

# Construction Codes and Licensing Division Code Administration Manual

Eighth Edition March 2016



## Minnesota Department of Labor and Industry

Construction Codes and Licensing Division  
443 Lafayette Road North  
St. Paul, MN 55155  
Phone: (651) 284-5068 Fax (651) 284-5749  
<http://www.dli.mn.gov/Ccld.asp>

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## **PURPOSE:**

The Code Administration Services (CAS) staff of the Construction Codes and Licensing Division (CCLD) has created this manual to assist individuals new to the building code industry in their administration of the Minnesota State Building Code. Although the information contained within this manual has been reviewed to ensure its accuracy, building officials must always use the official rules adopted into the Minnesota State Building Code when applying the code for a municipality.

There are numerous hyperlinks within this manual that can be accessed using the electronic version of this manual. Use the following link to access the electronic version:

<http://www.dli.mn.gov/cclD/pdf/cam.pdf>

(CAS) has staff available to meet with code officials to review delegation agreements, policies, procedures, forms, record keeping, plan review, inspections, appeals process and code interpretations.

To access CAS staff, use the following link:

<http://www.dli.mn.gov/CCLD/Administration.asp>

Doug Nord, Supervisor, (651) 284-5838, [doug.nord@state.mn.us](mailto:doug.nord@state.mn.us)

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# State Agency and Building Industry Resources

This manual was produced and provided by:

## Construction Codes and Licensing Division

Department of Labor and Industry

443 Lafayette Road N, St. Paul, MN 55155-4341

651-284-5012

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<http://www.dli.mn.gov>

### Code responsibilities

<ul style="list-style-type: none"><li>• accessibility</li><li>• boiler and boats for hire</li><li>• building official certification</li><li>• building plan review and inspections</li><li>• code administration</li><li>• code development</li><li>• commercial</li><li>• education</li><li>• elevator</li></ul>	<ul style="list-style-type: none"><li>• energy</li><li>• fire protection systems</li><li>• high pressure piping</li><li>• manufactured structures</li><li>• mechanical (heating, cooling, ventilation, make up air and exhaust)</li><li>• plumbing plan review and inspections</li><li>• recertification; building officials</li><li>• residential</li></ul>
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### Units within Construction Codes and Licensing Division (CCLD)

- code administration services (CAS)
- education
- plan review building
- manufactured structures
- plumbing and engineering
- board of electricity
- boilers, pressure vessels and boats for hire
- high pressure piping licensing and inspection including ammonia
- elevator licensing and inspection
- electrical licensing and inspection
- residential contractors and remodelers
- rulemaking

To access units click on link

<http://www.dli.mn.gov/Ccld.asp>

## Other boards, departments and organizations affiliated with CCLD

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### Boards:

- Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design (AELSLAGID)

AELSLAGID  
85 East 7<sup>th</sup> Place; Suite 160  
St. Paul, MN 55101

### Board Mission:

- Requiring anyone practicing or offering to practice architecture, engineering, land surveying, landscape architecture, geology or soil science be licensed and continue to maintain professional competence

<http://www.aelslagid.state.mn.us>

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### Departments:

#### Minnesota Department of Public Safety State Fire Marshal Division:

Minnesota Department of Public Safety  
445 Minnesota Street  
St. Paul, Minnesota 55101-5155

The State Fire Marshal Division is responsible for the Minnesota State Fire Code, sprinkler contractor licensing and plan review and pipeline safety.

<https://dps.mn.gov/pages/offices-locations.aspx>

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#### Minnesota Department of Agriculture:

Minnesota Department of Agriculture  
625 Robert St. North  
St. Paul, Minnesota 55107  
651-201-6000

### Department mission:

- To enhance Minnesotan's quality of life by ensuring the integrity of our food supply, the health of our environment, and the strength of our agricultural economy

<http://www.mda.state.mn.us/>

## **Minnesota Department of Commerce:**

Minnesota Department of Commerce  
Energy information center  
85 7<sup>th</sup> Place East, Suite 500  
St. Paul, Minnesota 55101  
651-539-1600

The department regulates Minnesota's insurance industry, financial institutions, securities, real estate sector, and has a major role in overseeing the electric, natural gas and telephone sectors, energy conservation and efficiency, and administering low-income energy transactions in Minnesota's economy.

<http://mn.gov/commerce/>

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## **Minnesota Department of Human Services (DHS):**

Minnesota Department of Human Services  
444 Lafayette Road  
St. Paul, Minnesota 55155

The Minnesota Department of Human Services ensures that certain minimum standards of care are met in private and public settings for children and vulnerable adults. DHS also provides direct service through our regional offices for people who are deaf or hard of hearing.

<http://mn.gov/dhs/>

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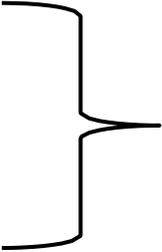
## **Minnesota Department of Health**

Health Regulation-Facilities and Professions  
P.O. Box 64975  
St. Paul, MN 55164-0975

The Health Regulation Division licenses and enforces regulations for most health care facilities, some health care professions and some health related occupations.

<http://www.health.state.mn.us/divs/fpc/index.html>

## Local Organizations:

AIA – American Institute of Architects – Minnesota	<a href="http://www.aia-mn.org">http://www.aia-mn.org</a>
AMBO – Association of Minnesota Building Officials	<a href="http://www.ambo.us">http://www.ambo.us</a>
AMC – Association of Minnesota Counties	<a href="http://www.mncounties.org">http://www.mncounties.org</a>
BATC – Builders Association of the Twin cities	<a href="http://www.batc.org/">http://www.batc.org/</a>
BAM – Builders Association of Minnesota	<a href="http://www.bamn.org">http://www.bamn.org</a>
FMAM – Fire Marshal’s Association of Minnesota	<a href="http://www.fmam.org">http://www.fmam.org</a>
LMC – League of Minnesota Cities	<a href="http://www.lmc.org/">http://www.lmc.org/</a>
Arrowhead Chapter	 <a href="http://www.dli.mn.gov/CCLD/EducationChapters.asp">http://www.dli.mn.gov/CCLD/EducationChapters.asp</a>
Southeast Chapter	
10,000 Lakes Chapter	
Southwest Chapter	
Northwest Chapter	
Carver County Area Inspectors	 <a href="http://www.dli.mn.gov/CCLD/EducationChapters.asp">http://www.dli.mn.gov/CCLD/EducationChapters.asp</a>
East Side (Metro) Area Inspectors	
Central MN Bldg. and Fire Officials	
Riverbend Area Inspectors	
Dakota County Area Inspectors	

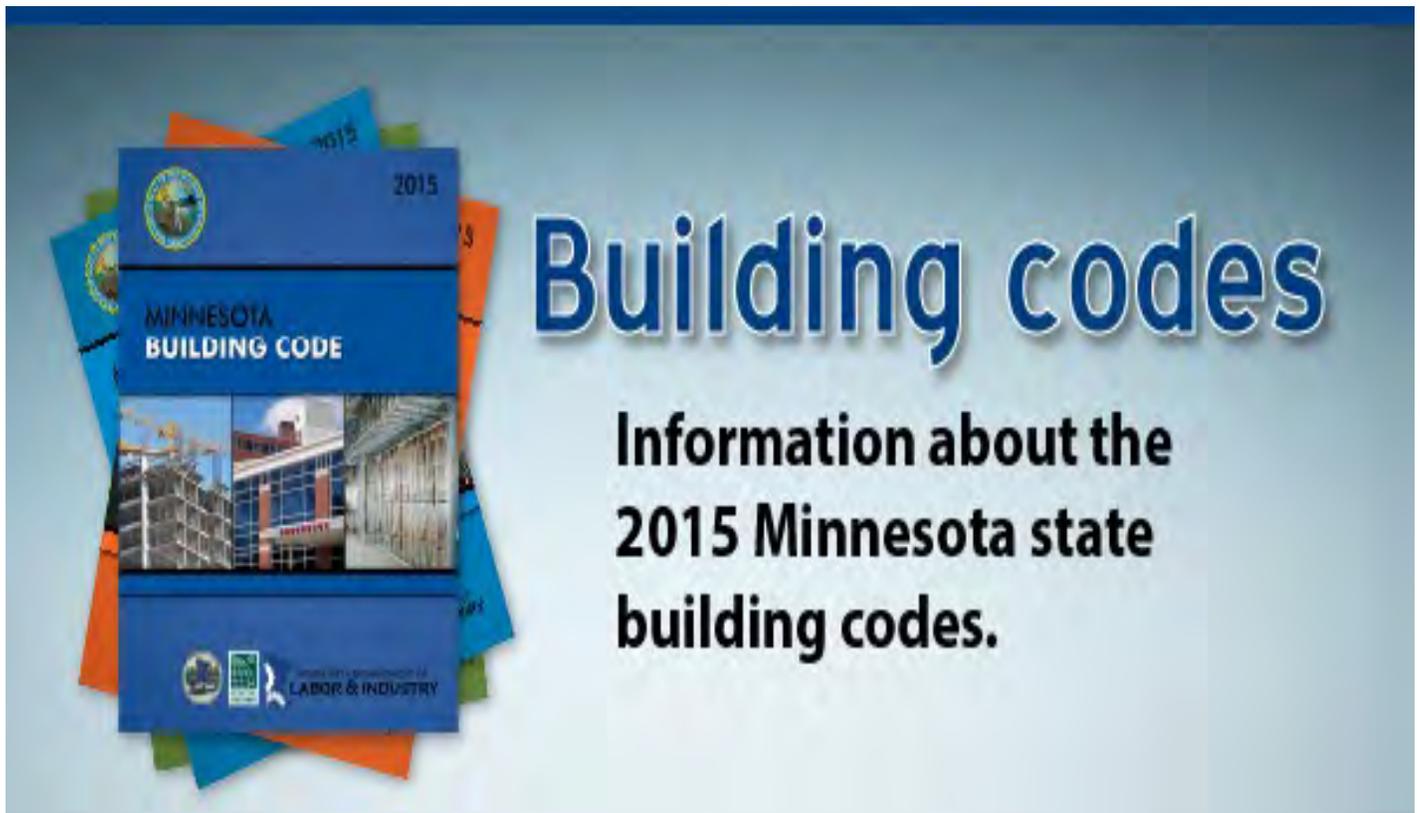
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## National Organizations:

Access - board.gov (Federal Accessibility Board)	<a href="http://www.access-board.gov/">http://www.access-board.gov/</a>
ADAAG – Americans with Disabilities Act Accessibility Guidelines	<a href="http://access-board.gov/adaag/html/adaag.htm">http://access-board.gov/adaag/html/adaag.htm</a>
ANSI – American National Standards Institute	<a href="http://www.ansi.org">http://www.ansi.org</a>
ASTM – American Society for Testing and Materials	<a href="http://www.astm.org">http://www.astm.org</a>
BOMA – Building Owners and Managers Association	<a href="http://www.boma.org">http://www.boma.org</a>
DOJ – Department of Justice	<a href="http://www.usdoj.gov/crt/ada/adahom1.htm">http://www.usdoj.gov/crt/ada/adahom1.htm</a>
HUD – Department of Housing and Urban Development	<a href="http://www.hud.gov">http://www.hud.gov</a>
ICC – International Code Council	<a href="http://www.iccsafe.org/index.html">http://www.iccsafe.org/index.html</a>
NAHB – National Association of Home Builders	<a href="http://www.nahb.org">http://www.nahb.org</a>
NCSBCS – National Conference of States on Building Codes and Standards	<a href="http://www.ncsbcs.org">http://www.ncsbcs.org</a>
NFPA – National Fire Protection Association	<a href="http://www.nfpa.org">http://www.nfpa.org</a>
SBCCI – Southern Building Code Conference International Inc	<a href="http://www.slbcci.org">http://www.slbcci.org</a>

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**Access Minnesota Codes on CCLD Webpage for Free!**

A graphic with a blue background. On the left, there is a stack of three book covers for the '2015 MINNESOTA BUILDING CODE'. The top cover is blue with the state seal and the year '2015'. The middle cover features three photographs of buildings under construction. The bottom cover is blue with the state seal and the text 'DEPARTMENT OF LABOR & INDUSTRY'. To the right of the books, the words 'Building codes' are written in a large, blue, 3D-style font. Below this, the text 'Information about the 2015 Minnesota state building codes.' is written in a bold, black, sans-serif font.

**Building codes**

**Information about the  
2015 Minnesota state  
building codes.**

- **Control/Click on Minnesota Building Code above**
  - **Scroll down to view or buy code books**
  - **Click view for desired code**
  - **2015 Residential code (English or Español)**
-

**To Purchase Codes from others:**

**Please note the code publications are amended or updated periodically and verification through the applicable organizations is necessary to have the most current published document**

Minnesota's Bookstore (for State Building Code)

660 Olive St

St. Paul, MN 55155

<http://www.comm.media.state.mn.us/bookstore/mnbookstore.asp>

ICC (International Code Council)

Headquarters:

1211 Connecticut Ave, NW, Suite 600

Washington, D.C. 20036

<https://www.iccsafe.org/about-icc/contact-icc/>

NFPA (National Fire Protection Association)

1 Batterymarch Park

Quincy, MA 02169-7471

<http://www.nfpa.org/about-nfpa/nfpa-overview>

ASME (American Society of Mechanical Engineers)

Two Park Avenue

New York, NY 10016-5990

[www.asme.org](http://www.asme.org)

IAMPO (International Association of Plumbing and Mechanical Officials)

5001 E. Philadelphia Street

Ontario, CA 91761

Email: [iapmo@iapmo.org](mailto:iapmo@iapmo.org)

Web: <http://www.iapmo.org>

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# 2015 Minnesota State Building Code

Manuals for proper administration of the state building code

- \* Required code manuals, state rules and national standards for proper application, administration, and enforcement of the

2015 Minnesota State Building Code

<http://www.dli.mn.gov/CCLD/Codes.asp>

## 2015 Minnesota State Building Code (Rules/Chapters)

- \* 1300 – Administration of the State Building Code
- \* 1301 – Building Official Certification
- \* 1302 – Construction Approvals
- \* 1303 – Minnesota Provisions of the State Building Code
- \* 1305 – Adoption of the 2012 International Building Code and amendments
- \* 1306 – Special Fire Protection Systems (Optional)
- \* 1307 – Elevators and Related Devices
- \* 1309 – Adoption of the 2012 International Residential Code and amendments
- \* 1311 – Rehabilitation of Existing Buildings (Minnesota Conservation Code for Existing Buildings)
- \* 1315 – Adoption of the 2014 National Electrical Code
- \* 1322 – Residential Energy Code
- \* 1323 – Commercial Energy Code
- \* 1325 – Solar Energy Systems
- \* 1335 – Flood proofing Regulations
- \* 1341 – Minnesota Accessibility Code
- \* 1346 – Adoption of the 2012 International Mechanical / Fuel Gas Codes
- \* 1350 – Manufactured Homes
- \* 1360 – Prefabricated Buildings
- \* 1361 – Industrialized / Modular Buildings
- \* 1370 – Storm Shelters (Manufactured Home Parks)
- \* 4714 – Minnesota Plumbing Code (Will take effect January 23, 2016)

<p style="text-align: center;">* <u>Required</u> code manuals, state rules and national standards for proper application, administration, and enforcement of the 2015 Minnesota State Building Code <a href="http://www.dli.mn.gov/CCLD/Codes.asp">http://www.dli.mn.gov/CCLD/Codes.asp</a></p>
* 2012 International Building Code
* 2012 International Residential Code
* 2012 International Fire Code (Pending adoption in spring of 2016)
* 2012 International Mechanical Code
* 2012 International Fuel Gas Code
* 2014 National Electrical Code (NFPA 70)
* 2015 Minnesota Conservation Code for Existing Buildings
* 2015 Minnesota Energy Code with ANSI/IES Standard 90.1-2010
* 2015 Minnesota Accessibility Code
* ACI 318-2011 Building Code Requirements for Structural Concrete
* ACI 530.1-2011 Building Requirements for Masonry Structures
* ACI 530.1 – 2011 Specifications for Masonry Structures
* ANSI/ASHRAE 62.1 – 2010 Appendix A
* ANSI/ASHRAE 15 – 2010 Safety standard for Refrigeration Systems
* ANSI/ASHRAE 34 – 2010 Designation and Safety Classification of Refrigerants
* SMACNA/ANSI – 2005 HVAC Duct Construction Standards – Metal and Flexible
* SMACNA – 2003 Fibrous Glass Duct Construction Standards
* NFPA 45 – 2011 Standard on Fire Protection for Laboratories Using Chemicals
* NFPA 96 – 2014 Ventilation & Fire Protection for Commercial Cooking Hoods
* NFPA 58 – 2011 Liquefied Petroleum Gases
* NFPA 13 – 2010 Installation of Fire Sprinklers
* NFPA 13R – 2010 Installation of Fire Sprinklers for Multifamily
* NFPA 13D – 2010 Installation of Fire Sprinklers for Dwellings
* NFPA 72 – 2010 Installation of Fire Alarm Systems
* NDS – 2012 National Design Specification for Wood Construction
* ICC 300 – 2012 ICC Standard on bleachers, folding & telescoping seating and grandstands.

**Recommended manuals, handbooks and/or national standards for proper application, administration and enforcement of the 2015 Minnesota State Building Code**  
<http://www.dli.mn.gov/CCLD/Codes.asp>

2012 IBC Commentary Manual Volume I & II
2012 IBC Handbook (Full color guide for structural and fire and life-safety provisions)
2012 IBC Significant changes (Full access to the most critical updates to the IBC)
2012 IRC Commentary Manual Volume I & II
2012 IMC Commentary Handbook
2012 IFGC Commentary Handbook
2012 IBC/ASTM Reference Standards Manual for the IBC
2012 IBC Nonstructural Q & A Manual
2012 IBC Structural/Seismic Design Manual Volume 1
2012 IBC ASTM Standards Manuals
2012 IBC UL Standards Manuals
2012 GA-600 Fire Resistance Design Manual – 18 <sup>th</sup> edition
2010 Fire Protection Handbook
2010 Fire Sprinkler & Standpipe Handbook
Hazardous Materials Guide
NFPA 80 – 2010 Installation of Fire Resistive Doors & Windows
NFPA 101- 2002 Life Safety Code
2001 ICC Performance Code for Buildings and Facilities
ASME A17.1/CSA B44-2010 Safety Code for Elevators and Escalators
ASME A17.3-2011 Safety Code for Existing Elevators and Escalators
ASME A17.5-2011 Electrical Equipment
ASME A17.18.1-2011 Safety Standard for Platform Lifts and Stairway Chairlifts
ASME A90.1-2009 Safety Standard for Belt Man lifts
ASME B20.1-2009 Safety Standard for Conveyors and Related Equipment
Building Official Management Manual
Building Department Guide to Disaster Mitigation
Legal Aspects of Code Administration
Architectural Graphic Standards (Most current edition)
Webster’s Dictionary (Most current edition)
U.L.’s and/or Warnock Hersey’s Fire Resistive Directories, Building Materials Directories, Roofing Materials & System’s Directories, etc.
Permanent Wood Foundation Design & Construction Guide
MN Rule 1800 & 1805 Board of Architecture and Engineering Rules
MPCA Rules 7080, 7081, 7082, 7083 – On-Site Septic System Rules

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**EFFECTIVE DATE:            CODE:**

July 1, 1971	Surcharges
July 1, 1972	State Building Code applies statewide; supersedes and takes the place of the building code of any municipality. Specifically the code applied to any municipality which as of May 28, 1971, had a building code and further applies to any municipality choosing to adopt a building code thereafter. The State Building Code adopts the 1970 Uniform Building Code by reference.
October 1972	Minnesota Uniform Fire Code adopted the 1973 Uniform Fire Code.
June/July 1973	Amendments to 1972 Southern Building Code (SBC).
January 14, 1974	1973 Uniform Building Code adopted by reference.
October 3, 1975	Minnesota Uniform Fire Code adopted the 1973 Uniform Fire Code.
November 18, 1975	Adoption of the Handicapped Code, Chapter 55, and new Uniform Building Code Section 1717, Foam Plastics.
January 14, 1976	1976 State Building Code January.
January 30, 1976	Energy Conservation in Buildings.
October 29, 1977	Solar Energy Code.
September 19, 1978	1978 State Building Code adopted the 1976 Uniform Building Code by reference; the Energy Conservation in Buildings code is amended.
October 27, 1978	1978 National Electric Code.
September 9, 1980	1980 State Building Code adopted the 1979 Uniform Building Code.
October 20, 1980	Elevator Rules – Home Energy Disclosure Rules.
April 6, 1981	1981 National Electric Code.
March 1, 1983	Amended 1980 State Building Code adopted the 1982 Uniform Building Code.

<b>EFFECTIVE DATE:</b>	<b>CODE:</b>
April 11, 1983	Minnesota Uniform Fire Code adopted the 1982 Uniform Fire Code.
April 25, 1983	Optional Appendix "E", Automatic Fire Suppression Systems.
January 1, 1984	Energy Conservation in Buildings adopted the 1983 Model Energy Code.
January 14, 1985	Rules adopted updating the State Building Code and governing Handicapped Accessibility, Electrical, Elevators and Plumbing.
February 18, 1986	Amended Energy Code Rules and Rental Housing Energy Standards.
February 17, 1987	1985 State Building Code adopted the 1985 Uniform Building Code.
January 11, 1988	Adopted the Group E Division 3 Rules.
April 15, 1988	Adopted Rules relating to Manufactured Home Park Storm Shelter Design.
October 1, 1989	1989 Minnesota Uniform Fire Code adopted the 1988 Uniform Fire Code.
July 2, 1990	1990 National Electrical Code.
July 16, 1990	1990 State Building Code adopted 1988 Uniform Building Code, 1988 Uniform Mechanical Code, 1987 ANSI Code for Elevators, Minnesota Plumbing Code.
May 13, 1991	1991 Minnesota Energy Code adopted the 1989 Model Energy Code.
September 7, 1992	1992 Minnesota Energy Code. (1989 Model Energy Code).
August 9, 1993	1993 National Electrical Code.
August 23, 1993	1993 Minnesota Uniform Fire Code adopted the 1991 Uniform Fire Code.
June 16, 1994	1994 Minnesota Energy Code.
July 12, 1994	Amended Building Official Certification Rules. (Accessibility Specialist, Building Official – Limited).
September 19, 1994	1994 Minnesota Plumbing Code.

