilles shall be fixed in the open position.

**Exception:** Motorized louvers shall be interlocked with the equipment so that they are proven to be in the full open position prior to main burner ignition and during main burner operation. Means shall be provided to prevent the main burner from igniting if the louvers fail to open during burner startup and to shut down the main burner if the louvers close during operation.

Subp. 2. **Section 709.2.** IMC Section 709.2 is amended to read as follows:

**709.2 Dampered openings.** Where the combustion air openings are provided with motorized dampers, the dampers shall be electrically interlocked with the firing cycle of the appliances served, so as to prevent operation of any appliance that draws combustion and dilution air from the room when any of the dampers are closed. Manually operated dampers shall not be installed in combustion air openings.

**1346.0801 SECTION 801 GENERAL.**

Subpart 1. **Section 801.10.** IMC Section 801.10 is amended to read as follows:

**801.10 Connection to fireplace.** Connection of appliances to chimney flues serving fireplaces is prohibited. Refer to IFGC Section 602 for *Decorative Appliances for Installation in Fireplaces* and IFGC Section 603 for *Log Lighters.*

Subp. 2. **Section 801.16.1.** IMC Section 801.16.1 is amended to read as follows:

**801.16.1 Residential and low-heat appliances; general.** Refer to amended IFGC Section 501.12 for masonry chimneys used to vent gas appliances. Flue lining systems for use with residential-type and low-heat appliances shall be limited to the following:

1. Clay flue lining complying with the requirements of ASTM C 315 or equivalent. Clay flue lining shall be installed in accordance with the *International Building Code*.

2. Listed chimney lining systems complying with UL 1777.

3. Other approved materials that will resist, without cracking, softening, or corrosion, flue gases and condensate at temperatures up to 1,800°F (982°C).

**1346.0803 SECTION 803 CONNECTORS.**

IMC Section 803 is amended to read as follows:

**803.10.1 Supports and joints.** Connectors shall be supported in an approved manner, and joints shall be fastened with a minimum of three equally spaced sheet metal screws, rivets, or other approved means.

**1346.0901 SECTION 901 GENERAL.**

IMC Section 901 is amended by adding a section to read as follows:

**901.5 Unvented heaters and appliances.** Unvented room heaters, unvented infrared heaters, and unvented decorative appliances shall not be installed in any dwelling or occupancy.

**Exception:** Unvented infrared heaters may be installed when mechanical ventilation is provided to exhaust at least 4 cubic feet per minute (cfm) (0.0203 $m^3/s$) per 1000 Btu/hr (0.292 kW) input and it is electrically interlocked with the heater. Makeup air shall be provided to the space to be heated.

**1346.1001 SECTION 1001 GENERAL.**

IMC Section 1001.1 is amended to read as follows:

**1001.1 Scope.** This chapter shall govern the installation, alteration and repair of boilers, water heaters, heat exchangers, and pressure vessels.

**Exceptions:**

1. Pressure vessels used for unheated water supply.

2. Portable unfired pressure vessels and Interstate Commerce Commission containers.

3. Containers for bulk oxygen and medical gas.

4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 $m^3$) or less operating at pressures not exceeding 100 pounds per square inch (psi) (1724 kPa) and located within occupancies of Groups B, F, H, M, R, S and U.

5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.

6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables, and other similar humidity control systems.

Refer to *Minnesota Statutes*, sections 183.375 to 183.62, and *Minnesota Rules*, chapter 5225, for additional requirements for boilers and pressure vessels under the jurisdiction of the Department of Labor and Industry. Refer to *Minnesota Statutes*, chapter 326, and *Minnesota Rules*, chapter 5230, for additional requirements for high pressure piping under the jurisdiction of the Department of Labor and Industry.

**1346.1003 SECTION 1003 PRESSURE VESSELS.**

IMC Section 1003.3 is amended to read as follows:

**1003.3 Welding.** Welding on boilers and pressure vessels shall be performed by approved welders in compliance with the *ASME Boiler and Pressure Vessel Code* Section IX and the *National Board Inspection Code.*

**1346.1004 SECTION 1004 BOILERS.**

~~UMC Section 1004(a), the second paragraph, is amended to read as follows:~~

~~Metal ducts must be installed with at least four inches separation from earth. Metal ducts when installed in or under concrete slab must comply with each of the following:~~

~~1. Ducts must be completely coated with asphalt or bituminous coating.~~

~~2. Ducts must be encased in at least two inches of concrete.~~

~~3. A vapor barrier of polyethylene at least four mill thickness or equal must be installed around the underground duct.~~

~~UMC Section 1004(d), is amended by adding a third paragraph to read as follows:~~

~~Duct system supports may be used for the support of other materials and equipment only when the duct support systems have been specifically engineered for the total load.~~

~~UMC Section 1004(e) is added to read as follows:~~

~~(e) Underground duct installation. Ducts must slope back to the plenum or a collection point. Access openings must be provided for inspection and cleaning at each low point of the system.~~

~~Underground ducts must not be installed unless means are provided to collect and drain surface and underground water by the installation of a drainage system around the perimeter of the space served by the underground duct system. The drainage system must be designed to prevent water from entering the duct system. When drain tile is installed, the top of the drain tile must be installed at an elevation lower than the bottom of the underground duct.~~

Subpart 1. **Section 1004.1.** IMC Section 1004.1 is amended to read as follows:

**1004.1 Standards.** Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726 and amended IMC Section 301.4. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834 and amended IMC Section 301.4. Boilers with an input rating above 400,000 Btu/hr (3,660 kW) shall be designed and constructed in accordance with the requirements of the *ASME Boiler and Pressure Vessel Code*, Sections I, II, IV, V, VIII and IX, as applicable. Boilers with an input rating above 400,000 Btu/hr (117 kW) and less than 12,500,000 Btu/hr (3,660 kW) shall comply with ASME CSD-1, and boilers with an input rating of 12,500,000 Btu/hr (3,660 kW) or greater shall comply with NFPA 85-2001, *Boiler and Combustion Systems Hazards Code.*

Subp. 2. **Section 1004.2.** IMC Section 1004.2 is amended to read as follows:

**1004.2 Installation.** In addition to the requirements of this code, the installation of boilers shall conform to the manufacturer's instructions. Operating instructions of a permanent type shall be attached to the boiler. Boilers shall have all controls set, adjusted, and tested by the installer in accordance with amended IMC Chapter 16. A complete control diagram together with complete boiler instructions shall be furnished by the installer. The manufacturer's rating data and the nameplate shall be attached to the boiler.

**1346.1006 SECTION 1006 SAFETY AND PRESSURE RELIEF VALVES AND CONTROLS.**

Subpart 1. **Section 1006.4.** IMC Section 1006.4 is amended to read as follows:

**1006.4 Approval of safety and safety relief valves.** Safety and safety relief valves shall meet the requirements of Section I, IV or VIII of the *ASME Boiler and Pressure Vessel Code,* as applicable. All boilers and pressure vessels shall have a safety relief valve stamped with the ASME code symbol and shall be set no higher than the maximum allowable working pressure of the pressure vessel. Safety relief valves shall have a rated volumetric capacity greater than the boiler or pressure vessel can produce at nameplate pressure and shall have a nonadjustable pressure set point below the rating of the boiler or pressure vessel capable of relieving all excess pressure at its pressure set point. Safety and safety relief valves shall have a manual method of lifting the seat, without endangering the operator, to ensure proper mechanical operation.

Subp. 2. **Section 1006.6.** IMC Section 1006.6 is amended to read as follows:

**1006.6 Safety and relief valve discharge.** Safety and relief valve discharge pipes shall be of rigid pipe that is approved for the temperature and pressure of the system. The discharge pipe shall be no smaller than the diameter of the safety or relief valve outlet and the discharge end shall be reamed and unthreaded. Safety and relief valves shall not discharge so as to be a hazard, a potential cause of damage, or otherwise a nuisance and shall terminate within 18 inches of the floor. High-pressure steam safety valves shall be vented to the outside of the structure in accordance with *Minnesota Rules*, parts 5225.4100 and 5230.0990 on boilers, pressure vessels, and high-pressure piping under the jurisdiction of the Department of Labor and Industry, as applicable. Where a low-pressure safety valve or a relief valve discharges to the drainage system, the installation shall conform to the Minnesota Plumbing Code, *Minnesota Rules*, Chapter 4715.

Subp. 3. **Section 1006.9.** IMC Section 1006 is amended by adding a section to read as follows:

**1006.9 Boiler shutdown switch.** A manually operated remote shutdown switch shall be located at the boiler room door and marked for easy identification. The emergency shutdown switch shall disable all power to the burner controls.

**Exception:** A single hot water boiler with a rated input of less than 400,000 Btu/hr (117 kW).

**1346.1007 SECTION 1007 BOILER LOW-WATER CUTOFF.**

Subpart 1. **Section 1007.1.** IMC Section 1007.1 is amended to read as follows:

**1007.1 General.** All steam and hot water boilers shall be protected with a low-water fuel cutoff control to stop the combustion operation when the water level drops below the lowest safe permissible water level in accordance with the following items and any other applicable requirements:

1. An automatically fired hot water boiler or group of boilers piped together having a rated input of 400,000 Btu/hr (117 kW) or above shall be equipped with an automatic low-water fuel cutoff to stop the combustion operation when the water level drops below the lowest safe permissible water level established by the boiler manufacturer.

2. A boiler installed at an elevation where all radiation in the system is below the lowest safe permissible water level shall be equipped with an automatic low-water fuel cutoff to stop the combustion operation when the water level drops below the lowest safe permissible water level established by the boiler manufacturer.

3. A low-water fuel cutoff shall be installed when recommended by the manufacturer's installation instructions or listing and when special consideration and installations will require a low-water fuel cutoff to protect a hot water or steam boiler in the opinion of the building official.

4. A means shall be provided for testing the operation of the low-water fuel cutoff without requiring the entire system to be drained.

**Exception:** A watertube or coil-type boiler requiring forced circulation to prevent overheating of the tubes or coils shall have a flow-sensing device installed, in lieu of the low-water fuel cutoff, to automatically stop the combustion operation when the circulating flow is interrupted.

Subp. 2. **Section 1007.2.** IMC Section 1007.2 is deleted.

**1346.1011 SECTION 1011 TESTS.**

IMC Section 1011.1 is amended to read as follows:

**1011.1 Tests.** Upon completion of the assembly and installation of boilers and pressure vessels, acceptance tests shall be conducted in accordance with the requirements of the *ASME Boiler and Pressure Vessel Code.* Where field assembly of pressure vessels or boilers is required, a copy of the completed Manufacturer's Data Report required by the *ASME Boiler and Pressure Vessel Code* shall be submitted to the building official.

**1346.1204 SECTION 1204 PIPE INSULATION.**

IMC Section 1204.2 is amended to read as follows:

**1204.2 Required thickness.** Hydronic, steam, and condensate piping shall be insulated in accordance with this section.

**Exceptions:** Piping insulation is not required for:

1. Piping installed within HVAC equipment; or

2. Piping installed in basements, crawl spaces, and cellars.

**Insulation Thickness for Nominal Pipe Diameters**

| Fluid Temperature Range °F | Runouts (see item C | 1 inch (25.4 mm) and Less | 1.25 to 2" (31.7 to 50.8 mm) | 2.5 to 4" (63.5 to 101.6 mm) | 5 to 6" (127 to 152 mm) | 8" (203 mm) and Larger |
|---|---|---|---|---|---|---|
| Piping System Type - Heating | | | | | | |
| Above 350 | 1.5 | 2.5 | 2.5 | 3.0 | 3.5 | 3.5 |
| 251-350 | 1.5 | 2.0 | 2.5 | 2.5 | 3.5 | 3.5 |
| 201-250 | 1.0 | 1.5 | 1.5 | 2.0 | 2.0 | 3.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 141-200 | 0.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| 105-140 | 0.5 | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 |
| Piping System Type - Cooling | | | | | | |
| 40-55 | 0.5 | 0.5 | 0.75 | 1 | 1 | 1 |
| Below 40 (see item D) | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 |

A. Insulation thickness in this section assumes a k-value of 0.27. If the k-value of a product is less than 0.22, then the thickness must be adjusted to have an equivalent *R*-value.

B. For piping exposed to outdoor air, insulation thickness must be 0.5 inch (12.7 mm) greater than required in the table.

C. This column applies only to runouts (branches) 2 inches (50.8 mm) in diameter and less, not exceeding 12 feet (3658 mm) in length, to individual terminal units. All other runouts shall meet the requirements given in other columns in the table, as appropriate.

D. For applications with fluid temperatures of 32° F (0° C) and below, a vapor retarder shall be installed in accordance with IMC Section 604.11.

**1346.1500 CHAPTER 15, REFERENCED STANDARDS.**

A. ASHRAE 2001 *Handbook of Fundamentals*;

B. ASHRAE 15-2001 *Safety Code for Mechanical Refrigeration*;

C. ASHRAE 34-2001 *Designation and Safety Classification of Refrigerants*;

D. ASHRAE 62-2001 *Ventilation for Acceptable Indoor Air Quality*;

E. ASME BPV-2001 (Sections I, II, IV, V, VIII & IX) *Boiler and Pressure Vessel Code*;

F. ASME CSD-1-2002 *Controls and Safety Devices for Automatically Fired Boilers*;

G. ASME B31.3-1999 *Process Piping Code*;

H. ASME B31.9-1996 *Building Services Piping Code*;

I. ASTM E119-99 *Standard Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances*;

J. NFPA 58-2001 *Liquefied Petroleum Gas Code*;

K. NFPA 96-2001 *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*;

L. NFPA 85-2001 *Boiler and Combustion Systems Hazards Code*;

M. UL 197-1993 including revisions through April 10, 2000, *Commercial Electric Cooking Appliances*;

N. UL 555-1999 *Fire Dampers*;

O. UL 555C-1999 *Ceiling Dampers*;

P. UL 555S-1999 *Smoke Dampers*; and

Q. UL 2034-1996 including revisions through June 28, 2002, *Single and Multiple Station Carbon Monoxide Alarms*.

## CHAPTER 16
## INSTALLATION AND TESTING OF OIL OR LIQUID FUEL-FIRED EQUIPMENT

**1346.1601 SECTION 1601 GENERAL.**

The IMC is amended by adding a section to read as follows:

### SECTION 1601
### GENERAL

**1601.1 General.** Chapter 16 governs the installation, testing, or repair of: oil or liquid fuel burners, oil or liquid fuel burning systems, oil or liquid fuel burning equipment, and the oil or liquid fuel piping systems installed within, or in conjunction with, buildings or structures. The requirements of this chapter shall apply to the following equipment:

1. Equipment utilized to provide control of environmental conditions.
2. Equipment with a fuel input of 1,000,000 Btu/hr or greater.
3. Unlisted equipment.

4. Miscellaneous equipment when required by the building official.

**1346.1602 SECTION 1602 EQUIPMENT PLACEMENT.**

The IMC is amended by adding a section to read as follows:

SECTION 1602

EQUIPMENT PLACEMENT

**1602.1 Placing equipment in operation.** After completion of all installations, the installer shall test all safety and operating controls and venting before placing the burner in service. The correct input of liquid fuel shall be determined and the fuel-to-air ratio set. Each oil or liquid fuel burner shall be adjusted to its proper input according to the manufacturer's instructions. Overrating the burners or the appliance is prohibited. The input range shall be appropriate to the appliance.

1. For conversion burners installed in hot water (liquid) boilers or warm air furnaces, the rate of flow of the oil or liquid fuel in Btu/h shall be adjusted to within plus or minus five percent of the design load, and not to exceed the design rate of the appliance.

2. For conversion burners installed in steam boilers, the oil or liquid fuel hourly input demand shall be adjusted to meet the steam load requirements. The oil or liquid fuel input demand necessitated by an oversized boiler shall be established and added to the input demand for load requirements to arrive at a total input demand.

**1346.1603 SECTION 1603 PILOT OPERATION.**

The IMC is amended by adding a section to read as follows:

SECTION 1603

PILOT OPERATION

**1603.1 Pilot operation.** Igniter or pilot flames shall be effective to ignite the oil or liquid fuel at the main burner or burners and shall be adequately protected from drafts. Pilot flames shall not become extinguished during the pilot cycle when the main burner or burners are turned on or off in a normal manner either manually or by automatic controls.

**1346.1604 SECTION 1604 BURNER OPERATION.**

The IMC is amended by adding a section to read as follows:

SECTION 1604

BURNER OPERATION

**1604.1 Burner operation.** In making tests to determine compliance with the requirements of this section, care shall be exercised to prevent the accumulation of unburned liquid fuel in the appliance that might result in an explosion or fire.

1. The flames from the burner shall freely ignite the liquid fuel when operating at the lowest firing position.

2. Burner flames shall not flash back when the liquid fuel is turned on or off by an automatic control mechanism.

3. Main burner flames shall ignite freely from the pilot when the pilot flame is reduced to a minimum point that will actuate the pilot safety device.

4. When ignition is made in a normal manner, the flame shall not flash outside the appliance.

5. Burners shall not expel liquid fuel through air openings when operating at prevailing pressure.

6. Burners shall have a proper liquid fuel air mixture to insure smooth ignition of the main burner.

**1346.1605 SECTION 1605 TEST METHODS.**

The IMC is amended by adding a section to read as follows:

SECTION 1605

TEST METHODS

**1605.1 Method of test.**

1. **Operational checking.** The flue gas, venting, safety, and operating controls of the appliance shall be checked to ensure proper and safe operation.

2. **Method of test - atmospheric type/induced draft type/fan assisted types.** The appliance shall be allowed to operate until the stack temperature becomes stabilized after which a sample of the undiluted flue products shall be taken from the appliance flue outlet. The sample taken shall be analyzed for carbon monoxide, carbon dioxide, and oxygen. Stack temperature shall be noted.

**Note:** Appliance designs incorporating induced draft assemblies may require a flue gas sample to be taken after the draft regulator or induced draft fan.

3. **Performance standards for atmospheric type.**

a. Minimum of 75 percent efficiency as determined by flue gas analysis method at appliance flue outlet.

b. Carbon monoxide concentration in flue gas not greater than 0.04 percent.

c. Stack temperature not greater than 700°F (371°C), plus ambient.

d. Carbon dioxide concentration between 8 and 13 percent, inclusive.

e. Oxygen concentration between 4 and 10 percent.

f. Smoke test no higher than #2 for light oils, or #4 for oils heavier than #4.

g. Draft shall be in accordance with burner manufacturer's specifications.

3a. **Performance standards for induced draft type/fan assisted types.**

a. Minimum of 75 percent efficiency as determined by flue gas analysis method at appliance flue outlet.

b. Carbon monoxide concentration in flue gas not greater than 0.04 percent.

c. Stack temperature not greater than 700°F (371°C), plus ambient.

d. Carbon dioxide concentration between 8 and 13 percent, inclusive.

e. Oxygen concentration between 4 and 10 percent, inclusive.

f. Smoke test no higher than #2 for light oils, or #4 for oils heavier than #4.

g. Draft shall be in accordance with burner manufacturer's specifications.

**Note:** Induced draft and fan assisted types of appliances may require a sample to be taken after the induced draft fan, which may cause oxygen figures in excess of the limits stated. In such cases, safe liquid fuel combustion ratios shall be maintained and be consistent with appliance listing.

4. **Method of test - power type.** The appliance shall be allowed to operate until the stack temperature becomes stabilized after which a sample of the undiluted flue products shall be taken from the appliance flue outlet. The sample shall be analyzed for carbon monoxide, carbon dioxide, and oxygen. Stack temperature shall be recorded.

5. **Performance standards for power type.**

a. Minimum of 80 percent efficiency as determined by flue gas analysis method at appliance flue outlet.

b. Carbon monoxide concentration in the flue gas not greater than 0.04 percent.

c. Stack temperature not greater than 700°F (371°C) plus ambient.

d. Carbon dioxide concentration between 8 and 13 percent, inclusive.

e. Oxygen concentration between 4 and 10 percent, inclusive.

f. Smoke test no higher than #2 for light oils, or #4 for oils heavier than #4.

g. Draft shall be in accordance with burner manufacturer's specifications.

6. **Test records filing; tag.** After completion of the test of newly installed oil or liquid fuel burner equipment as provided in this section, complete test records shall be filed with the building official on an approved form. The tag stating the date of the test and the name of the installer shall be attached to the appliance at the main valve.

7. **Oxygen concentration.**

a. The concentration of oxygen in the undiluted flue products of oil or liquid fuel burners shall in no case be less than 3 percent nor more than 10 percent, shall be in conformance with applicable performance standards and shall be consistent with the appliance listing.

b. The allowable limit of carbon monoxide shall not exceed 0.04 percent.

c. The flue gas temperature of an oil appliance, as taken on the appliance side of the draft regulator, shall not exceed applicable performance standards and shall be consistent with the appliance listing.

8. **Approved oxygen trim system.** The oxygen figures may not apply when there is an approved oxygen trim system on the burner that is designed for that use, including a low oxygen interlock when approved by the building official.

9. **Supervised start-up.**

a. Supervised start-up may be required to verify safe operation of oil or liquid fuel burner and to provide documentation that operation is consistent with this code, listing and approval. Supervised start-up is required for all liquid fuel burners listed in b, c, and d. Supervised start-up requires that the liquid fuel burner shall be tested in the presence of the building official in an approved manner. Testing shall include safety and operating controls, input, flue gas analysis, and venting. Flue gas shall be tested at high, medium, and low fires. Provisions shall be made in the system to allow firing test in warm weather. After completion of the test of newly installed oil or liquid fuel burner equipment as provided in this section, complete test records shall be filed with the building official on an approved form. The tag stating the date of the test and the name of the installer shall be attached to the appliance at the main valve.

b. Oil and liquid fuel burners of 1,000,000 Btu/hr input or more require a supervised start-up as in a.

c. Installation of oxygen trim systems, modulating dampers, or other draft control or combustion devices require a super-

vised start-up as in a.

d. All direct fired heaters require a supervised start-up as in a.

10. **Control diagram.** A complete control diagram of the installation and suitable operating instructions shall be supplied to the building official.

**1346.1606 SECTION 1606 EQUIPMENT.**

The IMC is amended by adding a section to read as follows:

SECTION 1606
EQUIPMENT

**1606.1 Equipment information.**

A. All installations of gas or fuel burners with input above 400,000 Btu/hr and all combination gas or fuel burners must be approved before installation. The following information must be supplied as required by the building official.

1. Name, model, and serial number of the burner.

2. Input rating and type of fuel.

3. Name of the nationally recognized testing laboratory that tested and listed the unit.

4. Name, model, and serial number of the furnace or boiler that the burner will be installed in if not part of a complete package.

5. A complete wiring diagram showing the factory and fuel wiring installed or to be installed including all controls, identified by the brand name and model number.

6. A print of the gas or fuel train from the manual shutoff to the appliance showing all controls that will be installed, their names, model numbers, and approvals.

B. All installations of gas or fuel burners with input above 400,000 Btu/hr and all combination gas and oil or other combination fuel burners that are installed in new or renovated boiler or equipment rooms, or are installed in a package with the boiler or furnace, shall include the following information in addition to that required in item A, subitems 1 to 6.

1. A complete piping diagram from the supply source showing all components and materials identified by brand name and model number with relevant approvals.

2. Detailed provisions for combustion air, venting, and stacks.

3. A floor plan drawn to scale showing all relevant equipment. Plans and specifications shall be approved before proceeding with an installation.

MINNESOTA FUEL GAS CODE

**1346.5050 TITLE; INCORPORATION BY REFERENCE.**

This section is known and may be cited as the "Minnesota Fuel Gas Code." As used in this section, "the code" and "this code" refer to this section.