<b>EFFECTIVE DATE:</b>	<b>CODE:</b>
December 19, 1994	1994 Minnesota Mechanical Code adopts 1991 Uniform Mechanical Code.
March 20, 1995	1995 Minnesota State Building Code adopts the 1994 Uniform Building Code.
January 23, 1996	New Accessibility rules – chapter 1340.
April 29, 1996	Adopted Rules updating chapters 1300, 1310, 1315, 1325, 1360 and 1361.
July 1, 1996	1996 National Electrical Code adopted.
June 29, 1998	Minnesota Fire Code adopted the 1997 Uniform Fire Code.
October 5, 1998	1997 Uniform Building Code adopted with state amendments.
October 5, 1998	1998 Plumbing Code amendments adopted.
May 3, 1999	1996 ASME A17.1, A17.3, A17.5, B.20.1 and 1997 A90.1 Elevators and Related Devices adopted with amendments.
July 6, 1999	1999 National Electrical Code adopted.
July 20, 1999	Minnesota Energy Code adopted – chapter 7676 and 7678.
April 15, 2000	Minnesota Energy Code adopted – chapters 7672 (with option of chapter 7670 and 7674).
June 26, 2000	Rules relating to Manufactured Homes updated.
September 16, 2002	2002 National Electrical Code adopted.
March 31, 2003	2000 International Building Code adopted with state amendments.
March 31, 2003	Guidelines for the Rehabilitation of Existing Buildings adopted with state amendments.
March 31, 2003	Adopted rules updating chapters 1300, 1301, 1303 and 1306.

<b>EFFECTIVE DATE:</b>	<b>CODE:</b>
September 20, 2004	International Mechanical and Fuel Gas Codes, chapter 1346.
July 1, 2005	2005 National Electrical Code adopted.
January 29, 2007	Elevators and Related Devices ASME A17.1-2004 with addenda and supplement, A17.3-2002, A17.5-2004, A18.1-2005, A90.1-2003 and B20.1-2003, chapter 1307.
July 10, 2007	2006 International Fire Code adopted with state amendments, new chapter 7511.
July 10, 2007	2006 International Building Code adopted with state amendments, chapter 1305.
July 10, 2007	2006 International Building Code adopted with state amendments, chapter 1309.
July 10, 2007	Adopted Rules updating chapters 1300, 1303, 1306 and 1341.
September 15, 2008	2008 National Electrical Code adopted.
June 1, 2009	Minnesota Residential Energy Code adopted – chapter 1322.
June 1, 2009	Minnesota Commercial Energy Code adopted – chapter 1323.
October 26, 2009	Minnesota Mechanical and Fuel Gas Codes (2006 International Mechanical and Fuel Gas Codes), chapter 1346.
October 26, 2009	Minnesota Plumbing code, chapter 4715.
December 29, 2009	Manufactured Homes (1350.6710 effective 4/1/2009).
August 8, 2011	2011 National Electrical code adopted.
July 1, 2014	2014 National Electrical code adopted.
January 24, 2015	Adopted rules updating chapters 1300, and 1303 (except for the Radon Code provisions that were moved from chapter 1322).

<b>EFFECTIVE DATE:</b>	<b>CODE:</b>
January 24, 2015	2010 ASME A17.1/CSA B44-2010, A17.3-2011, A17.5-2011, A18.1-2011, A90.1-2009, B20.1-2009, and A17.4-1999 adopted with state amendments-chapter 1307.
January 14, 2015	2012 International Residential Building Code adopted with state amendments – chapter 1309.
January 24, 2015	2012 International Existing Building Code adopted with state amendments chapter 1311.
January 24, 2015	Minnesota Accessibility Code adopted – chapter 1341 – amends 2012 International Building Code, chapter 11 (is based upon ICC/ANSI A117.1).
January 24, 2015	2012 International Mechanical and Fuel Gas Codes adopted with state amendments – chapter 1346.
February 14, 2015	Adopted rules updating and moving the Radon Code to chapter 1303.
February 14, 2015	2012 International Energy Conservation Code (Residential Provisions) adopted with state amendments – chapter 1322.
June 2, 2015	2012 International Building Code adopted with state amendments – chapter 1305.
June 2, 2015	2012 International Energy Conservation Code (Commercial Provisions) adopted with state amendments.
January 23, 2016	Minnesota Plumbing Code, chapter 4714.

## **Minnesota Energy Code Historical Development**

### **Early development (pre-1982)**

In 1975 Minnesota enacted a law that required the Commissioner of the Department of Administration to “provide building design and construction standards consistent with the most efficient use of energy.” The first energy code became effective January 30, 1976 as part of the state building code. The energy code was subsequently revised in 1977 and 1978. The latter revision adopted the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 90-75 “Energy Conservation in New Building Design” by reference. During this period, residential energy standards could generally be met with R-19 attic and R-13 wall insulation and double (clear) glazing. The period was also characterized by sporadic enforcement of the new energy standards.

### **Model Energy Code phase (1982 - 1992)**

In 1982 Minnesota statute was amended to transfer authority for the energy code rules to the “Energy Agency” (later to become the Energy Division of the Department of Public Service). The Department revised the energy code in 1983 to adopt the 1983 edition of the Model Energy Code published by the Council of American Building Officials (CABO). The Department revised the energy code in 1984 — adopted HUD minimum property standards for residential construction — including foundation wall insulation. During this period, residential construction was generally 2x6 walls (R-19 batts) and R-38 ceilings. A 1991 revision of the Minnesota Energy Code adopted the 1989 edition of the CABO Model Energy Code by reference.

### **Beyond the Model Energy Code (1994-2000)**

In 1991, several Minnesota statutes were enacted setting high goals for the energy code, requiring that the commercial code requirements for commercial buildings be at least as stringent as ASHRAE Standard 90.1-1989. Another simply required that the energy code must be equal to or exceed the most stringent standard adopted by any other state in the nation.

In September 1992 the Energy Code was revised to require higher efficiency levels. In June 1994, the rules were amended to adopt the criteria of ASHRAE Standard 90.1-1989. For the low rise residential sector (including 1 & 2 family dwellings), the minimum standard was identified as “Category 2,” with the only increased air tightness requirement over previous code was to require sealed recessed light fixtures. A voluntary “Category 1” standard was included that included additional air tightening and a mechanical ventilation system - with no detail other than sizing. To comply with the statutory mandate that the code be the most stringent in the country, a provision was added (and subsequently repealed as the “2000 code” was adopted), that all new residential buildings must meet the requirements of the Canadian Home Builders Association “R-2000” program.

## **Addition of provisions for ventilation and protection against backdrafting**

In late 1997, the department proposed code amendments that included requirements for additional air tightening, ventilation and protection against backdrafting for 1 & 2 family dwellings only, and repealed the Category 1 and Category 2 provisions. Five days of public hearing ensued, and in the end Administrative Law Judge Richard Luis recommended adoption of a strategy for ventilation and protection against backdrafting proposed by Minnesota building scientists and endorsed by the Department. A 1999 statute moved the proposed effective date of the 1 & 2 family dwelling code (Chapter 7672) from June 1999 to April 2000. As the effective date neared, a statute was enacted to retain the Category 1 standard with added provision to protect against backdrafting, as an alternative to Chapter 7672. Authority for energy code rulemaking was also transferred from the state energy office to the Department of Administration, Building Codes and Standards Division.

# MAKEUP AND USE OF THE MINNESOTA STATE BUILDING CODE

## Makeup of the Minnesota State Building Code Required Enforcement

- Chapter 1300 Minnesota Building Code Administration
- Chapter 1301 Building Official Certification
- Chapter 1302 State Building Code Construction Approvals
- Chapter 1303 Special Provisions
- Chapter 1305 Minnesota Building Code
- ❖ Chapter 1307 Elevators and Related Devices
- Chapter 1309 Minnesota Residential Code
- Chapter 1311 Minnesota Conservation Code for Existing Buildings
- ❖ Chapter 1315 Minnesota Electrical Code
- Chapter 1322 Residential Energy Code
- Chapter 1323 Commercial Energy Code
- Chapter 1325 Solar Energy Systems
- Chapter 1335 Floodproofing Regulations
- ❖ Chapter 1341 Minnesota Accessibility Code
- Chapter 1346 Minnesota Mechanical Code
- ❖ Chapter 1350 Manufactured Homes
- ❖ Chapter 1360 Prefabricated Structures
- ❖ Chapter 1361 Industrialized/Modular Buildings
- ❖ Chapter 1370 Storm Shelters (Manufactured Home Parks)
- ❖ Chapter 4714 Minnesota Plumbing Code
- ❖ Chapter 5230 Minnesota High Pressure Piping Systems
- ❖ **These codes have specific statutory authority and with limited exception, are mandatory throughout the entire state.**

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### Optional Enforcement:

#### 1300.0060 OPTIONAL ADMINISTRATION.

The following chapters of the code are not mandatory but may be adopted without change by a municipality which has adopted the code:

- A.  
chapter 1306, Special Fire Protection Systems; and
- B.  
Grading, IBC appendix chapter J.

## Use of the Minnesota State Building Code

**The Minnesota State Building Code is comprised of numerous chapters in Minnesota Rule that include references to other adopted publications with any necessary amendments.**

The Minnesota State Building Code, known also as the “State Building Code” or the “Code,” includes chapters of Minnesota Rule, which are outlined in the “Makeup of the Minnesota State Building Code,” also in this section. The State Building Code is comprised of the following:

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The following Rule Chapters *do not* incorporate by reference another published document:

- Minn. Rule 1300 Minnesota Building Code Administration
- Minn. Rule 1301 Building Official Certification
- Minn. Rule 1302 State Building Code Construction Approvals
- Minn. Rule 1303 Special Provisions
- Minn. Rule 1306 Special Fire Protection Systems
- Minn. Rule 1325 Solar Energy Systems
- Minn. Rule 1350 Manufactured Homes
- Minn. Rule 1360 Prefabricated Structures
- Minn. Rule 4714 Minnesota Plumbing Code

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The following Rule Chapters *do* incorporate by reference another published code, standard, or other document and include any necessary amendments to the document:

- Minn. Rule 1305, Minnesota Building Code  
*Incorporates the 2012 International Building Code with amendments.*
- Minn. Rule 1307, Elevator and Related Devices  
*Incorporates Chapter 30 of the 2012 International Building Code; ASME A17.1/CSAB44-2010 Safety Code for Elevators and Escalators; ASME A17,3- 2011 Safety Code for Existing Elevators and Escalators; ASME A17.5-2011 Elevator and Escalator Electrical Equipment; ASME A18.1-2011 Safety Standard for Platform Lifts and Stairway Chairlifts; ASME A90.1-2009 Safety Standard for Belt Manlifts; and ASME B20.1 2009 Safety Standard for Conveyors and Related Equipment, all with amendments.*
- Minn. Rule 1309, Minnesota Residential Code  
*Incorporates the 2012 International Residential Code, with amendments.*
- Minn. Rule 1311, Minnesota Conservation Code for Existing Buildings  
*Incorporates the 2012 International Existing Building Code, with amendments.*
- Minn. Rule 1315, Minnesota Electrical Code  
*Incorporates the 2014 National Electrical Code*
- Minn. Rule 1322, Residential Energy Code

*Incorporates the 2012 International Energy Conservation Code – residential provisions, with amendments*

- Minn. Rule 1323, Commercial Energy Code  
*Incorporates the 2012 International Energy Conservation Code – commercial provisions, with amendments*
- Minn. Rule 1335, Floodproofing Regulations  
*Incorporates the 1972 Flood Proofing Regulations promulgated by the Office of the Chief Engineers, U.S. Army*
- Minn. Rule 1341, Minnesota Accessibility Code  
*Incorporates Chapter 11 of the 2012 International Building Code; and the 2009 ICC/ANSI A117.1, both with amendments*
- Minn. Rule 1346, Minnesota Mechanical Code  
*Incorporates the 2012 International Mechanical Code and the 2012 International Fuel Gas code, both with amendments*
- Minn. Rule 1361, Industrialized/Modular Buildings  
*Incorporates the 1993 Model Rules and Regulations for Industrialized/Modular Buildings*
- Minn. Rule 1370, Storm Shelters  
*Incorporates the July 2000 FEMA 361 Design and Construction Guidance for Community Shelters*

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## **Specific Code Applications of Adopted**

### **Minnesota Rules, chapter 1305 – Minnesota Building Code**

Mandatory chapters of the 2012 ***International Building Code*** include chapters 2 through 33 and 35. See chapter 1300 for Administrative provisions. Amendments to Chapters 11 and 30 of the IBC are incorporated into 2007 SBC Chapters 1341 and 1307 respectively.

Optional Appendix Chapter J (Grading) may be adopted by reference. See Chapter 1300, Optional Administration. Several chapters in this Code have not been adopted but the Minnesota State Building Code Provides mandatory provisions elsewhere to replace some of the chapters not adopted here. The information relative to these chapters is as follows:

- For provisions relative to chapter 1, please refer to Minnesota Rules, chapter 1300, Minnesota Building Code Administration.
- For provisions relative to chapter 11, please refer to Minnesota Rules, chapter 1341, the Minnesota Accessibility Code.
- For provisions relative to chapter 30, please refer to Minnesota Rules, chapter 1307, Elevators and Related Devices.
- For information relative to chapter 34, please refer to Minnesota Rules, chapter 1311, Minnesota Conservation Code for Existing Buildings.

- For provisions related to floodproofing, please refer to Minnesota Rules, chapter 1335, Floodproofing Regulations.

Any seismic or earthquake provisions in this code are deleted and not required.

For a complete description of all applicable chapters and related information in this code, please refer to Minnesota Rules, part 1305.0011.

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### **Minnesota Rules, chapter 1309 – Minnesota Residential Code**

Mandatory chapters of the 2012 *International Residential Code* include chapters 2 through 10, chapter 44, Section P2904, and Appendix K.

Several chapters in this Code have not been adopted but the Minnesota State Building Code provides mandatory provisions elsewhere to replace the chapters not adopted here. The information relative to these chapters is as follows:

- For provisions relative to chapter 1, please refer to Minnesota Rules, chapter 1300, Minnesota Building Code Administration.
- For provisions relative to chapter 11, please refer to Minnesota Rules, chapter 1322, Residential Energy Code. For provisions relative to chapters 12 through 24, please refer to Minnesota Rules, chapter 1346, Minnesota Mechanical Code.
- For provisions relative to chapters 25 through 33, please refer to Minnesota Rules, chapter 4714, Minnesota Plumbing Code.
- For information relative to chapters 34 through 43 (other than section R314 Smoke Alarms), please refer to Minnesota Rules, chapter 1315, Minnesota Electrical Code.
- For provisions related to floodproofing, please refer to Minnesota Rules, chapter 1335, Floodproofing Regulations.

For a complete description of all applicable chapters and related information in this code, please refer to Minnesota Rules, part 1309.0010.

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### **Minnesota Rules, chapter 1311 – Minnesota Conservation Code for Existing Buildings**

Mandatory chapters of the 2012 *International Existing Building Code* include chapters 2 through 16.

IEBC Accessibility for Existing Building Sections 410, 605, 705, 801.1 exception, 806, 901.2 exception, 906, 1006, 1012.8, 1101.2, 1105, 1204, 1205.15 and 1401.2.5 are deleted in their entirety and not a part of the Minnesota State Building Code. If a reference is made to these sections in other provisions of this code, these sections shall not apply.

Any seismic or earthquake provisions in this code are deleted and not required.

For a complete description of all applicable chapters and related information in this code, please refer to Minnesota Rules, sections 1311.0010.

**Minnesota Rules, chapter 1315 – Minnesota Electrical Code**

The 2014 *National Electrical Code* is incorporated by reference and made part of the Minnesota State Building Code.

**Minnesota Rules, chapter 1346 – Minnesota Mechanical Code**

Mandatory chapters of the 2012 *International Mechanical Code* include chapters 2 through 15, as amended. Mandatory chapters of the 2012 *International Fuel Gas Code* include chapters 2 through 8, as amended.

For a complete description of all applicable chapters and related information in this Code, please refer to Minnesota Rules, parts 1346.0050 and 1346.5050.

# Minnesota State Building Code Adoption Guide

- To review the adoption guide
- Control / click on to follow link  
<http://www.doli.state.mn.us/CCLD/Gov.asp>



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# Fees

**Each municipality must determine its own permit fee schedules. The State Building Code does not establish fee schedules.**

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## **1300.0160 FEES.**

Subpart 1. **Schedule of permit fees.** The applicant for a permit for a building; structure; or electrical, gas, mechanical, or plumbing system or alterations requiring a permit shall pay the fee set forth by a fee schedule adopted by the municipality.

When submittal documents are required to be submitted by this chapter, a plan review fee shall be required. The plan review fee shall be established by the fee schedule adopted by the municipality.

**Exception:** The fee schedule adopted by the municipality may exempt minor work from plan review fees.

Subp. 2. **Fees commensurate with service.** Fees established by the municipality must be by legal means and must be fair, reasonable, and proportionate to the actual cost of the service for which the fee is imposed.

Subp. 3. **Building permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of all construction work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment, and permanent systems. Building permit valuation shall be set by the building official.

**Exceptions:** Building permit valuations for the following structures shall be based on the valuation of on-site work only:

- A. manufactured homes containing a Housing and Urban Development (HUD) certification label;
- B. prefabricated buildings with a Department of Labor and Industry prefabrication label; and
- C. industrialized/modular buildings with an Industrialized Building Commission (IBC) label.

Subp. 4. **Building permit fees.** Building permit fees shall be based on valuation.

**Exceptions:**

- A. one- and two-family dwelling maintenance permits for roofing, siding, windows, doors, or other minor projects may be charged a fixed fee;
- B. permits for plumbing, mechanical, electrical, or other building service equipment systems may be based on valuation or charged a fixed fee; and

Subp. 5. **Plan review fees for similar plans.** When submittal documents for similar plans are approved under subpart 6, plan review fees shall not exceed 25 percent of the normal building permit fee established and charged by the jurisdiction for the same structure.

**Subp. 6. Plan review of similar plans.**

A. Any number of similar buildings may be built from a master plan if:

- (1) plan review fees have been paid for the master plan;
- (2) a code change has not occurred that impacts the design of a master plan;
- (3) the similar building has the same physical dimensions and structural design as the master plan;

**Exception:** The following modifications to the master plan are not considered to be significant modifications, according to Minnesota Statutes, section 326B., subdivision 1, and are permitted for dwelling units and their accessory structures built to the International Residential Code, and residential occupancies built to the International Building Code that are three stories or less in height and their accessory structures:

- (a) foundation types to include walkout, lookout, and full basement;
- (b) foundation materials to include poured concrete, masonry units, and wood;
- (c) garage dimensions;
- (d) roof design changed by a revised truss plan approved by the building official;
- (e) bays or cantilevered floor areas;
- (f) decks and porches; and
- (g) other modifications approved by the building official;

(4) occupancy groups other than those identified in the exceptions listed in part 1300.0160, subpart 6, item A, subitem (3), must be the same type of construction and occupancy classification and must have the same exit system;

**Exception:** Minor changes to the exit access; and

(5) The similar plan is based on a master plan for which the municipality has issued a permit within the last 12 months.

B. Plan review fees for similar building plans must be based on the costs commensurate with the direct and indirect cost of the service, but must not exceed 25 percent of the normal building permit fee established and charged by the municipality for the same structure.

C. The plan review fee charged for similar building plans applies to all buildings regulated by the code regardless of occupancy classification including industrialized/modular buildings constructed under a program specified in Minnesota Statutes, section 326B.194.

D. The applicant must submit a new plan set and other information as required by the building official for each building reviewed as a similar building.

**Subp. 7. Payment of fees.** A permit shall not be issued until the fees prescribed by the municipality have been paid.

**Subp. 8. Work commencing before permit issuance.** If work for which a permit is required by the code has been commenced without first obtaining a permit, a special investigation shall be made before a permit may be issued for the work. An investigation fee established by the

municipality shall be collected and is in addition to the required permit fees, but it may not exceed the permit fee.

Subp. 9. **Fee refunds.** The municipality shall establish a permit and plan review fee refund policy.

Subp. 10. **State surcharge fees.** All municipal permits issued for work under the code are subject to a surcharge fee. The fees are established by Minnesota Statutes, section 326B.148. Reports and remittances by municipalities must be filed with the commissioner, directed to the attention of the state building official.

Surcharge fees imposed by the state are in addition to municipal permit fees. Surcharge report forms and information may be obtained by writing the commissioner, to the attention of the state building official.

**Statutory Authority:**

*MS s [16B.59](#); [16B.61](#); [16B.64](#); [326B.02](#); [326B.101](#); [326B.106](#); [326B.13](#)*

**History:**

*[27 SR 1471](#); L 2006 c 140 art 1 s 1; L 2007 c 140 art 4 s 61; art 13 s 4; [32 SR 5](#); [39 SR 91](#)*

**Published Electronically:**

*January 23, 2015*

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**As stated in MN Rules 1300.0120**, permits are required to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert, or replace any gas, mechanical, electrical, plumbing system, or other equipment, the installation of which is regulated by the code; or cause any such work to be done, shall first make application to the building official and obtain the required permit.

**Example:**

A mechanical permit would be required for a furnace change out.

For a single family dwelling you would be issuing a building permit, mechanical permit, plumbing permit, electrical permit, plumbing permit and all other applications within if not through the Department of Labor and Industry and others that you may require separate permits, such as a fireplace.

In the example above regarding a single family dwelling you would be issuing separate permits or you may be using an all-inclusive permit. In either case you would be separating the fees and charging the surcharge fee for each individual permit. On the following page is an example of an all-inclusive permit showing the fee breakdown.

**Permit fees are based on valuation with the exception of the following:**

Plan review	65% of Bldg. Permit Fee
Plan review of similar plans meeting 1300.0160, subp. 6	25% of Bldg. Permit Fee
Plumbing fee	\$5.00 per opening & .50 surcharge
Mechanical (residential)	\$25.00 & .50 surcharge
Air conditioning installations	\$25.00 & .50 surcharge
Air conditioning that's part of mechanical installation	\$10.00 & .50 surcharge
Gas piping (that's not part of mechanical installation)	\$25.00 & .50 surcharge
Fireplace (gas or wood)	\$30.00 & .50 surcharge
Re-roofing (residential)	\$25.00 & .50 surcharge
Re-siding	\$25.00 & .50 surcharge
Window replacement (in existing opening)	\$25.00 & .50 surcharge
Demolition	\$50.00 & .50 surcharge
Other maintenance or minor project as determined by the building official	\$25.00 & .50 surcharge

Commercial heating, ventilating, and air conditioning shall be based on valuation.  
Investigation fee shall be equal to the permit fee.

**The following items need consideration for being incorporated in the fee ordinance.**

- Fee table, see attached example or web page link <http://www.dli.mn.gov/CCLD/Codes.asp>
- Fixed fees for applicable permits that you don't want based on valuation (see 1300.0160 Subp 4).
- Plan review fee where applicable and plan review fee for similar plans if charging a review fee.
- Investigation fee for work starting prior to permit issuance.
- Fee refunds for permit and plan review, which can be by policy but recommend incorporating into the fee ordinance.
- Re-inspection fee if requiring.
- Permit and plan review expiration. When either expires and a new permit or fee is required would that fee be the full fee or something other than?
- Valuation worksheet. Some incorporate this into their fee ordinance for use in valuating construction work in a manner that treats everyone in a similar / fair manner. See web link for example of fee schedules. <http://www.dli.mn.gov/CCLD/Codes.asp>

### **Expiration of Plan Review**

Applications for which no permit is issued within 180 days following the date of application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the building official. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. In the event of a hardship and at the discretion of the building official a new plan review fee may be waived.

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### **Permit and Plan Review Fee Refund Policy:**

See municipality's written policy.

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### **Plan Review Fees**

When submittal documents are required by the building official, a plan review fee shall be paid. Said plan review fee shall be 65 percent of the building permit fee. The plan review fees are separate fees from the permit fees and are in addition to the permit fees. When submittal documents are incomplete or changed so as to require additional plan review, fees shall be charged at the rate shown in Table 1-A. Plan review fees for similar plans falling under 1300.0160, subpart 6, shall be 25 percent of the building permit fee.

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### **Fee Refunds**

The building official may authorize refunding of any fees paid here under which was erroneously paid or collected.

The building official may authorize refunding of not more than 80 percent of the permit fee or plan review fee paid when no work has been done under a permit issued.

The building official shall not authorize refunding of any fee paid except on written application filed by the original permittee not later than 180 days after the date of fee payment.

## **Re-Inspections**

A re-inspection fee may be assessed for each inspection or re-inspection when such portion of work for which inspection is called for is not complete or when corrections called for are not made.

To obtain a re-inspection, the permit applicant shall pay the re-inspection fee in accordance with Table 1-A in the fee schedule adopted by this Municipality.

In instances where re-inspection fees have been assessed, no additional inspections of the work will be performed until the required fees have been paid.

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## **Expiration**

Every permit issued by the building official shall expire by limitation and become null and void if the building or work authorized by such permit is not commenced within 180 days from the date of such permit, or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of 180 days. Before such work can be recommenced, a new permit shall be first obtained to do so, and the fee therefore shall be one half the amount required for a new permit for such work, excluding plan review fee, provided no changes have been made or will be made in the original plans and specifications for such work.

The building official may grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

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## **Expiration of Plan Review**

Applications for which no permit is issued within 180 days following the date of application shall expire by limitation, and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the building official. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee. In the event of a hardship and at the discretion of the building official a new plan review fee may be waived.

Statute 326B.153 is for example purposes only; the municipality will need to develop their own fee schedule. Please see the following link for more information:

<http://www.dli.mn.gov/CCLD/GovValue.asp>

### **326B.153 BUILDING PERMIT FEES.**

#### **Subdivision 1. Building permits.**

(a) Fees for building permits submitted as required in section 326B.106 include:

(1) the fee as set forth in the fee schedule in paragraph (b) or as adopted by a municipality;  
and

(2) the surcharge required by section 326B.148.

(b) ) The total valuation and fee schedule

is: (1) \$1 to \$500, \$29.50;

(2) \$501 to \$2,000, \$28 for the first \$500 plus \$3.70 for each additional \$100 or fraction thereof, to and including \$2,000;

(3) \$2,001 to \$25,000, \$83.50 for the first \$2,000 plus \$16.55 for each additional \$1,000 or fraction thereof, to and including \$25,000;

(4) \$25,001 to \$50,000, \$464.15 for the first \$25,000 plus \$12 for each additional \$1,000 or fraction thereof, to and including \$50,000;

(5) \$50,001 to \$100,000, \$764.15 for the first \$50,000 plus \$8.45 for each additional \$1,000 or fraction thereof, to and including \$100,000;

(6) \$100,001 to \$500,000, \$1,186.65 for the first \$100,000 plus \$6.75 for each additional \$1,000 or fraction thereof, to and including \$500,000;

(7) \$500,001 to \$1,000,000, \$3,886.65 for the first \$500,000 plus \$5.50 for each additional \$1,000 or fraction thereof, to and including \$1,000,000; and

(8) \$1,000,001 and up, \$6,636.65 for the first \$1,000,000 plus \$4.50 for each additional \$1,000 or fraction thereof.

(c) Other inspections and fees are:

(1) ) inspections outside of normal business hours (minimum charge two hours), \$63.25 per hour;

(2) reinspection fees, \$63.25 per hour;

(3) ) inspections for which no fee is specifically indicated (minimum charge one-half hour), \$63.25 per hour; and

(4) ) additional plan review required by changes, additions, or revisions to approved plans (minimum charge one-half hour), \$63.25 per hour.

(d) If the actual hourly cost to the jurisdiction under paragraph (c) is greater than \$63.25, then the greater rate shall be paid. Hourly cost includes supervision, overhead, equipment, hourly wages, and fringe benefits of the employees involved.

To obtain more information:

**Subd. 2. Plan review.**

Fees for the review of building plans, specifications, and related documents submitted as required by section 326B.106 must be paid based on 65 percent of the building permit fee required in subdivision 1.

**Subd. 3. Surcharge.**

Surcharge fees are required for permits issued on all buildings including public buildings and state licensed facilities as required by section 326B.148.

**Subd. 4. Distribution.**

(a) This subdivision establishes the fee distribution between the state and municipalities contracting for plan review and inspection of public buildings and state licensed facilities.

(b) If plan review and inspection services are provided by the state building official, all fees for those services must be remitted to the state.

(c) If plan review services are provided by the state building official and inspection services are provided by a contracting municipality:

(1) the state shall charge 75 percent of the plan review fee required by the state's fee schedule in subdivision 2; and

(2) the municipality shall charge 25 percent of the plan review fee required by the municipality's adopted fee schedule, for orientation to the plans, in addition to the permit and other customary fees charged by the municipality.

(d) If plan review and inspection services are provided by the contracting municipality, all fees for those services must be remitted to the municipality in accordance with their adopted fee schedule.

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# Surcharge Requirements and Computations

## 2015 Minnesota Statutes

### 326B.148 SURCHARGE.

#### Subdivision 1. **Computation.**

To defray the costs of administering sections [326B.101](#) to [326B.194](#), a surcharge is imposed on all permits issued by municipalities in connection with the construction of or addition or alteration to buildings and equipment or appurtenances after June 30, 1971. The commissioner may use any surplus in surcharge receipts to award grants for code research and development and education.

If the fee for the permit issued is fixed in amount the surcharge is equivalent to one-half mill (.0005) of the fee or \$1, except that effective July 1, 2010, until June 30, 2015, the permit surcharge is equivalent to one-half mill (.0005) of the fee or \$5, whichever amount is greater. For all other permits, the surcharge is as follows:

- (1) if the valuation of the structure, addition, or alteration is \$1,000,000 or less, the surcharge is equivalent to one-half mill (.0005) of the valuation of the structure, addition, or alteration;
- (2) if the valuation is greater than \$1,000,000, the surcharge is \$500 plus two-fifths mill (.0004) of the value between \$1,000,000 and \$2,000,000;
- (3) if the valuation is greater than \$2,000,000, the surcharge is \$900 plus three-tenths mill (.0003) of the value between \$2,000,000 and \$3,000,000;
- (4) if the valuation is greater than \$3,000,000, the surcharge is \$1,200 plus one-fifth mill (.0002) of the value between \$3,000,000 and \$4,000,000;
- (5) if the valuation is greater than \$4,000,000, the surcharge is \$1,400 plus one-tenth mill (.0001) of the value between \$4,000,000 and \$5,000,000; and
- (6) if the valuation exceeds \$5,000,000, the surcharge is \$1,500 plus one-twentieth mill (.00005) of the value that exceeds \$5,000,000.

#### Subd. 2. **Collection and reports.**

All permit surcharges must be collected by each municipality and a portion of them remitted to the state. Each municipality having a population greater than 20,000 people shall prepare and submit to the commissioner once a month a report of fees and surcharges on fees collected during the previous month but shall retain the greater of two percent or that amount collected up to \$25 to apply against the administrative expenses the municipality incurs in collecting the surcharges. All other municipalities shall submit the report and surcharges on fees once a quarter but shall retain the greater of four percent or that amount collected up to \$25 to apply against the administrative expenses the municipalities incur in collecting the surcharges. The report, which must be in a form prescribed by the commissioner, must be

submitted together with a remittance covering the surcharges collected by the 15th day following the month or quarter in which the surcharges are collected.

A municipality that fails to report or submit the required remittance to the department in accordance with this subdivision is subject to the remedies provided by section [326B.082](#).

**Subd. 3. Revenue to equal costs.**

Revenue received from the surcharge imposed in subdivision 1 should approximately equal the cost, including the overhead cost, of administering sections [326B.101](#) to [326B.194](#).

To obtain more information for State  
surcharge <http://www.dli.mn.gov/CCLD/GovValue.asp>

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### **Local government building valuation data**

Building valuation data is taken from International Code Council tables and modified for Minnesota.

The building valuation data format provides average square-foot construction cost value using the International Building Code occupancy classifications and types of construction. Data provided is for comparison with valuations submitted by the applicant for permits. Costs are intended to include architectural, structural, electrical, plumbing and mechanical work.

**DLI strongly recommends that all municipalities actively evaluate and assess the impact of using this building valuation data table. This table is not the only source of data one could use in making building value determinations; there are many others. Checking with neighboring building departments as to what they use to determine valuation is always a good practice.**

**Remember, fees are to be fair, reasonable, and proportionate to the actual cost of the service for which the fee is imposed.**

See [Minnesota Rules, Chapter 1300.0160](#) regarding permit fee regulations, including permit fee schedules adopted by the municipality, permit fees commensurate with service, building permit valuations, permit fees based on valuation and plan review fees for similar plans.

To obtain more information for building valuations:  
<http://www.dli.mn.gov/CCLD/GovValue.asp>

# Submittal Documents

## 1300.0130 CONSTRUCTION DOCUMENTS.

**Subpart 1. Submittal documents.** Construction documents, special inspection and structural observation programs, and other data shall be submitted in one or more sets with each application for a permit.

**Exception:** The building official may waive the submission of construction documents and other data if the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with the code.

The building official **may require** plans or other data be prepared according to the rules of the Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design, chapter 1800, and Minnesota Statutes, sections 326.02 to 326.15, and other state laws relating to plan and specification preparation by occupational licenses. If special conditions exist, the building official may require additional construction documents to be prepared by a licensed design professional.

**Subp. 2. Information on construction documents.** Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed and show in detail that it will conform to the code and relevant laws, ordinances, rules, and regulations, as determined by the building official.

**Subp. 3. Manufacturer's installation instructions.** When required by the building official, manufacturer's installation instructions for construction equipment and components regulated by the code, shall be available on the job site at the time of inspection.

**Subp. 4. Site plan.** The construction documents submitted with the application for permit shall be accompanied by a site plan drawn to scale, showing the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades, and the proposed finished grades, and it shall be drawn according to an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official may waive or modify the requirement for a site plan if the application for permit is for alteration or repair or when otherwise warranted.

**Subp. 5. Examination of documents.** The building official shall examine or cause to be examined the accompanying construction documents to ascertain whether the construction indicated and described complies with the requirements of the code and other pertinent laws and ordinances.

**Subp. 6. Approval of construction documents.**

- A. If the building official issues a permit, the construction documents shall be approved in writing or by a stamp, stating "**Reviewed for Code Compliance,**" dated, and signed by the building official or an authorized representative. One set of the construction documents that were reviewed shall be retained by the building official. The other set

shall be returned to the applicant, kept at the site of the work, and open to inspection by the building official or an authorized representative.

- B. Any code deficiencies identified by the building official during the plan review process for construction documents that are prepared by a design professional who is licensed or certified under Minnesota Statutes, sections 326.02 to 326.15, must be itemized by the building official through a comprehensive plan review letter only. Any code deficiencies identified by the building official during the plan review process for construction documents that are not prepared by a licensed or certified design professional may be marked directly on the document or itemized by the building official through a comprehensive plan review letter. The issuance of a permit based on construction documents and other data does not prevent the building official from requiring the correction of errors in the construction documents and other data. All sets of required construction documents, including the site copy, municipality copy, or inspector copy, must be marked identically by the building official, with one copy retained by the building official after construction is completed. Work regulated by the code must be installed according to the reviewed construction documents. Work that does not comply with approved construction documents must not proceed until the applicant submits changes that are approved by the building official.

**Subp. 7. Previous approvals.** The code in effect at the time of application shall be applicable.

**Subp. 8. Phased approval.** The building official may issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of the code. The holder of the permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

**Subp. 9. Design professional in responsible charge.**

- A. The building official may require the owner to engage and designate on the building permit application a licensed design professional who shall act as the licensed design professional in responsible charge. If the circumstances require, the owner shall designate a substitute licensed design professional in responsible charge who shall perform the duties required of the original licensed design professional in responsible charge. The building official shall be notified in writing by the owner if the licensed design professional in responsible charge is changed or is unable to continue to perform the duties.

The licensed design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

When structural observation is required by the code, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

- B. For the purposes of this part, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the building official within a specified period.

Deferral of any submittal items shall have the prior approval of the building official. The licensed design professional in responsible charge shall list the deferred submittals on the construction documents for review by the building official.

Submittal documents for deferred submittal items shall be submitted to the licensed design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general conformance with the design of the building. The deferred submittal items shall not be installed until their design and submittal documents have been approved by the building official.

- C. Work regulated by the code shall be installed according to the reviewed construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

## Permit Application Requirements

### 1300.0120 PERMITS.

**1300.0120 Subp. 7. Application for permit.** To obtain a permit, the applicant shall first file an application in writing on a form furnished by the department of building safety for that purpose. Such application shall:

- A. Identify and describe the work to be covered by the permit for which application is made.
- B. Describe the land on which the proposed work is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or work.
- C. Indicate the use and occupancy for which the proposed work is intended.
- D. Indicate the type of construction.
- E. Be accompanied by construction documents and other information as required by this code.
- F. State the valuation of the proposed work.
- G. Be signed by the applicant, or the applicant's authorized agent.
- H. Give such other data and information as required by the building official.
- I. The license number of the contractor when required to be licensed in the State of Minnesota, **(required by MN Statutes 326B.85).**

## Building Permits

**1300.0120 subp. 8. Action on application.** The building official shall examine or cause to be examined applications for permits and amendments within a reasonable time after filing. If the application or the construction documents do not conform to the requirements of pertinent laws, the building official shall reject the application and notify the applicant, of the reasons. The building official shall document the reasons for rejecting the application. The applicant may request written documentation of the rejection and the reasons for the rejection. When the building official is satisfied that the proposed work conforms to the requirements of the code and applicable laws and ordinances, the building official shall issue a permit.

What this means is that the:

- Permit is an official document or record issued by the building official authorizing performance of a specified activity;
- Building official shall determine what document will be used as the permit that will be issued to the permit applicant;
- Building official may determine that the signed permit application inspection record card or a separate document shall be the official "building permit" for issuance.

The following items shall be identified on the building permit that you develop:

- Legal description of the property;
- Street address, or similar description that will readily identify and locate the proposed building or work;
- Scope of work being permitted;
- Name of the contractor;
- Name and address of the owner of the structure;
- Signature of the building official authorizing the issuance of the permit;
- Date of the issuance of the permit; and
- Permit number.

Sample building permit/permit applications have been provided on the following four pages.

"Sample"  
**Building Permit/Application**

DATE RECEIVED	RECEIVED BY	PERMIT #
---------------	-------------	----------

**Applicant Complete Information Below**

PROJECT ADDRESS	OR PID#
-----------------	---------

PROPERTY OWNER	PHONE #
----------------	---------

ADDRESS	CITY STATE ZIP CODE
---------	---------------------

GENERAL CONTRACTOR	LICENSE #	PHONE #
--------------------	-----------	---------

Proposed Use [check one]:     Dwelling     Private Garage     Deck     Home Addition     Pole Building

Finish Basement     Three Season Porch   

Business/Commercial

Furnace     Water Heater     Other     Fireplace     Siding

DESCRIPTION OF PROJECT: \_\_\_\_\_

DIMENSIONS	USE AND OCCUPANCY	TYPE OF CONSTRUCTION	ESTIMATED VALUE	LOT SIZE/DIMENSIONS
------------	-------------------	----------------------	-----------------	---------------------

This permit becomes null and void if work or construction authorized is not commenced within 180 days, or if construction or work is suspended or abandoned for a period of 180 days at any time after work has commenced. I hereby certify that I have read and examined this application and know the same to be true and correct. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or the performance of construction.

NAME [please print]	ADDRESS	STATE	ZIP CODE	CITY
---------------------	---------	-------	----------	------

SIGNATURE	DATE	PHONE #
-----------	------	---------

**City Use Only**

**PLANNING:**

ZONING DISTRICT	MINIMUM SETBACKS REQUIRED
	Front _____ Side _____ Rear _____
	Road Right of Way _____ Other: _____

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS: \_\_\_\_\_

**BUILDING:**

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS: \_\_\_\_\_

**PUBLIC WORKS:**

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS: \_\_\_\_\_

**Fees**

Building Permit _____	Plan Review _____	State Surcharge _____
-----------------------	-------------------	-----------------------

**TOTAL DUE:** \_\_\_\_\_

Date Issued: _____	Issued By: _____	Receipt # _____
--------------------	------------------	-----------------

City Address XXXXXXXX XXXXXXXXXXXXXXXX  
 If you have questions on code-items, required inspections or to schedule an inspection call: XXX-XXX-XXXX



"Sample"  
**Plumbing Permit/Application**

DATE RECEIVED	RECEIVED BY	PERMIT #
---------------	-------------	----------

**Applicant Complete Information Below**

PROJECT ADDRESS		OR PID#	
PROPERTY OWNER		PHONE #	
ADDRESS		CITY	STATE    ZIP CODE
PLUMBING CONTRACTOR		LICENSE #	PHONE #
ADDRESS		CITY	STATE    ZIP CODE
Proposed Work: <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Other			
USE AND OCCUPANCY	TYPE OF CONSTRUCTION	ESTIMATED VALUE (labor & materials)	NEW BUILDING <input type="checkbox"/> Yes <input type="checkbox"/> No
DESCRIPTION OF WORK			

This permit becomes null and void if work or construction authorized is not commenced within 180 days, or if construction or work is suspended or abandoned for a period of 180 days at any time after work has commenced. I hereby certify that I have read and examined this application and know the same to be true and correct. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or the performance of construction.

NAME [please print]	ADDRESS	STATE	ZIP CODE	CITY
SIGNATURE	DATE	PHONE #		

**City Use Only**

**BUILDING OFFICIAL:**

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS:

**PUBLIC WORKS:**

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS:

**Fees**

Plumbing Permit \_\_\_\_\_ Plan Review \_\_\_\_\_ State Surcharge \_\_\_\_\_  
 Other: \_\_\_\_\_

**TOTAL DUE:** \_\_\_\_\_

Date Issued: \_\_\_\_\_ Issued By: \_\_\_\_\_ Receipt # \_\_\_\_\_

If you have questions on code-items, required inspections or to schedule an inspection call:  
 XXX-XXX-XXXX

"Sample"  
**Mechanical Permit/Application**

DATE RECEIVED	RECEIVED BY	PERMIT #
---------------	-------------	----------

**Applicant Complete Information Below**

PROJECT ADDRESS	OR PID#
-----------------	---------

PROPERTY OWNER	PHONE #
----------------	---------

ADDRESS	CITY STATE ZIP CODE
---------	---------------------

MECHANICAL CONTRACTOR	MN BOND ID #	PHONE #
-----------------------	--------------	---------

ADDRESS	CITY STATE ZIP CODE
---------	---------------------

Proposed Work:  Residential  Commercial  Other

USE AND OCCUPANCY	TYPE OF CONSTRUCTION	ESTIMATED VALUE (labor & materials)	NEW BUILDING <input type="checkbox"/> Yes <input type="checkbox"/> No
-------------------	----------------------	-------------------------------------	---

DESCRIPTION OF WORK

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This permit becomes null and void if work or construction authorized is not commenced within 180 days, or if construction or work is suspended or abandoned for a period of 180 days at any time after work has commenced. I hereby certify that I have read and examined this application and know the same to be true and correct. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or the performance of construction.

NAME [please print]	ADDRESS	STATE	ZIP CODE	CITY
---------------------	---------	-------	----------	------

SIGNATURE	DATE	PHONE #
-----------	------	---------

**City Use Only**

**BUILDING OFFICIAL:**

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS:

---

**Fees**

Mechanical Permit \_\_\_\_\_ Plan Review \_\_\_\_\_ State Surcharge \_\_\_\_\_

Other: \_\_\_\_\_

**TOTAL DUE:** \_\_\_\_\_

Date Issued: \_\_\_\_\_ Issued By: \_\_\_\_\_ Receipt # \_\_\_\_\_

City address XXXXXXXXXXXXXXXXXXXXXXXXX  
 If you have questions on code-items, required inspections or to schedule an inspection call:  
 XXX-XXX-XXXX

# Residential Combustion Air Calculation Worksheet E-1

## 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 assist)

Fan Assisted  
& Power Vent

Direct Vent

Input: \_\_\_\_\_ Btu/hr

Water Heater:

\_\_\_ Draft Hood  
(Not fan assist)

Fan Assisted  
& Power Vent

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<sup>3</sup>

**Step 3: Determine Air Changes per Hour (ACH)<sup>1</sup>**

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<sup>3</sup>

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 and power vent 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<sup>3</sup>

Total Btu/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<sup>3</sup>

Total Required Volume (TRV) = RVFA + RVNFA

TRV = \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ ft<sup>3</sup>

If CAS Volume (Step 2) is **greater than** TRV, then no outdoor openings are needed.