Chapters 2 to 7 of the 2000 edition of the International Fuel Gas Code, promulgated by the International Code Council, Inc., 5203 Leesburg Pike, Suite 600, Falls Church, Virginia 22041-3401, are incorporated by reference as part of the Minnesota Fuel Gas Code with the amendments in this section. As used in this section, "IFGC" means the International Fuel Gas Code incorporated in this part.

The IFGC is not subject to frequent change and a copy of the IFGC, with amendments for use in Minnesota, is available in the office of the commissioner of administration.

**1346.5201 SECTION 201 (IFGC) GENERAL.**

IFGC Section 201.4 is amended to read as follows:

**201.4 Terms not defined.** Where terms are not defined through the methods authorized by this chapter, the Merriam-Webster Collegiate Dictionary, available at *www.m-w.com*, shall be considered as providing ordinarily accepted meanings. The dictionary is incorporated by reference, is subject to frequent change, and is available through the Minitex interlibrary loan system.

**1346.5202 SECTION 202 (IFGC) GENERAL DEFINITIONS.**

Subpart 1. **Section 202.** IFGC Section 202 is amended by adding the following definitions:

**GAS PIPING SYSTEM - LOW PRESSURE.** A system that operates at a pressure not exceeding 14 inches of water column. LPG is a pressure not exceeding 14 inches of water column.

**GAS PIPING SYSTEM - MEDIUM PRESSURE.** A system that operates at a pressure exceeding 14 inches of water column but not exceeding five (5) psig. LPG is a pressure exceeding 14 inches of water column but not exceeding twenty (20) psig.

**GAS PIPING SYSTEM - HIGH PRESSURE.** A system that operates at a pressure exceeding five (5) psig. LPG is a pressure exceeding twenty (20) psig.

Subp. 2. **Definition amended.** The definition of "Ready Access (to)" in IFGC Section 202, is amended to read as follows:

**READY ACCESS (TO).** That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction, and without requiring the use of portable access equipment (see "Access").

**1346.5301 SECTION 301 (IFGC) GENERAL.**

IFGC Section 301.3 is amended to read as follows:

**301.3 Listed and labeled.** Appliances regulated by this code shall be listed and labeled to an appropriate standard by a nationally recognized testing laboratory which is qualified to evaluate the appliance, unless otherwise approved in accordance with the administrative provisions of the Minnesota State Building Code, *Minnesota Rules*, chapter 1300. The approval of unlisted appliances shall be based upon engineering evaluation. Unlisted appliances shall be installed with clearances to combustibles in accordance with IFGC Chapter 5. Unlisted appliances with a fuel input rating of less than 12,500,000 Btu/hr (3,660 kW) shall have fuel gas trains, controls and safety devices installed in accordance with Part CF, Combustion Side Control, of ASME CSD-1. Unlisted appliances with a fuel input rating of 12,500,000 Btu/hr (3,660 kW) or greater shall have fuel gas trains, controls and safety devices installed in accordance with NFPA 85-2001.

**1346.5303 SECTION 303 (IFGC) APPLIANCE LOCATION.**

IFGC Section 303.3 is amended to read as follows:

**303.3 Prohibited locations.** Appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

1. Sleeping rooms.
2. Bathrooms.
3. Toilet rooms.
4. Storage closets.
5. Surgical rooms.

**Exceptions:**

1. Direct-vent appliances that obtain all combustion air directly from the outdoors.

2. Vented room heaters, wall furnaces, vented decorative appliances and decorative appliances for installation in vented solid fuel-burning fireplaces, provided that the room is not a confined space and the building is not of unusually tight construction.

3. Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with amended IFGC Section 304.3. Access to such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door air leakage requirements of the Minnesota Energy Code and equipped with an approved self-closing device.

**1346.5304 SECTION 304 (IFGC) COMBUSTION, VENTILATION AND DILUTION AIR.**

Subpart 1. **Section 304.1.** IFGC Section 304 is deleted and replaced with the following:

**304.1 General.** Air for combustion, ventilation, and dilution of flue gases for gas utilization equipment installed in buildings shall be obtained by application of one of the methods covered in IFGC Section 304.2, 304.3, 304.4, 304.5, or 304.6. Gas utilization equipment of other than natural draft, power vent, and category I vented appliances shall be provided with combustion, ventilation, and dilution air in accordance with the equipment manufacturer's instructions. Where infiltration does not provide the necessary air, outdoor air shall be introduced in accordance with methods covered in IFGC Sections 304.3, 304.4, 304.5, and 304.6. Refer to IFGC Appendix E for Worksheet E-1, "Residential Combustion Air Calculation Method" and Table E-1, "Residential Combustion Air Required Volume."

**Exceptions:**

1. Direct vent appliances.

2. Type 1 clothes dryers that are provided with makeup air in accordance with the manufacturer's installation instructions.

3. Replacement of fuel gas utilization equipment that complies with all of the following conditions:

3.1 Replacement equipment has a Btu/hr (kW) input rating not greater than 30 percent above the original equipment input rating.

3.2 Combustion air provisions meet the code requirements in effect at the time of the original installation.

3.3 Replacement equipment shall not cause an existing mechanical system to become unsafe, hazardous, or overloaded.

**304.1.1 Equipment location.** Equipment shall be located so as not to interfere with proper circulation of combustion, ventilation, and dilution air.

**304.1.2 Draft hood or regulator.** Where used, a draft hood or a barometric draft regulator shall be installed in the same room or enclosure as the equipment served so as to prevent any difference in pressure between the hood or regulator and the combustion air supply.

Subp. 2. **Section 304.2.** IFGC Section 304.2 is amended to read as follows:

**304.2 Indoor combustion air.** The required volume of indoor air shall be determined in accordance with IFGC Section 304.2.1, Standard Method, or IFGC Section 304.2.2, Known Air Infiltration Rate Method. The total required volume shall be the sum of the required volume calculated for all appliances located within the space. Rooms communicating directly with the space in which the appliances are installed through openings not furnished with doors, and through combustion air openings sized and located in accordance with IFGC Section 304.2.3 are considered a part of the required volume.

**304.2.1 Standard method.** The minimum required volume shall be 50 cubic feet per 1,000 Btu/hour (4.8 $m^3$/kW).

**304.2.2 Known air infiltration rate method.** Where the air infiltration rate of a structure is known, the minimum required volume shall be determined as follows:

**Known Air Infiltration Rate Method Equations:**

1. **304.2.2.1 For appliances other than fan-assisted and power vent.**

**Equation 304.2.2.1:**

$$\text{Required Volume}_{other} \geq \frac{21\ ft^3}{ACH} \left(\frac{I_{other}}{1{,}000\ Btu/hr}\right)$$

2. **304.2.2.2 For fan-assisted and power vent appliances.**

**Equation 304.2.2.2:**

$$\text{Required Volume}_{fan} \geq \frac{15\ ft^3}{ACH} \left(\frac{I_{fan}}{1{,}000\ Btu/hr}\right)$$

**Where:**

$I_{other}$ = All appliances other than fan-assisted and power vent Input in Btu/hr.

$I_{fan}$ = Fan-assisted and power vent appliances Input in Btu/hr.

ACH = Air change per hour (percent of volume of space exchanged per hour, expressed as a decimal).

3. An infiltration rate greater than 0.60 ACH shall not be used in the calculations in 1. and 2.

**304.2.3 Indoor opening size and location.** Openings used to connect indoor spaces shall be sized and located in accordance with the following.

**304.2.3.1 Combining spaces on the same story.** Each opening shall have a minimum free area of 1 $inch^2$/1,000 Btu/hr (220 $mm^2$/kW) of the total input rating of all gas utilization equipment in the space, but not less than 100 $inches^2$ (0.06 $m^2$). One opening shall commence within 12 inches (300 mm) of the top, and one opening shall commence within 12 inches (300 mm) of the bottom, of the enclosure. The minimum dimension of air openings shall be not less than 3 inches (80 mm).

**304.2.3.2 Combining spaces in different stories.** The volumes of spaces in different stories shall be considered as communicating spaces where such spaces are connected by one or more openings indoors or floors having a total minimum free area of 2 $inches^2$/1,000 Btu/hr of total input rating of all gas utilization equipment.

Subp. 3. **Section 304.3.** IFGC Section 304.3 is amended to read as follows:

**304.3 Outdoor combustion air.** Outdoor combustion air shall be provided through openings to the outdoors in accordance with IFGC Section 304.3.1 or 304.3.2. The minimum dimension of air openings shall not be less than 3 inches (80 mm).

**304.3.1 Two permanent openings method.** Two permanent openings, one commencing within 12 inches (300 mm) of the top, and one commencing within 12 inches (300 mm) of the bottom, of the enclosure shall be provided. The openings shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors.

1. Where directly communicating with the outdoors or where communicating to the outdoors through vertical ducts, each opening shall have a minimum free area of 1 inch$^2$/4,000 Btu/hr (550 mm$^2$/kW) of total input rating of all equipment in the enclosure.

2. Where communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of 1 inch$^2$/2,000 Btu/hr (1,100 mm$^2$/kW) of total input rating of all equipment in the enclosure.

**304.3.2 One permanent opening method.** When any natural draft equipment is installed, one permanent opening, commencing within 12 inches (300 mm) of the bottom of the enclosure, shall be provided. When other than natural draft equipment is installed, one permanent opening, commencing within 12 inches (300) of the top of the enclosure, shall be provided. The equipment shall have clearances of at least 1 inch (25 mm) from the sides and back and 6 inches (160 mm) from the front of the appliance. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces that freely communicate with the outdoors and shall have a minimum free area of 1 inch$^2$/3,000 Btu/hr (700 mm$^2$/kW) of the total input rating of all equipment located in the enclosure.

Subp. 4. **Section 304.4.** IFGC Section 304.4 is amended to read as follows:

**304.4 Combination indoor and outdoor combustion air.** The use of a combination of indoor and outdoor combustion air shall be in accordance with IFGC Sections 304.4.1 through 304.4.3.

**304.4.1 Indoor openings.** Where used, openings connecting the interior spaces shall comply with IFGC Section 304.2.3.

**304.4.2 Outdoor openings location.** Outdoor openings shall be located in accordance with IFGC Section 304.3.

**304.4.3 Outdoor openings size.** The outdoor openings size shall be calculated in accordance with the following:

1. The ratio of interior spaces shall be the available volume of all communicating spaces divided by the required volume.

2. The outdoor size reduction factor shall be 1 minus the ratio of interior spaces.

3. The minimum size of outdoor openings shall be the full size of outdoor openings calculated in accordance with Section 304.3, multiplied by the reduction factor.

Subp. 5. **Section 304.5.** IFGC Section 304.5 is amended to read as follows:

**304.5 Engineered installations.** Engineered combustion air installations shall provide adequate supply of combustion, ventilation, and dilution air and shall be approved by the building official.

Subp. 6. **Section 304.6.** IFGC Section 304.6 is amended to read as follows:

**304.6 Mechanical combustion air supply.** Where all combustion air is provided by a mechanical air supply system, the combustion air shall be supplied from outdoors at the minimum rate of 0.35 feet$^3$/min (cfm) per 1,000 Btu/hr (0.034 m$^3$/min per kW) for all appliances located within the space.

**304.6.1.** Where exhaust fans are installed, additional air shall be provided to replace the exhausted air.

**304.6.2.** Each of the appliances served shall be interlocked to the mechanical air supply system to prevent main burner operation where the mechanical air supply system is not in operation.

**304.6.3.** Where combustion air is provided by the building's mechanical ventilation system, the system shall provide the specified combustion air rate in addition to the required ventilation air.

Subp. 7. **Section 304.7.** IFGC Section 304.7 is amended to read as follows:

**304.7 Louvers and grilles.** The required size of openings for combustion, ventilation, and dilution air shall be based on the net free area of each opening. Where the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. Where the design and free area are not known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Nonmotorized louvers and grilles shall be fixed in the open position.

**304.7.1 Motorized louvers.** Motorized louvers shall be interlocked with the equipment so they are proven in the full open position prior to main burner ignition and during main main burner operation. Means shall be provided to prevent the main burner from igniting should the louver fail to open during burner startup and to shut down the main burner if the louvers close during burner operation.

Subp. 8. **Section 304.8.** IFGC Section 304.8 is amended to read as follows:

**304.8 Combustion air ducts.** Combustion air ducts shall comply with the following:

1. Ducts shall be of galvanized steel or an equivalent corrosion-resistant material.

2. Ducts shall terminate in an unobstructed space, allowing free movement of combustion air to the appliances.

3. Ducts shall serve a single space.

4. Ducts shall not service both upper and lower combustion air openings where both such openings are used. The separation between ducts serving upper and lower combustion air openings shall be maintained to the source of combustion air.

5. Ducts shall not terminate in an attic space.

6. The remaining space surrounding a chimney liner, gas vent, special gas vent, or plastic piping installed within a masonry, metal or factory-built chimney shall not be used to supply combustion air.

**Exception:** Direct vent gas-fired appliances designed for installation in a solid fuel-burning fireplace where installed in accordance with the listing and the manufacturer's instructions.

7. Vertical ducts shall not extend through two or more stories without prior approval from the building official.

8. Ducts shall not terminate in the return air plenum of a forced air heating system unless installed in accordance with the heating equipment manufacturer's installation instructions.

9. Combustion air intake openings shall be located to avoid intake of exhaust air in accordance with IFGC Sections 401.5.2 and 503.8 and shall be covered with corrosion resistant screen of not less than 1/4 inch (6.4 mm) mesh.

10. Combustion air intake openings shall be located at least 12 inches (305 mm) above adjoining grade level.

11. When both makeup air and combustion air openings are required, they shall be provided through separate openings to the outdoors. Refer to IMC Section 501.4 to determine requirements for makeup air.

**Exception:** Combination makeup air and combustion air systems may be approved by the building official.

Subp. 9. **Sections 304.9 through 304.15.** IFGC Sections 304.9 through 304.15 are deleted.

**1346.5306 SECTION 306 (IFGC) ACCESS AND SERVICE SPACE.**

Subpart 1. **Section 306.5.** IFGC Section 306.5 is amended to read as follows:

**306.5 Mechanical equipment and appliances on roofs or elevated structures.** Where mechanical equipment or appliances requiring periodic inspection, service or maintenance are installed on roofs or elevated structures, a permanent stair shall be provided for access.

**Exception:** A portable ladder may be used for dwellings, replacement equipment on existing buildings, and for exterior roof access points not exceeding 16 feet (4.9 m) above grade, unless the building official determines that the unique shape of the roof does not allow safe access with a portable ladder.

The permanent stair shall be as required by relevant safety regulations, but shall not be less than the following:

1. The stair shall be installed at an angle of not more than 60 degrees measured from the horizontal plane.

2. The stair shall have flat treads at least 6 inches (152 mm) deep and a clear width of at least 18 inches (457 mm) with equally spaced risers at least 10.5 inches (267 mm) high and not exceeding 14 inches (356 mm).

3. The stair shall have intermediate landings not exceeding 18 feet (5.5 m) vertically.

4. Continuous handrails shall be installed on both sides of the stair.

5. Interior stairs shall terminate at the under side of the roof at a hatch or scuttle of at least 8 square feet (0.74 $m^2$) with a minimum dimension of 20 inches (508 mm).

6. When a roof access hatch or scuttle is located within 10 feet (3.0 m) of a roof edge, a guard shall be installed in accordance with IFGC Section 306.6.

7. Exterior stairs shall terminate at the roof access point or at a level landing of at least 8 square feet (0.74 $m^2$) with a minimum dimension of 20 inches (508 mm). The landing shall have a guard installed in accordance with IFGC Section 306.6.

Subp. 2. **Section 306.5.** IFGC Section 306.5 is amended by adding a section to read as follows:

**306.5.3 Permanent ladders.** Where a change in roof elevation greater than 30 inches (762 mm) but not exceeding 16 feet (4.9 m) exists, a permanent ladder shall be provided. The ladder may be vertical and shall be as required by relevant safety regulations, but shall not be less than the following:

1. Width shall be at least 16 inches (406 mm).

2. Rung spacing shall be a maximum of 14 inches (356 mm).

3. Toe space shall be at least 6 inches (152 mm).

4. Side railings shall extend at least 30 inches (762 mm) above the roof or parapet wall.

**1346.5402 SECTION 402 (IFGC) PIPE SIZING.**

Subpart 1. **Section 402.3.** IFGC Section 402.3 is amended to read as follows:

**402.3 Sizing.** Gas piping shall be sized in accordance with IFGC Table 402.3(1) through Table 402.3(34) or other approved engi-

neering methods. If the pressure drop is not specified, use IFGC Table 402.3(35) through Table 402.3(38) for the appropriate gas piping material and inlet pressure: (See IFGC Appendix A).

Subp. 2. **Section 402.3, Tables.** IFGC Section 402.3 is amended by adding tables as follows:

(The following tables are all new material.)

**Table 402.3(35)**

Pipe Sizing Table for Natural Gas

| Semi-rigid Copper Tubing (Type K or. L) | | Inlet Pressure | | | 7" wc |
|---|---|---|---|---|---|
| For 0.60 Specific Gravity Natural Gas | | Pressure Drop | | | 1" wc |
| Nominal | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 |
| Actual OD | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
| Actual ID | 0.305 | 0.402 | 0.527 | 0.652 | 0.745 |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas per Hour | | | | |
| 10 | 38 | 79 | 160 | 280 | 398 |
| 20 | 26 | 54 | 110 | 193 | 273 |
| 30 | 21 | 44 | 89 | 155 | 220 |
| 40 | 18 | 37 | 76 | 132 | 188 |
| 60 | 15 | 30 | 61 | 106 | 151 |
| 80 | 12 | 26 | 52 | 91 | 129 |
| 100 | 11 | 23 | 46 | 81 | 114 |
| 125 | 10 | 20 | 41 | 72 | 101 |
| 150 | 9 | 18 | 37 | 65 | 92 |
| 200 | 8 | 16 | 32 | 55 | 79 |
| 250 | 7 | 14 | 28 | 49 | 70 |
| 300 | 6 | 13 | 25 | 45 | 63 |
| 350 | 6 | 12 | 23 | 41 | 58 |
| 400 | 5 | 11 | 22 | 38 | 54 |
| Nominal | 1 | 1-1/4 | 1-1/2 | 2 | 2-1/2 |
| Actual OD | 1-1/8 | 1-3/8 | 1-5/8 | 2-1/8 | 2-5/8 |
| Actual ID | 0.995 | 1.245 | 1.481 | 1.959 | 2.435 |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas per Hour | | | | |
| 10 | 850 | 1530 | 2412 | 5024 | 8889 |
| 20 | 584 | 1052 | 1658 | 3453 | 6109 |
| 30 | 469 | 844 | 1331 | 2773 | 4906 |
| 40 | 401 | 723 | 1139 | 2373 | 4199 |
| 60 | 322 | 580 | 915 | 1906 | 3372 |
| 80 | 276 | 497 | 783 | 1631 | 2886 |
| 100 | 245 | 440 | 694 | 1446 | 2558 |
| 125 | 217 | 390 | 615 | 1281 | 2267 |
| 150 | 196 | 354 | 557 | 1161 | 2054 |
| 200 | 168 | 303 | 477 | 994 | 1758 |
| 250 | 149 | 268 | 423 | 881 | 1558 |
| 300 | 135 | 243 | 383 | 798 | 1412 |
| 350 | 124 | 224 | 352 | 734 | 1299 |
| 400 | 116 | 208 | 328 | 683 | 1208 |

**Table 402.3(36)**

Pipe Sizing Table for Natural Gas

| Semi-rigid Copper Tubing (Type K or L) For 0.60 Specific Gravity Natural Gas | | | Inlet Pressure / Pressure Drop | | | 2 psig / 1 psig |
|---|---|---|---|---|---|---|
| Nominal | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | |
| Actual OD | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | |
| Actual ID | 0.305 | 0.402 | 0.527 | 0.652 | 0.745 | |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas Per Hour | | | | | |
| 10 | 240 | 496 | 1008 | 1763 | 2501 | |
| 20 | 165 | 341 | 693 | 1211 | 1719 | |
| 30 | 133 | 274 | 557 | 973 | 1380 | |
| 40 | 113 | 234 | 476 | 833 | 1181 | |
| 60 | 91 | 188 | 383 | 669 | 949 | |
| 80 | 78 | 161 | 327 | 572 | 812 | |
| 100 | 69 | 143 | 290 | 507 | 720 | |
| 125 | 61 | 126 | 257 | 449 | 638 | |
| 150 | 56 | 115 | 233 | 407 | 578 | |
| 200 | 48 | 98 | 199 | 349 | 495 | |
| 250 | 42 | 87 | 177 | 309 | 438 | |
| 300 | 38 | 79 | 160 | 280 | 397 | |
| 350 | 35 | 72 | 147 | 258 | 365 | |
| 400 | 33 | 67 | 137 | 240 | 340 | |
| Nominal | 1 | 1-1/4 | 1-1/2 | 2 | 2-1/2 | |
| Actual OD | 1-1/8 | 1-3/8 | 1-5/8 | 2-1/8 | 2-5/8 | |
| Actual ID | 0.995 | 1.245 | 1.481 | 1.959 | 2.435 | |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas Per Hour | | | | | |
| 10 | 5341 | 9616 | 15161 | 31577 | 55867 | |
| 20 | 3671 | 6609 | 10420 | 21703 | 38397 | |
| 30 | 2948 | 5307 | 8368 | 17428 | 30834 | |
| 40 | 2523 | 4542 | 7162 | 14916 | 26390 | |
| 60 | 2026 | 3648 | 5751 | 11978 | 21192 | |
| 80 | 1734 | 3122 | 4922 | 10252 | 18138 | |
| 100 | 1537 | 2767 | 4362 | 9086 | 16075 | |
| 125 | 1362 | 2452 | 3866 | 8053 | 14247 | |
| 150 | 1234 | 2222 | 3503 | 7296 | 12909 | |
| 200 | 1056 | 1902 | 2998 | 6245 | 11048 | |
| 250 | 936 | 1685 | 2657 | 5535 | 9792 | |
| 300 | 848 | 1527 | 2408 | 5015 | 8872 | |
| 350 | 780 | 1405 | 2215 | 4614 | 8162 | |
| 400 | 726 | 1307 | 2061 | 4292 | 7593 | |