If CAS Volume (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

Input: \_\_\_\_\_

Btu/hr

(EXCEPT DIRECT VENT)

Combustion Air opening Area (CAOA):

Total Btu/hr **divided by** 3000 Btu/hr per in<sup>2</sup>

CAOA = \_\_\_\_\_ / 3000 Btu/hr per in<sup>2</sup> = \_\_\_\_\_ in<sup>2</sup>

**Step 8: Calculate Minimum CAO A.**

Minimum CAO A = CAO A **multiplied by** RF

Minimum CAO A = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ in<sup>2</sup>

**Step 9: Calculate Combustion Air Opening Diameter (CAOD)**

CAOD = 1.13 **multiplied by the square root of** minimum CAO A

CAOA = 1.13 x  $\sqrt{\text{Minimum CAO A}}$  = \_\_\_\_\_ in

<sup>1</sup> If desired, ACH can be determined using ASHRAE calculation or blower door test. Follow procedures in Section 304.

## Makeup Air Quantity for Exhaust Equipment Table 501.4.1

Table 501.4.1				
Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling Unit				
	One or multiple power vent or direct vent appliances or no combustion appliances <sup>A</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>B</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>C</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>D</sup>
1. Use the Appropriate Column to Estimate House Infiltration				
a) pressure facture (CFM/SF)	0.15	0.09	0.06	0.03
b) conditioned floor area (sf) (includes unfinished basements)				
Estimated House Infiltration (cfm) [ 1a x 1b ]				
2. Exhaust Capacity				
a) clothes dryer (cfm)	135	135	135	135
b) 80% of largest exhaust rating (cfm): (Not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)				
c) 80% of next largest exhaust rating (cfm): (Not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)	Not applicable			
Total Exhaust Capacity (cfm): [2a + 2b + 2c]				
3. Makeup Air Requirements				
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 <i>Makeup Air</i> Opening Sizing. Refer to Table 501.4.2				

<sup>A</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil *appliances* or if there are no *combustion appliances*.

<sup>B</sup> Use this column if there is one fan-assisted *appliance* per venting system. Other than atmospherically vented *appliances* may also be included.

<sup>C</sup> Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil *appliance* per venting systems or one solid fuel *appliance*.

<sup>D</sup> 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*.

**TABLE 501.4.2 MAKEUP AIR OPENING SIZING TABLE FOR NEW AND EXISTING DWELLING UNITS**

TABLE 501.4.2 MAKEUP AIR OPENING SIZING TABLE FOR NEW AND EXISTING DWELLING UNITS					
TYPE OF OPENING OR SYSTEM	ONE OR MULTIPLE POWER VENT OR DIRECT VENT APPLIANCES OR NO COMBUSTION APPLIANCES <sup>A</sup>	ONE OR MULTIPLE FAN-ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES <sup>B</sup>	ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE <sup>C</sup>	MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES <sup>D</sup>	PASSIVE MAKEUP AIR OPENING DUCT DIAMETER <sup>E, F, G</sup>
	(cfm)	(cfm)	(cfm)	(cfm)	(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 <sup>H</sup>	> 679	> 419	> 290	> 179	Not applicable

<sup>A</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil *appliances* or if there are no *combustion appliances*.

<sup>B</sup> Use this column if there is one fan-assisted *appliance* per venting system. Other than atmospherically vented *appliances* may also be included.

<sup>C</sup> 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*.

<sup>D</sup> 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*.

<sup>E</sup> 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.

<sup>F</sup> If flexible duct is used, increase the duct diameter by one inch. Flexible duct shall be stretched with minimal sags.

<sup>G</sup> Barometric dampers are prohibited in passive *makeup air* openings when any atmospherically vented *appliance* is installed.

<sup>H</sup> Powered *makeup air* shall be electrically interlocked with the largest exhaust system.

## **1322.0103 CONSTRUCTION DOCUMENTS.**

**1322.0103 Construction Documents.** Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems, and equipment as herein governed. The details shall include the following when applicable:

- A. Insulation materials and their R-values;
- B. Fenestration U-factors and SHGCs;
- C. Area-weighted U-factor and SHGC calculations;
- D. Mechanical system design criteria;
- E. Mechanical and service water heating system and equipment types, sizes, and efficiencies;
- F. Equipment and systems controls;
- G. Fan motor horsepower (hp) and controls;
- H. Duct sealing, and the location and insulation of ducts and pipes;
- I. Lighting fixture schedule with wattage and control narrative; and
- J. Air sealing details.

**MN Residential Energy Code (RE) Section R401.3 Building certificate.** A building certificate shall be posted on or in the electrical distribution panel by the builder or design professional, and posted in a manner that does not cover or obstruct the visibility of the circuit directory label, service disconnect label, or other required labels.

The “New Construction Energy Compliance Certificate” (pictured on the next page) could be also be used to satisfy the submittal requirements of 1322.0103.

# New Construction Energy Code Compliance Certificate

Per R401.3 Certificate. A building certificate shall be posted on or in the electrical distribution panel.				Date Certificate Posted		<b>Place your logo here</b>			
Mailing Address of the Dwelling or Dwelling Unit				City					
Name of Residential Contractor				MN License Number					
<b>THERMAL ENVELOPE</b>						<b>RADON CONTROL SYSTEM</b>			
Insulation Location						Type: Check All That Apply			
						Total R-Value of all Types of Insulation		Non or Not Applicable	Fiberglass, Blown
						Passive (No Fan)			
						Active (With fan and monometer or other system monitoring device)			
						Location (or future location) of Fan:			
						Other Please Describe Here			
Below Entire Slab									
Foundation Wall									
Perimeter of Slab on Grade									
Rim Joist (1st Floor)									
Rim Joist (2nd Floor+)									
Wall									
Ceiling, flat									
Ceiling, vaulted									
Bay Windows or cantilevered areas									
Floors over unconditioned area									
Describe other insulated areas									
<b>Building Envelope Air Tightness:</b>				<b>Duct System Air Tightness:</b>					
<b>Windows &amp; Doors</b>				<b>Heating or Cooling Ducts Outside Conditioned Spaces</b>					
Average U-Factor (excludes skylights and one door) U:				Not applicable, all ducts located in conditioned space					
Solar Heat Gain Coefficient (SHGC):				R-value					
<b>MECHANICAL SYSTEMS</b>						<b>Make-up Air Select a Type</b>			
<b>Appliances</b>		<b>Heating System</b>		<b>Domestic Water Heater</b>		<b>Cooling System</b>			
Fuel Type						Not required per mech. code			
Manufacturer						Powered			
Model						Interlocked with exhaust device. Describe:			
Rating or Size		Input in BTUS:		Capacity in Gallons:		Output in Tons:			
Efficiency		AFUE or HSPF%		SEER /EER		Other, describe:			
<b>Residential Load Calculations</b>		<b>Heating Loss</b>		<b>Heating Gain</b>		<b>Cooling Load</b>			
						Location of duct or system:			
						CFMs			
						"round" duct OR			
						"metal" duct			
<b>MECHANICAL VENTILATION SYSTEM</b>						<b>Combustion Air Select a Type</b>			
Describe any additional or combined heating or cooling systems if installed: (e.g. two furnaces or air source heat pump with gas back-up furnace):						Not required per mech. code			
<b>Select Type</b>						Passive			
Heat Recovery Ventilator (HRV) Capacity in CFMs:		Low:		High:		Other, describe:			
Energy Recovery Ventilator (ERV) Capacity in CFMs:		Low:		High:		Location of duct or system:			
Balanced Ventilation Capacity in CFMs:									
Location of fans(s), describe:						CFMs			
Capacity of continuous ventilation rate in CFMs:						"round" duct OR			
Total ventilation (intermittent + continuous) rate in CFMs:						"metal" duct			

# Architecture and Engineering Requirements

## 1322.0130 CONSTRUCTION DOCUMENTS.

**1300.0130 Subp. 1. Submittal documents.** Construction documents, special inspection and structural observation programs and other data shall be submitted in one or more sets with each application for a permit.

**Exception:** The building official may waive the submission of construction documents and other data not if the nature of the work applied for is such that reviewing the construction documents is not necessary to obtain compliance with the code.

The building official may require plans or other data be prepared according to the rules of the Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design, chapter 1800, and Minnesota Statutes sections 326.02 to 326.15, and other state laws relating to plan and specification preparation by occupational licenses. If special conditions exist, the building official may require additional construction documents to be prepared by a licensed design professional.

The following pages are excerpts from the Minnesota Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design publication, Minnesota Rules 1800.

<http://mn.gov/aelslagid/>

**Minnesota Board of Architecture, Engineering, Land Surveying,  
Landscape Architecture, Geoscience and Interior Design**

<http://mn.gov/aelslagid/>

**Building Officials' Quick Reference to Professional Licensing  
Statutes and Rules**

This overview does not address all details or circumstances.  
Refer to the statutes and rules, or contact the Board office, for additional information.

**1. Professional Practice Requirements**

- a. Drawings, specifications, plats, reports, and other documents (i.e. shop drawings for reinforcing steel, embedment plates, welded studs, structural steel, pre-fabricated concrete, spray-on fire protection systems, cold form steel framing systems, plan addenda or changes, requests for information [RFIs], and others similar) for construction (new or remodel) shall be prepared by, or under the direct supervision of, licensed professionals, unless specifically exempted by statute or rule.
- b. Such documents shall be certified by the responsible licensed professional, including required "I hereby certify..." language, printed name, license number, signature and date.
- c. Minimum expected documentation contents for code official submission: definition of scope of work, building code compliance, life safety, architectural barriers, structural integrity, mechanical and electrical systems.
- d. Incidental practice is not authorized. For example, architects cannot practice professional engineering, and engineers cannot practice architecture.
- e. Minnesota does not license engineers by discipline. Adequate engineering documents may not be rejected merely because the responsible engineer tested in a discipline other than that embodied in the documents.

**2. Statutory Exceptions (Minnesota Statutes 326.02, Subd. 5 and 326.03, Subd. 2)**

- a. Projects for exclusive occupancy or use by preparer.
- b. Contractor's shop drawings that are to be reviewed and certified by the design professional.
- c. Planning for work of licensed electrical contractor or master plumber, where such work is within the scope of such licensed activity and not within the practice of professional engineering or architecture.
- d. Dwellings for single families, and associated outbuildings such as barns and private garages.
- e. Two family dwellings
- f. Any farm building or accessory thereto
- g. Temporary buildings or sheds used exclusively for construction purposes, not exceeding two stories in height, and not used for living quarters

**3. Remodeling Exceptions (Minnesota Rule 1800.5200 Subp. 3)**

- a. Remodeling or renovation of an existing building, structure, or work which does not change any of the following:
  - i. The load on its mechanical or electrical systems, or the live or dead load on its structural systems, such that a violation of the MSBC might occur
  - ii. A building's access or exit pattern such that a violation of the MSBC might occur
  - iii. The MSBC occupancy classification of the building
- b. Remodeling or renovation in an exempt class of building (see item 4 below) which does not disqualify it from its exemption.

**4. Building Class Exceptions (Minnesota Rule 1800.5200 Subp. 4)**

- a. See exemption table inside.
- b. Exceptions in table do not apply to:
  - i. A second new building to be constructed by the same person on the same parcel or a contiguous parcel to a new building previously exempted
  - ii. An addition to an existing building where the existing building exceeds the exemption size thresholds if the addition results in changes as indicated in 3a above.
  - iii. New construction within a larger building (e.g., individual shops within a shopping center) where the larger building exceeds the exemption size thresholds if the new construction results in changes as indicated in 3a above.
- c. Notwithstanding these exceptions, the responsible building official may require plans and specifications to be designed and prepared by a licensed architect or engineer if the official finds a hazard to life, health, safety, or welfare due to the unusual circumstances of the building or structure or an unusually large number of potential occupants in relation to square footage for a particular use. (Minnesota Rule 1800.5400).

**5. Submittal of Plans and Specifications (Minnesota Rule 1800.5300)**

Exercise of the exceptions in items 3 and 4 above requires that the building permit applicant provide the responsible building official with two sets of plans and specifications for the building or remodeling, containing the name and address of the preparer of the plans and specifications, and the preparer's certification that reasonable care has been given to compliance with applicable laws, ordinances, and building codes relating to design.

Contact the Board office to:

Obtain additional information as to licensing or certification requirements.

Verify the status of a professional license.

File a compliant.

Contact Information:

MINNESOTA BOARD OF ARCHITECTURE, ENGINEERING, LAND SURVEYING,  
LANDSCAPE ARCHITECTURE, GEOSCIENCE, AND INTERIOR DESIGN

85 East 7th Place, Suite 160, St. Paul, MN 55101

Voice 651.296.2388 Fax 651.297.5310

<http://mn.gov/aelslagid/>

This publication is intended for general information only. The language in Minnesota Statutes and Rules controls, and is subject to periodic change. Please refer to the current statutes and rules, which are available at the Board’s Web site.

**1800.5900 CLASSES OF BUILDINGS.**

In accordance with Minnesota Statutes, sections 326.02, subdivision 5, and 326.03, subdivision 2, the following classes of buildings are exempt subject to the limitations of the elements listed below:

<b>Classifications</b>	<b>Elements that must be met to be exempt*</b>
Assembly (as defined by the MSBC under occupancy group A2: Dining and drinking less than 50 persons)	Not greater than 1-story with no basement; and Seating for not more than 20 persons; and Not greater than 1,000 Gross Square Footage (GSF)
Business (as defined by the MSBC under occupancy group B)	Not greater than 2-story with a basement; and Not greater than 2250 GSF
Factory (as defined by the MSBC under occupancy group F2)	Not greater than 1-story with no basement; and Not greater than 3,000 GSF
Mercantile (as defined by the MSBC under occupancy group M)	Not greater than 2-story with a basement; and Not greater than 1,500 GSF
Residential (as defined by the MSBC under occupancy group, R)	Apartment houses/condominiums (3 units or less), dwellings, lodging houses, attached single family dwellings/townhomes, and congregate residences (each accommodating 10 persons or less)
Storage (as defined by the MSBC under occupancy group S1: Aircraft hangars and helistops)	Not greater than 1-story with no basement; and Not greater than 3,000 GSF
Storage (as defined by the MSBC under occupancy group S2 except for parking garages, open or enclosed)	Not greater than 1-story with no basement; and Not greater than 5,000 GSF
Utility (as defined by the MSBC under occupancy group U except for fences higher than 8 feet, tanks and towers, and retaining walls with over 4 feet of vertical exposed face)	Not greater than 1-story with no basement; and Not greater than 1,000 GSF

\* All terms used in this table shall be as defined by the Minnesota State Building Code.

INSTRUCTION TO REVISOR. The revisor of statutes shall change references in Minnesota Rules from parts “1800.5700” and “1800.5800” to part “1800.5900.

REPEALER: Minnesota Rules, part 1800.5800, is repealed.

# Guidelines for Special Inspection and Testing

**Purpose:** To provide a method for complying with requirements of the Minnesota State Building Code 2015, Section 1704 – Special Inspections.

**Before Permit Issuance:** The architect or engineer of record shall prepare and submit a Special Structural Testing and Inspection Program to the building official. The Program may be included in the contract documents or as a separate submittal document. The completed Program Summary Schedule should include the following:

1. A specific listing of the items requiring special inspection (observation and testing).
2. The associated technical scope sections, which define the applicable standard to judge conformance of construction work and describe the duties of special inspectors.
3. The type of special inspector required for each item.
4. The frequency of reporting, i.e., weekly, monthly, per test/inspection, per floor, etc.
5. The parties responsible for performing the special inspections.
6. Acknowledgements by each designated party.

**Requirements:** “Special Inspection” includes inspection (work requiring observation and engineering judgment) and testing (work analyzing materials in accordance with approved standards). Special Inspection shall meet the minimum requirements of the *Minnesota State Building Code*, which includes IBC Section 1704, and the approved drawings and specifications. Special inspectors shall be employed by the owner or engineer/architect of record, but not the contractor. Special Inspection shall not relieve the contractor of responsibility to complete the work in accordance with the approved drawings and specifications.

**Guideline Program:** To assist with standardization of Special Inspections and Testing, the Council of American Structural Engineers/Minnesota Chapter (CASE/MN) <http://www.acecmn.org> developed a *Guideline Program for Special Structural Testing and Inspection, 5<sup>th</sup> Edition*. The document is intended to identify items critical to the structural integrity of buildings and clearly outline the responsibilities of parties involved in design, construction, testing, and inspection. An excerpt regarding responsibilities is included in the following paragraph. Copies of this **voluntary-use** document can be obtained through the American Council of Engineering Companies/Minnesota (ACEC/MN) office at (952) 593-5533.

## 1.5 Responsibilities

### A. Special Structural Testing and Inspection

1. Special Inspectors:
  - a. Sign the Special Structural Testing and Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.
  - b. If requested, attend a pre-construction meeting to review the scope of special structural testing and inspection.
  - c. Test and/or inspect the work assigned for conformance with the building department approved design drawings, specifications and applicable material and workmanship provisions of the Code. Perform testing and inspection in a timely manner to avoid delay of work.

- d. Bring discrepancies to the immediate attention of the contractor for correction, then, if uncorrected after a reasonable period of time, to the attention of the structural engineer of record, the building official, and to the architect.
  - e. Submit test and/or inspection reports to the building official, contractor, the structural engineer of record, and other designated persons in accordance with the Special Structural Testing and Inspection Summary Schedule.
  - f. Submit a final signed report stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications and the applicable workmanship provisions of the Code.
2. Architect of Record (or other prime consultant):
    - a. Complete and sign the Special Structural Testing and Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction. Provide a completed copy of the schedule to all signed parties including the building official.
    - b. If appropriate, arrange and attend a pre-construction meeting to review the scope of special structural testing and inspection. Include contractor, building official, SER, testing agency and other parties concerned.
    - c. Coordinate the flow of reports and related information to expedite resolution of construction issues.
3. Structural Engineer of Record (SER):
    - a. Identify items requiring special structural testing and inspection including special cases.
    - b. Define "type" of special inspector required for "description" of work indicated on the special structural testing and inspection schedule.
    - c. Complete and sign the Special Structural Testing and Inspection Summary Schedule prior to commencement of construction.
    - d. If requested, attend a pre-construction meeting to review the scope of special structural testing and inspection.
    - e. Review reports submitted by special inspectors.
    - f. If engaged as a special inspector, provide special structural testing and inspection services as previously described.
4. Testing Agency:
    - a. Sign the Special Structural Testing and Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.
    - b. If requested, attend a pre-construction meeting to review the scope of special structural testing and inspection.
    - c. When engaged as a special inspector, provide special structural testing and inspection services as previously described.

5. Contractor:
  - a. Sign the Special Structural Testing and Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.
  - b. If requested, attend a pre-construction meeting to review the scope of special structural testing and inspection.
  - c. Post or make available the Special Structural Testing and Inspection Summary Schedule within its office at the job site. Also, provide adequate notification to those parties designated on the schedule so they may properly prepare for and schedule their work.
  - d. Provide the special inspectors access to the approved drawings and specifications at the job site.
  - e. Review reports submitted by special inspectors.
  - f. Retain at the job site all reports submitted by the special inspectors for review by the building official upon request.
  - g. Correct, in a timely manner, deficiencies identified in inspection and/or testing reports.
  - h. Provide the special inspector safe access to the work requiring inspection and/or testing.
  - i. Provide labor and facilities to provide access to the work and to obtain, handle and deliver samples, to facilitate testing and inspection and for storage and curing of test samples.
  - j. Verification of conformance of the work within specified construction tolerances is solely the contractor's responsibility.
  
6. Fabricator:
  - a. Sign the Special Structural Testing and Inspection Summary Schedule in conjunction with other responsible parties prior to commencing construction.
  - b. Submit a Certificate of Compliance to the building official, special inspector, and structural engineer of record that the work was performed in accordance with the approved plans and specifications.
  
7. Building Official (Typical responsibilities noted for information only):
  - a. Determine work which, in the building official's opinion, involves unusual hazards or conditions in accordance with the Minneosta State Building Code.
  - b. Review special inspector qualifications.
  - c. Accept and sign the completed Special Structural Testing and Inspection Summary Schedule.
  - d. Review all fabricators who perform work in their shop, which requires special inspection.
  - e. Review reports and recommendations submitted by the special inspectors.
  - f. Review and retain in the municipalities' official record the final signed reports submitted by the special inspector(s). These documents should be accepted and approved by the building department prior to issuance of a Certificate of Occupancy.

8. Owner:
  - a. Establish direct funding to provide for cost of special structural testing and inspection services.
  - b. Provide special inspector with approved design drawings, specifications and approved shop drawings.
  - c. Sign the Special Structural Testing and Inspection Summary Schedule in conjunction with other responsible parties prior to commencement of construction.

<http://www.dli.mn.gov/CCLD/Codes.asp> (See Helpful Information)

**Special Structural Testing and Inspection Schedule  
Program Summary Schedule**

Project Name \_\_\_\_\_ Project No. \_\_\_\_\_  
 Location \_\_\_\_\_ Permit No. \_\_\_\_\_ (1)

Technical (2)		Description (3)	Type of Inspector (4)	Report Frequency (5)	Assigned Firm (6)
Section	Article				

Notes: This schedule shall be filled out and included in the Special Structural Testing and Inspection Program.

- (1) Permit No. to be provided by the Building Official.
- (2) Referenced to the specific technical scope section in the program.
- (3) Use descriptions per IBC Section 17, as adopted by Minnesota State Building Code.
- (4) Special Inspector - Technical, Special Inspector - Structural.
- (5) Weekly, monthly, per test/inspection, per floor, etc.
- (6) Firm contracted to perform services.

**ACKNOWLEDGEMENTS**

Each appropriate representative shall sign below:

Owner:	Firm:	Date:
Contractor	Firm:	Date:
:		
Architect:	Firm:	Date:
SER:	Firm:	Date:
SI-S:	Firm:	Date:
SI-T:	Firm:	Date:
TA:	Firm:	Date:
F:	Firm:	Date:

If requested by engineer/architect of record or building official, the individual names of all prospective special inspectors and the work they intend to observe shall be identified.