**Table 402.3(37)**

Pipe Sizing Table for Natural Gas

Schedule 40 Metallic Pipe — Inlet Pressure — 7" wc

For 0.60 Specific Gravity Natural Gas — Pressure Drop — 1" wc

| Nominal | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1-1/4 | 1-1/2 |
|---|---|---|---|---|---|---|---|
| Actual ID | 0.364 | 0.493 | 0.622 | 0.824 | 1.049 | 1.380 | 1.610 |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas Per Hour | | | | | | |
| 10 | 61 | 135 | 248 | 518 | 976 | 2004 | 3003 |
| 20 | 42 | 93 | 170 | 356 | 671 | 1378 | 2064 |
| 30 | 34 | 74 | 137 | 286 | 539 | 1106 | 1657 |
| 40 | 29 | 64 | 117 | 245 | 461 | 947 | 1419 |
| 50 | 25 | 56 | 104 | 217 | 409 | 839 | 1257 |
| 60 | 23 | 51 | 94 | 197 | 370 | 760 | 1139 |
| 80 | 20 | 44 | 80 | 168 | 317 | 651 | 975 |
| 100 | 17 | 39 | 71 | 149 | 281 | 577 | 864 |
| 125 | 16 | 34 | 63 | 132 | 249 | 511 | 766 |
| 150 | 14 | 31 | 57 | 120 | 226 | 463 | 694 |
| 175 | 13 | 29 | 53 | 110 | 208 | 426 | 638 |
| 200 | 12 | 27 | 49 | 102 | 193 | 396 | 594 |
| 250 | 11 | 24 | 43 | 91 | 171 | 351 | 626 |
| 300 | 10 | 21 | 39 | 82 | 155 | 318 | 477 |
| 350 | 9 | 20 | 36 | 76 | 143 | 293 | 439 |
| 400 | 8 | 18 | 34 | 70 | 133 | 272 | 408 |
| 450 | 8 | 17 | 32 | 66 | 124 | 256 | 383 |
| 500 | 7 | 16 | 30 | 62 | 118 | 241 | 362 |

| Nominal | 2 | 2-1/2 | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Actual ID | 2.067 | 2.469 | 3.068 | 4.026 | 5.047 | 6.065 | 7.891 |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas Per Hour | | | | | | |
| 10 | 5784 | 9218 | 16296 | 33239 | 60134 | 97370 | 194195 |
| 20 | 3975 | 6336 | 11200 | 22845 | 41330 | 66922 | 133469 |
| 30 | 3192 | 5088 | 8994 | 18345 | 33189 | 53741 | 107181 |
| 40 | 2732 | 4354 | 7698 | 15701 | 28406 | 45995 | 91733 |
| 50 | 2421 | 3859 | 6822 | 13916 | 25175 | 40765 | 81301 |
| 60 | 2194 | 3497 | 6182 | 12609 | 22811 | 36936 | 73665 |
| 80 | 1878 | 2993 | 5291 | 10791 | 19523 | 31612 | 63047 |
| 100 | 1664 | 2652 | 4689 | 9564 | 17303 | 28017 | 55878 |
| 125 | 1475 | 2351 | 4156 | 8477 | 15335 | 24831 | 49523 |
| 150 | 1336 | 2130 | 3765 | 7680 | 13895 | 22499 | 44872 |
| 175 | 1229 | 1960 | 3464 | 7066 | 12783 | 20699 | 41281 |
| 200 | 1144 | 1823 | 3223 | 6573 | 11892 | 19256 | 38404 |
| 250 | 1014 | 1616 | 2856 | 5826 | 10540 | 17066 | 34037 |
| 300 | 918 | 1464 | 2588 | 5279 | 9550 | 15463 | 30840 |
| 350 | 845 | 1347 | 2381 | 4856 | 8786 | 14226 | 28373 |
| 400 | 786 | 1253 | 2215 | 4518 | 8173 | 13235 | 26395 |
| 450 | 738 | 1176 | 2078 | 4239 | 7669 | 12418 | 24766 |
| 500 | 697 | 1110 | 1963 | 4004 | 7244 | 11730 | 23394 |

**Table 402.3(38)**

Pipe Sizing Table for Natural Gas

| Schedule 40 Metallic Pipe | | | Inlet Pressure | | | 2 psig | |
|---|---|---|---|---|---|---|---|
| For 0.60 Specific Gravity Natural Gas | | | Pressure Drop | | | 1 psig | |
| Nominal | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1-1/4 | 1-1/2 |
| Actual ID | 0.364 | 0.493 | 0.622 | 0.824 | 1.049 | 1.380 | 1.610 |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas Per Hour | | | | | | |
| 10 | 382 | 847 | 1558 | 3257 | 6136 | 12597 | 18874 |
| 20 | 263 | 582 | 1071 | 2239 | 4217 | 8658 | 12972 |
| 30 | 211 | 467 | 860 | 1798 | 3386 | 6953 | 10417 |
| 40 | 180 | 400 | 736 | 1539 | 2898 | 5950 | 8916 |
| 50 | 160 | 354 | 652 | 1364 | 2569 | 5274 | 7902 |
| 60 | 145 | 321 | 591 | 1236 | 2327 | 4778 | 7160 |
| 80 | 124 | 275 | 506 | 1057 | 1992 | 4090 | 6128 |
| 100 | 110 | 244 | 448 | 937 | 1765 | 3625 | 5431 |
| 125 | 97 | 216 | 397 | 831 | 1565 | 3212 | 4813 |
| 150 | 88 | 196 | 360 | 753 | 1418 | 2911 | 4361 |
| 175 | 81 | 180 | 331 | 692 | 1304 | 2678 | 4012 |
| 200 | 76 | 167 | 308 | 644 | 1213 | 2491 | 3733 |
| 250 | 67 | 148 | 273 | 571 | 1075 | 2208 | 3308 |
| 300 | 61 | 134 | 247 | 517 | 974 | 2001 | 2997 |
| 350 | 56 | 124 | 228 | 476 | 896 | 1840 | 2758 |
| 400 | 52 | 115 | 212 | 443 | 834 | 1712 | 2565 |
| 450 | 49 | 108 | 199 | 415 | 782 | 1606 | 2407 |
| 500 | 46 | 102 | 188 | 392 | 739 | 1517 | 2274 |
| Nominal | 2 | 2-1/2 | 3 | 4 | 5 | 6 | 8 |
| Actual ID | 2.067 | 2.469 | 3.068 | 4.026 | 5.047 | 6.065 | 7.891 |
| Length (ft) | Maximum Capacity in Cubic Feet of Gas Per Hour | | | | | | |
| 10 | 36350 | 57936 | 102420 | 208905 | 377939 | 611970 | 1220513 |
| 20 | 24983 | 39819 | 70393 | 143579 | 259755 | 420604 | 838852 |
| 30 | 20062 | 31976 | 56528 | 115299 | 208593 | 337760 | 673627 |
| 40 | 17171 | 27367 | 48381 | 98681 | 178528 | 289079 | 576538 |
| 50 | 15218 | 24255 | 42879 | 87459 | 158226 | 256205 | 510975 |
| 60 | 13789 | 21977 | 38851 | 79244 | 143364 | 232140 | 462980 |
| 80 | 11801 | 18809 | 33252 | 67823 | 122701 | 198682 | 396251 |
| 100 | 10459 | 16670 | 29470 | 60110 | 108748 | 176088 | 351190 |
| 125 | 9270 | 14775 | 26119 | 53275 | 96381 | 156064 | 311253 |
| 150 | 8399 | 13387 | 23666 | 48271 | 87329 | 141405 | 282018 |
| 175 | 7727 | 12316 | 21772 | 44408 | 80341 | 130091 | 259453 |
| 200 | 7189 | 11458 | 20255 | 41313 | 74742 | 121024 | 241371 |
| 250 | 6371 | 10155 | 17952 | 36615 | 66242 | 107262 | 213923 |
| 300 | 5773 | 9201 | 16265 | 33176 | 60020 | 97187 | 193829 |
| 350 | 5311 | 8465 | 14964 | 30522 | 55218 | 89411 | 178321 |
| 400 | 4941 | 7875 | 13921 | 28395 | 51370 | 83179 | 165893 |
| 450 | 4636 | 7389 | 13062 | 26642 | 48198 | 78044 | 155652 |
| 500 | 4379 | 6979 | 12338 | 25166 | 45528 | 73720 | 147028 |

**1346.5403 SECTION 403 (IFGC) PIPING MATERIALS.**

Subpart 1. **Section 403.8.** IFGC Section 403.8 is amended to read as follows:

**403.8 Protective coating.** Where in contact with material or atmosphere exerting a corrosive action, metallic piping and fittings coated with a corrosion-resistant material shall be used. Steel pipe exposed in exterior locations shall be galvanized or coated with approved corrosion-resistant material. External or internal coatings or linings used on piping or components shall not be considered as adding strength.

Subp. 2. **Section 403.10.4.** IFGC Section 403.10.4 is amended to read as follows:

**403.10.4 Metallic fittings.** Metallic fittings, including valves, strainers, and filters, shall comply with the following:

1. Threaded fittings in sizes larger than 2 inches (51 mm) shall not be used except where approved.
2. Fittings used with steel or wrought-iron pipe shall be steel, brass, bronze, or malleable iron.
3. Fittings used with copper or brass pipe shall be copper, brass, or bronze.
4. Fittings used with aluminum alloy pipe shall be of aluminum alloy.
5. Brass, bronze, or copper fittings. Fittings, if exposed to soil, shall have a minimum 80 percent copper content.
6. Aluminum alloy fittings. Threads shall not form the joint seal.
7. Zinc-aluminum alloy fittings. Fittings shall not be used in systems containing flammable gas-air mixtures.

**1346.5404 SECTION 404 (IFGC) PIPING SYSTEM INSTALLATION.**

Subpart 1. **Section 404.4.** IFGC Section 404.4 is amended to read as follows:

**404.4 Piping through foundation wall.** Underground piping shall not be installed below grade through the outer foundation or basement wall of a building. If necessary due to structural conditions, underground piping may be installed with prior approval from the building official.

Subp. 2. **Section 404.6.** IFGC Section 404.6 is amended to read as follows:

**404.6 Piping in solid floors.** Piping in solid floors shall be laid in channels in the floor and covered in a manner that will allow access to the piping with a minimum amount of damage to the building. Where such piping is subject to exposure to excessive moisture or corrosive substances, the piping shall be protected in an approved manner. If necessary due to structural conditions, piping may be installed in other locations with prior approval from the building official.

Subp. 3. **Section 404.8.** IFGC Section 404.8 is amended to read as follows:

**404.8 Protection against corrosion.** Metallic pipe or tubing exposed to corrosive action, such as soil condition or moisture, shall be protected in an approved manner. Zinc coatings (galvanizing) shall not be deemed adequate protection for gas piping underground. Steel pipe exposed in exterior locations shall be galvanized or coated with approved corrosion-resistant material. Where dissimilar metals are joined underground, an insulating coupling or fitting shall be used. Piping shall not be laid in contact with cinders.

Subp. 4. **Section 404.11.** IFGC Section 404.11 is amended to read as follows:

**404.11 Piping underground beneath buildings.** Piping installed underground beneath buildings is prohibited except where the piping is encased in a conduit of wrought iron, plastic pipe, or steel pipe designed to withstand the superimposed loads with prior approval from the building official. Such conduit shall extend into an occupiable portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of any gas leakage. Where the end sealing is capable of withstanding the full pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe. Such conduit shall extend not less than 4 inches (102 mm) outside the building, shall be vented above grade to the outdoors, and shall be installed so as to prevent the entrance of water and insects. Such conduit shall be identified with a yellow label marked "Gas" in black letters, spaced at intervals not exceeding 5 feet (1,524 mm), and shall be located a minimum of 6 inches (152 mm) below the bottom of the concrete floor. The conduit shall be protected from corrosion in accordance with IFGC Section 404.8.

Subp. 5. **Section 404.15.** IFGC Section 404.15 is amended to read as follows:

**404.15 Prohibited devices.** A device shall not be placed inside the piping or fittings that will obstruct the free flow of gas.

**1346.5406 SECTION 406 (IFGC) INSPECTION, TESTING AND PURGING.**

Subpart 1. **Section 406.1.2.** IFGC Section 406.1.2 is amended to read as follows:

**406.1.2 Alterations, repairs and additions.** In the event alterations, repairs or additions are made following the pressure test, the affected piping shall be tested.

> **Exception:** Equipment replacement, minor alterations, repairs, or additions, provided the work is inspected and connections are tested with a noncorrosive leak-detecting fluid or other leak-detecting methods approved by the building official.

Subp. 2. **Section 406.1.4.** IFGC Section 406.1.4 is deleted.

Subp. 3. **Section 406.4.1.** IFGC Section 406.4.1 is amended to read as follows:

**406.4.1 Test pressure.** The test pressure to be used shall be no less than one and one-half times the proposed maximum working pressure, but not less than 25 psig (172 kPa gauge), irrespective of design pressure. Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.

Subp. 4. **Section 406.4.2.** IFGC Section 406.4.2 is amended to read as follows:

**406.4.2 Test duration.** Test duration shall be not less than one-half hour. When testing a system in a single-family dwelling, the test duration shall be permitted to be reduced to 10 minutes with prior approval from the building official.

Subp. 5. **Section 406.4.** IFGC Section 406.4 is amended by adding a section to read as follows:

**406.4.3 Test gauges.** Tests which utilize dial gauges shall be performed with gauges of 2 psi (13.8 kPa) incrementation or less and shall have a pressure range not greater than twice the test pressure applied. The test pressure shall be within the middle 50 percent of the test gauge pressure range.

**1346.5407 SECTION 407 (IFGC) PIPING SUPPORT.**

IFGC Section 407 is amended by adding a section to read as follows:

**407.3 Expansion and flexibility.** Piping systems shall be designed to have sufficient flexibility to prevent thermal expansion or contraction from causing excessive stresses in the piping material, excessive bending or loads at joints, or undesirable forces at points of connections to equipment and at anchorage or guide points.

**1346.5408 SECTION 408 (IFGC) DRIPS AND SLOPED PIPING.**

IFGC Section 408.4 is amended to read as follows:

**408.4 Sediment trap.** A sediment trap shall be installed before all automatically controlled gas utilization equipment where a sediment trap is not incorporated as part of the equipment. The sediment trap shall be installed as close to the inlet of the equipment as practical, before any regulator or automatic gas valve, and ahead of all pounds-to-inches pressure regulators. The sediment trap shall be either a tee fitting with a capped nipple, a minimum of 3 inches (80 mm) in length, in the bottom opening of the run of the tee, or other device approved as an effective sediment trap. If a tee fitting is used, it shall provide a 90-degree change of direction of gas flow and the cap shall be at an elevation lower than the tee fitting.

**1346.5409 SECTION 409 (IFGC) SHUTOFF VALVES.**

Subpart 1. **Section 409.1.** IFGC Section 409.1 is amended to read as follows:

**409.1 General.** Piping systems shall be provided with an approved main shutoff valve before the first branch line. The main shutoff valve shall be installed in the first available location that provides ready access and shall have a permanently attached handle. Main shutoff valves controlling several gas piping systems shall be protected from physical damage and shall be placed an adequate distance from each other so they will be easy to operate.

Subp. 2. **Section 409.2.** IFGC Section 409.2 is amended to read as follows:

**409.2 Meter valve.** Every meter shall be equipped with a shutoff valve located on the supply side of the meter. The main shutoff valve required in amended IFGC Section 409.1 shall serve as the shutoff valve.

Subp. 3. **Section 409.3.1.** IFGC Section 409.3.1 is amended to read as follows:

**409.3.1 Multiple tenant buildings.** In multiple tenant buildings, where a common piping system is installed to supply other than one- and two-family dwellings, shutoff valves shall be provided for each tenant. Each tenant shall have access to the shutoff valve serving that tenant's space. A main shutoff valve shall be installed in a common utility room or otherwise located to provide ready access to all tenants of the building, and it shall not be located in a locked room without prior permission from the building official.

**1346.5410 SECTION 410 (IFGC) FLOW CONTROLS.**

IFGC Section 410.3 is amended to read as follows:

**410.3 Venting of regulators.** Pressure regulators that require a vent shall have an independent vent to the outside of the building. The vent shall be designed to prevent the entry of water or foreign objects. Regulator vents shall terminate at least 3 feet (914 mm) from doors, operable windows, nonmechanical intake openings, and openings into direct-vent appliances. The vent termination shall be located at least 12 inches (305 mm) above grade and shall be suitably screened and hooded to prevent accidental closure of the vent pipe.

> **Exception:** A vent to the outside of the building is not required for regulators equipped with and labeled for utilization with approved vent-limiting devices installed in accordance with the manufacturer's instructions.

**1346.5501 SECTION 501 (IFGC) GENERAL.**

Subpart 1. **Section 501.7.** IFGC Section 501.7 is amended to read as follows:

**501.7 Connection to fireplace.** Connection of any appliance to chimney flues serving fireplaces is prohibited. Refer to IFGC Section 602 for Decorative Appliances for Installation in Fireplaces and IFGC Section 603 for Log Lighters.

Subp. 2. **Section 501.8.** IFGC Section 501.8 is amended to read as follows:

**501.8 Equipment not required to be vented.** The following appliances shall not be required to be vented.

1. Ranges.

2. Built-in domestic cooking units listed and marked for optional venting.

3. Hot plates and laundry stoves.

4. Type 1 clothes dryers (Type 1 clothes dryers shall be exhausted in accordance with the requirements of IFGC Section 613).

5. A single booster-type automatic instantaneous water heater, where designed and used solely for the sanitizing rinse requirements of a dishwashing machine, provided that the heater is installed in a commercial kitchen having a mechanical exhaust system. Where installed in this manner, the draft hood, if required, shall be in place and unaltered and the draft hood outlet shall be not less than 36 inches (914 mm) vertically and 6 inches (152 mm) horizontally from any surface other than the heater.

6. Refrigerators.

7. Counter appliances.

8. Direct-fired make-up air heaters.

9. Other equipment listed for unvented use and not provided with flue collars.

10. Specialized equipment of limited input such as laboratory burners and gas lights.

Automatically operated equipment vented with a hood or exhaust system shall comply with IFGC Section 503.3.4. Where the appliances and equipment listed in items 5 through 10 are installed so that the aggregate input rating exceeds 20 Btu/hr per cubic foot (207 watts per $m^3$) of volume of the room or space in which such appliances and equipment are installed, one or more shall be provided with venting systems or other approved means for conveying the vent gases to the outdoor atmosphere so that the aggregate input rating of the remaining unvented appliances and equipment does not exceed the 20 Btu/hr per cubic foot (207 watts per $m^3$) figure. Where the room or space in which the equipment is installed is directly connected to another room or space by a doorway, archway, or other opening of comparable size that cannot be closed, the volume of such adjacent room or space shall be permitted to be included in the calculations.

Subp. 3. **Section 501.12.** IFGC Section 501.12 is amended to read as follows:

**501.12 Residential and low-heat appliances flue lining systems.** An approved metallic liner shall be installed in masonry chimneys used to vent gas appliances. The liner shall comply with one of the following:

1. Aluminum (1100 or 3003 alloy or equivalent) not less than 0.032 inches thick to 8 inches diameter.

2. Stainless steel (304 or 430 alloy or equivalent) not less than 26 gauge (0.018 inches thick) to 8 inches diameter or not less than 24 gauge (0.024 inches thick) 8 inches diameter and larger.

3. Listed vent systems.

**Exception:** Metallic liners are not required when each appliance connected into the masonry chimney has a minimum input rating greater than 400,000 Btu/hr.

**501.12.1 Terminations.** Metallic liners shall terminate in accordance with the requirements for gas vents in IFGC Section 503.6.6.

**1346.5503 SECTION 503 (IFGC) VENTING OF EQUIPMENT.**

Subpart 1. **Section 503.2.2.** IFGC Section 503.2.2 is deleted.

Subp. 2. **Section 503.5.3.** IFGC Section 503.5.3 is amended to read as follows:

**503.5.3 Masonry chimneys.** Masonry chimneys shall be built and installed in accordance with NFPA 211, or the IBC and shall be lined with approved clay flue lining, a listed chimney lining system, or other approved material that will resist corrosion, erosion, softening, or cracking from vent gases at temperatures up to 1800° F (982° C). Masonry chimneys used to vent gas appliances shall comply with amended IFGC Section 501.12.

**Exception:** Masonry chimney flues serving listed gas appliances with draft hoods, Category I appliances, and other gas appliances listed for use with Type B vent shall be permitted to be lined with a chimney lining system specifically listed for use only with such appliances. The liner shall be installed in accordance with the liner manufacturers' instructions and the terms of the listing. A permanent identifying label shall be attached at the point where the connection is to be made to the liner. The label shall read: "This chimney liner is for appliances that burn gas only. Do not connect to solid or liquid fuel-burning appliances or incinerators."

For information on installation of gas vents in existing masonry chimneys, see IFGC Section 503.6.5.

Subp. 3. **Section 503.5.5.** IFGC Section 503.5.5 is amended to read as follows:

**503.5.5 Size of chimneys.** The effective area of a chimney venting system serving listed appliances with draft hoods, Category I appliances, and other appliances listed for use with Type B vents shall be in accordance with IFGC Section 504 or other approved engineering methods.

**Exceptions:**

1. As an alternate method of sizing an individual chimney venting system for a single appliance with a draft hood, the effective areas of the vent connector and chimney flue shall be not less than the area of the appliance flue collar or draft hood outlet, nor greater than four times the draft hood outlet area.

2. As an alternate method for sizing a chimney venting system connected to two appliances with draft hoods, the effective area of the chimney flue shall be not less than the area of the larger draft hood outlet plus 50 percent of the area of the smaller draft hood outlet, nor greater than four times the smallest draft hood outlet area.

Where an incinerator is vented by a chimney serving other gas utilization equipment, the gas input to the incinerator shall not be included in calculating chimney size, provided the chimney flue diameter is not less than 1 inch (25.4 mm) larger in equivalent diameter than the diameter of the incinerator flue outlet.

Subp. 4. **Section 503.5.6.** IFGC Section 503.5.6 is amended to read as follows:

**503.5.6 Inspection of chimneys.** Before replacing an existing appliance or connecting a vent connector to a chimney, the chimney passageway shall be examined to ascertain that it is clear and free of obstructions and it shall be cleaned if previously used for venting solid or liquid fuel-burning appliances or fireplaces.

**Exception:** Existing chimneys shall be lined in accordance with amended IFGC Section 501.12 unless otherwise approved by the building official.

Subp. 5. **Section 503.5.10.** IFGC Section 503.5.10 is amended to read as follows:

**503.5.10 Space surrounding lining or vent.** The remaining space surrounding a chimney liner, gas vent, special gas vent, or plastic piping installed within a masonry, metal or factory-built chimney shall not be used to vent another appliance.

**Exception:** Direct vent gas-fired appliances designed for installation in a solid fuel burning fireplace where installed in accordance with the listing and the manufacturer's instructions.

Subp. 6. **Section 503.6.9.1.** IFGC Section 503.6.9.1 is amended to read as follows:

**503.6.9.1 Category I appliances.** The sizing of natural draft venting systems serving one or more listed appliances equipped with a draft hood or appliances listed for use with Type B gas vent, installed in a single story of a building, shall be in accordance with IFGC Section 504 or in accordance with sound engineering practice. Category I appliances are either draft hood-equipped or fan-assisted combustion system in design. Different vent design methods are required for draft hood-equipped and fan-assisted combustion system appliances.

**Exceptions:**

1. As an alternate method for sizing an individual gas vent for a single, draft hood-equipped appliance, the effective area of the vent connector and the gas vent shall be not less than the area of the appliance draft hood outlet, nor greater than four times the draft hood outlet area. Vents serving fan-assisted combustion system appliances shall be sized in accordance with IFGC Section 504 or other approved engineering methods.

2. As an alternate method for sizing a gas vent connected to two appliances with draft hoods, the effective area of the vent shall be not less than the area of the larger draft hood outlet plus 50 percent of the smaller draft hood outlets, nor greater than four times the smallest draft hood outlet area. Vents serving fan-assisted combustion system appliances, or combinations of fan-assisted combustion system and draft hood-equipped appliances, shall be sized in accordance with IFGC Section 504 or other approved engineering methods.

Subp. 7. **Section 503.7.8.** IFGC Section 503.7.8 is amended to read as follows:

**503.7.8 Size of single-wall metal pipe.** A venting system constructed of single-wall metal pipe shall be sized in accordance with one of the following methods and the equipment manufacturer's instructions:

1. For a draft hood-equipped appliance, in accordance with IFGC Section 504.

2. For a venting system for a single appliance with a draft hood, the areas of the connector and the pipe each shall be not less than the area of the appliance flue collar or draft hood outlet, whichever is smaller. The vent area shall not be greater than four times the draft hood outlet area.

3. Other approved engineering methods.

Subp. 8. **Section 503.8.** IFGC Section 503.8 is amended to read as follows:

**503.8 Venting system termination location.** The location of venting system terminations shall comply with the following:

1. A mechanical draft venting system shall terminate at least 3 feet (914 mm) above any mechanical air inlet located within 10 feet (3048 mm).

**Exceptions:**

a. This provision shall not apply to the combustion air intake of a direct-vent appliance.

b. This provision shall not apply to the separation of the integral outdoor air inlet and flue gas discharge of listed outdoor appliances.

2. A mechanical draft venting system, including power vent and direct-vent appliances, shall terminate in accordance with the following minimum clearances from doors, operable windows, and nonmechanical air inlets:

| Input (Btu/hr) | Clearance (inches) | Input (kW) | Clearance (mm) |
|---|---|---|---|
| 10,000 or less | 6 | 3 or less | 152 |
| 10,001 to 50,000 | 9 | 3.1 to 14.7 | 230 |
| Over 50,000 | 12 | Over 14.7 | 305 |

**Exception:** Where this section specifies a minimum clearance that is less restrictive than the conditions of listing of the equipment or appliances, the conditions of listing and the manufacturer's installation instructions shall apply.

3. The bottom of the vent terminal and the air intake of a mechanical draft venting system shall be located at least 12 inches (305 mm) above grade.

4. Through-the-wall vents for Category II and Category IV appliances and noncategorized condensing appliances shall not terminate over public walkways or over an area where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves, or other equipment. Where local experience indicates that condensate is a problem with Category I and Category III appliances, this provision shall also apply.

Subp. 9. **Section 503.10.7.** IFGC Section 503.10.7 is amended to read as follows:

**503.10.7 Joints.** Joints between sections of connector piping and connections to flue collars and hood outlets shall be fastened by a minimum of three equally spaced sheet metal screws or other approved means.

**1346.5504 SECTION 504 (IFGC) SIZING OF CATEGORY 1 APPLIANCE VENTING SYSTEMS.**

Subpart 1. **Section 504.2.7.** IFGC Section 504.2.7 is amended to read as follows:

**504.2.7 Liner system sizing.** Listed corrugated metallic chimney liner systems in masonry chimneys shall be sized by using IFGC Table 504.2(1) or 504.2(2) for Type B vents with the maximum capacity reduced by 20 percent (0.80 x maximum capacity) and the minimum capacity as shown in IFGC Table 504.2(1) or 504.2(2). Corrugated metallic liner systems installed with bends or offsets shall have their maximum capacity further reduced in accordance with IFGC Section 504.3. Approved metallic liners, other than listed corrugated metallic liner systems, installed in accordance with amended IFGC Section 501.12, shall be sized by using IFGC Table 504.2(1) or 504.2(2) for Type B vents. When IFGC Table 504.2(1) or 504.2(2) permits more than one diameter for a connector or vent of a fan-assisted appliance, the smallest permitted diameter shall be used.

Subp. 2. **Section 504.2.8.** IFGC Section 504.2.8 is amended to read as follows:

**504.2.8 Vent area and diameter.** Where the vertical vent has a larger diameter than the vent connector, the vertical vent diameter shall be used to determine the minimum vent capacity, and the connector diameter shall be used to determine the maximum vent capacity. The flow area of the vertical vent shall not exceed four times the flow area of the listed appliance categorized vent area, flue collar area, or draft hood outlet area unless designated in accordance with approved engineering methods.

Subp. 3. **Section 504.3.15.** IFGC Section 504.3.15 is amended to read as follows:

**504.3.15 Vertical vent maximum size.** Where two or more appliances are connected to a vertical vent or chimney, the flow area of the largest section of vertical vent or chimney shall not exceed four times the smallest listed appliance categorized vent areas, flue collar area, or draft hood outlet area unless designed in accordance with approved engineering methods.

Subp. 4. **Section 504.3.17.** IFGC Section 504.3.17 is amended to read as follows:

**504.3.17 Liner system sizing.** Listed corrugated metallic chimney liner systems in masonry chimneys shall be sized by using IFGC Table 504.3(1) or 504.3(2) for Type B vents, with the maximum capacity reduced by 20 percent (0.80 x maximum capacity) and the minimum capacity as shown in IFGC Table 504.3(1) or 504.3(2). Corrugated metallic liner systems installed with bends or offsets shall have their maximum capacity further reduced in accordance with IFGC Sections 504.3.5 and 504.3.6. Approved metallic liners, other than listed corrugated metallic liner systems, installed in accordance with amended IFGC Section 501.12, shall

be sized by using IFGC Table 504.3(1) or 504.3(2) for Type B vents. When IFGC Table 504.3(1) or 504.3(2) permits more than one diameter for a connector or vent of a fan-assisted appliance, the smallest permitted diameter shall be used.

**1346.5602 SECTION 602 (IFGC) DECORATIVE APPLIANCES FOR INSTALLATION IN FIREPLACES.**

Subpart 1. **Section 602.1.** IFGC Section 602.1 is amended to read as follows:

**602.1 General.** Decorative appliances for installation in approved solid fuel burning fireplaces shall be tested in accordance with ANSI Z21.50-2000, *Vented Gas Fireplaces*, and ANSI Z21.88-2000, *Vented Gas Fireplace Heaters*, and shall be installed in accordance with the manufacturer's installation instructions. Manually lighted natural gas decorative appliances shall be tested in accordance with an approved method.

Subp. 2. **Section 602.3.** IFGC Section 602.3 is amended to read as follows:

**602.3 Prohibited installations.** Decorative appliances for installations in fireplaces shall not be installed where prohibited by IFGC Section 303.3. Unvented decorative appliances shall not be installed in any dwelling or occupancy.

**1346.5620 SECTION 620 (IFGC) UNVENTED ROOM HEATERS.**

IFGC Section 620 is deleted and replaced with the following:

**620.1 Unvented heaters.** Unvented room heaters and unvented decorative appliances shall not be installed in any dwelling or occupancy.

**1346.5629 SECTION 629 (IFGC) INFRARED RADIANT HEATERS.**

IFGC Section 629.3 is amended by adding a section to read as follows:

**629.3 Ventilation air.** Where unvented infrared heaters are installed, mechanical ventilation shall be provided to exhaust at least 4 cubic feet per minute (cfm) (0.0203 $m^3/s$) per 1,000 Btu/hr (0.292 kW) input rating and it shall be electrically interlocked with the heater. Makeup air shall be provided to the space to be heated.

**1346.5630 SECTION 630 (IFGC) BOILERS.**

Subpart 1. **Section 630.1.** IFGC Section 630.1 is amended to read as follows:

**630.1 Standards.** Boilers with an input rating below 400,000 Btu/hr (3,660 kW) shall be listed in accordance with the requirements of ANSI Z21.13/CSA 4.9 or UL 795. Boilers with an input rating of 400,000 Btu/hr (3,660 kW) or greater shall be designed and constructed in accordance with the *ASME Boiler and Pressure Vessel Code*, Sections I, II, IV, V, VIII, and IX, and amended IFGC Section 301.3, as applicable. Boilers with an input rating above 400,000 Btu/hr (117 kW) and less than 12,500,000 Btu/hr (3,660 kW) shall comply with ASME CSD-1, and boilers with an input rating of 12,500,000 Btu/hr (3,660 kW) or greater shall comply with NFPA 85-2001, *Boiler and Combustion Systems Hazards Code*.

Subp. 2. **Section 630.2.** IFGC Section 630.2 is amended to read as follows:

**630.2 Installation.** In addition to the requirements of this code, the installation of boilers shall be in accordance with the manufacturer's instructions and IMC Chapter 10. Operating instructions of a permanent type shall be attached to the boiler. Boilers shall have all controls set, adjusted and tested by the installer in accordance with amended IFGC Chapter 8. A complete control diagram together with complete boiler instructions shall be furnished by the installer. The manufacturer's rating data and the nameplate shall be attached to the boiler.

**1346.5700 CHAPTER 7, REFERENCED STANDARDS.**

A. ANSI Z21.13-2000 *Gas-Fired Low-Pressure Steam and Hot Water Boilers*;

B. ANSI Z21.50-2000 *Vented Gas Fireplaces*;

C. ANSI Z21.88-2000 *Vented Gas Fireplace Heaters*;

D. ASME BPV-2001 *Boiler and Pressure Vessel Code*, Sections I, II, IV, V, VIII, and IX;

E. ASME CSD-1-2002 *Controls and Safety Devices for Automatically Fired Boilers*;

F. NFPA 58-2001 *Liquefied Petroleum Gas Code*; and

G. NFPA 85-2001 *Boiler and Combustion Systems Hazards Code*.

CHAPTER 8
INSTALLATION AND TESTING OF FUEL
GAS-FIRED EQUIPMENT

**1346.5801 SECTION 801 (IFGC) GENERAL.**

The IFGC is amended by adding a chapter to read as follows:

SECTION 801
GENERAL

**801.1 General.** Chapter 8 shall regulate the installation and testing or repair of gas or fuel burning systems, gas or fuel burners,

and gas or fuel burning equipment installed within, or in conjunction with, building or structures. The requirements of this chapter shall apply to the following equipment:

1. Equipment utilized to provide control of environmental conditions.

2. Equipment with a fuel input of 1,000,000 Btu/hr or greater.

3. Unlisted equipment.

4. Miscellaneous equipment when required by the building official.

**1346.5802 SECTION 802 (IFGC) EQUIPMENT PLACEMENT.**

The IFGC is amended by adding a section to read as follows:

SECTION 802
EQUIPMENT PLACEMENT

**802.1 Placing equipment in operation.** After completion of the installation, all safety and operating controls and venting shall be tested before placing the burner in service. The correct input of fuel shall be determined and the fuel-to-air ratio set. Each gas or fuel burner shall be adjusted to its proper input according to the manufacturer's instructions. Overrating the burners or appliance is prohibited. Btu/hr input range shall be appropriate to the appliance.

1. The rate of flow of the gas or fuel shall be adjusted to within plus or minus two percent of the required Btu/hr rating at the manifold pressure specified by the manufacturer. When the prevailing pressure is less than the manifold pressure specified, the rates shall be adjusted at the prevailing pressure.

2. For conversion burners installed in hot water (liquid) boilers or warm air furnaces, the rate of flow of the gas or fuel in Btu/hr shall be adjusted to within plus or minus five percent of the calculated Btu/hr heat loss of the building in which it is installed, or the design load, and shall not exceed the design rate of the appliance.

3. For conversion burners installed in steam boilers, the gas or fuel hourly input demand shall be adjusted to meet the steam load requirements. The gas or fuel input demand necessitated by an oversized boiler shall be established and added to the input demand for load requirements to arrive at a total input demand.

**1346.5803 SECTION 803 (IFGC) PILOT OPERATION.**

The IFGC is amended by adding a section to read as follows:

SECTION 803
PILOT OPERATION

**803.1 Pilot operation.** Pilot flames shall ignite the gas or fuel at the main burner or burners and shall be adequately protected from drafts. Pilot flames shall not become extinguished during pilot cycle when the main burner or burners are turned on or off in a normal manner, either manually or by automatic controls.

**1346.5804 SECTION 804 (IFGC) BURNER OPERATION.**

The IFGC is amended by adding a section to read as follows:

SECTION 804
BURNER OPERATION

**804.1 Burner operation.** When testing to determine compliance with this section, care shall be exercised to prevent the accumulation of unburned gas or fuel in the appliance or flues that might result in explosion or fire.

1. The flames from each burner shall freely ignite the gas or fuel from adjacent burners when operating at the prevailing gas or fuel pressure and when the main control valve is regulated to deliver at one-third of the fuel gas or fuel rate.

2. Burner flames shall not flash back after immediate ignition nor after turning the fuel cock until the flow rate to the burner is one-third the full supply.

3. Burner flames shall not flash back when the gas or fuel is turned on or off by an automatic control mechanism.

4. Main burner flames shall ignite freely from each pilot when the main control valve is regulated to one-third the full gas or fuel rate and when the pilot flame is reduced to a minimum point at which it will actuate the safety device.

5. When ignition is made in a normal manner, the flame shall not flash outside the appliance.

6. Burners shall not expel gas or fuel through air openings when operating at prevailing pressure.

7. Burners shall have proper fuel air mixture to ensure smooth ignition of the main burner.

8. Dual fuel burners may have controls common or independent to both fuels. Transfer from one fuel to the other shall be by a manual interlock switching system to prevent the gas and other fuel being used simultaneously except by special permission from the building official. The transfer switch shall have a center off position and shall not pass through the center off position without stopping in the center off position.

**1346.5805 SECTION 805 (IFGC) METHOD OF TEST.**

The IFGC is amended by adding a section to read as follows:

SECTION 805
METHOD OF TEST

**805.1 Method of test.**

1. **Operational checking.** The flue gas, venting, safety and operating controls of the appliance shall be checked to ensure proper and safe operation.

2. **Method of test - atmospheric type/induced draft type/fan-assisted type.** The appliance shall be allowed to operate until the stack temperature becomes stabilized after which a sample of the undiluted flue products shall be taken from the appliance flue outlet. The sample taken shall be analyzed for carbon monoxide, carbon dioxide and oxygen. Stack temperature shall be noted.

**Note:** Appliance designs incorporating induced draft assemblies may require a flue gas sample to be taken after the draft regulator or induced draft fan.

3. **Performance standards for atmospheric type.**

a. Minimum of 75 percent efficiency as determined by flue gas analysis method at appliance flue outlet.

b. Carbon monoxide concentration in flue gas not greater than 0.04 percent on an air-free basis.

c. Stack temperature not greater than 480° F, plus ambient.

d. Carbon dioxide concentration between 6 and 9 percent, inclusive.

e. Oxygen concentration between 4 and 10 percent, inclusive.

3a. **Performance standards for induced draft type/fan-assisted type.**

a. Minimum of 75 percent efficiency as determined by flue gas analysis method at appliance flue outlet.

b. Carbon monoxide concentration in flue gas not greater than 0.04 percent on an air free basis.

c. Stack temperature not greater than 480° F, plus ambient

d. Oxygen concentration between 4 and 10 percent, inclusive, with carbon dioxide concentration between 6 and 9 percent, inclusive.

**Note:** Induced draft type and fan-assisted type appliances may require a sample to be taken after the induced draft fan, which may cause oxygen figures in excess of limits stated. In such cases, safe fuel combustion ratios shall be maintained and be consistent with appliance listing.

4. **Method of test - power type.** The appliance shall be allowed to operate until the stack temperature becomes stabilized after which a sample of the undiluted flue products shall be taken from the appliance flue outlet. The sample shall be analyzed for carbon monoxide, carbon dioxide and oxygen. Stack temperature shall be recorded.

5. **Performance standards for power type.**

a. Minimum of 80 percent efficiency as determined by flue gas analysis method method at appliance flue outlet.

b. Carbon monoxide concentration in flue gas not greater than 0.04 percent.

c. Stack temperature not greater than 480° F plus ambient, or 125° F in excess of fluid temperature plus ambient.

d. Carbon dioxide concentration between 6 and 9 percent, inclusive.

e. Oxygen concentration between 3 and 10 percent, inclusive.

6. After completion of the test of newly installed gas or fuel burner equipment as provided in this section, complete test records shall be filed with the building official on an approved form. The tag stating the date of the test and the name of the installer shall be attached to the appliance at the main valve.

7. **Oxygen concentration.**

a. The concentration of oxygen in the undiluted flue products of gas or fuel burners shall in no case by less than 3 percent nor more than 10 percent, shall be in conformance with applicable performance standards and shall be consistent with the appliance listing.

b. The allowable limit of carbon monoxide shall not exceed 0.04 percent.

c. The flue gas temperature of a gas appliance, as taken on the appliance side of the draft regulator, shall not exceed applicable performance standards and shall be consistent with the appliance listing.

8. **Approved oxygen trim system.** The oxygen figures may not apply when there is an approved oxygen trim system on the burner that is designed for that use, including a low oxygen interlock when approved by the building official.

9. **Supervised start-up.**

a. Supervised start-up may be required to verify safe operation of gas or fuel burner and to provide documentation that operation is consistent with this code, listing and approval. Supervised start-up is required for all fuel burners in b, c, and d. Supervised start-up requires that fuel burners shall be tested in the presence of the building official in an approved manner. Testing shall include safety and operating controls, input, flue gas analysis, and venting. Flue gas shall be tested at high, medium and low fires. Provisions shall be made in the system to allow firing test in warm weather. After completion of the test of newly installed gas or fuel burner equipment as provided in this section, complete test records shall be filed with the building official on an approved form. The tag stating the date of the test and the name of the installer shall be attached to the appliance at the main valve.

b. Gas and fuel burners of 1,000,000 Btu/hr input or more require a supervised start-up as in a.

c. Installation of oxygen trim systems, modulating dampers, or other draft control or combustion devices require a supervised start-up as in a.

d. All direct fired heaters require a supervised start-up as in a.

10. A complete control diagram of the installation and suitable operating instructions shall be supplied to the building official.

**1346.5806 SECTION 806 (IFGC) PRESSURE REGULATORS.**

The IFGC is amended by adding a section to read as follows:

SECTION 806
PRESSURE REGULATORS

**806.1 Pressure regulators.**

(a) General.

1. Regulators shall be provided with access for servicing.

2. Regulators shall be provided with a shutoff valve, union and test taps (both upstream and downstream of the regulator) for servicing.

3. All regulators with inlet gas pressure exceeding 14 inches water column pressure or used on an appliance having an input exceeding 400,000 Btu/hr shall have an approved high pressure manual gas valve in the supply piping upstream of the regulator.

4. Medium and high pressure regulators shall have the upstream pressure identified by a metal tag permanently attached to the regulator stating the inlet and outlet gas pressures and the words "WARNING! HIGH PRESSURE GAS! DO NOT REMOVE!"

5. All regulators with inlet gas pressure exceeding 14 inches water column pressure or used on an appliance having an input exceeding 400,000 Btu/hr shall be vented to the outdoors in separate vents sized according to the manufacturer's specifications.

**Exception:** Regulators equipped with limiting orifices installed in accordance with amended IFGC Section 410.3.

6. Regulators may not be vented into a combustion chamber or an appliance vent.

7. Regulator vents shall terminate at least 3 feet (914 mm) from doors, operable windows, nonmechanical intake openings, and openings into direct-vent appliances. The vent termination shall be located at least 12 inches (305 mm) above grade and shall be suitably screened and hooded to prevent accidental closure of the vent pipe.

8. All pounds-to-pounds and pounds-to-inches regulators used as appliance regulators shall be of the full lock-up type.

(b) Primary.

All pounds-to-pounds or pounds-to-inches gas pressure regulators shall be designed to regulate at a pressure of not less than the gas supplier delivery pressure.

(c) Appliance.

1. Appliance regulators shall be installed consistent with the listing and approval of the equipment and the listing and approval of the regulator manufacturer.

2. Each gas burner or appliance shall have its own gas pressure regulator. This appliance regulator is in addition to any pounds-to-pounds or pounds-to-inches regulators in the system.

**1346.5807 SECTION 807 (IFGC) EQUIPMENT INFORMATION.**

The IFGC is amended by adding a section to read as follows:

SECTION 807
EQUIPMENT INFORMATION

**807.1 Equipment information.**

A. All installations of gas or fuel burners with input above 400,000 Btu/hr and all combination gas or fuel burners shall be approved before installation. The following information shall be supplied if required by the building official.

1. Name, model, and serial number of the burner.

2. Input rating and type of fuel.

3. Name of the nationally recognized testing laboratory that tested and listed the unit.

4. Name, model, and serial number of the furnace or boiler that the burner will be installed in if not part of a complete package.

5. A complete wiring diagram showing the factory and fuel wiring installed or to be installed including all controls, identified by the brand name and model number.

6. A print of the gas or fuel train from the manual shutoff to the appliance showing all controls that will be installed, their names, model numbers, and approvals.

B. All installations of gas or fuel burners with input above 400,000 Btu/hr and all combination gas and oil or other combination fuel burners that are installed in new or renovated boiler or equipment rooms, or are installed in a package with the boiler or furnace, shall include the following information in addition to that required in item A, subitems 1 to 6.

1. A complete piping diagram from the supply source showing all components and materials identified by brand name and model number with relevant approvals.

2. Detailed provisions for combustion air, venting, and stacks.

3. A floor plan drawn to scale showing all relevant equipment. Plans and specifications shall be approved before proceeding with an installation.

**1346.5900 SECTION 900 MANUFACTURED HOME PARK/COMMUNITY FUEL GAS EQUIPMENT AND INSTALLATION.**

The IFGC is amended by adding a chapter to read as follows:

CHAPTER 9

MANUFACTURED HOME PARK/COMMUNITY FUEL GAS

EQUIPMENT AND INSTALLATION

**901 General.** Except as otherwise permitted or required by this chapter, all fuel gas equipment and installations in manufactured home parks and communities shall comply with the provisions of this code. The provisions of this chapter shall not apply to manufactured home gas piping and equipment.

**902 Required gas supply.** The minimum hourly volume of gas required at each manufactured home lot outlet or any section of the manufactured home gas piping system shall be calculated as shown in IFGC Table 902. Required gas supply for buildings or other fuel gas utilization equipment connected to the manufactured home gas piping system shall be calculated as provided in this code.

(The following table is all new material.)

Table 902

Demand Factors for Calculating Gas Piping Systems
in Manufactured Home Parks and Communities

| Number of Manufactured Home Sites | Demand Factor (Btu/hr) per Manufactured Home Site | Demand Factor (Watts) per Manufactured Home Site |
|---|---|---|
| 1 | 125,000 | 36,638 |
| 2 | 117,000 | 34,293 |
| 3 | 104,000 | 30,482 |
| 4 | 96,000 | 28,138 |
| 5 | 92,000 | 26,965 |
| 6 | 87,000 | 25,500 |
| 7 | 83,000 | 24,327 |
| 8 | 81,000 | 23,741 |
| 9 | 79,000 | 23,155 |
| 10 | 77,000 | 22,569 |
| 11-20 | 66,000 | 19,345 |
| 21-30 | 62,000 | 18,172 |

| | | |
|---|---|---|
| 31-40 | 58,000 | 17,000 |
| 41-60 | 55,000 | 16,121 |
| Over 60 | 50,000 | 14,655 |

**903 Installation.** Gas piping shall not be installed underground beneath buildings or that portion of the manufactured home lot reserved for the location of manufactured homes, manufactured home accessory buildings or structures, concrete slabs, or automobile parking, unless installed in a gas-tight conduit complying with the following:

1. The conduit shall be of material approved for installation underground beneath buildings and not less than Schedule 40 pipe. The interior diameter of the conduit shall be not less than 0.5 inch (15 mm) larger than the outside diameter of the gas piping.

2. The conduit shall extend to a point not less than 12 inches (305 mm) beyond any area where it is required to be installed, or the outside wall of a building, and the outer ends shall not be sealed. Where the conduit terminates within a building, it shall be provided with access, and the space between the conduit and the gas piping shall be sealed to prevent leakage of gas into the building.

**Exception:** A gas piping lateral terminating in a manufactured home lot riser surrounded by a concrete slab shall not be required to be installed in a conduit, provided the concrete slab is entirely outside the wall line of the manufactured home, and is used for stabilizing other utility connections.