Legend: SER = Structural Engineer of Record  
 SI-T = Special Inspector – Technical  
 TA = Testing Agency  
 SI-S = Special Inspector – Structural  
 F = Fabricator

Accepted for the Building Department by: \_\_\_\_\_ Date: \_\_\_\_\_

<http://www.dli.mn.gov/CCLD/Codes.asp> (See Helpful Information)

**Structural Testing and Special Inspection  
Program Summary Schedule**

Project Name \_\_\_\_\_ Project No. \_\_\_\_\_  
 Location \_\_\_\_\_ Permit No. \_\_\_\_\_ (1)

Technical (2)		Description (3)	Type of Inspector (4)	Report Frequency (5)	Assigned Firm (6)
Section	Article				

Notes: This schedule shall be filled out and included in the Structural Testing and Special Inspection Program.

- (1) Permit No. to be provided by the Building Official.
- (2) Referenced to the specific technical scope section in the program.
- (3) Use descriptions per IBC Section 1704, as adopted by Minnesota State Building Code.
- (4) Special Inspector - Technical, Special Inspector – Structural, Testing Agency.
- (5) Weekly, monthly, per test/inspection, per floor, etc.
- (6) Firm contracted to perform services.

## Alternative Methods and Materials Proposals:

Construction methods, materials and technologies are always evolving. Building codes however, are static in nature, as they are developed and adopted on cyclical basis that perpetuates “outdated” code provisions even upon their most recent adoption. To that end, the State Building Code provides for “alternative means and methods” to allow the code official an opportunity to review or examine modern conditions, materials or methods not specifically addressed or allowed by the code. To consider an alternative method or material is an option. An applicant always has the opportunity to request this; as such, the code official must consider it. This is supported by Minnesota statute 326B.101 where it states in part..... “ the code shall provide for the use of modern methods, devices, materials, and techniques which will in part tend to lower construction costs.” In the Minnesota State Building Code, Minnesota Rule 1300.0110, Subpart 13 states:

***“The code is not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by the code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety. The details of any action granting approval of an alternate shall be recorded and entered into the files of the code enforcement agency.”***

The building code (and state statute) mandate that the code official consider an alternate design request, but it is up to the code official to determine if the proposal meets with the intent of the code. The code official may deny a proposal if they determine that it does not meet with the prerequisites of what is minimally expected by the code for an alternate design, method, material, or work offered.

Under an alternate design application, the code official should receive the following minimal information with the alternate request:

- ✓ An application for a request to use an alternate design or method of construction (see attached), or a letter from the applicant/design profession specifically requesting the code official consideration of the request.
- ✓ Identifies the exact project and site address where the alternate would be used.
- ✓ The request must clearly identify the design condition and building areas affected by the proposal.
- ✓ The request must detail the exact code sections the proposed alternate or modification would violate the code.
- ✓ The request must include exact information on what is being proposed in lieu of the specific code requirement(s).
- ✓ The request must include supporting information/documentation to substantiate that the alternate material, method or work offered is, for the purpose intended, at least equivalent of that prescribed in the code in terms of suitability, strength, effectiveness,

fire-resistance, durability, safety and sanitation. This may include testing criteria, manufacturers data, history of a materials performance results, etc.

- ✓ If other elements or components are to be “built-in” or included with the alternate proposal, those items should also be identified. Examples include life safety elements that are installed in addition to what the code would otherwise minimally require, like alarms or sprinklers, or fire resistive construction, etc.
- ✓ If special or third party testing is proposed or required, the applicant should identify this and provide an outline that would include information such as who would do the inspections, what inspections would be performed, the times and intervals of inspections, performance expectations, final reporting, costs, etc.
- ✓ If regular or annual maintenance is required or expected, the applicant should identify the conditions. Operational and/or maintenance agreements or contracts should also be proposed and submitted along with the schedules.
- ✓ The applicant needs to sign and date the request and submit all data to the code official for their consideration.

The code official needs to review the application and supporting documentation and make the final determination on its acceptance. If deemed necessary, the code official may use third party consultants and/or testing agencies to assist in making a final determination. Whether accepted or not, the code official must provide a written document outlining his/her conclusion on the proposal. All documentation must then be filed in the municipal property files and maintained indefinitely.

It should be noted that because the building department is a regulatory agency, by virtue of its function, it is vulnerable and susceptible to legal attack at any time. The refusal to consider an alternate design proposal could, in itself, precipitate a legal action. Notwithstanding, the basis for accepting or denying an alternate design proposal should therefore be exercised under considerable thought, regardless of the outcome.

### **Checklist of items that must be addressed in a proposal for an “alternative material, design, or method of construction”**

#### **Requirements**

#### **1300.0110, Subp. 13. Alternative materials, design, and methods of construction and equipment.**

“The code is not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by the code, provided that any alternative has been approved. An alternative material, design, or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the code, and that the material, method, or work offered is, for the purpose intended, at least the equivalent of that prescribed in the code in quality, strength, effectiveness, fire resistance, durability, and safety. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.”

### **Appropriately prepared “Alternative”**

In accordance with the above, a completed alternate must document how the design *...complies with the intent of the code, and [how] the material, method, or work offered is...at least the equivalent of that prescribed in the code in quality, strength, effectiveness, fire resistance, durability, and safety.* This must be contained in the form of a **written request** that includes the following information:

- A. An overview statement that summarizes the request.
- B. Name of project and site address or location.
- C. Specifics about the building or structure including the: type of construction; occupancy classification; number of stories; floor area; and other code features relevant to the issue.
- D. Citation and description of the specific code requirement and how it applies in this building.
- E. The negative result(s) by literally complying with the code requirement. Elaborate on each and include details regarding costs, hardships, difficulty, and/or impracticality of literal code compliance.
- F. Specifics of the alternate being proposed. Include technical details and plans if necessary.
- G. How this alternate complies with the intent of the code
- H. How this alternate material, method, or work is at least the equivalent of that prescribed in the code in quality, strength, effectiveness, fire-resistance, durability, and safety.
- I. Applicable test results, product listing, or alternate compliance standards.
- J. Signature and date of the applicant. Applicant must be the architect or engineer of record if the alternate is a modification of an original licensed design. However, alternates may reference work prepared by consultants.

Project Name: \_\_\_\_\_  
No.

## ALTERNATE DESIGN/METHOD/MATERIAL APPLICATION

<b>SITE</b>	Project Title		County
	Project Site address		City, Zip
<b>OWNER</b>	Owner		Contact Person
	Owner Address		Phone No (    )
	City, State, Zip		Fax No (    )
<b>CONTR.</b>	Contractor	Contractor License No	Contact Person
	Contractor Address		Phone No (    )
	City, State, Zip		Fax No (    )
<b>DESIGN FIRM</b>	Designer		Contact Person
	Firm Address		Phone No (    )
	City, State, Zip		Fax No (    )
<b>APPLICANT</b>	Alternative Provision Applicant Is: <input type="radio"/> Owner <input type="radio"/> Designer <input type="radio"/> Contractor <input type="radio"/> Other; specify		
	Applicant's Printed Name		Applicant's Phone No (    )
	Applicant's Address		Applicant's Fax No (    )
	City, State, Zip		Applicant's License No (If Applicable)
<b>ALTERNATE</b>	<u>Permit Number:</u>	<u>Current Code Edition:</u>	<u>Date:</u>
	Description of Alternate Design/Method/Material:		
<p><b><i>Pursuant to MSBC 1300.0110, Subpart 13, I hereby apply for authorization to deviate from the standard minimum requirements of the Minnesota State Building Code by use of an alternate material, design, and/or method as described in this application. I acknowledge that information in this submittal is complete and accurate; that this is not a permit; that the work will be performed in accordance with the conditions of this authorization, the approved plans and specifications, and the Minnesota State Building Code; and, that I will cause the work to remain accessible and exposed for inspection purposes. I also acknowledge that this design alternative privilege may be revoked at any time upon evidence that the alternative construction condition has been violated in any way.</i></b></p>			
Applicant Signature			Date

## ALTERNATE DESIGN/METHOD/MATERIAL APPLICATION

**An alternative design, method or material must be shown to meet the intent of the code and be equivalent to the code in terms of quality, strength, durability, effectiveness, fire-resistance, safety and sanitation. If these are not, or cannot be evidenced, then the alternate design, method or material shall not be accepted. Acceptance of this provision is not intended to represent a "variance" to minimum standards required of the code.**

<b>ALTERNATE DESIGN/METHOD/MATERIAL</b>	Clearly identify the specific code section(s) this alternative relates to:	
	Identify the original intent of the code provisions identified above:	
	Describe the elements of those provisions where an alternative is desired:	
	Identify why this specific alternative is being proposed:	
	Substantiate how the proposed alternate provides an equivalency in terms of quality, strength, effectiveness, fire resistance, durability and/or safety when compared to the specific requirement(s) of the code. (Attach additional information if necessary.)	
<b>SYNOPSIS OF DESIGN</b>	<b>Please attach all information evidencing or demonstrating that the proposed alternate meets accepted standards, testing, certification, guidelines, or computability with conditions required by code. Engineering computations, modeling, references, assumptions, factors of safety and data input and anticipated output should also be documented.</b>	
	<b>If Special or Third Party Inspection is required, the applicant shall specify exactly where and when said inspections are required, and who will be performing each required inspection. If necessary, a Special Inspections Agreement must be completed and submitted with this application.</b>	
	<b>Where building use functions or restrictions are required (e.g., yard limitations, maintenance schedules, special security measures, training, periodic inspections, etc.), said conditions shall be documented with a schedule identifying the intricacies and relationships of the proposal. Copies of proposed Deed restrictions shall also be submitted for review.</b>	
	<b>The Building Department has the responsibility to review design submittal(s) for compliance with the current adopted codes and department procedures. If the Department does not have the technical expertise to make a thorough and competent review, a third party or other resource may be used. If so, costs associated with the review will be charged to the applicant.</b>	
<b>For Office Use Only</b>		
Building Official Approval:	Assigned Alternate Number:	Date:
Conditions of Approval:		Expiration of Approval:

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# Plan Review

The Building Official of a municipality is charged with the responsibility of enforcing the Minnesota State Building Code. On the surface one may think that the least complicated means of enforcement would be to inspect the work in progress on the site to ensure code compliance. The designer and builder should know before costly outlays, what changes to the design must be made to conform to the State Building Code. This reason alone is sufficient justification for conducting a plan review prior to work on site. The Building Official legally is required to approve the building before issuance of any permit for construction according to Minnesota Rule 1300.0130 subpart 5.

Most projects requiring a building permit must be accompanied with building plans and specifications regardless of the size and scope of the project. Construction documents shall be dimensioned and drawn upon suitable material. Electronic documents are permitted to be submitted when approved by the Building Official. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed, and show in detail that it will conform to the code and relevant laws, ordinances, rules, and regulations as determined by the building official. A thorough plan review can head off problems that may arise in the field later. (MN rules 1300.0130)

## **Department Processes and Requirements:**

### **“Front Counter” interaction and plan review effectiveness**

- Identify yourself/department personnel (names/numbers, etc.)
- Define required submittals completely
- Review plan review process and inspections requirements thoroughly
- Identify required/necessary time frames for plan review and inspections
- Verify submittal document accuracy/completeness
- Verify project alternatives/summary (scope of project)
- Identify customer contact method (when/how)
- Identify “known” code issues up front - right away
- Identify “other” required agency reviews (state/local) and time constraints if known. Let the applicant know if they need to submit plans to other agencies as well as your own.
- Identify who will disburse required submittals to other agencies as/if required
- Document date/time plan submittal received on application and plans (initial)
- Identify/verify required licensing (state or local)
- Identify process for notification of “issues” and how applicant is expected to respond
- Identify process for plan review/construction authorization and Building Permitting.
- Apply and interpret codes and process uniformly/consistently

## **Permit Application Form(s)**

- Identify and describe the work to be covered by the permit for which application is made;
- Describe the land on which the proposed work is to be done by legal description, street address, or similar description that will readily identify and definitely locate the proposed building or work;
- Indicate the use and occupancy for which the proposed work is intended;
- Indicate the type of construction;
- Be accompanied by construction documents and other information as required by the code; State the valuation of the proposed work;
- Be signed by the applicant, or the applicant's authorized agent;
- Give other data and information required by the building official. Property address and legal description

## **Beneficial Plan Review Procedures and Practices:**

- Identify land use/zoning issues immediately (at front counter is necessary)
- Prior to the start of any large-scale project, promote a preliminary plan review meeting to correct and identify major code issues as soon as possible
- If a "third-party" review will be required, notify applicant immediately. Discuss the processes, timeframes, costs, etc.
- Identify project summary (in specs) and accepted project alternates for proper review
- Write all notes on plans in red ballpoint waterproof ink – legible – outside plan details/notes. Attach plan review letter(s) to approved plans.
- Always write in legible - drafting style lettering – outside the plans' drawings, dimensions, details, legends, etc.
- Date stamp and initial each plan submittal (application and plan set) as soon as it is received. Also date stamp and initial the plans at the time you start the actual review.
- Date stamp every deferred submittal, addenda, change order, RFP, etc. when it is received by department.
- If using plan stamps, keep to a minimum – nobody will read them otherwise.
- Make construction notes on the plan for your field inspector(s) and the contractor(s) as well as for yourself as the plan reviewer.
- Make a reference note on the plan itself if code review comments are contained on a separate letter document. Tell contractor to see these letters for additional code requirements.
- Make sure commentary is perfectly clear when indicating what is wrong and what is expected for correction.
- If accepting deferred submittals, make notes on plan referencing what is required so designer can coordinate schedule for submittal.
- If additional plans or specifications are needed, notify applicant immediately.
- If a "large-scale" code issue is found, notify applicant immediately.
- Maintain accurate, dated documentation on all conferences, phone calls, e-mails, faxes, meetings, etc. Keep all records for the file.
- Define permitting requirements and/or construction authorization conditions clearly (for each trade).

## Required Document Submittals:

The following is a partial summary of plan review for a single-family dwelling and should include but not be limited to the following items:

1. Provide a survey/site plan showing lot size, building size, setbacks from property lines, other buildings, sewer/ water, septic systems, wells, and any other items required by code or ordinance.
2. Two sets of complete plans and specifications to be reviewed and approved. One for the building department and one to be on site.
3. Energy code compliance certificate.
4. Minimum ventilation requirements Minnesota Energy Code 1322 Chapter 4.
5. Residential combustion air calculations IFGC 304.1 I.F.G.C. Appendix E, worksheet E-1
6. Residential makeup air calculations. I.M.C 501.4. 1 I.M.C. Chapter 5 Table 501.4.1
7. Provide floor plans for all levels. Include room size, room use, kitchen and bathroom layout, dimensions of stairway and location, window and door location with sizes, and decks and porches.
8. Provide all exterior elevations showing top of foundation in relation to final grade, grading and drainage, windows, doors, siding type, roof pitch, roof covering, decks and miscellaneous.
9. Provide a typical wall section or section through the building. The following items should include but not limited to:
  - Footing size and reinforcing if required
  - Foundation size, type, height, and reinforcing
  - Foundation anchor size, type, and spacing
  - Foundation drainage (drain tile)
  - Foundation waterproofing (membrane)
  - Foundation insulation type, R value, and vapor retarder
  - Rim joist insulation type, location and sealing
  - Floor joist type, size, and spacing
  - Subfloor type, size, and thickness
  - Stud, size, and spacing
  - Wall sheathing type and size
  - Water- Resistive Barrier (Building paper/house wrap)

- Exterior wall finish type and application
- Insulation type and R value
- Vapor retarder type
- Interior wall finish
- Roof rafter or trusses, size, and spacing
- Subfascia/fascia type and size
- Soffit system type and size
- Eave Baffle (wind wash barrier)
- Soffit ventilation
- Roof pitch indicator
- Roof underlayment and eave protection
- Roof covering
- Roof/attic ventilation
- Roof Sheathing

**Structural:**

- Provide all header,
- beams, post size,
- location of braced wall lines,
- braced wall panel design,
- all structural elements should be specified.
- Certified roof truss drawings floor truss drawings and all engineered drawings shall be required.
- Truss drawings and all engineered drawings are required on site at the framing inspection.

**Non-structural:**

- Show location and specification of smoke detectors
- Show location and specification of handrails, guardrails, and rise and run of stairways
- Verify location and requirements for egress windows and/or doors
- Verify requirements for safety glazing and location
- Verify bathrooms for minimum space requirements
- Verify ventilation requirements for bathroom
- Verify fire protection as required for common wall between house and garage and floor system.

**ONE AND TWO FAMILY DWELLINGS  
BUILDING PLAN SUBMITTAL CHECKLIST AND GUIDE**

This checklist covers items to be included with plan submittals of Residential One and Two Family Dwellings and Townhouses. This list may not be all inclusive of all items required.

Code references: 2015 Minnesota State Building Code, 2012 International Residential Code, 2012 International Mechanical Code and 2012 International Fuel Gas Code, 2016 Minnesota State Plumbing Code, and 2014 National Electrical Code, 2012 International Energy Conservation Code as amended.

**REQUIRED CONSTRUCTION DETAILS**

**EXTERIOR ELEVATIONS**

	<b>COMPLIES</b>		
	YES	NO	N/A
Zoning Approval	_____	_____	_____
Site Plan Review	_____	_____	_____
Foundation Elevation R 403.1.7.3	_____	_____	_____
Site Address R 319	_____	_____	_____
Chimney Terminations (Masonry) R 1003.9	_____	_____	_____
Decks R 507	_____	_____	_____
Footing Depths MSBC 1303.160 & R 403.1.4.1	_____	_____	_____
Fuel Burning Appliances Vent Terminations IMC 802.5 & .6, IFGC 503.5.4 & .6.4	_____	_____	_____
Grade/Landscaping to Wood Separation R 317.1	_____	_____	_____
Grade Definition R202	_____	_____	_____
Guardrail R 312.1	_____	_____	_____
Handrails R 311.7.8	_____	_____	_____
Stairs R 311.7	_____	_____	_____
Lighting: exit-stair-room R 303.7 NEC 210-70 (A)(2)	_____	_____	_____
Skylights Glass R 308.6	_____	_____	_____
Skylights Plastic R 308.6	_____	_____	_____
Safety glazing R 308.1 thru 308.4	_____	_____	_____
Soil Stack Terminations MPC 4714	_____	_____	_____
Attic Ventilation R 806.2	_____	_____	_____
Crawl Space Ventilation R 408.1	_____	_____	_____
Weather Protection Coverings R 703	_____	_____	_____
Exterior Flashing R 703.8	_____	_____	_____

**FOUNDATION & BASEMENT PLANS**

	<b>COMPLIES</b>		
	YES	NO	N/A
Anchor Bolts R403.1.6, R606.11	_____	_____	_____
Anchoring Joist and Blocking in	_____	_____	_____
Bearing Wall Plate R 602.4 and table R602.3 (1)	_____	_____	_____
Blocking First 3 Joist Spaces (MN) R 404.1 (4)	_____	_____	_____
Bridging/Blocking R 404.1 and R 502.7.1	_____	_____	_____
Column/Posts (protection) R 407.1 and R 317	_____	_____	_____
Crawl Space Access R 408.4	_____	_____	_____
Escape or Rescue Window R 310.1 thru 310.5	_____	_____	_____
Foundation Wall Insulation R 402.1.3 & MSBC 1322.0402	_____	_____	_____
Foundation Wall Reinforcement (Size and Placement)	_____	_____	_____
MSBC 1309.0404 R404.1.1 tables (1 through 7)	_____	_____	_____
Foundation Walls (Type and Size)	_____	_____	_____
R 404, MSBC 1309.0404	_____	_____	_____
Headers/Beams (Size and Species or its Grade)	_____	_____	_____
R 502.1, R 602 R 502.5 tables (1)&(2)	_____	_____	_____
Interior/Intermediate Footing Design	_____	_____	_____
(Size and Reinforcement) R 403.1.1, MSBC 1309.403	_____	_____	_____
Footing concrete compressive strength Table R402.2	_____	_____	_____
Interior/Intermediate Support Systems (Type and Location)	_____	_____	_____
Joists table R 602.3(5),	_____	_____	_____
(Grade, Size, Species, and Spacing of Joists)	_____	_____	_____
R502.1, R502.3 thru R502.3.3	_____	_____	_____
Spacing and Specifications for Engineered Trusses	_____	_____	_____
R 502.11.4	_____	_____	_____
Engineered Joist (Per Manufacturer) R 502.1	_____	_____	_____
Notching of Joists R 502.8, R 502.8.2	_____	_____	_____
Parallel to Foundation, R 502.4	_____	_____	_____
Perimeter Footings Design	_____	_____	_____
R 403.1, R 403.1.4, and R 403.1.4.1(MN amendment)	_____	_____	_____
Concrete Strength Table R 402.2 (MN)	_____	_____	_____
Sill Plate R 403.1.6 (MN)	_____	_____	_____
Smoke Alarms R 314	_____	_____	_____
Fire protection of floors R 501.3	_____	_____	_____
Soil Bearing Table R 401.4.1	_____	_____	_____
Stair Handrails R311.7.8	_____	_____	_____
Window Wells (Egress/Escape Windows) R 310.2	_____	_____	_____
Radon Control Passive MSBC 1303.2402	_____	_____	_____
Radon Control Active MSBC 1303.2403	_____	_____	_____
Attic Access R 807.1	_____	_____	_____
Bath and laundry ventilation IMC table 403.3	_____	_____	_____