**904 Manufactured home lot shutoff valve.** Each manufactured home lot shall have an approved gas shutoff valve installed upstream of the manufactured home lot gas outlet and located on the outlet riser at a height at least 6 inches (152 mm) above grade. Such valve shall not be located under a manufactured home. When the manufactured home lot is not in use, the outlet shall be equipped with an approved cap or plug to prevent accidental discharge of gas.

**905 Manufactured home lot gas outlet.** Each manufactured home lot piped for gas shall be provided with an individual outlet riser at the manufactured home lot. The manufactured home lot gas outlet shall terminate with the point of delivery in the rear third section and within 4 feet (1,219 mm) of the proposed location of the manufactured home.

**906 Manufactured home gas connector.** Each manufactured home shall be connected to the lot outlet by an approved or listed gas connector, a maximum of 6 feet (1,829 mm) in length. Approved pipe and fittings may be used between the flexible connector and the lot gas outlet when the distance exceeds that required to make a safe installation with only an approved or listed gas connector. Gas connectors shall be of a size to adequately supply the total demand of the connected manufactured home.

**907 Mechanical protection.** All gas outlet risers, regulators, meters, valves, or other exposed equipment shall be protected from mechanical damage. Atmospherically controlled regulators shall be installed in such a manner that moisture cannot enter the regulator vent and accumulate above the diaphragm. Where the regulator vent may be obstructed due to snow and icing conditions, shields, hoods, or other suitable devices shall be provided to guard against closing the vent opening.

**908 Meters.** Meters shall not be installed in unvented or inaccessible locations or closer than 3 feet (914 mm) from sources of ignition. When meters are installed, they shall not depend on the gas outlet riser for support, but shall be adequately supported by a post or bracket placed on a firm footing, or other means providing equivalent support.

**909 Meter shutoff valve.** All meter installations shall be provided with a shutoff valve located adjacent to and on the inlet side of the meter. For installations utilizing a liquefied petroleum gas container, the container service valve shall serve as the shutoff valve.

**910 Gas pipe sizing.** The size of each section of natural gas or liquefied petroleum gas piping systems shall be determined as specified in this code.

**911 Maintenance.** The manufactured home park/community operator shall be responsible for maintaining all gas piping installations and equipment in good working condition.

(The following appendix is all new material.)

IMC Appendix C, Table C-1
Recommended Capacities for
Domestic Kitchen Exhaust Hoods

| Hood Size | Equipment with Grills or Deep Fryers (Number of Exposed Sides) | Ranges and Ovens (Number of Exposed Sides) |
|---|---|---|

| Area (Sq. Ft.) | Four (CFM) | Three (CFM) | Four (CFM) | Three (CFM) |
|---|---|---|---|---|
| Up to 4 | Up to 400 | Up to 300 | Up to 300 | Up to 200 |
| 4 | 400 | 300 | 300 | 200 |
| 4.5 | 450 | 338 | 338 | 225 |
| 5 | 500 | 375 | 375 | 250 |
| 5.5 | 550 | 413 | 413 | 275 |
| 6 | 600 | 450 | 450 | 300 |
| 6.5 | 650 | 488 | 488 | 325 |
| 7 | 700 | 525 | 525 | 350 |
| 7.5 | 750 | 563 | 563 | 375 |
| 8 | 800 | 600 | 600 | 400 |
| 8.5 | 850 | 638 | 638 | 425 |
| 9 | 900 | 675 | 675 | 450 |
| 9.5 | 950 | 713 | 713 | 475 |
| 10 | 1,000 | 750 | 750 | 500 |
| 10.5 | 1,050 | 788 | 788 | 525 |
| 11 | 1,100 | 825 | 825 | 550 |
| 11.5 | 1,150 | 863 | 863 | 575 |
| 12 | 1,200 | 900 | 900 | 600 |
| 12.5 | 1,250 | 938 | 938 | 625 |
| 13 | 1,300 | 975 | 975 | 650 |
| 13.5 | 1,350 | 1,013 | 1,013 | 675 |
| 14 | 1,400 | 1,050 | 1,050 | 700 |
| 14.5 | 1,450 | 1,088 | 1,088 | 725 |
| 15 | 1,500 | 1,125 | 1,125 | 750 |
| 15.5 | 1,550 | 1,163 | 1,163 | 775 |
| 16 | 1,600 | 1,200 | 1,200 | 800 |

(The following appendix is all new material.)

IFGC Appendix E, Worksheet E-1

Residential Combustion Air Calculation Method
(for Furnace, Boiler, and/or Water Heater
in the Same Space)

**Step 1:** Complete vented combustion appliance information.

Furnace/Boiler:

__ Draft Hood (Not fan assisted) & Power Vent __ Fan Assisted __ Direct Vent Input: _____Btu/hr

Water Heater:

__ Draft Hood (Not fan assisted) & Power Vent __ Fan Assisted __ Direct Vent Input: _____Btu/hr

**Step 2:** Calculate the volume of the Combustion Appliance Space (CAS) containing combustion appliances.

The CAS includes all spaces connected to one another by code compliant openings. CAS volume:_____$ft^3$

**Step 3:** Determine Air Changes per Hour (ACH)[1]

Default ACH values have been incorporated into Table E-1 for use with Method 4b (KAIR Method).
If the year of construction or ACH is not known, use method 4a (Standard Method).

**Step 4:** Determine Required Volume for Combustion Air.

**4a.** Standard Method

Total Btu/hr input of all combustion appliances (DO NOT COUNT DIRECT VENT APPLIANCES) Input:_____Btu/hr

Use Standard Method column in Table E-1 to find Total Required Volume (TRV) TRV:_____$ft^3$

If CAS Volume (from Step 2) *is greater than* TRV then no outdoor openings are needed.
If CAS Volume (from Step 2) *is less than* TRV then go to **STEP 5.**

**4b.** Known Air Infiltration Rate (KAIR) Method

Total Btu/hr input of all fan-assisted appliances (DO NOT COUNT DIRECT VENT APPLIANCES) Input:_____Btu/hr

Use Fan-Assisted Appliances column in Table E-1 to find Required Volume Fan Assisted (RVFA) RVFA:_____$ft^3$

Total But/hr input of all non-fan-assisted appliances Input:_____Btu/hr

Use Non-Fan-Assisted Appliances column in Table E-1 to find Required Volume Non-Fan-Assisted (RVNFA) RVNFA:_____$ft^3$

Total Required Volume (TRV) = RVFA + RVNFA

RV = _____ + _____ = _____$ft^3$

If CAS Volume (from Step 2) *is greater than* TRV then no outdoor openings are needed.
If CAS Volume (from Step 2) *is less than* TRV then go to **STEP 5**.

**STEP 5:** Calculate the ratio of available interior volume to the total required volume.

Ratio = CAS Volume (from Step 2) *divided by* TRV (from Step 4a or Step 4b) Ratio = _____ / _____ = _____

**STEP 6:** Calculate Reduction Factor (RF).

RF = 1 *minus* Ratio RF = 1 - _____ = _____

**STEP 7:** Calculate single outdoor opening as if all combustion air is from outside.

Total Btu/hr input of all Combustion Appliances in the same CAS (EXCEPT DIRECT VENT) Input:_____Btu/hr

Combustion Air Opening Area (CAOA):

Total Btu/hr *divided by* 3000 Btu/hr per $in^2$ CAOA = _____ / 3000 Btu/hr per $in^2$ = _____$in^2$

**STEP 8:** Calculate Minimum CAOA.

Minimum CAOA = CAOA *multiplied by* RF

Minimum CAOA = _____ x _____ = _____$in^2$

**Step 9.** Calculate Combustion Air Opening Diameter (CAOD)

CAOD = 1.13 *multiplied by the square root of* Minimum CAOA

CAOD = 1.13 Minimum CAOA = ____in

[1] If desired, ACH can be determined using ASHRAE calculation or blower door test. Follow procedures in Section G304.

IFGC Appendix E, Table E-1

Residential Combustion Air Required Volume
(Required Interior Volume Based on Input Rating of Appliances)
Known Air Infiltration Rate (KAIR)
Method ($ft^3$)

| | | Fan Assisted | | Non-Fan-Assisted | |
|---|---|---|---|---|---|
| Input Rating (Btu/hr) | Standard Method ($ft^3$) | 1994[1] to Present | Pre 1994[2] | 1994[1] to Present | Pre 1994[2] |
| 5,000 | 250 | 375 | 188 | 525 | 263 |
| 10,000 | 500 | 750 | 375 | 1,050 | 525 |
| 15,000 | 750 | 1,125 | 563 | 1,575 | 788 |
| 20,000 | 1,000 | 1,500 | 750 | 2,100 | 1,050 |
| 25,000 | 1,250 | 1,875 | 938 | 2,625 | 1,313 |
| 30,000 | 1,500 | 2,250 | 1,125 | 3,150 | 1,575 |
| 35,000 | 1,750 | 2,625 | 1,313 | 3,675 | 1,838 |
| 40,000 | 2,000 | 3,000 | 1,500 | 4,200 | 2,100 |
| 45,000 | 2,250 | 3,375 | 1,688 | 4,725 | 2,363 |
| 50,000 | 2,500 | 3,750 | 1,875 | 5,250 | 2,625 |
| 55,000 | 2,750 | 4,125 | 2,063 | 5,775 | 2,888 |
| 60,000 | 3,000 | 4,500 | 2,250 | 6,300 | 3,150 |
| 65,000 | 3,250 | 4,875 | 2,438 | 6,825 | 3,413 |
| 70,000 | 3,500 | 5,250 | 2,625 | 7,350 | 3,675 |
| 75,000 | 3,750 | 5,625 | 2,813 | 7,875 | 3,938 |
| 80,000 | 4,000 | 6,000 | 3,000 | 8,400 | 4,200 |
| 85,000 | 4,250 | 6,375 | 3,188 | 8,925 | 4,463 |
| 90,000 | 4,500 | 6,750 | 3,375 | 9,450 | 4,725 |
| 95,000 | 4,750 | 7,125 | 3,563 | 9,975 | 4,988 |
| 100,000 | 5,000 | 7,500 | 3,750 | 10,500 | 5,250 |
| 105,000 | 5,250 | 7,875 | 3,938 | 11,025 | 5,513 |
| 110,000 | 5,500 | 8,250 | 4,125 | 11,550 | 5,775 |
| 115,000 | 5,750 | 8,625 | 4,313 | 12,075 | 6,038 |
| 120,000 | 6,000 | 9,000 | 4,500 | 12,600 | 6,300 |
| 125,000 | 6,250 | 9,375 | 4,688 | 13,125 | 6,563 |
| 130,000 | 6,500 | 9,750 | 4,875 | 13,650 | 6,825 |
| 135,000 | 6,750 | 10,125 | 5,063 | 14,175 | 7,088 |
| 140,000 | 7,000 | 10,500 | 5,250 | 14,700 | 7,350 |
| 145,000 | 7,250 | 10,875 | 5,438 | 15,225 | 7,613 |
| 150,000 | 7,500 | 11,250 | 5,625 | 15,750 | 7,875 |
| 155,000 | 7,750 | 11,625 | 5,813 | 16,275 | 8,138 |
| 160,000 | 8,000 | 12,000 | 6,000 | 16,800 | 8,400 |
| 165,000 | 8,250 | 12,375 | 6,188 | 17,325 | 8,663 |
| 170,000 | 8,500 | 12,750 | 6,375 | 17,850 | 8,925 |
| 175,000 | 8,750 | 13,125 | 6,563 | 18,375 | 9,188 |
| 180,000 | 9,000 | 13,500 | 6,750 | 18,900 | 9,450 |
| 185,000 | 9,250 | 13,875 | 6,938 | 19,425 | 9,713 |

| | | | | | |
|---|---|---|---|---|---|
| 190,000 | 9,500 | 14,250 | 7,125 | 19,950 | 9,975 |
| 195,000 | 9,750 | 14,625 | 7,313 | 20,475 | 10,238 |
| 200,000 | 10,000 | 15,000 | 7,500 | 21,000 | 10,500 |
| 205,000 | 10,250 | 15,375 | 7,688 | 21,525 | 10,763 |
| 210,000 | 10,500 | 15,750 | 7,875 | 22,050 | 11,025 |
| 215,000 | 10,750 | 16,125 | 8,063 | 22,575 | 11,288 |
| 220,000 | 11,000 | 16,500 | 8,250 | 23,100 | 11,550 |
| 225,000 | 11,250 | 16,875 | 8,438 | 23,625 | 11,813 |
| 230,000 | 11,500 | 17,250 | 8,625 | 24,150 | 12,075 |

[1]The 1994 date refers to dwellings constructed under the 1994 Minnesota Energy Code. The default KAIR used in this section of the table is 0.20 ACH.

[2]This section of the table is to be used for dwellings constructed prior to 1994. The default KAIR used in this section of the table is 0.40 ACH.

**REPEALER.** *Minnesota Rules*, parts 1346.0108; 1346.0203; 1346.0204; 1346.0302; 1346.0304; 1346.0405; 1346.0406; 1346.0407; 1346.0408; 1346.0409; 1346.0410; 1346.0411; 1346.0414; 1346.0418; 1346.0421; 1346.0424; 1346.0504; 1346.0602; 1346.0605; 1346.0606; 1346.0607; 1346.0608; 1346.0707; 1346.0710; 1346.0807; 1346.0808; 1346.0809; 1346.0913; 1346.1002; 1346.1005; 1346.1104; 1346.1107; 1346.1207; 1346.1503; 1346.1505; 1346.1520; 1346.1521; 1346.1906; 1346.2002; 1346.2003; 1346.2101; 1346.2102; 1346.2104; 1346.2106; 1346.2107; 1346.2108; 1346.2109; 1346.2110; 1346.2111; 1346.2113; 1346.2114; 1346.2115; 1346.2120; 1346.2122; 1346.2123; 1346.2124; 1346.2125; 1346.2126; 1346.2127; 1346.2133; 1346.2201; 1346.2202; 1346.2205; 1346.2206; 1346.2211; 1346.2212; 1346.2213; 1346.2215; 1346.2216; 1346.2220; 1346.2226; 1346.2500; and 1346.2600, are repealed.

**INCORPORATIONS BY REFERENCE:** Part 1346.0050: Chapters 2 to 15 of the 2000 Edition of the INternational Mechanical Code, promulgated by the International Code Council, Inc., 5203 Leesburg Pike, Suite 600, Falls Church, Virginia 22041-3401, available in the office of the commissioner of administration; parts 1346.0201 and 1346.5201: Merriam-Webster Collegiate Dictionary, available at *www.m-w.com*, available through the Minitex interlibrary loan system; part 1346.5050: Chapters 2 to 7 of the 2000 edition of the INternational Fuel Gas Code, promulgated by the International Code Council, Inc., 5203 Leesburg Pike, Suite 600, Falls Church, Virginia 22041-3401, available in the office of the commissioner of administration.

# Expedited Emergency Rules

Provisions exist for the Commissioners of some state agencies to adopt emergency expedited rules when conditions exist that do not allow the Commissioner to comply with the requirements for emergency rules. The Commissioner must submit the rule to the attorney general for review and must publish a notice of adoption that includes a copy of the rule and the emergency conditions. Emergency expedited rules are effective upon publication in the *State Register*, and may be effective up to seven days before publication under certain emergency conditions. Emergency expedited rules are effective for the period stated or up to 18 months. Specific *Minnesota Statutes* citations accompanying these emergency expedited rules detail the agency's rulemaking authority.

# Department of Education

## Proposed Permanent Rules Relating to Statewide Rigorous Core

### NOTICE OF INTENT TO ADOPT EXPEDITED RULES WITHOUT A PUBLIC HEARING

### Proposed Permanent Rules Relating to Statewide Rigorous Core Academic Standards, *Minnesota Rules* 3501.0505 to 3501.0635.

**Introduction.** The Minnesota Department of Education intends to adopt rules under the expedited rulemaking process set forth in the rules of the Office of Administrative Hearings, part 1400.2410, and the Administrative Procedure Act, *Minnesota Statutes*, section 14.389. You may submit written comments on the proposed expedited rules until November 5, 2003.

**Agency Contact Person.** Comments or questions on the rule must be submitted to: Kristen Schroeder, Rulemaking Coordinator, Minnesota Department of Education, 1500 Highway 36 West, Roseville, Minnesota, 55113; **Telephone:** (651) 582-8607; **FAX:** (651) 582-8725; **E-mail:** *kristen.schroeder@state.mn.us*.

**Subject of Expedited Rule and Statutory Authority.** The proposed expedited rule governs core academic standards in language arts, mathematics and the arts for public school students, kindergarten through grade 12. The statutory authority to adopt this rule under the expedited rulemaking process is *2003 Minnesota Laws*, chapter 129, article 1, section 3, to be codified at *Minnesota*

*Statutes*, section 120B.021, subdivision 3. A copy of the proposed rule is published in the *State Register* and available upon request from the agency contact person.

**Comments.** You have until 4:30 p.m. on November 5, 2003 to submit written comment in support of or in opposition to the proposed expedited rule and any part or subpart of the rule. Your comment must be in writing and received by the agency contact person by the due date. Comment is encouraged. Your comment should identify the portion of the proposed expedited rule addressed and the reason for the comment. You are encouraged to propose any change desired. Any comments that you would like to make on the legality of the proposed rule must also be made during this comment period.

**Modifications.** The agency may modify the proposed expedited rule if the modifications do not make the rule substantially different as defined in *Minnesota Statutes*, section 14.05, subdivision 2, paragraphs (b) and (c), unless the procedure under part 1400.2110 has been followed. If the final rule is identical to the rule originally published in the *State Register*, the agency will publish a notice of adoption in the *State Register*. If the final rule is different from the rule originally published in the *State Register*, the agency must publish a copy of the changes in the *State Register*. If the proposed expedited rule affects you in any way, you are encouraged to participate in the rulemaking process.

**Adoption and Review of Expedited Rule.** The agency may adopt the rules at the end of the comment period. The rules and supporting documents will then be submitted to the Office of Administrative Hearings for review for legality. You may ask to be notified of the date the rules are submitted to the office. If you want to be so notified, or want to receive a copy of the adopted rules, or want to register with the agency to receive notice of future rule proceedings, submit your request to the agency contact person listed above.

Dated:

Cheri Pierson Yecke, Ph.D.
Commissioner

**Summary of Nature and Effect of Proposed Rules Regarding Proposed Permanent Rules Relating to Statewide Rigorous Core Academic Standards**

**Overview**

*2003 Minnesota Laws*, chapter 129, article 1, section 3, authorizes the Commissioner of Education to adopt rules under *Minnesota Statutes*, chapter 14.389 (expedited process) for implementing statewide rigorous core academic standards in language arts, mathematics and the arts. *2003 Minnesota Laws* ch. 129, art. 1, sec. 3 to be codified at *Minnesota Statutes* § 120B.021, subd. 3.

Beginning in the 2003-2004 school year, public schools must implement the state language arts and mathematics standards and must also implement the arts standards in required areas using either state or locally developed standards. *2003 Minnesota Laws* ch. 129, art. 1, sec. 3 to be codified at *Minnesota Statutes* § 120B.021, subd. 1. This proposed rule establishes the state standards for language arts, mathematics and the arts.

This summary contains a description of the nature and the effect of the K-12 academic standards in language arts, mathematics, and the arts.

**Nature of the Proposed Rules**

The proposed standards identify what students are expected to know (content) and be able to do (skills) in the subject areas of mathematics, language arts and the arts. The proposed standards apply to all public school students, with the exception of "the very few students with extreme cognitive or physical impairments for whom an individualized education plan team has determined that the required academic standards are inappropriate." The team must establish alternative standards for those students. *2003 Minnesota Laws* ch. 129, art. 1, sec. 3 to be codified at *Minnesota Statutes* § 120B.021.

A standard in the subject areas of mathematics and language arts is a summary statement of a core competency that a student is expected to achieve by the end of each specified grade level (kindergarten through grade 12). The standards are the basis for required statewide assessment tests. The proposed standards for language arts and mathematics are written to be clear, concise, objective, measurable, and grade-level appropriate. The proposed standards in language arts and mathematics are organized by grade level and areas of concentration within the scope of the discipline. For example, the language arts standards are organized around three main areas of concentration or strands: 1) Reading and Literature, 2) Writing, and 3) Speaking, Listening and Viewing. The proposed standards are sequenced K-12 so that the skills and knowledge become increasingly more complex as students move from grade to grade. The proposed rule contains 104 language arts standards designated by grade level K-12 and 98 mathematics standards designated by grade level K-8 and grade spans 9-11 and 11-12.

The proposed standards for the arts are written more broadly and are organized by grade spans. There are six proposed standards in the arts organized according to the following grade spans: kindergarten through grade 3; grades 4 and 5; grades 6 through 8; and grades 9 through 12. A standard in the arts is a statement of what a student is expected to achieve by the end of the grade span.

In addition to authorizing the commissioner to adopt rules for the standards, *2003 Minnesota Laws*, ch. 129, art. 1, sec. 5 (to be codified at *Minnesota Statutes* § 120B.023) requires the commissioner to supplement the academic standards with grade-level bench-

marks and publish the benchmarks in the *State Register*. The benchmarks specify the academic knowledge that schools must offer and the skills students must achieve to complete the state standards.

**Effect of the Proposed Rules**

The proposed standards will affect various stakeholders in Minnesota, including students, parents, schools, taxpayers and citizens at large.

The standards in language arts and mathematics as proposed in this rule set clear expectations for student performance and define the level of accountability for students by providing the basis for statewide assessments. The proposed standards set clear expectations for school accountability. It will be necessary for schools to align their choice of curriculum and delivery system, including forms of instruction, with the standards. The arts standards set the requirements for what schools must offer and students must complete in the arts.

The proposed standards, in conjunction with assessments, help parents, teachers, and citizens know whether students have mastered what they are expected to learn. Further, the proposed standards inform parents/guardians, taxpayers, institutions of higher education and employers what learning opportunities Minnesota schools must make available to all students and what Minnesota public school students are expected to master.

By clearly defining expectations for all students, standards are central to significantly enhancing student learning and are essential in measuring student learning. The standards, the accompanying benchmarks and assessments of these standards enhance student achievement by setting high expectations for all students, by aligning what students are expected to know and do with concrete measures of learning, and by clearly defining expected results for schools and for student progress.

ACADEMIC STANDARDS IN LANGUAGE ARTS

**3501.0505 KINDERGARTEN STANDARDS.**

Subpart 1. **Reading and literature.** The student will listen to and begin to read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will understand and apply knowledge of the sounds of the English language (phonemic awareness) and of the sound-symbol relationship (phonics).

B. Vocabulary expansion. The student will use a variety of strategies to develop and expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will listen to and understand the meaning of text.

D. Literature. The student will read or listen to a variety of texts.

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes.

A. Types of writing. Writing is addressed in subpart 1, item A.

B. Elements of composition. Standards under this heading may be locally determined.

C. Spelling, grammar, and usage. The student will begin to recognize correct spelling and punctuation.

D. Research. Standards under this heading may be locally determined.

E. Handwriting and word processing. The student will form letters and numbers.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will communicate effectively through listening and speaking.

B. Viewing. The student will become familiar with the structure of printed material.

**3501.0510 GRADE 1 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will understand and apply knowledge of the sounds of the English language (phonemic awareness), the sound-symbol relationship (phonics), and word recognition strategies to read grade-level materials with accuracy and emerging fluency.

B. Vocabulary expansion. The student will use a variety of strategies to develop and expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will actively engage in the reading process and use a variety of comprehension strategies to understand the meaning of texts that have been read or listened to.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to communicate effectively for a variety of audiences and purposes.

A. Types of writing. The student will compose various pieces of writing.

B. Elements of composition. The student will demonstrate emerging knowledge of a writing process with attention to organization, topic, and quality of ideas.

C. Spelling, grammar, and usage. The student will demonstrate emerging knowledge of punctuation, spelling, and capitalization.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will improve the student's handwriting.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will communicate effectively through listening and speaking.

B. Viewing. The student will become familiar with the structure of printed material.

**3501.0515 GRADE 2 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will understand and apply knowledge of the sounds of the English language (phonemic awareness), the sound-symbol relationship (phonics), and word recognition strategies to read grade-level materials with accuracy and fluency.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will actively engage in the reading process and use a variety of comprehension strategies to understand the meaning of texts that have been read.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes, demonstrating an emerging knowledge and application of skills.

A. Types of writing. The student will compose narrative and informational pieces of writing.

B. Elements of composition. The student will demonstrate increased emerging knowledge in a writing process, with attention to organization, focus, and quality of ideas.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will begin to write legibly.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Viewing. The student will become familiar with the structure of printed material.

**3501.0520 GRADE 3 STANDARDS.**

Subpart 1. **Word recognition, analysis, and fluency.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will apply word recognition strategies to decode unfamiliar multisyllabic words and will read grade-appropriate text with accuracy and fluency.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will understand the meaning of texts using a variety of comprehension strategies and will demonstrate literal, interpretive, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to communicate effectively for a variety of audiences and purposes.

A. Types of writing. The student will compose various pieces of writing.

B. Elements of composition. The student will engage in a writing process, with attention to organization, focus, and quality of ideas.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will write legibly.

Subp. 3. **Speaking, listening, and viewing.**

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

**3501.0525 GRADE 4 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will decode unfamiliar words using phonetic and structural analysis and will read with fluency and expression.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will understand the meaning of texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes.

A. Types of writing. The student will compose various pieces of writing.

B. Elements of composition. The student will engage in writing, with attention to organization, focus, and quality of ideas.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will write legibly and use a keyboard.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

**3501.0530 GRADE 5 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will decode unfamiliar words using phonetic and structural analysis and will read with fluency and expression.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will understand the meaning of texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes.

A. Types of writing. The student will compose various pieces of writing.

B. Elements of composition. The student will engage in a writing process, with attention to organization, focus, quality of ideas, audience, and a purpose.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will write legibly and demonstrate effective keyboarding skills.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

**3501.0535 GRADE 6 STANDARDS.**

Subpart 1. **Reading and literature.** Students will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will read with accuracy and fluency.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will understand the meaning of informational, expository, or persuasive texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes.

A. Types of writing. The student will create informative, expressive, and persuasive writing.

B. Elements of composition. The student will engage in a writing process, with attention to organization, focus, quality of ideas, and a purpose.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will write legibly and demonstrate effective keyboarding skills.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

**3501.0540 GRADE 7 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. The student will read with accuracy and fluency.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will understand the meaning of texts, using a variety of strategies, and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently for a variety of audiences and purposes.

A. Types of writing. The student will create informative, expressive, and persuasive writing.

B. Elements of composition. The student will engage in a writing process, with attention to context, organization, focus, quality of ideas, and a purpose.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will write legibly and demonstrate effective keyboarding skills.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

**3501.0545 GRADE 8 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. Standards under this heading may be locally determined and based on the individual needs of the student.

B. Vocabulary expansion. The student will use a variety of strategies to expand reading, listening, and speaking vocabularies.

C. Comprehension. The student will understand the meaning of texts using a variety of strategies and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently to effectively communicate for a variety of audiences and purposes.

A. Types of writing. The student will create informative, expressive, and persuasive writing.

B. Elements of composition. The student will engage in a writing process with attention to context, organization, focus, quality of ideas, and a purpose.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. The student will write legibly and demonstrate effective keyboarding skills.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences, and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

**3501.0550 GRADES 9 THROUGH 12 STANDARDS.**

Subpart 1. **Reading and literature.** The student will read and understand grade-appropriate English language text.

A. Word recognition, analysis, and fluency. Standards under this heading may be locally determined.

B. Vocabulary expansion. The student will apply a variety of strategies to expand vocabulary.

C. Comprehension. The student will understand the meaning of informational, expository, or persuasive texts, using a variety of strategies and will demonstrate literal, interpretive, inferential, and evaluative comprehension.

D. Literature. The student will actively engage in the reading process and read, understand, respond to, analyze, interpret, evaluate, and appreciate a wide variety of fiction, poetic, and nonfiction texts.

Subp. 2. **Writing.** The student will write clearly and coherently for a variety of audiences and purposes.

A. Type of writing. The student will write in narrative, expository, descriptive, persuasive, and critical modes.

B. Elements of composition. The student will engage in a writing process with attention to audience, organization, focus, quality of ideas, and a purpose.

C. Spelling, grammar, and usage. The student will apply standard English conventions when writing.

D. Research. The student will locate and use information in reference materials.

E. Handwriting and word processing. Standards under this heading may be locally determined.

Subp. 3. **Speaking, listening, and viewing.** The student will speak clearly and effectively for a variety of purposes and audiences and actively listen to, view, and evaluate oral communication and media.

A. Speaking and listening. The student will demonstrate understanding and communicate effectively through listening and speaking.

B. Media literacy. The student will critically analyze information found in electronic and print media, and will use a variety of these sources to learn about a topic and represent ideas.

ACADEMIC STANDARDS IN MATHEMATICS

**3501.0560 KINDERGARTEN STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will represent quantities using whole numbers and understand relationships among whole numbers.

B. Computation and operation. The student will add and subtract whole numbers up to six in real-world and mathematical problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will sort, classify, and compare objects based on their attributes. The student will understand simple repeating patterns.

B. Algebra, algebraic thinking. Standards under this heading may be locally determined.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will depict data with objects and pictures.

B. Probability. Standards under this heading may be locally determined.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand the meanings of terms used to describe location and placement of objects.

B. Geometry. The student will sort two- and three-dimensional shapes.

C. Measurement. The student will understand terms and comparative language used in various measurement situations, identify tools to measure time, and identify coins.

**3501.0565 GRADE 1 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will understand place value, ways of representing whole numbers, and relationships among whole numbers. The student will understand the concept of one-half.

B. Computation and operation. The student will add and subtract one-digit whole numbers in real-world and mathematical problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will sort, classify, and compare objects based on their attributes. The student will understand repeating patterns.

B. Algebra, algebraic thinking. Standards under this heading may be locally determined.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will gather and record data in real-world and mathematical problems.

B. Probability. Standards under this heading may be locally determined.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will explore the concept of symmetry in real-world situations.

B. Geometry. The student will use attributes of two- and three-dimensional shapes to identify them and distinguish between them.

C. Measurement. The student will measure length, time, and money using appropriate tools or units to solve real-world and mathematical problems.

**3501.0570 GRADE 2 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will understand place value, ways of representing whole numbers, and relationships among whole numbers. The student will understand the concept of unit fractions.

B. Computation and operation. The student will compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will understand repeating, growing, and shrinking patterns.

B. Algebra, algebraic thinking. The student will understand basic properties of addition and subtraction.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will collect and represent data in real-world and mathematical problems.

B. Probability. Standards under this heading may be locally determined.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand the concept of symmetry and apply it to simple drawings.

B. Geometry. The student will use attributes of two- and three-dimensional shapes to identify them and distinguish between them.

C. Measurement. The student will measure length, time, temperature, and money using appropriate tools and units to solve real-world and mathematical problems.

**3501.0575 GRADE 3 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will represent whole numbers in various ways to quantify information and to solve real-world and mathematical problems. The student will understand the concepts of decimals and common fractions.

B. Computation and operation. The student will compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems. The student will understand addition and subtraction and how they relate to one another. The student will understand the concepts of multiplication and division.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will understand and describe patterns in numbers and shapes.

B. Algebra, algebraic thinking. The student will add and subtract whole numbers in the correct order to solve real-world and mathematical problems.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent and interpret data in real-world and mathematical problems.

B. Probability. The student will explore the basic concept of probability.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand the concept of reflection symmetry as applied to geometric shapes. The student will understand how representations of shapes are affected by various motions.

B. Geometry. The student will classify shapes by specified attributes. The student will identify simple shapes within complex shapes.

C. Measurement. The student will measure and calculate length, time, weight, temperature, and money using appropriate tools and units to solve real-world and mathematical problems.

**3501.0580 GRADE 4 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will represent whole numbers in various ways to quantify information and to solve real-world and mathematical problems. The student will understand the concepts of fractions and decimals.

B. Computation and operation. The student will compute fluently and make reasonable estimates with whole numbers in real-world and mathematical problems. The student will understand the meanings of arithmetic operations and how they relate to one another.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will understand and describe patterns in tables and graphs.

B. Algebra, algebraic thinking. The student will apply arithmetic operations in the correct order to compute with whole numbers in real-world and mathematical problems.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent and interpret data in real-world and mathematical problems.

B. Probability. The student will model simple probabilities by displaying the outcomes for real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand spatial relationships and describe them using language such as congruent, similar, parallel, and perpendicular.

B. Geometry. The student will use attributes of two- and three-dimensional shapes to identify them and distinguish between them.

C. Measurement. The student will measure and calculate length and area using appropriate tools and units to solve real-world and mathematical problems. The student will make change with money.

**3501.0585 GRADE 5 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will represent fractions, decimals, and whole numbers in a variety of ways, to quantify information and to solve real-world and mathematical problems. The student will understand the concept of negative numbers.

B. Computation and operation. The student will compute fluently and make reasonable estimates with fractions, decimals, and whole numbers, in real-world and mathematical problems. The student will understand the meanings of arithmetic operations and how they relate to one another.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will understand and describe patterns in numbers, shapes, tables, and graphs.

B. Algebra, algebraic thinking. The student will represent mathematical relationships using equations.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends.

B. Probability. The student will model simple probabilities by displaying the outcomes for real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will understand the concepts of reflection and rotation symmetry as applied to two-dimensional shapes.

B. Geometry. The student will sort, classify, compare, and describe two- and three-dimensional objects.

C. Measurement. The student will measure and calculate length, area, and capacity using appropriate tools and units to solve real-world and mathematical problems.

**3501.0590 GRADE 6 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will use positive and negative rational numbers, represented in a variety of ways, to quantify information, and to solve real-world and mathematical problems.

B. Computation and operation. The student will compute fluently and make reasonable estimates with positive and negative rational numbers in real-world and mathematical problems. The student will understand the meanings of arithmetic operations and factorization, and how they relate to one another. The student will appropriately use calculators and other technologies to solve problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will demonstrate understanding of the rectangular coordinate system.

B. Algebra, algebraic thinking. The student will apply arithmetic operations in the correct order to simplify and evaluate numeric expressions in real-world and mathematical problems.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends.

B. Probability. The student will calculate and express probabilities numerically, and apply probability concepts to solve real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will recognize the relationship between different representations of two- and three-dimensional shapes. The student will understand the effects of various transformations.

B. Geometry. The student will identify a variety of simple geometric figures by name, calculate various quantities associated with them, and use appropriate tools to draw them.

C. Measurement. The student will make calculations of time, length, area, and volume within standard measuring systems, using good judgment in choice of units.

**3501.0595 GRADE 7 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will use positive and negative rational numbers, represented in a variety of ways, to quantify information, and to solve real-world and mathematical problems.

B. Computation and operation. The student will compute fluently and make reasonable estimates with rational numbers in real-world and mathematical problems. The student will understand the meanings of the basic operations, including the use of integer exponents and square roots, and how the operations relate to one another. The student will appropriately use calculators and other technologies to solve problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will demonstrate an understanding of rate of change graphically and numerically.

B. Algebra, algebraic thinking. The student will apply arithmetic operations in the correct order to generate equivalent algebraic expressions and to solve simple formulas in real-world and mathematical problems.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends.

B. Probability. The student will calculate and express probabilities numerically and apply probability concepts to solve real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will recognize the relationship between different representations of two- and three-dimensional shapes. The student will understand the effects of various transformations.

B. Geometry. The student will use basic geometric principles and proportional reasoning to solve real-world and mathematical problems.

C. Measurement. The student will make calculations of time, length, area, and volume within standard measuring systems using good judgment in choice of units.

**3501.0600 GRADE 8 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will use rational and irrational numbers, represented in a variety of ways, to quantify information and to solve real-world and mathematical problems.

B. Computation and operation. The student will compute fluently and make reasonable estimates with rational and irrational numbers in real-world and mathematical problems. The student will understand the meanings of the basic operations, including the use of integer exponents and $n^{th}$ roots, and how the operations relate to one another. The student will appropriately use calculators and other technologies to solve problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will understand and describe progressions. The student will use graphs and tables to solve real-world and mathematical problems.

B. Algebra, algebraic thinking. The student will use algebraic operations to generate equivalent expressions, and use proportional reasoning to solve real-world and mathematical problems. The student will demonstrate the ability to manipulate an equation by applying arithmetic operations to both sides to maintain equivalence.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends.

B. Probability. The student will calculate and express probabilities numerically and apply probability concepts to solve real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will recognize the relationship between different representations of two- and three-dimensional shapes. The student will understand the effects of various transformations.

B. Geometry. The student will use basic geometric principles and proportional reasoning to solve real-world and mathematical problems.

C. Measurement. The student will make calculations of time, length, area, and volume within and between standard measuring systems using good judgment in choice of units.

**3501.0605 GRADES 9 THROUGH 11 STANDARDS.**

Subpart 1. **Mathematical reasoning.** The student will apply skills of mathematical representation, communication, and reasoning for the standards under subparts 2 to 5.

Subp. 2. **Number sense, computation, and operations.**

A. Number sense. The student will use real numbers, represented in a variety of ways, to quantify information and to solve real-world and mathematical problems.

B. Computation and operation. The student will appropriately use calculators and other technologies to solve algebraic, geometric, probabilistic, and statistical problems.

Subp. 3. **Patterns, functions, and algebra.**

A. Patterns and functions. The student will represent and analyze real-world and mathematical problems using numeric, graphic, and symbolic methods for a variety of functions.

B. Algebra, algebraic thinking. The student will solve simple equations and inequalities numerically, graphically, and symbolically. The student will use recursion to model and solve real-world and mathematical problems.

Subp. 4. **Data analysis, statistics, and probability.**

A. Data and statistics. The student will represent data and use various measures associated with data to draw conclusions and identify trends. The student will understand the effects of display distortion and measurement error on the interpretation of data.

B. Probability. The student will use appropriate counting procedures, calculate probabilities in various ways and apply theoretical probability concepts to solve real-world and mathematical problems.

Subp. 5. **Spatial sense, geometry, and measurement.**

A. Spatial sense. The student will use models to represent and understand two- and three-dimensional shapes and how various motions affect them. The student will recognize the relationship between different representations of the same shape.

B. Geometry. The student will apply basic theorems of plane geometry, right triangle trigonometry, coordinate geometry, and a variety of visualization tools to solve real-world and mathematical problems.

C. Measurement. The student will use the interconnectedness of geometry, algebra, and measurement to explore real-world and mathematical problems.

**3501.0610 GRADES 11 AND 12 STANDARDS FOR ELECTIVE COURSES.**

Subpart 1. **Statistics.** The student will use tables of the normal distribution and properties of that distribution to make judgments about populations based on random samples from these populations.

Subp. 2. **Algebra.** The student will demonstrate facility with a wide range of algebraic operations and use the relationship between coordinate geometry and algebraic equations to solve real-world and mathematical problems.

Subp. 3. **Trigonometry and geometry.** The student will understand the properties of the standard trigonometric functions and apply them to real-world and mathematical problems, especially geometrical problems. The student will develop increased mastery of geometric proof methodology.

ACADEMIC STANDARDS IN THE ARTS

**3501.0620 KINDERGARTEN THROUGH GRADE 3 STANDARDS.**

The student will understand and use artistic processes to create, perform, and interpret art works in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts.

**3501.0625 GRADES 4 AND 5 STANDARDS.**

The student will understand and use artistic processes to create, perform, and interpret art works in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts.

**3501.0630 GRADES 6 THROUGH 8 STANDARDS.**

Subpart 1. **Artistic interpretation.** The student will understand and use artistic processes to analyze and interpret a variety of works in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts.

Subp. 2. **Artistic creativity and performance.** The student will understand and use artistic processes to create and perform in at least two of the three arts areas required to be offered by a school from the following: dance, music, theater, and visual arts.

**3501.0635 GRADES 9 THROUGH 12 STANDARDS.**

Subpart 1. **Analysis and interpretation.** The student will understand and apply artistic processes to analyze, interpret, and evaluate art works in at least one of the three arts areas required to be offered by a school from the following: dance, media arts, music, theater, and visual arts.

Subp. 2. **Creation and performance.** The student will understand and use artistic processes to create original or perform existing works of art in at least one of the three arts areas required to be offered by a school from the following: dance, media arts, music, theater, and visual arts. As an elective, the student may understand and use artistic processes to create original or perform existing works of art in another art form or creative writing.

# Executive Orders

The governor has the authority to issue written statements of orders, called Executive Orders, as well as Emergency Executive Orders. The governor's authority is specified in the *Constitution of the State of Minnesota*, Article V, and in *Minnesota Statues* 4.035. Emergency Executive Orders, for protection from an imminent threat to health and safety, become effective immediately, are filed with the secretary of state, and published in the *State Register* as soon as possible after they are issued. Other Executive Orders become effective 15 days after publication in the *State Register* and filing with the secretary of state. Unless otherwise specified, an executive order expires 90 days after the date the governor who issued the order vacates office.

# Office of the Governor

## Executive Order #03-12: Providing for the Establishment of a Governor's Committee on Minnesota's Mining Future

**I, TIM PAWLENTY, GOVERNOR OF THE STATE OF MINNESOTA,** by virtue of the authority vested in me by the Constitution and the applicable statutes, do hereby issue this Executive Order:

**WHEREAS,** mining is an important industry to the northeast region of the state and the state as a whole; and

**WHEREAS,** the mining of minerals strengthens the state's economy, provides employment opportunities, and adds value to the state's natural resources; and

**WHEREAS,** a strong and competitive mining and minerals industry is an important component to providing a sustainable economy in northeastern Minnesota and the state as a whole;

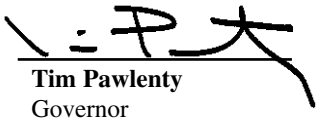
**NOW, THEREFORE,** I hereby order that:

1. A Governor's Committee on Minnesota's Mining Future be established to advise the Governor in relation to the strengthening and development of a sustainable mining and minerals industry in Minnesota.
2. The Council shall also:
   a. Serve as a forum for discussion and evaluation of Minnesota's governmental policies that affect the mining and minerals industry including, but not limited to, regulations, royalties, taxation, development incentives and financing for minerals projects, environmental stewardship, and permitting;
   b. Develop and provide advice on public policy strategies aimed at enhancing the growth of the mining and minerals industry, retaining and creating mining-related employment, sustaining the viability of Minnesota's mining and minerals industry in the global marketplace, promoting innovation and the development of new technologies;
   c. Serve as an advisor and catalyst for the development of partnerships between industry, institutions, funding groups, state and federal government resources, and other entities; and
3. The Committee shall have up to fifteen (15) members appointed by the Governor including:
   (a) Commissioner of the Iron Range Resources and Rehabilitation Agency ("IRRRA"), or designee;
   (b) Commissioner of the Minnesota Department of Natural Resources, or designee;
   (c) Commissioner of the Minnesota Pollution Control Agency, or designee;
   (d) Commissioner of the Minnesota Department of Employment and Economic Development, or designee;
   (e) Individuals representing each of Minnesota's United States Senators and the United States Representative for Minnesota's Eighth Congressional District;
   (f) Eight public members including individuals with experience in the mining industry, unions representing mining workers, and/or other relevant business, leadership and economic development experience.
4. The Commissioner of the IRRRA and a public member selected by the Governor will serve as co-chairs for the Committee. Committee members will serve at the pleasure of the Governor.
5. The IRRRA will provide staff and administrative support to the Committee, assisted as needed by the staff from other state agencies including the Department of Natural Resources, the Minnesota Pollution Control Agency and the Department of Employment and Economic Development.
6. Committee members will not receive per diem, but may be paid for expenses in accordance with *Minnesota Statutes* 2002, section 15.0593.
7. The Committee will provide the Governor with its initial recommendations no later than June 1, 2004. This Order will be reviewed each year by the Governor, in consultation with the affected agency or agencies, in order to assess the progress of the Committee and determine whether the continued existence of the Committee is needed.

# Executive Orders

Pursuant to *Minnesota Statutes* 2002, section 4.035, subdivision 2, this Order will be effective fifteen (15) days after publication in the *State Register* and filing with the Secretary of State and will remain in effect until rescinded by proper authority or until it expires in accordance with *Minnesota Statutes 2002*, section 4.035, subdivision 3.

**IN TESTIMONY WHEREOF,** I have set my hand this 22nd day of September, 2003.



**Tim Pawlenty**
Governor

Filed According to Law:

**Mary Kiffmeyer**
Secretary of State

# Revenue Notices

The Department of Revenue began issuing revenue notices in July of 1991. Revenue notices are statements of policy made by the department that provide interpretation, detail, or supplementary information concerning a particular statute, rule, or departmental practice. The authority to issue revenue notices is found in *Minnesota Statutes* § 270.0604

## Department of Revenue

### Revenue Notice # 03-11: Sales and Use Tax - Gravel Sales - Revocation of Revenue Notice # 95-08

Revenue Notice # 95-08: "Sales & Use Tax: Gravel Sales," is hereby revoked.

Revenue Notice # 02-17: "Sales and Use Tax - Taxable Sales - Delivery of Aggregate Materials and Concrete Block" provides a comprehensive explanation of how aggregate materials are taxed. Revenue Notice # 02-12 makes it clear that the term "aggregate materials" includes gravel.

Raymond R. Krause, Assistant Commissioner

# Official Notices

*Pursuant to Minnesota Statutes* § § 14.101, an agency must first solicit comments from the public on the subject matter of a possible rulemaking proposal under active consideration within the agency by publishing a notice in the *State Register* at least 60 days before publication of a notice to adopt or a notice of hearing, and within 60 days of the effective date of any new statutory grant of required rulemaking. The *State Register* also publishes other official notices of state agencies and non-state agencies, including notices of meetings and matters of public interest.

## Minnesota Emergency Medical Services Regulatory Board

### NOTICE OF CONTESTED CASE HEARING: In the Matter of Chaska Fire Department Ambulance

Pursuant to *Minnesota Statutes* § 144E.11 (2002), Chaska Fire Department Ambulance ("Applicant") has made application to the Minnesota Emergency Medical Services Regulatory Board ("Board") to provide advanced life support ambulance service in their primary service area. Another entity, Allina Medical Transportation, currently provides this service for the primary service area. Because there were a sufficient number of written comments opposing its application and the Applicant has requested a contested case hearing, pursuant to *Minnesota Statutes* § 144E.11, subd. 5 (2002), the Board has scheduled a contested case before Administrative Law Judge George A. Beck of the State of Minnesota Office of Administrative Hearings to be held on October 30, 2003 at 9:30 a.m. at the Chaska Community Center, 1661 Park Ridge Drive, Chaska, Minnesota.

A preliminary discussion with the Applicant and formal objectors to the application will be conducted by telephone by Administrative Law Judge George A. Beck, (612) 341-7601. Interested persons, the Applicant and formal objectors to the application, should promptly provide the Office of Administrative Hearings with a telephone number at which they can be contacted to participate in the preliminary discussion.