**FLOOR PLANS (MAIN AND UPPER LEVELS)**

	<b>COMPLIES</b>		
	YES	NO	N/A
Ducting IMC 603 with MN amendments	_____	_____	_____
Braced Wall Lines R 602.10.	_____	_____	_____
Egress or Rescue Window Manufacturer, Catalog Number, Installation Requirements R 310 (MN amendment)	_____	_____	_____
Windows/Doors (Manufacturer, Catalog Number, Installation Requirements, R 612	_____	_____	_____
Flashing, Back-caulking) R703.8, R703.8.1	_____	_____	_____
Exits Width and Height R 311.2	_____	_____	_____
Fire Blocks and Draft Stops R 502.12, R 502.13, R 602.8	_____	_____	_____
Grade and Species of Plates R 602.1, R602.3.2, R 602.3.4	_____	_____	_____
Grade, Species, and Size of Headers R 602.1, R 602.7	_____	_____	_____
Grade, Species, and Spacing of Joist R 502.1, R 502.3	_____	_____	_____
Grade, Species, and Spacing of Rafters R 602.1, R 802.4, R 802.3	_____	_____	_____
Grade, Species, and Spacing of Studs R 602.1, R 602.3.1	_____	_____	_____
Guardrails R 312.1	_____	_____	_____
Window Fall Protection R 312.2	_____	_____	_____
Hallway Width R 311.6	_____	_____	_____
Handrails R 311.7.8	_____	_____	_____
Natural Light R 303.1	_____	_____	_____
Natural Ventilation R 303.1	_____	_____	_____
Occupancy Separation and Labeled 20 Minute Door R 302.5, R 302.6	_____	_____	_____
Room Sizes R 304	_____	_____	_____
Safety Glazing R 308	_____	_____	_____
Sanitation R 306, MSPC 4715.0200 (C)	_____	_____	_____
Smoke Alarms Locations and Interconnection R 314	_____	_____	_____
Carbon Monoxide Alarms R 315	_____	_____	_____
Stair Design ( <i>Rise 7.75" max. Run 10" min.</i> ) R 311.7	_____	_____	_____
Stair Width R 311.7.1.2	_____	_____	_____
Under-stair Protection R 302.7	_____	_____	_____
Trap Access (Required if Basement Finished) MSPC 4715.0900	_____	_____	_____
Wall Finishes R 302.9, R 316.4, R 316.5.10	_____	_____	_____
Water Resistant Gypsum Board R 702.3.8	_____	_____	_____

**CROSS SECTION**

**COMPLIES**

	YES	NO	N/A
Anchor Bolts (Size, Spacing, and Embedment) R 403.1.6, R 602.11	_____	_____	_____
Anchoring Joist and Blocking in Joist Spaces to Sill table R 602.3 (1)	_____	_____	_____
Blocking First 3 Joist Spaces Parallel to Foundation R 404.1 (MN amendment) and R 502.4	_____	_____	_____
Ceiling Heights R 305.1	_____	_____	_____
Damp-proofing-waterproofing R 406 (MN amendments)	_____	_____	_____
Fastening and Anchoring Requirements for Trusses R 802.11, R 802.3.1	_____	_____	_____
Foam Insulation Protection R 316	_____	_____	_____
Foundation Drainage System (Size, Placement, Infiltration Barrier R 405	_____	_____	_____
Foundation Wall (Type, Size, and Reinforcement Size and Spacing) R 404, tables R 404.1.1 (1 thru 7)	_____	_____	_____
Frost Depth R 403.1.4, R 403.1.4.1, MSBC 1303.1600 (depths)	_____	_____	_____
Grade & Species of Rafters R 602.1, R 802.4, R 802.3	_____	_____	_____
Grade and Species Floor Joists R 502.1, R 502.3	_____	_____	_____
Grade, Species, and Spacing of Studs R 602.1, R 602.3.1	_____	_____	_____
Grade and Species of Plates R 602.1, R602.3.2, R 602.3.4	_____	_____	_____
Grade and Species of Window & Door Headers R 602.1, R 602.7	_____	_____	_____
Grade to Wood Separation R 317.1	_____	_____	_____
Insulation R Values & Fenestration Values	_____	_____	_____
Foundation Wall MSBC 1322.0402, IECC R 402.1	_____	_____	_____
Ceiling MSBC 1322.0402, IECC R 402.1	_____	_____	_____
Rim MSBC 1322.0402, IECC R 402.1	_____	_____	_____
Walls MSBC 1322.0402, IECC R 402.1	_____	_____	_____
Windows MSBC 1322.0402, IECC R 402.1	_____	_____	_____
Interior/Intermediate Footing Design (Size and Reinforcement) R 403.1 (Compressive strength of concrete)	_____	_____	_____
Table R402.2 (MN amendment)	_____	_____	_____
Joist Bearing R 502.6	_____	_____	_____
Nailing Schedule Table R 602.3(1)	_____	_____	_____
Perimeter Footings Design (Size and Reinforcement) R 403, R 403.1, R 403.2, R 403.1.4, R 403.1.4.1	_____	_____	_____
Roof Coverings R 905	_____	_____	_____
Roof Ice Build-up R 905.2.7.1, R 905.2	_____	_____	_____
Roofing Underlayment R 905.2.3, R 905.2.7, R 905.3.3	_____	_____	_____

**CROSS SECTION**  
(cont.)

**COMPLIES**

	YES	NO	N/A
Sheathing Span Index Sub-floor R 503.1, tables R 503.2.1.1 (1) & (2)	_____	_____	_____
Wall Sheathing Tables R 602.3 (1 thru 4)	_____	_____	_____
Wall bracing R 602.10.1.3 and Tables R602.10.3 (1 thru 4) & R602.10.4	_____	_____	_____
Roof R 803.1, table R 503.2.1.1 (1)	_____	_____	_____
Fastening Requirements Tables R 602.3 (1) & (2)	_____	_____	_____
Sill Plate R 404.3, R 403.1.6	_____	_____	_____
Sill Seal MSBC 1322 R 402.4	_____	_____	_____
Soil Bearing R 401.4.1	_____	_____	_____
Spacing and Specifications for Engineered Trusses R 802.10, MSBC 1309.802	_____	_____	_____
Vapor Retarder R 402.1.1 and R 405.2.2	_____	_____	_____
Moisture Barrier R 406.3.2	_____	_____	_____
Ventilation Attic R 806.	_____	_____	_____
Ventilation Foundation R 408.1	_____	_____	_____
Wall and Ceiling Finishes R 302	_____	_____	_____
Wall and Ceiling Openings Sealed (Wall and Ceilings) (Electrical, Plumbing, & Heating) 1322 R 402.4 , 1322 R 402.2.4	_____	_____	_____
Wall Bracing R 602.10.	_____	_____	_____
Ventilation Weather Protection/exterior covering R 703	_____	_____	_____
Windows/Doors (Manufacturer, Catalog Number, Installation Requirements, Flashing, and Caulking/Back-Caulking) R 703, R 703.8	_____	_____	_____
(Eave Baffle) Windwash Barrier at Trusses R 402.2.3	_____	_____	_____

**STAIR SECTION**

Framing Interior or Exterior R 311.7	_____	_____	_____
Generic Design R 311.7	_____	_____	_____
Guardrail R 312	_____	_____	_____
Handrails R 311.7.8	_____	_____	_____
Headers R 502.10	_____	_____	_____
Headroom R 311.7.2	_____	_____	_____
Landing R 311.7.6	_____	_____	_____
Rise and Run, and Maximum Differential R 311.7.5	_____	_____	_____
Useable Space Under-Stair R 302.7	_____	_____	_____

**FLOOR FRAMING PLAN**

	<b>COMPLIES</b>		
	YES	NO	N/A
<b>CONVENTIONAL FRAMING</b>			
Anchoring Joist and Blocking in Joist Spaces to Sill R 502.9, table 602.3 (1)	_____	_____	_____
Blocking R 502.7, R 502.4	_____	_____	_____
Blocking First 3 Joist Spaces parallel to Foundation R 404.1, R 502.4	_____	_____	_____
Bridging R 502.7.1	_____	_____	_____
Double Joists R 502.4	_____	_____	_____
Framed Openings R 502.10	_____	_____	_____
Girder R 502.5, tables R 502.5(1) & (2)	_____	_____	_____
Hangers R 502.6.2	_____	_____	_____
Headers R 602.7	_____	_____	_____
Joist Lap R 502.6.1	_____	_____	_____
Joists R 502.1	_____	_____	_____
Notching & Drilling R 502.8	_____	_____	_____
<b>ENGINEERED FLOOR SYSTEM</b>			
All items to be reviewed by a Minnesota Certified Structural Engineer (MN Statutes Chapter Parts 326.02 thru 326.15)			
Floor Truss Engineering R 502.11.1	_____	_____	_____
Framing Details R 502.11.4	_____	_____	_____
Hangers R 502.11.4	_____	_____	_____
Nailing/Bolting Schedules R 502.11.4	_____	_____	_____
Draft stopping R 502.12	_____	_____	_____
Fire blocking R 502.13	_____	_____	_____
Fire protection of floors 501.3	_____	_____	_____
Anchoring Joist and Blocking in Joist Spaces to Sill R 502.9, R 602.3(1)	_____	_____	_____

**ROOF FRAMING PLAN**

<b>CONVENTIONAL FRAMING</b>			
Blocking R 802.1.1	_____	_____	_____
Fastening Table 602.3 (1)	_____	_____	_____
Ceiling Joists R 802.4	_____	_____	_____
Hip Rafters R 802.3	_____	_____	_____

**ROOF FRAMING PLAN**

(cont.)

**COMPLIES**

	YES	NO	N/A
Purlins R 802.5.1	_____	_____	_____
Rafters R 802.5	_____	_____	_____
Ridge Beam R 802.3	_____	_____	_____
Valley Rafters R 802.3	_____	_____	_____
<b>ENGINEERED ROOF SYSTEM</b>			
All Truss Designs are to be certified by Minnesota Registered Structural Engineer (MN Statutes Chapter Parts 326.02 thru 326.15)			
Common Trusses R 802.10.2	_____	_____	_____
Dormers R 802.10.4	_____	_____	_____
Girder Trusses R 802.10.2	_____	_____	_____
Hangers R 802.11	_____	_____	_____
Hips Trusses R 802.10.2	_____	_____	_____
Nailing Schedule R 802.11	_____	_____	_____
Valleys R 802.10.2	_____	_____	_____
Fastening/Anchoring Requirements of Trusses R 802.11, R 802.10.3	_____	_____	_____
Connection to wall R 802.10.5	_____	_____	_____
Insulation clearance R 302.13	_____	_____	_____

**MECHANICAL DETAILS**

Ventilation IMC Table 403.3, MN 3122.403.5	_____	_____	_____
<b>Combustion Air</b>			
IMC Chapter 7, MN 1346.5304, IFGC Section 304	_____	_____	_____
Specific Room Exhaust IMC 502.18	_____	_____	_____
Drilling and Notching of Joist and Studs IMC 302.3, R502.8, R 602.6	_____	_____	_____
Dryers Vents and Terminations IMC 504 (electric), IFGC 613 & 614 (gas)	_____	_____	_____
<b>Energy Design</b>			
Minnesota Energy Code, Chapter 1322	_____	_____	_____
Plenums IMC 602	_____	_____	_____
Environmental Ducts IMC Chapter 6	_____	_____	_____
Location of Equipment IMC/IFGC 303, IMC/IFGC 306	_____	_____	_____
Mechanical Ventilation (Introduction of Outside Air and Removal of Inside Air)			
Vent Terminations MSBC 1322.0403.5, IRC R403			
IMC 802.4 & .5, IMC 804.3, IFGC 503.5.4, IFGC 503.6.4, IFGC 503.7.3, IFGC 503.8	_____	_____	_____

**ENERGY CODE**

**COMPLIES**

	YES	NO	N/A
Air Barrier Continuous to the Interior of the Building Envelope IECC R 402.4	_____	_____	_____
Ducting in Unconditioned Spaces IECC R 403.2.2	_____	_____	_____
Mechanical Ventilation, (Introduction of Outside Air and Removal of Inside Air) MN Rule 1302.403.5	_____	_____	_____
Energy building certificate IECC R 401.3 (MN web-site)	_____	_____	_____
Skylight Insulation Supported on Unconditioned side IECC R 402 section	_____	_____	_____
Wall and Ceiling Openings Sealed, (Wall and Ceilings), (Electrical, Plumbing, and Heating) IECC R 402.4	_____	_____	_____
Walls Framing at Corners and Partitions, (Framed to Allow Insulation Installation from Interior) ECC R 402.4	_____	_____	_____
Wind Wash at Attic Edge (Eave Baffle)	_____	_____	_____
Wind Wash at Canted Floors and Bay Windows IECC R 402.2.3	_____	_____	_____
Radon Prevention MSBC 1303.2400	_____	_____	_____
Radon Control (PASSIVE) MSBC 1303.2402	_____	_____	_____
Radon Control (ACTIVE) MSBC 1301.2403	_____	_____	_____

*Note: Items listed under categories do not necessarily have to be detailed on that particular drawing but are to be indicated somewhere on the plan documents.*

## 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)      \_\_\_\_\_ Fan Assisted & Power Vent      \_\_\_\_\_ Direct Vent      Input: \_\_\_\_\_ Btu/hr

Water Heater:

\_\_\_\_\_ Draft Hood (Not fan assisted)      \_\_\_\_\_ Fan Assisted & Power Vent      \_\_\_\_\_ 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<sup>3</sup>

**Step 3:** Determine Air Changes per Hour (ACH)<sup>1</sup>

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<sup>3</sup>

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 and power vent 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<sup>3</sup>

Total Btu/hr of all non-fan-assisted appliances      Input: \_\_\_\_\_ Btu/hr

501.4.1 Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling Unit				
	One or multiple power vent or direct vent appliances or no combustion appliances <sup>A</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>B</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>C</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>D</sup>
2. Use the Appropriate Column to Estimate House Infiltration				
a) pressure facture (CFM/SF)	0.15	0.09	0.06	0.03
b) conditioned floor area (sf) (includes unfinished basements)				
Estimated House Infiltration (cfm) [ 1a x 1b ]				
2. Exhaust Capacity				
a) clothes dryer (cfm)	135	135	135	135
b) 80% of largest exhaust rating (cfm): (Not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)				
c) 80% of next largest exhaust rating (cfm): (Not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)	Not applicable			
Total Exhaust Capacity (cfm): [2a + 2b + 2c]				
3. Makeup Air Requirements				
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 <i>Makeup Air</i> Opening Sizing. Refer to Table 501.4.2				

<sup>A</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil *appliances* or if there are no *combustion appliances*.

<sup>B</sup> Use this column if there is one fan-assisted *appliance* per venting system. Other than atmospherically vented *appliances* may also be included.

<sup>C</sup> Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil *appliance* per venting systems or one solid fuel *appliance*.

<sup>D</sup> 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*.

**TABLE 501.4.2 MAKEUP AIR OPENING SIZING TABLE FOR NEW AND EXISTING DWELLING UNITS**

TYPE OF OPENING OR SYSTEM	ONE OR MULTIPLE POWER VENT OR DIRECT VENT APPLIANCES OR NO COMBUSTION APPLIANCES <sup>A</sup>	ONE OR MULTIPLE FAN-ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES <sup>B</sup>	ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE <sup>C</sup>	MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES <sup>D</sup>	PASSIVE MAKEUP AIR OPENING DUCT DIAMETER <sup>E, F, G</sup>
	(cfm)	(cfm)	(cfm)	(cfm)	(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 <sup>H</sup>	> 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 *appliances*.

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.

**MN Residential Energy Code (RE) Section R401.3 Building certificate.** A building certificate shall be posted on or in the electrical distribution panel by the builder or design professional, and posted in a manner that does not cover or obstruct the visibility of the circuit directory label, service disconnect label, or other required labels.

**New Construction Energy Code Compliance Certificate**

Per R401.3 Certificate. A building certificate shall be posted on or in the electrical distribution panel.		Date Certificate Posted		<b>Place your logo here</b>					
Mailing Address of the Dwelling or Dwelling Unit			City						
Name of Residential Contractor			MN License Number						
<b>THERMAL ENVELOPE</b>				<b>RADON CONTROL SYSTEM</b>					
Insulation Location	Total R-Value of all Types of Insulation	Type: Check All That Apply						Passive (No Fan)	
		Non or Not Applicable	Fiberglass, Blown	Fiberglass, Batts	Foam, Closed Cell	Foam Open Cell	Mineral Fiberboard	Rigid, Extruded Polystyrene	Active (With fan and monometer or other system monitoring device)
									Location (or future location) of Fan:
									Other Please Describe Here
Building Envelope Air Tightness:		Duct System Air Tightness:							
Windows & Doors				Heating or Cooling Ducts Outside Conditioned Spaces					
Average U-Factor (excludes skylights and one door) U:				Not applicable, all ducts located in conditioned space					
Solar Heat Gain Coefficient (SHGC):				R-value					
<b>MECHANICAL SYSTEMS</b>					<b>Make-up Air - Select a Type</b>				
Appliances		Heating System	Domestic Water Heater	Cooling System	Not required per mech. code				
Fuel Type					Passive				
Manufacturer					Powered				
Model					Interlocked with exhaust device. Describe:				
Rating or Size		Input in BTUS:	Capacity in Gallons:	Output in Tons:	Other, describe:				
Efficiency		AFUE or HSPF%		SEER /EER	Location of duct or system:				
<b>Residential Load Calculations</b>		Heating Loss	Heating Gain	Cooling Load					
					CFMs				
					"round" duct OR				
					"metal" duct				
<b>MECHANICAL VENTILATION SYSTEM</b>					<b>Combustion Air - Select a Type</b>				
Describe any additional or combined heating or cooling systems if installed: (e.g. two furnaces or air source heat pump with gas back-up furnace):					Not required per mech. code				
<b>Select Type</b>					Passive				
Heat Recovery Ventilator (HRV) Capacity in CFMs:		Low:	High:		Other, describe:				
Energy Recovery Ventilator (ERV) Capacity in CFMs:		Low:	High:		Location of duct or system:				
Balanced Ventilation Capacity in CFMs:					CFMs				
Location of fans(s), describe:					"round" duct OR				
Capacity of continuous ventilation rate in CFMs:					"metal" duct				
Total ventilation (intermittent + continuous) rate in CFMs:									

# Stamps

The following are *samples* of rubber stamps that may be useful during plan review. Prior to ordering, verify that the stamps comply with the current code and local ordinances.

## **A Certificate of Occupancy is required prior to any use or occupancy.**

Approved numbers or address shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property.

**7'-0" minimum ceiling height for habitable space**

**36" minimum Guard height,  
openings less than 4".**

**A minimum 22" X 30" attic access  
is required when an attic has 30" or  
greater vertical clear headroom.**

**PROVIDE ROOF AND FLOOR TRUSS  
SPECIFICATIONS ON-SITE**

## **OFFICE COPY**

NAME:

\_\_\_\_\_  
ADDRESS: \_\_\_\_\_

## **FIELD COPY**

**(TO BE KEPT ON THE JOB SITE AT ALL TIMES)**

NAME:

\_\_\_\_\_  
ADDRESS: \_\_\_\_\_

**MANUFACTURER'S LABELED  
SAFETY GLAZING  
REQUIRED**

The floor rim joist framing must be insulated and sealed per the Energy Code.

**STAIRWAYS**

7 3/4" maximum rise, 10" minimum run and 6'8" of headroom.

**NOTICE**

Plan review was done in accordance with the current Minnesota Building Code. Plan review does not waive any additional code compliance issues found on site.

**BELOW GRADE INSULATION REQUIREMENTS**

Provide a minimum of R- 15 insulation on all foundations [see minimum required on energy code calculations]. Foam insulation on the exterior must be protected above grade and six inches below grade. Most foam insulation installed on the interior require protection of 1/2 inch sheet rock or other approved material.

**RESIDENTIAL GUARDS**

Unenclosed floor and roof opening, open and glazed sides of landings and ramps, balconies, decks or porches which are more than 30" above grade or floor below, require a guard with a minimum 36" height. Open guardrails must have intermediate rails or an ornamental pattern so that a sphere 4" in diameter cannot pass through.

**FIREPLACES/WOODSTOVES**

**MASONRY FIREPLACES:** Combustible material shall not be placed within 2" of fireplace, smoke chamber or chimney walls. HEARTH shall extend at least 16" in front of and 8" beyond each side of the fireplace opening.

Fireplace openings 6 sq. ft. or larger require min. 20" hearth.

**MANUFACTURED FIREPLACES/WOODSTOVES:** Install to specifications, provide specifications on site

## **EMERGENCY EGRESS REQUIREMENTS**

Basements with habitable space and every sleeping room shall have at least one operable emergency escape and rescue window or exterior door opening for emergency escape or rescue. Minimum window requirements: net clear open area = 5.7 sq. ft., min. width 20" min. height 24", max. height off floor to the sill of 44". (exception: grade floor windows)

## **STAIRWAYS**

Stairways 7 3/4" maximum rise, 10" minimum run, Install a handrail on one side of the stair 34" to 38" high, continuous and uninterrupted full length of stairs, handrail ends shall be returned or shall terminate in a newel post of safety terminal, minimum 6'-8" headroom

## **House/Garage Wall Separation**

One layer of 1/2" gypsum board is required on the garage side of the common wall from the floor to the roof sheathing. If the firewall terminates at the underside of the ceiling the walls and columns supporting the ceiling must have the same protection. Doors between the house and garage shall be a 1 3/8 inch solid wood door, solid or honeycomb steel doors not less 1-3/8 inch in thickness or 20 minute fire rated label.

**REVIEWED for CODE COMPLIANCE**

**PLAN CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_**

## **Under Stair Protection**

If enclosed, provide one layer of 1/2" gypsum on the walls and ceilings on the underside of the stairway.

## **PENETRATIONS**

FLASH AND SEAL ALL EXTERIOR OPENING TO PREVENT THE ENTRY OF WATER INTO THE WALL CAVITY.

WEATHER RESISTIVE PAPER REQUIRED ON ALL EXTERIOR WALLS OF ALL BUILDINGS, INCLUDING GABLE ENDS

## **Exterior Stairway Illumination**

Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. The illumination of exterior stairs shall be controlled from the dwelling unit.

# Footings and Foundations

This chapter covers foundations regulated by the Minnesota State Building Code that apply to Minnesota Rules 1309, Minnesota Residential Code (MRC). **It is not intended to be all-inclusive of all applicable code sections. See Minnesota State Code for complete requirements.**

## Foundation Summary

### \*References

**Footings:** R403

**Soils:** R401.2, R401.4, R401.4.1, Table R401.4.1, Table R405.1

**Concrete/Masonry Foundations:** R401, R402.2, R404, R404.1

**Wood Foundations:** R401, R401.2, R402.1, R403.2, R404.2.3, 404, R405.1, R405.2, R405.2.3, R406.3, R406.3.1, R406.3.2, R406.3.3, R406.3.4

**Insulated Concrete Forms [ICF]:** R404.4

**Frost Protected Shallow Foundations:** R403.3, R403.3.1

**MN Rules 1303.1900:** Alternate foundation guide

**Grading/Drainage:** R401.3, R403.3.2, R404.1.6, R405, R405.2.3, R408.5

**Dampproofing/Waterproofing:** R406, Dampproofing, R406.2 Waterproofing

**Concrete Floors:** MN Rules 1309.0506 [R506.2.3] amended

\*This is a partial list of referenced material. Refer to IRC Chapters 4 and 6, for additional information not included in this summary.