### ADDITIONAL NOTICE

1. If any party has good cause for requesting a delay of the hearing, the request must be made in writing to the Administrative Law Judge at least five days prior to the hearing. A copy of the request must be served on all other parties.

2. Interested persons, the Applicant and formal objectors to the application, intending to appear at the hearing must file a Notice of Appearance form and return it to the Administrative Law Judge within 20 days of the date of service of this Notice and Order. A copy must be served on the Emergency Medical Services Regulatory Board.

3. At the hearing, the parties have the right to be represented by legal counsel, by themselves, or by a person of their choice if not otherwise prohibited as the unauthorized practice of law. The parties are entitled to the issuance of subpoenas to compel witnesses to attend the hearing. The parties will have the opportunity to be heard orally, to present evidence and cross-examine witnesses, and to submit evidence and argument. Ordinarily the hearing is tape-recorded. The parties may request that a court reporter record the testimony at their expense. Pursuant to *Minnesota Statutes* § 144E.11 (2002), the Administrative Law Judge shall also allow any interested person the opportunity to be heard, to be represented by counsel and to present oral and written evidence at the public hearing and will provide a transcript of the public hearing at the expense of any individual requesting it.

4. Persons attending the hearing should bring all evidence bearing on the case, including any records or other documents. Be advised that if data that is not public is admitted into the record, it may become public data unless an objection is made and relief is requested under *Minnesota Statutes* § 14.60, subd. 2.

5. Requests for subpoenas for the attendance of witnesses or the production of documents at the hearing shall be made in writing to the Administrative Law Judge pursuant to *Minnesota Rules* 1400.7000. A copy of the subpoena request shall be served on the other parties. A subpoena request form is available at *www.oah.state.mn.us* or by calling (612) 341-7600.

6. This case may be appropriate for mediation. The parties are encouraged to consider requesting the Chief Administrative Law Judge to assign a mediator so that mediation can be scheduled promptly.

7. The Office of Administrative Hearings conducts contested case proceedings in accordance with the Minnesota Rules of Professional Conduct and the Professionalism Aspirations adopted by the Minnesota Supreme Court. A Guide to Participating in Contested Case Proceedings at the Office of Administrative Hearings is available at *www.oah.state.mn.us* or by calling (612) 341-7600.

8. Any party who needs an accommodation for a disability in order to participate in this hearing process may request one. Examples of reasonable accommodations include wheelchair accessibility, an interpreter, or Braille or large-print materials. If any party requires an interpreter, including a foreign language interpreter, the administrative law judge must be promptly notified. To arrange for an accommodation or an interpreter, contact the Office of Administrative Hearings at 100 Washington Avenue South, Suite 1700, Minneapolis, Minnesota 55401, or may call (612) 341-7610 (voice) or (612) 341-7346 (TTY).

9. The Administrative Law Judge will review and comment upon the application and make written recommendations as to its disposition to the Board within 90 days of the publication of notice of the hearing in the *State Register*. In making recommendations, the Administrative Law Judge shall consider and make written comments as to whether the proposed service change is needed based on consideration of factors specified in *Minnesota Statutes* § 144E.11, subd. 6 (2002).

Dated: September 22, 2003

MINNESOTA EMERGENCY MEDICAL
SERVICES REGULATORY BOARD
MARY HEDGES
Executive Director of the
Minnesota Emergency Medical Services
Regulatory Board

# Department of Labor and Industry

## Labor Standards Unit

## Notice of Correction to Highway/Heavy Prevailing Wage Rates

**Corrections** have been made to the Highway/Heavy Prevailing Wage Rates certified 10/14/02 for:

- **Region 8, Labor Code 407, Electricians.**

Copies of the certified wage rates for Region 8 may be obtained by writing the Minnesota Department of Labor and Industry, Prevailing Wage Section, 443 Lafayette Road North, St. Paul, Minnesota 55155-4306, or by calling (651) 284-5091, or accessing

our web site at *www.doli.state.mn.us*. Charges for the cost of copying and mailing are $.65 per page. Make check or money order payable to the State of Minnesota.

M. Scott Brener
Commissioner

# Department of Labor and Industry

## Labor Standards Unit

### Notice of Determination of Truck Rental Rates and Notice of Informal Conference Pursuant to *Minnesota Rules*, Part 5200.1105

On October 6, 2003 the commissioner determined the operating costs and the minimum truck rental rates for highway projects in the state's ten highway and heavy construction areas for trucks and drivers operating "four or more axle units, straight body trucks," "three axle units," "tractor only," and "tractor trailers."

The operating costs were determined by survey on a state-wide basis. The operating cost for "four or more axle units, straight body trucks" is determined to be $31.87 per hour. The operating cost for "three axle units" is determined to be $30.39 per hour. The operating cost for "tractor only" is determined to be $39.42 per hour. The operating cost for "tractor trailers" is determined to be $39.71 per hour.

Adding the prevailing wage for drivers of these four types of trucks from each of the state's ten highway and heavy construction areas, the minimum hourly truck rental rate for the four types of trucks in each area is determined to be as follows:

| | Tractor Trailer | 4 or More Axle | 3 Axle | Tractor Only |
|---|---|---|---|---|
| Region 1 | 68.81 | 60.42 | 58.84 | 68.52 |
| 5/1/2004 | 70.01 | 61.62 | 60.04 | 69.72 |
| Region 2 | 60.11 | 51.06 | 51.04 | 59.82 |
| Region 3 | 58.76 | 50.38 | 49.44 | 58.47 |
| Region 4 | 57.83 | 49.51 | 44.14 | 57.54 |
| Region 5 | 57.56 | 51.89 | 50.41 | 57.27 |
| Region 6 | 53.71 | 55.47 | 57.04 | 53.42 |
| 5/1/2004 | | | 58.24 | |
| Region 7 | 63.81 | 55.47 | 53.73 | 63.52 |
| Region 8 | 64.76 | 44.07 | 54.75 | 64.47 |
| 5/1/2004 | 65.73 | | 55.75 | 65.44 |
| Region 9 | 69.11 | 60.72 | 59.14 | 68.82 |
| 5/1/2004 | 70.41 | 62.02 | 60.44 | 70.12 |
| Region 10 | 60.56 | 56.38 | 51.24 | 60.27 |
| 5/1/2004 | | 57.38 | | |

The operating costs and truck rental rates may also be reviewed by accessing the department's web site at *www.doli.state.mn.us*. Questions regarding the truck rental rates or the informal conference noticed below can be answered by calling (651) 284-5091.

**PLEASE TAKE NOTICE** that on Thursday, October 23, 2003 from 9:30AM until noon, in the Minnesota Room, at the Minnesota Department of Labor and Industry, 443 Lafayette Rd. No., St. Paul, Minnesota, the department will hold the informal conference pursuant to *Minnesota Rules*, part 5200.1105. The informal conference is a public meeting and its purpose is to receive further input prior to the certification and publication of the minimum truck rental rates for these four types of trucks on highway and heavy construction projects. The data, summary sheets and other documents used in making the determinations will be reviewed and available for inspection at the informal conference.

Subsequent to the informal conference the minimum truck rental rates for these four types of trucks will be certified and notice of the certification will be published in the *State Register*.

The minimum truck rental rate for these four types of trucks in the state's ten highway and heavy construction areas will be effective for all highway and heavy construction projects financed in whole or part with state funds advertised for bid on or after the day the notice of certification is published in the *State Register*.

Dated: October 6, 2003

M. Scott Brener
Commissioner

# Department of Labor and Industry

## Labor Standards Unit

### Notice of Prevailing Wage Determination for Highway/Heavy Projects

On October 6, 2003, the commissioner determined and certified prevailing wage rates for Highway/Heavy construction projects in each of 10 regions statewide.

Copies may be obtained by writing the Minnesota Department of Labor and Industry, Prevailing Wage Section, 443 Lafayette Road North, St. Paul, Minnesota 55155-4306 or by calling (651) 284-5091, or accessing our web site at *www.doli.state.mn.us*. Charges for the cost of copying and mailing are $.65 per page. Make check or money order payable to the State of Minnesota.

M. Scott Brener
Commissioner

# Public Employees Retirement Association (PERA)

### Notice of Meeting of the Board of Trustees

A meeting of the Board of Trustees of the Public Employees Retirement Association (PERA) will be held on Thursday, October 9, 2003, at 9:30 a.m., in the PERA offices, 60 Empire Drive, Room 117, Saint Paul, Minnesota.

A Legislature Committee meeting will be held on Thursday, October 23, 2003, at 9:30 a.m. in the association office.

# State Grants & Loans

In addition to requests by state agencies for technical/professional services (published in the State Contracts Section), the *State Register* also publishes notices about grants and loans available through any agency or branch of state government. Although some grant and loan programs specifically require printing in a statewide publication such as the *State Register*, there is no requirement for publication in the *State Register* itself. Agencies are encouraged to publish grant and loan notices, and to provide financial estimates as well as sufficient time for interested parties to respond.

# Department of Labor and Industry

## Workplace Safety Consultation Unit

### Notice of Safety Grants for Employers

The Department of Labor and Industry (DLI) announces continuation of its safety hazard abatement matching grant program under *Minnesota Statutes*, section 79.253, and *Minnesota Rules*, parts 5203.0010 through 5203.0070. Employers covered by workers' compensation insurance and those approved as self-insured employers, are eligible to apply for safety/health matching grants to abate safety hazards in their workplace. The safety/health hazards must have been identified in an on-site survey conducted by one of the following: 1) MNOSHA safety/health investigator, 2) DLI Workplace Safety Consultation safety/health consultant, 3) in-house employee safety/health committee, 4) workers' compensation underwriter, 5) private safety/health consultant or 6) a person under contract with the Assigned Risk Plan. The on-site safety/health survey must have resulted in specifically recommended safety practices or equipment designed to reduce the risk of injury to employees. Costs eligible for program participation are all or part of the cost of purchasing and installing recommended safety/health equipment, the cost of operating or maintaining safety/health equipment, and/or the cost of purchasing or renting real property; if necessary, to meet criteria established by the on-site safety/health survey. Program development, training and education, and employee costs will not be covered by this grant.

Whether we approve your grant application or not, in no way diminishes, delays or absolves you of any obligation to abate hazards as required by law. No state funds will be distributed until all grant documents are signed by all parties; funds expended before that must not rely on grant approval. Invoices dated prior to your fully executed grant agreement are not eligible for this program.

Grants are limited to a total maximum match of $10,000 per project. The employer must provide at least $1.00 (one dollar) in project costs for every dollar awarded. No grant will be awarded for more than half the amount of the approved project. Projects will be judged according to the criteria established by the laws. Qualified projects having the greatest impact and feasibility will be given priority. Priority will also be given to projects, meeting the other requirements for grants, creating production jobs in an area, preventing loss of jobs due to safety problems, and in areas that are the current focus of Minnesota OSHA compliance and consultation strategies, including public sector, food and kindred products, lumber and wood products, furniture and fixtures, paper and allied products, printing and publishing, rubber and miscellaneous plastics, industrial machinery and equipment, communications,

hotels and other lodging places, automotive dealers and service stations, and construction. Less than the requested amount may be awarded if program resources are insufficient to provide full assistance to all approved applicants and if the reduced grant could still achieve safety objectives.

Grant applications will be accepted continuously and awarded on a monthly basis. Applications must be received by the last day of the month to be awarded the next month. An employer that has received a grant for a particular worksite will not be eligible to receive another grant for that worksite during the two years after the date of the award. All information requested on the grant application form is required for grant approval. Missing information will result in your application being returned to you.

Eligible applicants who seek assistance must submit their proposals to: James Collins, OSHA Management Team Director, Workplace Safety Consultation, 443 Lafayette Road N., St. Paul, MN 55155. For further information or to request a grant application, please call Tracey Josephson, Grants Administrator, Workplace Safety Consultation, at (651) 284-5162, 1-800-731-7232 or e-mail at *tracey.josephson@state.mn.us*.

# State Contracts

**Informal Solicitations:** Informal solicitations for professional/technical (consultant) contracts valued at over $5,000 through $50,000, may either be published in the *State Register* or posted on the Department of Administration, Materials Management Division's (MMD) website. Interested vendors are encouraged to monitor the P/T Contract Section of the MMD website at *www.mmd.admin.state.mn.us* for informal solicitation announcements.

**Formal Solicitations:** Department of Administration procedures require that formal solicitations (announcements for contracts with an estimated value over $50,000) for professional/technical contracts must be published in the *State Register*. Certain quasi-state agency and Minnesota State College and University institutions are exempt from these requirements.

## Department of Administration

### Facilities Management Bureau
### Plant Management Division

### INVITATION TO QUALIFY (ITQ) for Consideration as "an Approved" Provider of Sub-systems, Elements and Units for the Capitol Complex Automation System

The Plant Management Division, of the Department of Administration, is inviting interested manufacturers and distributors of sub-systems, element and units of sub-systems to demonstrate the interoperability, integration and enhanced features of products in a controlled, real-life setting.

Interested responders should request a copy of the ITQ from:

Linc Starkey
Plant Management Division
**Fax:** (651) 297-5158
**E-mail:** *Linc.starkey@state.mn.us*

Responses to the ITQ are due October 17, 2003 and demonstrations will begin at some point after November 10, 2003.

## Minnesota State Colleges and Universities (MnSCU)

### Notice of Request for Proposal (RFP) for Consultant Services for Design of a Central Heating Plant at Mesabi Range Community and Technical College - Virginia

The Minnesota State Colleges and Universities, Office of the Chancellor, acting as the owner for the State of Minnesota is soliciting proposals for experienced Consultant Services to design a Central Heating Plant at Mesabi Range Community and Technical College in Virginia, Minnesota. The Consultant's team will be responsible for complete design, bidding, and construction administration, including equipment, controls, and connections to existing utilities.

An informational meeting will be held on Wednesday, October 8, 2003, at 1:00 PM, in the Schieb Confernence Room at Mesabi Range Community and Technical College, 1001 West Chestnut Street, Virginia, MN.

Minnesota State Colleges and Universities is not obligated to complete the proposed project and reserves the right to cancel the solicitation if it is considered to be in its best interest.

To receive a full request for proposal write or call:

James P. Morgan
Minnesota State Colleges and Universities
500 Wells Fargo Place
30 East 7th Street
St. Paul, MN 55101
**Phone:** (651) 296-3823
**Fax:** (651) 296-0318
**E-mail:** *James.morgan@so.mnscu.edu*

Completed proposals are due by 4:00 PM on Monday, October 27, 2003.

# Minnesota State Colleges and Universities (MnSCU)

## Request for Proposal (RFP) for Design Services Associated With Minneapolis Community and Technical College's Installation of Replacement Boilers and Generator

This RFP is to provide design services for replacement boilers and generator. The design will include new boilers, plant modification, domestic hot water heaters, emergency generator and associated pumps, piping, electric distribution, and accessories.

Interested parties should contact Dave MacLeod for informational meeting, RFP, and pre-design report (Central Heating & Cooling Plant Upgrades - dated August 17, 2000) prepared by Ashley Engineering. Informational meeting is scheduled for **Tuesday, October 14, 2003, at 9:00 a.m.** at Minneapolis Community and Technical College Building, 1415 Hennepin Avenue, Minneapolis, MN 55403 in Lower Level conference room T11. All proposals must be addressed to Bill Hansen; **proposals are due by 3:00 p.m. Central Standard Time, Tuesday, October 28, 2003.**

| | | |
|---|---|---|
| Name: | ***Bill Hansen*** | ***Dave MacLeod*** |
| Title: | Program Manager | Physical Plant Director |
| Address: | 500 Wells Fargo Place | Minneapolis Community and Technical College |
| | 30 E. 7th Street | 1501 Hennepin Avenue |
| | St. Paul, MN 55101 | Mpls, MN 55403 |
| **Phone #:** | (651) 297-5578 | (612) 659-6805 |
| **Fax #:** | (651) 296-0318 | (612) 359-1421 |
| **Email:** | *bill.hansen@so.mnscu.edu* | *macleoda@mctc.mnscu.edu* |
| Cell #: | (651) 214-3857 | |

# Minnesota State Colleges and Universities (MnSCU)

## Inver Hills Community College

## Advertisement for Bids for Spacesaver Pro Mobile Shelving System

**Sealed Bids For:** Spacesaver Pro Mobile Shelving System
Inver Hills Community College
2500 East 80th Street, IGH, MN 55076-3224

Bids are to be sealed and delivered no later then Oct 13, 2003 at 10 a.m. to the Director of Facilities Planning and Development Inver Hills Community College located in Heritage Hall room 102

**Project Scope:** Furnish and install a Spacesaver Pro Mobile Shelving Unit.

(No substitutions will be accepted) in the Library building.

The project includes but not limited to: Electric, carriage mounted high density storage units, support rails, fabrication and installation leveling of support rails. Removal of existing flooring and supply new flooring that conforms to the carpet specifications in the project specifications. Painting of all walls related to the installation and power wiring to the units to make this a complete operating system. Prior to the bid being awarded the successful bidder will be required to show College representative's a Spacesaver Pro system installed in a Library setting in the Twin Cities metro area. The successful bidder will be required to install this system between the semester break (December 22, 2003 through January 9, 2004)

Contact Person: Patrick Buhl, Director of Facilities Planning and Management
Inver Hills Community College
2500 East 80th Street
IGH, MN 55076-3224
**Office:** (651) 450-8536
**Fax:** (651) 554-3706
**Email:** *pbuhl@inverhills.edu*

This is the only person designated to answer questions in regards to this request. If you are interested in submitting a proposal please contact Patrick Buhl for a bid package.

The deadline for receipt of proposals is 10 a.m., Monday October 13, 2003. Late proposals will not be accepted.

# Minnesota State Colleges and Universities (MnSCU)

## Minneapolis Community & Technical College

### NOTICE OF INTENT to Request Proposals for Snow Removal Services at Minneapolis Community & Technical College at both the Minneapolis and Eden Prairie Campuses for the Period November 1, 2003 through March 31, 2004

**Project Scope:** Contractor will provide snow removal services as specified for parking areas, driveways, sidewalks and related areas after each 1.5" or greater snowfall. Contractor will also inspect and treat for icy conditions as specified. Contractor will also provide sand and salt as specified. At end of season contractor will inspect, identify and repair damages caused by snow removal equipment during 2003-2004 season.

**Sealed Proposals** to be submitted to: Dave MacLeod - Facilities Director
Minneapolis Community & Technical College
Suite T.11
1501 Hennepin Avenue
Minneapolis, MN 55403

**Due Date & Time:** **1:00 p.m., Monday October 20, 2003**

**Questions:** Contact Dave MacLeod at (612) 659-6805 or Curt Schmidt at (612) 659-6902 with questions or to request a site visit.

**To obtain a copy of the RFP and specifications contact:**

Michael Noble-Olson - Purchasing Manager
Minneapolis Community & Technical College
1501 Hennepin Avenue
Minneapolis, MN 55403
**Phone:** (612) 659-6866
**Email:** *Michael.Noble-Olson@minneapolis.edu*

# Department of Employment and Economic Development

## Workforce Partnerships Division, Dislocated Worker Program

### Notice of Request for Proposal for Federal Workforce Investment Act (WIA) 10 Percent Allowable Activities

The Department of Employment and Economic Development and the Minnesota Job Skills Partnership Board are soliciting public or private nonprofit organizations to propose projects in the area of workforce development. These projects would involve programs, services or systems that are innovative and build or improve capacity in the workforce development system related to job placement, job retention and upgrading the skills of job seekers and/or incumbent workers. Preference will be given to programs, services or systems that demonstrate innovation, creativity and new capacity in any of the following areas:

- increase the number of skilled workers in industries or occupations that are expected to grow for the next five to ten years and have good wages and career opportunities
- conduct research & demonstration projects that increase the capacity of existing workforce development programs and services

- establish new and innovative incumbent worker programs that meet the workforce training needs of businesses
- establish and implement programs targeted to enterprise zones and empowerment communities that involve economic opportunity, sustainable community development, community-based partnerships and meeting the workforce training needs of businesses
- establish and implement innovative programs for displaced homemakers and programs to increase the number of individuals trained for and placed in non-traditional employment
- establish and implement employment programs or services that target under-served populations such as individuals with limited English proficiency or low-wage incumbent workers

A written request by direct mail or FAX is required to receive the complete "Request for Proposal" which can be obtained from:

Ed Retka
Minnesota Dislocated Worker Program
Minnesota Department of Employment and Economic Development
500 Metro Square Bldg.
121 7th Place East
St. Paul, MN 55101
**FAX:** (651) 215-3842
**PHONE:** (651) 296-2953

**Five copies of the final proposal must be submitted by 4:00 p.m., Friday, October 31, 2003.**

**For the final proposal, FAXed or e-mailed proposals will not be considered. Late proposals will not be considered.**

A total of up to $600,000 may be awarded to projects by the Minnesota Job Skills Partnership Board that are deemed innovative and capacity building. This request does not obligate the Board to fund all six categories outlined in this notice. The Minnesota Job Skills Partnership Board reserves the right to cancel this solicitation. All expenses incurred in responding to this notice are solely the responsibility of the responder.

# Minnesota Historical Society

## Minnesota History Center, Saint Paul, Minnesota

### Request for Bids for Exterior Lighting

The Minnesota Historical Society seeks bids for electrical work required for the renovation of the pedestrian lighting at the entrances to the Minnesota History Center, 345 Kellogg Boulevard West, Saint Paul, Minnesota 55102.

The Request for Bids is available by contacting Mary Green-Toussaint, Contracting and Procurement Technician, Minnesota Historical Society, 345 Kellogg Boulevard West, Saint Paul, Minnesota 55102. Telephone Number (651) 297-7007, or *mary.green-toussaint@mnhs.org*.

All bids must be received by Chris M. Bonnell, Contracting Officer, or his agent, Minnesota Historical Society, 345 Kellogg Boulevard West, St. Paul, MN 55102 no later than 2:00 p.m. on Tuesday October 14, 2003. A bid opening will be held at this time. **Late bids will not be considered.** Authorized agents for receipt of proposals are the following: Contracting and Procurement Assistant or the Finance Department Administrative Assistant on the 4th floor of the History Center. Proposals may also be delivered to the information desk at the History Center.

Dated: October 6, 2003

# Minnesota Historical Society

### Request for Proposals for Professional Planning, Design, and Engineering Services for the Construction of the Sylvan Point Trail

### Grand Rapids, Minnesota

The Minnesota Historical Society seeks proposals for professional landscape architectural and engineering services for a trail planning and design project. The project primarily involves construction of a trail from the Forest History Center (FHC) site to Sylvan Point, Grand Itasca Hospital and Grand Rapids. Work Requirements include but are not limited to working with the FHC Trail Advisory Committee, topographical survey of trail alignment and stake trail, prepare final plans and construction documents, prepare all necessary permits, assist with bidding, and provide construction engineering.

**A MANDATORY pre-proposal meeting will be held at 1:00 p.m., Thursday October 16, 2003 at the Forest History Center.** The request for proposals, including attachments, is available by calling (651) 297-7007, e-mailing Mary Green-Toussaint at *mary.greentoussaint@mnhs.org* or writing:

Mary Green-Toussaint, Contracting and Procurement Asst.
Minnesota Historical Society
345 Kellogg Boulevard West
St. Paul, Minnesota 55102

**The deadline for the receipt of proposals is 2:00 p.m., Tuesday October 28, 2003.** Late proposals will not be accepted.