**IRC SECTION R301.1 Design.** Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, wind loads and seismic loads as prescribed by this code. The construction of buildings and structures shall result in a system that provides a complete load path capable of transferring all loads from their point of origin through the load-resisting elements **to the foundation**. When a building of otherwise conventional construction contains structural elements that exceed the limits of Section R301, those elements shall be designed in accordance with accepted engineering practice.

**1309.0301 SECTION R301, DESIGN CRITERIA**

**Subpart 1. Table R301.2(1).** IRC Table R301.2(1) is amended to read as follows:

**TABLE R301.2(1) CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA**

ROOF SNOW LOAD <sup>f</sup>	WIND DESIGN		SEISMIC DESIGN CATEGORY <sup>l</sup>
$p_f = 0.7 * p_g$	Speed <sup>d</sup> (mph) 90	Topographic effects <sup>k</sup> YES	A
SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP <sup>e</sup>
Weathering <sup>a</sup>	Frost line depth <sup>b</sup>	Termite <sup>c</sup>	
Severe	See MR part 1303.1600	See Footnote "c"	See MR chapter 1323
ICE BARRIER UNDERLAYMENT REQUIRED <sup>h</sup>	FLOOD HAZARDS <sup>g</sup>	AIR FREEZING INDEX <sup>i</sup>	MEAN ANNUAL TEMP <sup>j</sup>
Yes	See MR Chapter 1335	See Table R403.3(2)	41.16

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

- a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index, such as "negligible," "moderate," or "severe," for concrete as determined from the Weathering Probability Map [Figure R301.2(3)]. The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216, or C 652.
- b. See Minnesota Rules, part 1303.1600 – Footing Depth for Frost Protection to verify whether the county requires Zone I or Zone II frost protection.
- c. The jurisdiction shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.
- d. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.
- e. See Minnesota Rules, Chapter 1322 - Table R403.5.17 Climate Data Design Conditions to verify by city.
- f. The ground snow loads to be used in determining the design snow loads for buildings and other structures are given in Minnesota Rules, part 1303.1700 - Ground Snow Load to verify by county. The roof snow load is a uniform load on the horizontal projection of the roof.
- g. See Minnesota Rules, Chapter 1335, Flood Proofing Regulations.
- h. In accordance with Sections R905.2.7.1, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1, and R905.8.3.1, where there has been a history of local damage from the effects of ice damming.
- i. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)" at [www.ncdc.noaa.gov/oa/fpsf](http://www.ncdc.noaa.gov/oa/fpsf).
- j. The jurisdiction shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Average Mean Temperature Index" at <http://www.esrl.noaa.gov/psd/data/usclimate/tmp.state.19712000.climo>.
- k. In accordance with Section R301.2.1.5.
- l. Assigned to allow the application of the least restrictive topographic provisions of the code.

The following table was developed to assist in determining equivalent areas.

TABLE OF STEEL REINFORCMENT EQUIVALENT AREA

Spacing O.C.									
	8"	16"	24"	32"	40"	48"	56"	64"	72"
#3 .11in <sup>2</sup>	.0138	.0069	.0046	.0034	.0028	.0023	.0020	.0017	.0015
#4 .20in <sup>2</sup>	.0250	.0125	.0083	.0063	.0050	.0042*	.0036	.0031	.0028
#5 .31in <sup>2</sup>	.0388	.0194	.0129	.0097	.0078	.0064	.0055	.0048	.0043
#6 .44in <sup>2</sup>	.055	.0275	.0183	.0138	.0110	.0091	.0078	.0069	.0061

From Table #4 @ 48" o.c. \* (Eq. Area =  $0.2\text{in}^2/48\text{in} = 0.0042\text{ in}^2/\text{in}$ )

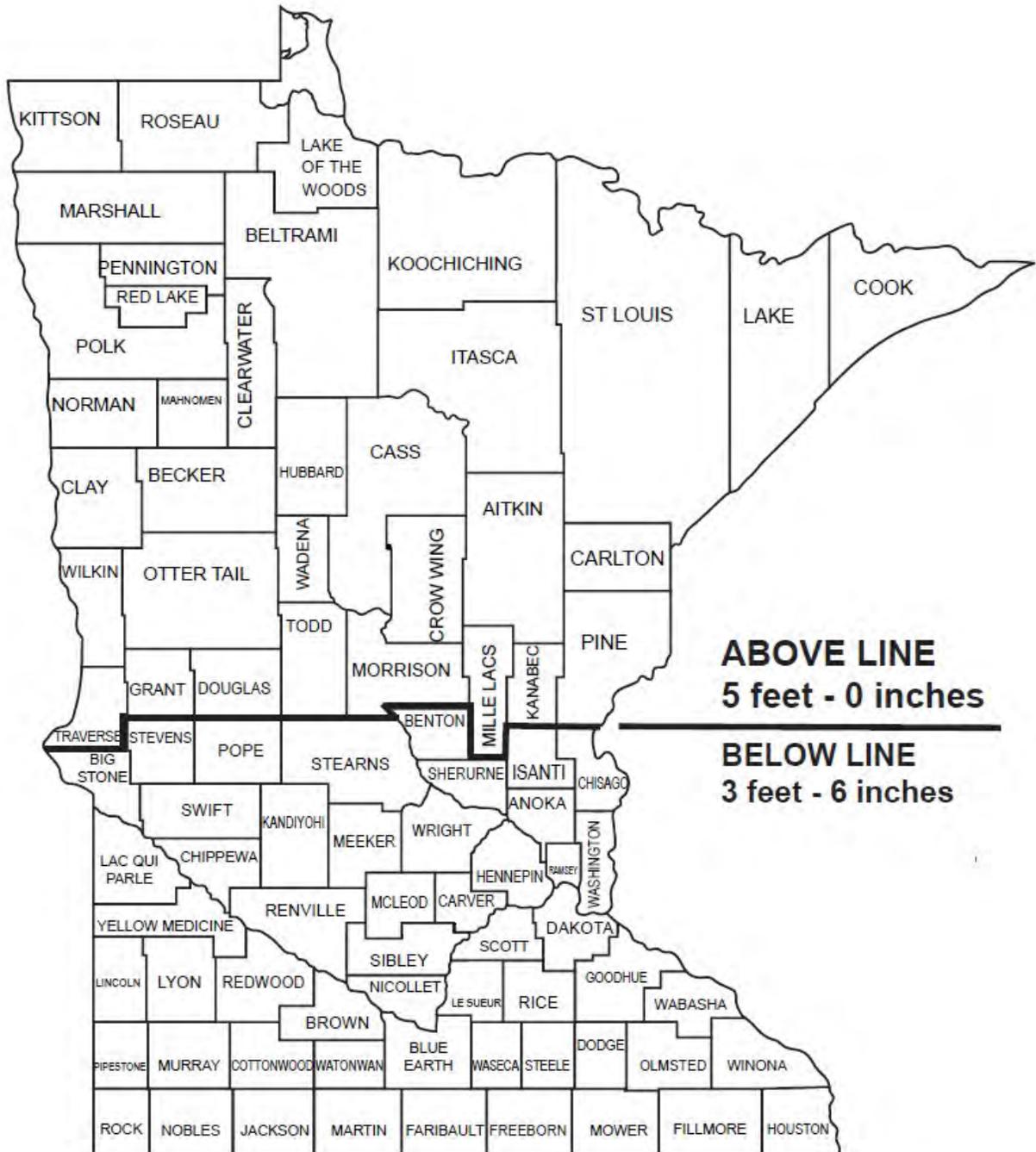
From Table #5 @ 72" o.c. =  $.0043\text{ in}^2/\text{in}$

From Table #3 @ 24" o.c. =  $.0045\text{ in}^2/\text{in}$

**Sample: From the table above: if #4 rods @ 48" o.c. have an area of .0042. Equivalent area from the table could be #3 rods @ 24" o.c. or #5 rods @ 72" o.c..**

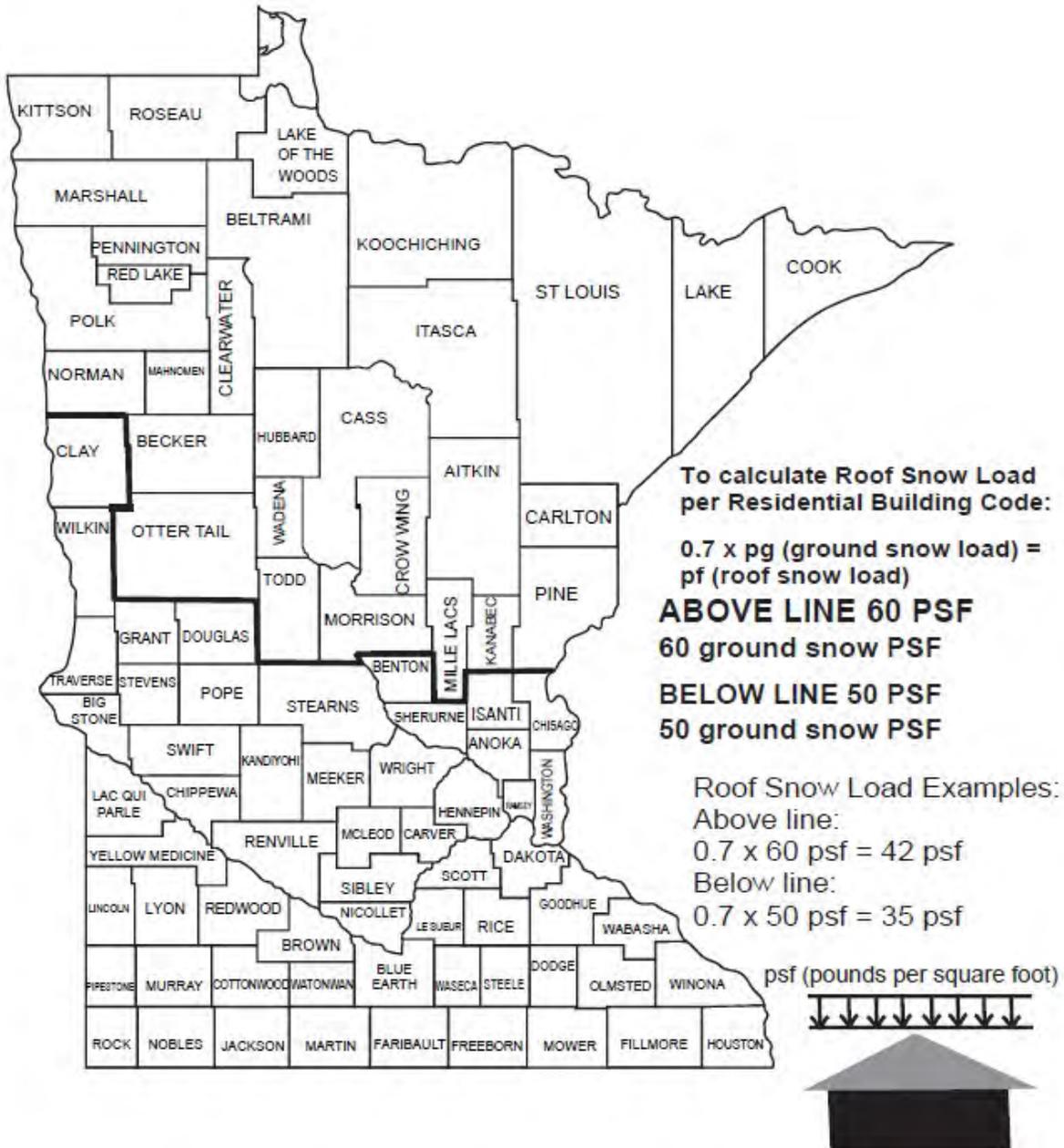
# FROST DEPTH

MSBC RULES 1303.1600



# SNOW LOAD

MSBC RULES 1303.1700 table R301.2(1)





# Residential Plan Review Guide for Round Footing Sizing

	Footing Sizes		Required (Min.) Soil Load Bearing Capacity (PSF)					
	Dia. Inches	Footing Area Sq. In.	Footing Area Sq. Ft.	1000 PSF	1500 PSF	2000 PSF	2500 PSF	3000 PSF
8" Ftg. Thickness – Min.	8	50.27	0.35	349	524	698	873	1047
	9	63.62	0.44	442	663	884	1104	1325
	10	78.54	0.55	545	818	1091	1364	1636
	11	95.03	0.66	660	990	1320	1650	1980
	12	113.10	0.79	785	1178	1571	1964	2356
	13	132.73	0.92	922	1383	1844	2304	2765
	14	153.94	1.07	1069	1604	2138	2673	3207
	15	176.72	1.23	1227	1841	2454	3068	3682
10" Ftg.	16	201.06	1.40	1396	2094	2793	3491	4189
	17	226.98	1.58	1576	2364	3153	3941	4729
	18	254.47	1.77	1767	2651	3534	4418	5301
	19	283.53	1.97	1969	2953	3938	4922	5907
12" Ftg. Thickness - Minimum	20	314.16	2.18	2182	3273	4363	5454	6545
	21	346.36	2.41	2405	3608	4811	6013	7216
	22	380.13	2.64	2640	3960	5280	6600	7919
	23	415.48	2.89	2885	4328	5771	7213	8656
	24	452.39	3.14	3142	4712	6283	7854	9425
	25	490.88	3.41	3409	5113	6818	8522	10227
	26	530.93	3.69	3687	5531	7374	9218	11061
	27	572.56	3.98	3976	5964	7952	9940	11928
	28	615.75	4.28	4276	6414	8552	10690	12828
	29	660.52	4.59	4587	6880	9174	11467	13761
	30	706.86	4.91	4909	7363	9818	12272	14726
14" Footing	31	754.77	5.24	5241	7862	10483	13104	15724
	32	804.25	5.59	5585	8378	11170	13963	16755
	33	855.30	5.94	5940	8909	11879	14849	17819
	34	907.92	6.31	6305	9458	12610	15763	18915
	35	962.12	6.68	6681	10022	13363	16703	20044
	36	1017.88	7.07	7069	10603	14137	17672	21206

*Shaded total load numbers may require special column types or sizes and/or addition footing steel reinforcement.*

NOTE: This table should only be used as a guide for establishing round column pad sizes. When the actual column type, size and total loading has been determined, each column footing condition should be reviewed to determine the required round column pad size and thickness. Although actual concrete compressive strength (PSI) may vary, it is assumed that at a minimum, Plain Structural Concrete (2500 PSI) will be used for column footings sized herein. Soil types and bearing capacities must also be verified at each site. Consult with the local Building Code Official prior to using this table.

**Formula For Calculating Footing Sizes**  
**Guide Use Only, Verify Local Requirements**  
**Using 50# ground snow load for this example ( 50# x 0.7 = 35 psf )**

**Formula:**

**Roof Area x Roof Loading = Concentrated Load on Footing**

½ of Roof Span (20'-0") + Overhang (1'-0) = 21'

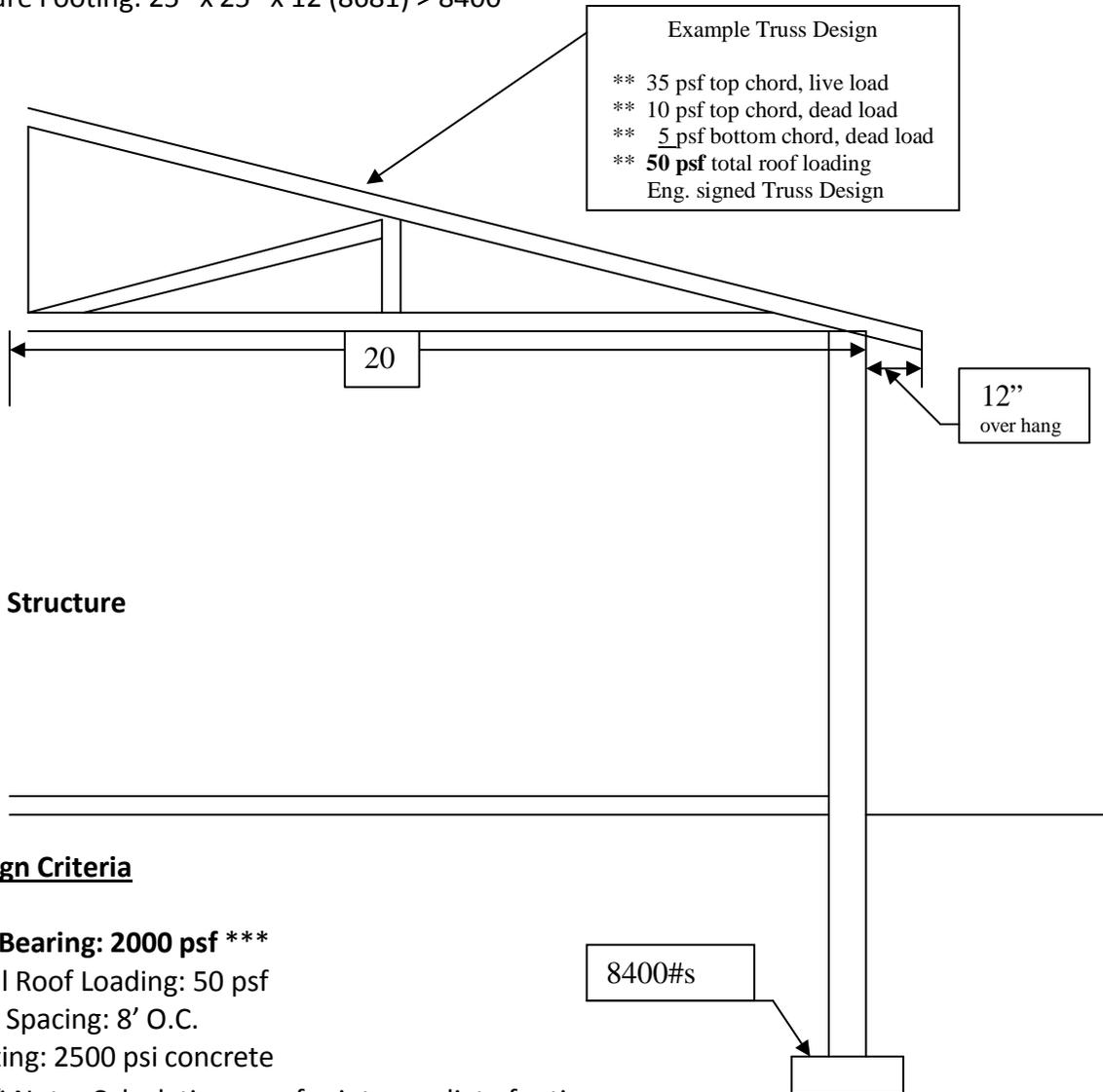
21' x 50# (roof loading) = 1050 PLF

1050 x 8' (Post Spacing) = 8400# (Total Concentrated Load)

**Footing Size per Chart:**

Round Footing: 28" x 12" (8552) > 8400

Square Footing: 25" x 25" x 12 (8681) > 8400



**Pole Structure**

**Design Criteria**

**Soil Bearing: 2000 psf \*\*\***

Total Roof Loading: 50 psf

Post Spacing: 8' O.C.

Footing: 2500 psi concrete

- \* Note: Calculations are for intermediate footings.
- \*\* Verify local snow load requirements, and top and bottom chord loading, from the submitted engineered truss design.
- \*\*\* Assuming 2000 psf, soils vary in different areas

**Example Footing Sizing**  
**60 pound ground snow load ( 60# x 0.7 = 42 psf )**

**Design Criteria - Roof Load**

Live Load: 42 psf  
 Dead Load Top Chord: + 10 psf  
**Dead Load Bottom Chord: + 5 psf**  
**Total Load: 57 psf**

**Design Criteria – Floor Load**

Live Load: 40 psf  
 Dead Load: + 10 psf  
**Total Load: 50 psf**

Soil Bearing Capacity: 2000 psf  
**Concrete: 2500 psi**

**Formula**

$\frac{1}{2}$  Roof Span + Roof Overhang x Total Load x  $\frac{1}{2}$  Beam Span = Total Roof Load on Footing

$\frac{1}{2}$  Floor Joist Span x Total Load x  $\frac{1}{2}$  Beam Span = Total Floor Load on Footing

**Total Load on Footing**

**Corner Footings:**

Roof Load: 10' + 2' = 12' x 57 psf = 684 x 7 ( 6' + 1' overhang ) = 4788 # Total Roof Load

Floor Load: 6' x 50 psf = 300 x 5' = 1500 # Total Floor Load

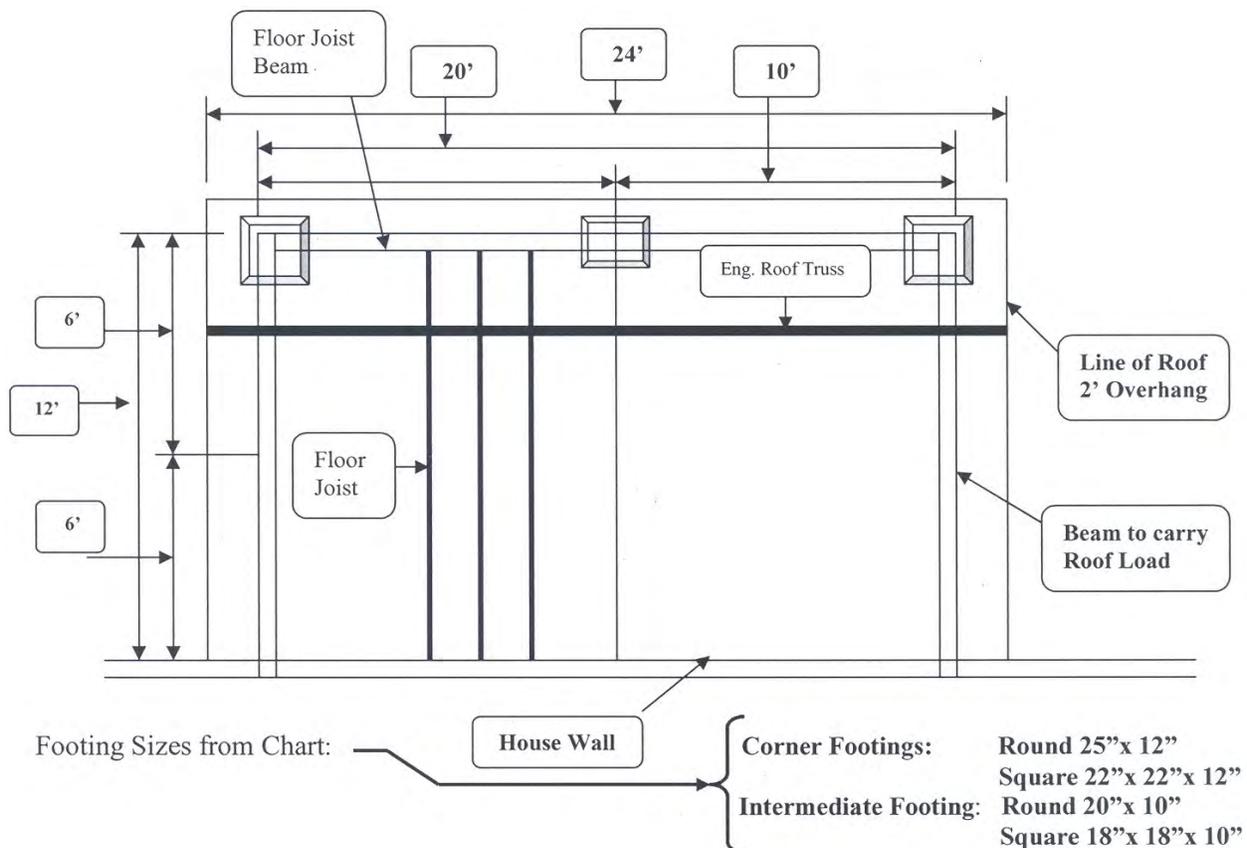
6288 # Total Load

**Intermediate Footing:**

Roof Load: \* 2' x 57 psf = 114 x 10' (  $\frac{1}{2}$  the beam each way ) = 1140 # Total Roof Load

Floor Load: 6' x 50 psf = 300 x 10' (  $\frac{1}{2}$  the beam each way ) = 3000 # Total Floor Load

\*( The above roof load span of 2' is the 1' overhang + 1' to next truss ) 4140 # Total Load



## Example: Size Footing

### DESIGN CRITERIA:

FLOOR LOAD 40# LL. 10# D.L.