Dated: October 6, 2003

# Department of Public Safety

## Office of the Commissioner

### Request for Proposals for the Study of Emergency Medical Services Preparedness

The Minnesota Department of Public Safety (DPS) is soliciting proposals for the study of emergency medical services preparedness in Minnesota. The DPS is seeking a qualified team/person to conduct a study of Minnesota's emergency medical service preparedness and its relationship to the department's overall homeland security planning. The study must analyze the coordination of responses to emergencies, financial stability of the industries involved in providing prehospital emergency care, effect of primary service area determinations, availability in response to terroristic activity, and authority of governmental subdivisions in determining the level of care. DPS is seeking proposals from people/organizations that can complete the study within a six month period from the beginning date of the contract. The actual contract is contingent upon the DPS locating non-state funding for the study. The department is seeking applicants with demonstrated expertise in health systems, EMS, homeland security, healthcare delivery systems or related areas. Eligible applicants are for-profit and nonprofit entities and units of government. To be considered for funding, proposals must be received by 4:00 p.m. CDT, Monday, October 27, 2003 at the Minnesota Department of Public Safety, Office of the Commissioner, North Central Life Tower, Suite 1000, 445 Minnesota Street, St. Paul, MN 55101, attention: Nancy Franke Wilson. If proposals are sent by U.S. mail or other delivery service, it is wholly the responsibility of the proposer to ensure that the proposal package is properly addressed and physically delivered on time. Late proposals will not be considered.

A copy of the full Request for Proposals may be obtained on the Department of Public Safety website: *http://www.hsem.state.mn.us/uploadedfile/rfp_ems.pdf* or by contacting:

Nancy Franke Wilson
11025 39th Avenue North
Plymouth, MN 55441
**Phone:** (763) 545-2684
**E-mail:** *nancyfranke@earthlink.net*

# Department of Transportation

## Program Support Group

### Notice of Potential Availability of Contracting Opportunities for a Variety of Highway Related Technical Activities (the "Consultant Pre-Qualification Program")

This document is available in alternative formats for persons with disabilities by calling Robin Valento at (651) 284-3622 for persons who are hearing or speech impaired by calling the Minnesota Relay Service at (800) 627-3529.

Mn/DOT, working in conjunction with the Consultant Reform Committee, the Minnesota Consulting Engineers Council, and the Department of Administration, has developed the Consultant Pre-qualification Program as a new method of consultant selection. The ultimate goal of the Pre-Qualification Program is to streamline the process of contracting for highway related professional/technical services. Mn/DOT anticipates that most consultant contracts for highway-related technical activities will be awarded using this method, however, Mn/DOT also reserves the right to use RFP or other selection processes for particular projects. Nothing in this solicitation requires Mn/DOT to complete or use the Consultant Pre-qualification Program.

Mn/DOT is currently requesting applications from consultants. Refer to Mn/DOT's Consultant Services web site, indicated below, to see which highway related professional/technical services are available at this time. Following the advertisement of a particular category of services, applications will be accepted on a continual basis.

All expenses incurred in responding to this notice will be borne by the responder. Response to this notice becomes public infor-

mation under the Minnesota Government Data Practices.

Consultant Pre-Qualification Program information, application requirements and application forms are available on Mn/DOT's **web site** at *http://www.dot.state.mn.us/consult*

Send completed application material to:

Robin Valento
Pre-Qualification Administrator
Minnesota Department of Transportation
Consultant Services
395 John Ireland Boulevard, Seventh Floor North, Mail Stop 680
St. Paul, MN 55155

Note: DUE DATE: APPLICATION MATERIAL WILL BE ACCEPTED ON A CONTINUAL BASIS.

# Department of Transportation

## Engineering Services Division

### Notice Concerning Professional/Technical Contract Opportunities

**NOTICE TO ALL:** The Minnesota Department of Transportation (Mn/DOT) is now placing additional public notices for professional/technical contract opportunities on Mn/DOT's Consultant Services **website** at: *www.dot.state.mn.us/consult.*

New public notices may be added to the website on a daily basis and be available for the time period as indicated within the public notice.

# Non-State Contracts & Grants

The *State Register* also serves as a central marketplace for contracts let out on bid by the public sector. The *State Register* meets state and federal guidelines for statewide circulation of public notices. Any tax-supported institution or government jurisdiction may advertise contracts and requests for proposals from the private sector. It is recommended that contracts and RFPs include the following: 1) name of contact person; 2) institution name, address,and telephone number; 3) brief description of project and tasks; 4) cost estimate; and 5) final submission date of completed contract proposal. Allow at least three weeks from publication date (four weeks from date article is submitted for publication). Surveys show that subscribers are interested in hearing about contracts for estimates as low as $1,000. Contact editor for further details.

# Metropolitan Council

### Notice of Invitation for Bids (IFB) for the Procurement of Low-Sulfur, Red-Dyed Number 2 Diesel Fuel for Metropolitan Wastewater Treatment Plant

#### Reference Number 03P061

The Metropolitan Council is requesting bids for the Furnishing and Delivery of Low-sulfur, Red-Dyed Number 2 Diesel Fuel for the Metropolitan Wastewater Treatment Plant.

| | |
|---|---|
| ***Issue Invitation for Bids*** | **October 6, 2003** |
| ***Bids Due*** | **October 21, 2003** |
| ***Award Contract*** | **October 2003** |

All firms interested in submitting bids for this contract and desiring to receive an IFB package are invited to make a written request either by e-mail, fax or phone request to:

Sunny Jo Emerson, Senior Administrative Assistant
Contracts and Procurement Unit
Metropolitan Council
230 East Fifth Street
St. Paul, MN 55101
**Phone:** (651) 602-1499
**Fax:** (651) 602-1083
**e-mail:** *sunnyjo.emerson@metc.state.mn.us*

*Minnesota Statutes*, Sections 473.144 and 363.073, and *Minnesota Rules*, Parts 5000.3400 to 5000.3600 will be incorporated into any contract based upon the Proposal or any modifications to it. If a contract for the project is awarded in excess of $100,000, the requirements of *Minnesota Rules* 5000.3530 will be applicable.

# Non-State Contracts & Grants

## Metropolitan Council - Metro Transit

### Notice of Request for Proposals Credit Card Processor

#### RFP No. 03P106

**NOTICE IS HEREBY GIVEN** that the Metropolitan Council, on behalf of its Metro Transit Division, is soliciting proposals from credit card processors who are currently processing transactions from merchants under the International Standards Organization ISO-8583 format and protocol.

The Council is seeking proposals for merchant card network/acquirer/processor services to process approximately $4 million of retail sales in credit (but not debit) card transactions per year, for up to 3 years. The estimated average sale per transaction is $35. Vendor must accept Council transactions from a host computer, in accordance with ISO format 8583. The Council submits about $2 million in annual sales to its current card processor who is not ISO 8583 compliant. These sales are expected, but not guaranteed, to migrate to the new processor and are part of the above $4 million of annual sales forecast.

The ***tentative*** schedule for this process is:

| | |
|---|---|
| ***RFP Issue Date*** | **September 29, 2003** |
| ***Proposals Due*** | **October 28, 2003** |
| ***Consultant Selection*** | **November 5, 2003** |
| ***Notice to Proceed*** | **November 19, 2003** |
| ***Commence System Set-ups*** | **November 20, 2003** |
| ***Start System Testing*** | **December 1, 2003** |
| ***Production*** | **January 1, 2004** |

All firms interested in this project should submit a written request for a copy of the RFP through:

Harriet Simmons, Administrative Assistant, Contracts and Procurement Unit
Metropolitan Council
Mears Park Centre
230 East Fifth Street
St. Paul, MN 55101
**Phone:** (651) 602-1086
**Fax:** (651) 602-1138
**e-mail:** *harriet.simmons@metc.state.mn.us*

Please provide the name of **one** contact person; complete company name; address/city/state/zip along with phone/fax/cell phone and pager numbers as well as e-mail information if you wish to be placed on the Solicitation List. **All other inquiries** regarding this procurement shall be directed by e-mail to Hugh McConnell at: *hugh.mcconnell@metc.state.mn.us*. **Any other contact with Council employees on this matter throughout the entire solicitation process risks vendor disqualification.**

## Metropolitan Council

### Notice of Request for Proposals (RFP) for the Hiawatha Light Rail Transit Line Transportation Services

#### Contract 03P104

The Hiawatha Light Rail Transit Line (Hiawatha LRT) is currently under construction in the Minneapolis-St. Paul Metropolitan Area and is scheduled to commence revenue service in April 2004. After completion of construction, the Metropolitan Council (Council) will be responsible for operation of the Hiawatha LRT.

The Council is seeking proposals for providing transportation services in the operation of the Hiawatha LRT in Minneapolis, Minnesota. The services are expected to include management of the operations function, supervision of central control, line supervision and train operations. The service provider will work under the direction of the Council's Metro Transit Assistant General Manager for Rail Operations.

A tentative schedule for this project is as follows:

| | |
|---|---|
| ***Issue Request for Proposals*** | **October 9, 2003** |
| ***Receive Proposals*** | **November 10, 2003** |
| ***Complete Evaluation and Council Action*** | **December 1, 2003** |
| ***Start of Services*** | **April 2004** |

In September 2003 the Council published a Request for Statements of Interest (SOI) concerning this project. An RFP package will be sent to all those who previously responded to the SOI. All other firms interested in being considered for this project and desiring to receive an RFP package are invited to submit a written request for the RFP to:

Amanda Houston
Metropolitan Council
Mears Park Centre
230 East Fifth Street
St. Paul, MN 55101
**Phone:** (651) 602-1585
**Fax:** (651) 602-1138
**e-mail:** *amanda.houston@metc.state.mn.us*

# Metropolitan Council - Metro Transit

## Invitation for Bids for Bus Security Camera Maintenance

The Metropolitan Council is soliciting sealed bids for Bus Security Camera Maintenance. Bids are due at 2:00 p.m., Monday, October 27, 2003. Bids must be submitted in accordance with the Invitation for Bids document available from:

Metropolitan Council
Metro Transit Purchasing Department
515 N. Cleveland Avenue
St. Paul, MN 55114
(612) 349-5070

# Northstar Corridor Development Authority

## Notice of Request for Proposals for Public Information Services

The Northstar Corridor Development Authority (NCDA), a joint powers board, requests proposals from firms to provide public information services for the Northstar Commuter Rail project. The work will include the publishing and mailing of two newsletters, coordination of public information meetings and a brief survey of Northstar Commuter Coach riders. The Northstar Corridor is an 82-mile transportation corridor that follows Trunk Highway 10, the primary direct link between the northern Twin Cities' region and St. Cloud/Rice, Minnesota.

A pre-proposal conference is scheduled for October 10, 2003, at 1:30 p.m. Proposals must be received by 4:00 pm CST on Wednesday, October 29, 2003.

An RFP package may be obtained by submitting an e-mail or written request to:

Tim Yantos, Project Director
Anoka County Administration
2100 3rd Avenue
Anoka, MN 55303
Phone: (763) 323-5692
**Fax:** (763) 323-5682
**E-mail:** *Tim.yantos@co.anoka.mn.us*

# University of Minnesota

## Notice of Bid Information Service (BIS) Available for All Potential Vendors

The University of Minnesota offers 24 hour/day, 7 day/week access to all Request for Bids/Proposals through its web based Bid Information Services (BIS). Subscriptions to BIS are $75/year. Visit our web site at *bidinfo.umn.edu* or call the BIS Coordinator at (612) 625-5534.

Requests for Bids/Proposals are available to the public at no charge each business day from 8:00 a.m. to 4:30 p.m. in the Purchasing Services lobby, Suite 560, 1300 S. 2nd Street, Mpls., MN 55454.

# Non-State Contracts & Grants

## University of Minnesota

### Request for Qualifications (RFQ) for University of Minnesota 2004 Consultant Prequalification Program

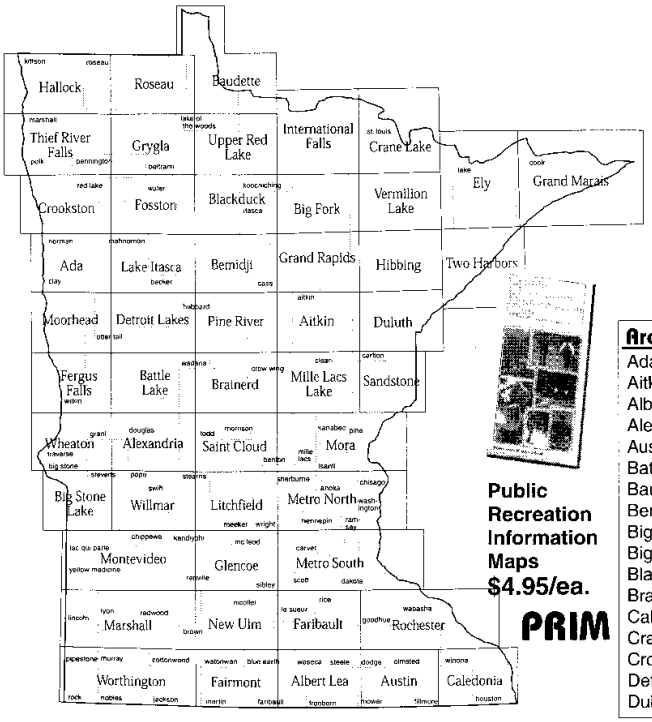
The University of Minnesota is accepting submittals for its prequalification program for architects, engineers, and other providers of professional services for small construction projects (where the consultant's fee is under $100,000). This program is currently planned to be in effect for calendar 2004.

Consultants who successfully prequalified in the University's 2003 Consultant Prequalification Program are having their prequalification status renewed automatically for 2004. These consultants need not take any action, or submit any documents unless they wish to update their prequalification profile.

Consultants need not prequalify under this program in order to submit proposals on large University projects (where consultant fees are over $100,000). Projects in this category are awarded by an open RFP process.

Consultants wishing to submit documents for the 2004 Consultant Prequalification Program may download the RFQ document, instructions, and forms at the following web site beginning Wednesday October 1, 2004 *http://www.facm.umn.edu/facm/construction.htm* The deadline for both new submittals, and updated profiles is 2:00 p.m. CST Monday November 3, 2003. Documents received after this deadline will not be accepted.

For additional information, contact: Kevin McCourt, Business Manager, Capital Planning and Project Management, by e-mail at *mccourtk@facm.umn.edu*, by **fax** at (612) 625-0770, or by **phone** at (612) 626-8973. Contact by e-mail or fax is preferred.






**Public Recreation Information Maps $4.95/ea.**

**PRIM**

### Public Recreation Information Maps

Produced by the MN Dept. of Natural Resources, 51 PRIM maps chart all county, state and federal public lands. With an easy map legend and charts, you will find trails for hiking and biking, areas where hunting is allowed, camp sites, boat access, wildlife refuges, and more. Includes topographical information.

| Area | Stock No. | Area | Stock No. | Area | Stock No. |
|---|---|---|---|---|---|
| Ada | 12-148 | Ely | 12-132 | Mille Lacs | 12-109 |
| Aitkin | 12-108 | Fairmont | 12-149 | Montevideo | 12-145 |
| Albert Lea | 12-147 | Faribault | 12-142 | Moorhead | 12-135 |
| Alexandria | 12-123 | Fergus Falls | 12-136 | Mora | 12-146 |
| Austin | 12-115 | Fosston | 12-119 | New Ulm | 12-127 |
| Battle Lake | 12-122 | Glencoe | 12-144 | Pine River | 12-104 |
| Baudette | 12-129 | Grand Marais | 12-134 | Rochester | 12-114 |
| Bemidji | 12-103 | Grand Rapids | 12-107 | Roseau | 12-117 |
| Big Fork | 12-106 | Grygla | 12-118 | Saint Cloud | 12-141 |
| Big Stone Lake | 12-101 | Hallock | 12-128 | Sandstone | 12-113 |
| Black Duck | 12-124 | Hibbing | 12-111 | Thief River Falls | 12-140 |
| Brainerd | 12-105 | International Falls | 12-125 | Two Harbors | 12-126 |
| Caledonia | 12-116 | Lake Itasca | 12-120 | Upper Red Lake | 12-130 |
| Crane Lake | 12-131 | Litchfield | 12-139 | Vermilion Lake | 12-110 |
| Crookston | 12-150 | Marshall | 12-143 | Wheaton | 12-151 |
| Detroit Lakes | 12-121 | Metro North | 12-138 | Willmar | 12-102 |
| Duluth | 12-112 | Metro South | 12-137 | Worthington | 12-152 |

## MN Guidebook to State Agency Services

This 2001-2003 reference provides information on each state agency and their services, as well as the legislative and judicial branches of government. You'll find information about:

* access to state officials and offices, including key contact people, phone numbers, e-mail and Internet addresses for each agency
* solid business connections, how to bid on state contracts, apply for grants
* business development resources
* print and media guides and resources
* information on grants, contracts, scholarships
* license and permit information, recreational opportunities

and more. Spiral-bound, 550pp. **Stock No. 1-6 $19.95**

## State of Minnesota Telephone Directory

***2001-2002 edition*** *Please note: This directory will no longer be available in print once the current supply of directories is exhausted. The North Star web site now provides phone numbers via an electronic white and yellow pages database.* Alphabetical listings of all employees plus department listings (both metro area and greater MN), fax numbers, e-mail, web sites and TTY. Softcover, 477pp. **Stock No. 1-87 $15.95**

## U.S. Government Manual

This comprehensive 2001-2002 overview of the U.S. government outlines and describes functions of the legislative, judicial and executive branches, provides a "who's who" listing of federal officials and agencies. Softcover, 693pp. **Stock No. 16-46 $41.00**

## Minnesota Constitution

The complete constitution as adopted on Oct. 13, 1857 and subsequent amendments. Softcover, 25pp. **Stock No. 7-12 $7.00**

## A Citizen's Guide to State Finance:

### *An Overview of Minnesota Government Revenue & Expenditures*

This volume reviews the state budget process, the "big picture," expenditures, property and income tax, etc. Softcover, 60pp.
**Stock No. 7-7 $7.00**

## Annual Compilation Report of Multi-Member Agencies

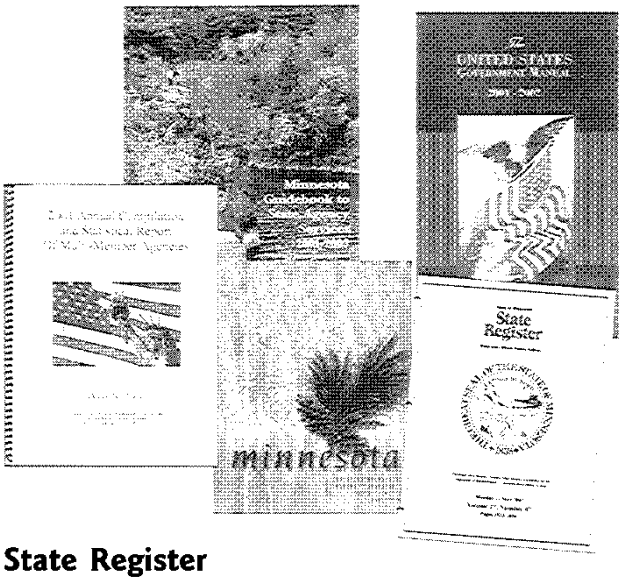
Get involved in government! This 2001 report from the Secretary of State documents openings and current membership in state agency committees and councils, including appointing authority, address/phone for members, term length, and compensation. Perhaps you can contribute in policy making! Spiral-bound, 119pp. **Stock No. 10-43 $16.00**

## Revisors Manual

Organized as both a ready reference and an instruction manual, this book teaches general methods of drafting Minnesota legislative bills, offers practical help, style suggestions, etc. Looseleaf, 343pp. *(This 1997 edition is still current.)* **Stock No. 7-1 $10.00**

## MN Legal Compliance Audit Guide for Local Government 2001

Prepared in a handy checklist format, this guide outlines minimum legal compliance for auditors. Guides you through depositories of public funds, investments, conflicts of interest, public indebtedness, bid laws, claims and disbursements, etc. Softcover, 130pp. **Stock No. 10-30 $30.00**




## State Register

The *State Register* is the official magazine of the State of Minnesota. Published every Monday, it is your source for:

* proposed and adopted state rules
* state contracts for professional, technical and consulting services to include: construction and testing services, photographic and graphic design, laundry, janitorial services
* non-state public contract requests, state grants
* official announcements from state government including requests for outside opinions
* executive orders and commissioners' orders
* proclamations & commendations

**State Register - One Year Subscription**

**#1 Mail Delivery** Sent VIA second class mail, mailed Friday before publication date. **Stock No. 91-2 $160.00**

### *NEW E-MAIL SERVICE*

***State Register*** automatically e-mailed to you each Friday evening at 4:30pm so you are ready to go to work on its published day, Monday morning! With your subscription you will receive:

- Links - to contracts, rules, official notices, grants
- Running index of ALL issues, and ALL items
- Table of contents sidebar
- Contracts listed by agency with bid-due date
- and, a MORE USEFUL State Register in a highly readable format

**#2 E-Mail Delivery** Sent to your e-mail address the Friday prior to publication date. **Stock No. 91-1 $180.00**

*Now you can insure important rule-making or bid opportunities don't pass you by while you're away from the office.*

Purchase 2 E-mail subscriptions and have one sent to a "back-up" at your office and you will receive a $25 gift certificate.

### *ALSO AVAILABLE: Solicitation Announcements*

Visit our website or give us a call for information.

Minnesota's Bookstore sells the complete volume set of State statutes and rules. We also publish extracts from the **Minnesota Statutes and Rules** for a wide variety of business and professional concerns. For example, we offer the State Building Code, OSHA, Nursing Laws & Rules, Real Estate Laws & Rules and many others.

Call for a free ***Laws, Rules & Subscriptions Catalog***

OR visit our website. ***www.minnesotasbookstore.com***

Admin MINNESOTA
Department of Administration

660 Olive Street • St. Paul, Minnesota 55155
Metro Area 651-297-3000
Toll Free 1-800-657-3757
FAX 651-297-8260
Metro Area 651-282-5077 Greater MN 1-800-657-3706

Periodicals
U.S. Postage
Paid
Permit No.
326630
St. Paul, MN

Please notify us of any address changes so that we can continue to give you our best service. Include your old mailing label to speed your service.

Printed on recycled paper
20% post-consumer waste

TO ORDER:

Complete attached order blank. Please include sales tax. Include either your VISA/MasterCard, American Express or Discover credit card number with the expiration date, or a check/money order made out to the State of Minnesota. Orders by phone are accepted when purchasing with your credit card. Please include a phone number where you can be reached during the day in case we have questions about your order.

PREPAYMENT REQUIRED.

Merchandise may be returned if it is in resalable condition.

**NOTE:**

***State Register*** and other subscriptions do not require sales tax or postage and handling fees.

**Shipping Charges**

| **Subtotal** | **Add:** |
|---|---|
| Up to $25.00 | $3.00 |
| $25.01 - $50.00 | $5.00 |
| $50.01 - $100.00 | $7.00 |
| $100.01 - $1,000.00 | $10.00 |

***Prices subject to change without notice.***
Please allow about 6 weeks for delivery.
In a hurry? Stop by our Bookstore.
Bookstore hours: 8:00-5:00 Monday-Friday

**For Your Convenience, photocopy this order blank**

| Code No. | Quantity | Description | Item Price | Total |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| Name or Company | | | **Subtotal** | |
| Attention | | | 6½ % tax MN residents 7% St. Paul residents | |
| Address | | | | |
| City | State | Zip | Add Shipping Charges from chart at left. | |
| American Express/VISA/MasterCard/Discover No. | | | **TOTAL** | |
| Signature | Expiration Date | Telephone (During Day) | | |

**If tax exempt, please provide ES number or send completed exemption form.**

**Source Code** SR003