TOTAL LOAD 50# PSF

SOIL BEARING CAPACITY 2000 PSF

CONCRETE: 2500 PSI UNREINFORCED

### FORMULA:

$\frac{1}{2}$  SPAN  $\times$  LOAD  $\times$   $\frac{1}{2}$  POST SPAN

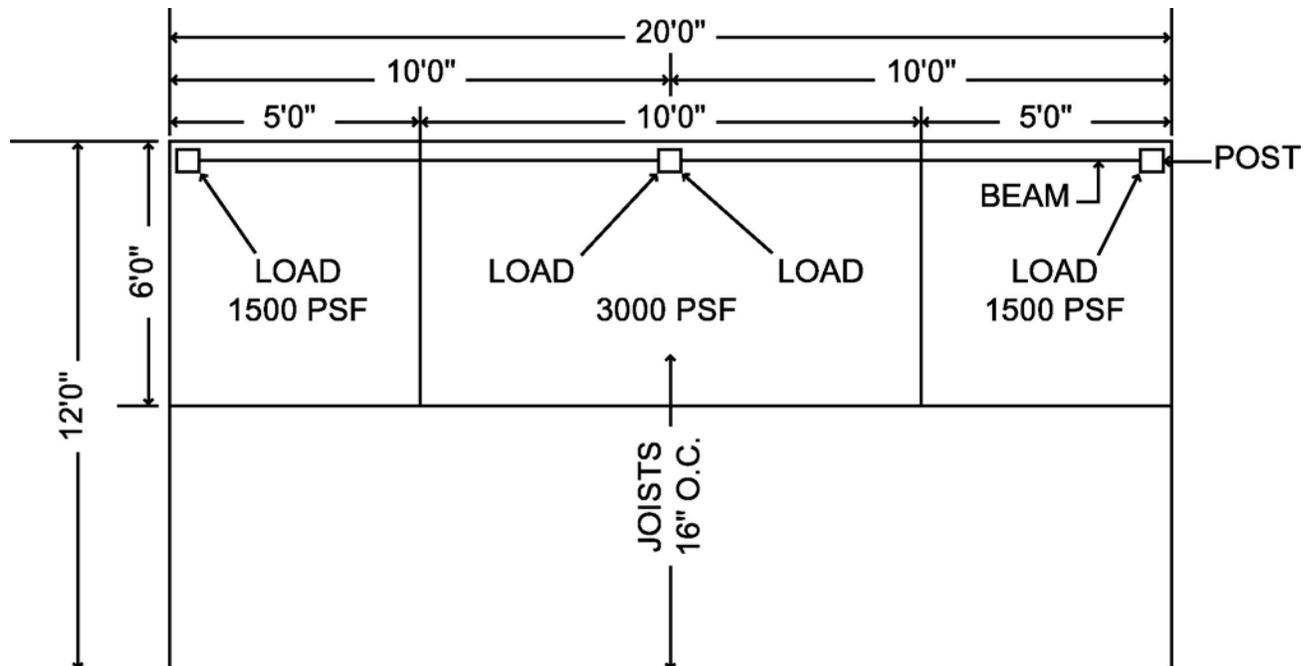
CORNER POSTS: 6'-0"  $\times$  50# = 300  $\times$  5'-0" = 1500 PSF TOTAL LOAD

CENTER POST 6'-0"  $\times$  50 = 300  $\times$  10'-0" = 3000 PSF TOTAL LOAD

### FOOTING SIZE FROM CHART:

CORNER FOOTING – ROUND 12"  $\times$  8" SQUARE FOOTING 11"  $\times$  11"  $\times$  8"

CENTER FOOTING ROUND 17"  $\times$  10" SQUARE FOOTING 15"  $\times$  15"  $\times$  8"



DECK FOUNDATION PLAN  $\frac{1}{4}$ " = 1'-0"



**TABLE R502.3.1(1)—continued FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential sleeping areas, live load = 30 psf, L/Δ = 360)<sup>a</sup>**

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)		
12	Douglas fir-larch	SS	12-6	16-6	21-0	25-7	12-6	16-6	21-0	25-7
	Douglas fir-larch	#1	12-0	15-10	20-3	24-8	12-0	15-7	19-0	22-0
	Douglas fir-larch	#2	11-10	15-7	19-10	23-0	11-6	14-7	17-9	20-7
	Douglas fir-larch	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Hem-fir	SS	11-10	15-7	19-10	24-2	11-10	15-7	19-10	24-2
	Hem-fir	#1	11-7	15-3	19-5	23-7	11-7	15-2	18-6	21-6
	Hem-fir	#2	11-0	14-6	18-6	22-6	11-0	14-4	17-6	20-4
	Hem-fir	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Southern pine	SS	12-3	16-2	20-8	25-1	12-3	16-2	20-8	25-1
	Southern pine	#1	12-0	15-10	20-3	24-8	12-0	15-10	20-3	24-8
	Southern pine	#2	11-10	15-7	19-10	24-2	11-10	15-7	18-7	21-9
	Southern pine	#3	10-5	13-3	15-8	18-8	9-4	11-11	14-0	16-8
	Spruce-pine-fir	SS	11-7	15-3	19-5	23-7	11-7	15-3	19-5	23-7
	Spruce-pine-fir	#1	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
	Spruce-pine-fir	#2	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
	Spruce-pine-fir	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
16	Douglas fir-larch	SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-0
	Douglas fir-larch	#1	10-11	14-5	18-5	21-4	10-8	13-6	16-5	19-1
	Douglas fir-larch	#2	10-9	14-1	17-2	19-11	9-11	12-7	15-5	17-10
	Douglas fir-larch	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6
	Hem-fir	SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir	#1	10-6	13-10	17-8	20-9	10-4	13-1	16-0	18-7
	Hem-fir	#2	10-0	13-2	16-10	19-8	9-10	12-5	15-2	17-7
	Hem-fir	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6
	Southern pine	SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine	#1	10-11	14-5	18-5	22-5	10-11	14-5	17-11	21-4
	Southern pine	#2	10-9	14-2	18-0	21-1	10-5	13-6	16-1	18-10
	Southern pine	#3	9-0	11-6	13-7	16-2	8-1	10-3	12-2	14-6
	Spruce-pine-fir	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-4
	Spruce-pine-fir	#1	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10
	Spruce-pine-fir	#2	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10
	Spruce-pine-fir	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6

(continued)

**TABLE R502.3.1(1)—continued FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential sleeping areas, live load = 30 psf, L/Δ = 360)<sup>a</sup>**

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
		(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	
19.2	Douglas fir-larch	SS	10-8	14-1	18-0	21-10	10-8	14-1	18-0	21-0
	Douglas fir-larch	#1	10-4	13-7	16-9	19-6	9-8	12-4	15-0	17-5
	Douglas fir-larch	#2	10-1	12-10	15-8	18-3	9-1	11-6	14-1	16-3
	Douglas fir-larch	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
	Hem-fir	SS	10-1	13-4	17-0	20-8	10-1	13-4	17-0	20-7
	Hem-fir	#1	9-10	13-0	16-4	19-0	9-6	12-0	14-8	17-0
	Hem-fir	#2	9-5	12-5	15-6	17-1	8-11	11-4	13-10	16-1
	Hem-fir	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
	Southern pine	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Southern pine	#1	10-4	13-7	17-4	21-1	10-4	13-7	16-4	19-6
	Southern pine	#2	10-1	13-4	16-5	19-3	9-6	12-4	14-8	17-2
	Southern pine	#3	8-3	10-6	12-5	14-9	7-4	9-5	11-1	13-2
	Spruce-pine-fir	SS	9-10	13-0	16-7	20-2	9-10	13-0	16-7	19-6
	Spruce-pine-fir	#1	9-8	12-9	15-8	18-3	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#2	9-8	12-9	15-8	18-3	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
24	Douglas fir-larch	SS	9-11	13-1	16-8	20-3	9-11	13-1	16-2	18-9
	Douglas fir-larch	#1	9-7	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Douglas fir-larch	#2	9-1	11-6	14-1	16-3	8-1	10-3	12-7	14-7
	Douglas fir-larch	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0
	Hem-fir	SS	9-4	12-4	15-9	19-2	9-4	12-4	15-9	18-5
	Hem-fir	#1	9-2	12-0	14-8	17-0	8-6	10-9	13-1	15-2
	Hem-fir	#2	8-9	11-4	13-10	16-1	8-0	10-2	12-5	14-4
	Hem-fir	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0
	Southern pine	SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11
	Southern pine	#1	9-7	12-7	16-1	19-6	9-7	12-4	14-7	17-5
	Southern pine	#2	9-4	12-4	14-8	17-2	8-6	11-0	13-1	15-5
	Southern pine	#3	7-4	9-5	11-1	13-2	6-7	8-5	9-11	11-10
	Spruce-pine-fir	SS	9-2	12-1	15-5	18-9	9-2	12-1	15-0	17-5
	Spruce-pine-fir	#1	8-11	11-6	14-1	16-3	8-1	10-3	12-7	14-7
	Spruce-pine-fir	#2	8-11	11-6	14-1	16-3	8-1	10-3	12-7	14-7
	Spruce-pine-fir	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

**Note:** Check sources for availability of lumber in lengths greater than 20 feet.

a. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub> shall be determined in accordance with Section R301.2.2.2.1.

**TABLE R502.3.1(2) FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential living areas, live load = 40 psf, L/Δ = 360)<sup>b</sup>**

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)
12	Douglas fir-larch	SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-3
	Douglas fir-larch	#1	10-11	14-5	18-5	22-0	10-11	14-2	17-4	20-1
	Douglas fir-larch	#2	10-9	14-2	17-9	20-7	10-6	13-3	16-3	18-10
	Douglas fir-larch	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Hem-fir	SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir	#1	10-6	13-10	17-8	21-6	10-6	13-10	16-11	19-7
	Hem-fir	#2	10-0	13-2	16-10	20-4	10-0	13-1	16-0	18-6
	Hem-fir	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Southern pine	SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine	#1	10-11	14-5	18-5	22-5	10-11	14-5	18-5	22-5
	Southern pine	#2	10-9	14-2	18-0	21-9	10-9	14-2	16-11	19-10
	Southern pine	#3	9-4	11-11	14-0	16-8	8-6	10-10	12-10	15-3
	Spruce-pine-fir	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Spruce-pine-fir	#1	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir	#2	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
16	Douglas fir-larch	SS	10-4	13-7	17-4	21-1	10-4	13-7	17-4	21-0
	Douglas fir-larch	#1	9-11	13-1	16-5	19-1	9-8	12-4	15-0	17-5
	Douglas fir-larch	#2	9-9	12-7	15-5	17-10	9-1	11-6	14-1	16-3
	Douglas fir-larch	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
16	Hem-fir	SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11
	Hem-fir	#1	9-6	12-7	16-0	18-7	9-6	12-0	14-8	17-0
	Hem-fir	#2	9-1	12-0	15-2	17-7	8-11	11-4	13-10	16-1
	Hem-fir	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Southern pine	SS	10-2	13-4	17-0	20-9	10-2	13-4	17-0	20-9
	Southern pine	#1	9-11	13-1	16-9	20-4	9-11	13-1	16-4	19-6
	Southern pine	#2	9-9	12-10	16-1	18-10	9-6	12-4	14-8	17-2
	Southern pine	#3	8-1	10-3	12-2	14-6	7-4	9-5	11-1	13-2
	Spruce-pine-fir	SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Spruce-pine-fir	#1	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#2	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4

(continued)

**TABLE R502.3.1(2)—continued FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES (Residential living areas, live load = 40 psf, L/Δ = 360)<sup>b</sup>**

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
		(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	
19.2	Douglas fir-larch	SS	9-8	12-10	16-4	19-10	9-8	12-10	16-4	19-2
	Douglas fir-larch	#1	9-4	12-4	15-0	17-5	8-10	11-3	13-8	15-11
	Douglas fir-larch	#2	9-1	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Douglas fir-larch	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Hem-fir	SS	9-2	12-1	15-5	18-9	9-2	12-1	15-5	18-9
	Hem-fir	#1	9-0	11-10	14-8	17-0	8-8	10-11	13-4	15-6
	Hem-fir	#2	8-7	11-3	13-10	16-1	8-2	10-4	12-8	14-8
	Hem-fir	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Southern pine	SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Southern pine	#1	9-4	12-4	15-9	19-2	9-4	12-4	14-11	17-9
	Southern pine	#2	9-2	12-1	14-8	17-2	8-8	11-3	13-5	15-8
	Southern pine	#3	7-4	9-5	11-1	13-2	6-9	8-7	10-1	12-1
	Spruce-pine-fir	SS	9-0	11-10	15-1	18-4	9-0	11-10	15-1	17-9
	Spruce-pine-fir	#	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir	#2	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
24	Douglas fir-larch	SS	9-0	11-11	15-2	18-5	9-0	11-11	14-9	17-1
	Douglas fir-larch	#1	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Douglas fir-larch	#2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Douglas fir-larch	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Hem-fir	SS	8-6	11-3	14-4	17-5	8-6	11-3	14-4	16-10 <sup>a</sup>
	Hem-fir	#1	8-4	10-9	13-1	15-2	7-9	9-9	11-11	13-10
	Hem-fir	#2	7-11	10-2	12-5	14-4	7-4	9-3	11-4	13-1
	Hem-fir	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Southern pine	SS	8-10	11-8	14-11	18-1	8-10	11-8	14-11	18-1
	Southern pine	#1	8-8	11-5	14-7	17-5	8-8	11-3	13-4	15-11
	Southern pine	#2	8-6	11-0	13-1	15-5	7-9	10-0	12-0	14-0
	Southern pine	#3	6-7	8-5	9-11	11-10	6-0	7-8	9-1	10-9
	Spruce-pine-fir	SS	8-4	11-0	14-0	17-0	8-4	11-0	13-8	15-11
	Spruce-pine-fir	#1	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir	#2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

**Note:** Check sources for availability of lumber in lengths greater than 20 feet.

a. End bearing length shall be increased to 2 inches.

b. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub>, and D<sub>2</sub> shall be determined in accordance with Section R301.2.2.2.1.

# Span Tables

## No. 2 Grade Wood Members

Rafters No Ceiling Finish																	Loading 35#LL + 10#DL									
L/180																										
Size	2x4				2x6				2x8				2x10				2x12									
Spacing o/c	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"						
Douglas Fir	9-0	7-10	7-1	6-4	13-2	11-5	10-5	9-4	16-8	14-5	13-2	11-9	20-4	17-8	16-1	14-5	23-7	20-6	18-8	16-9						
Hem Fir	8-5	7-7	7-2	6-8	13-2	12-0	11-0	9-7	17-5	15-2	13-10	12-5	21-5	18-7	17-0	15-2	24-10	21-6	19-8	17-7						
SPF	8-7	7-8	7-0	6-3	13-0	11-2	10-3	9-2	16-5	14-3	13-0	11-7	18-0	17-4	15-10	14-2	23-3	20-2	18-5	16-6						

Rafters Ceiling Finish Applied/Low Slope																	Loading 35#LL + 10#DL									
L/240																										
Size	2x4				2x6				2x8				2x10				2x12									
Spacing o/c	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"						
Douglas Fir	8-2	7-5	7-0	6-4	12-10	11-5	10-5	9-4	16-8	14-5	13-2	11-9	20-4	17-8	16-1	14-5	23-7	20-6	18-8	16-9						
Hem Fir	7-7	7-0	6-6	6-0	12-0	10-10	10-3	9-6	15-9	14-4	13-6	12-6	20-1	18-3	17-0	15-2	24-6	21-6	19-8	17-7						
SPF	7-9	7-1	6-8	6-2	12-3	11-1	10-3	9-2	16-2	14-3	13-0	11-7	20-0	17-4	15-10	14-3	23-3	20-2	18-5	16-6						

Vaulted Rafters Ceiling Finish Applied																	Loading 35#LL + 15#DL									
L/240																										
Size	2x4				2x6				2x8				2x10				2x12									
Spacing o/c	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"						
Douglas Fir	8-2	7-4	6-9	6-0	12-6	10-9	9-10	8-10	15-9	13-8	12-6	11-2	19-3	16-8	15-3	13-7	22-4	19-4	17-8	15-10						
Hem Fir	7-7	6-11	6-6	6-0	12-0	10-10	10-2	9-3	15-9	14-4	13-2	11-9	20-1	17-7	16-1	14-4	23-7	20-5	18-8	16-8						
SPF	7-9	7-1	6-7	5-7	12-3	10-8	9-9	8-8	16-2	13-6	12-4	11-0	19-0	16-6	15-0	13-5	22-1	19-10	17-5	15-7						

Rafters No Ceiling Finish																	Loading 42#LL + 10#DL									
L/180																										
Size	2x4				2x6				2x8				2x10				2x12									
Spacing o/c	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"						
Douglas Fir	8-4	7-3	6-6	6-1	12-0	10-7	9-8	8-7	15-6	13-5	12-3	11-0	18-11	16-5	15-0	13-5	21-11	19-0	17-4	15-6						
Hem Fir	7-10	7-2	6-8	6-2	12-10	11-2	10-2	9-1	16-4	14-1	12-11	11-6	20-0	17-3	15-9	14-1	23-1	20-1	18-3	16-4						
SPF	8-1	7-1	6-6	5-10	12-0	10-5	9-0	8-6	15-3	13-3	12-1	9-7	18-8	16-2	14-9	13-2	21-8	18-9	17-1	15-3						

Rafters Ceiling Finish Applied/Low Slope																	Loading 42#LL + 10#DL									
L/240																										
Size	2x4				2x6				2x8				2x10				2x12									
Spacing o/c	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"						
Douglas Fir	7-8	6-11	6-7	5-11	12-3	10-7	9-8	8-7	15-6	13-5	12-3	11-0	18-11	16-5	15-0	13-5	21-11	19-0	17-4	15-6						
Hem Fir	7-2	6-6	6-1	5-8	11-3	10-2	9-7	8-11	14-10	13-5	12-8	11-6	18-11	17-2	15-9	14-1	23-0	20-0	18-3	16-4						
SPF	7-4	6-8	6-3	5-10	11-6	10-5	9-6	8-6	15-2	13-3	12-1	9-1	18-8	16-2	14-9	13-2	21-8	18-9	17-1	15-3						

Vaulted Rafters Ceiling Finish Applied																	Loading 42#LL + 15#DL									
L/240																										
Size	2x4				2x6				2x8				2x10				2x12									
Spacing o/c	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"						
Douglas Fir	7-8	6-11	6-3	5-7	11-8	10-1	9-3	8-3	14-9	12-9	11-8	10-5	18-1	15-8	14-3	12-9	21-0	18-2	16-7	14-10						
Hem Fir	7-2	6-6	6-1	5-3	11-3	10-2	9-7	8-3	14-40	13-5	12-4	10-11	18-11	16-6	15-0	13-5	22-1	19-1	17-5	15-7						
SPF	7-4	6-8	6-2	4-11	11-6	10-0	9-1	7-9	14-7	12-7	11-6	10-2	17-10	15-5	14-1	12-7	20-8	17-11	16-4	14-7						

<b>Floor Joists</b>		<b>Loading 40#LL + 10#DL</b>															
<b>L/360</b>		2x6				2x8				2x10				2x12			
Size		12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"
Spacing o/c		12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"
Douglas Fir		10-9	9-9	9-1	8-1	14-2	12-7	11-6	10-3	17-9	15-5	14-1	12-7	20-7	17-10	16-3	14-7
Hem Fir		10-0	9-1	8-7	7-11	13-2	12-0	11-3	10-2	16-10	15-2	13-10	12-5	20-4	17-7	16-1	14-4
SPF		10-3	9-4	8-9	8-1	13-6	12-3	11-6	10-3	17-3	15-5	14-1	12-7	20-7	17-10	16-3	14-7

<b>Ceiling Joists</b>		<b>Loading 20#LL + 10#DL</b>															
<b>L/240</b>		2x6				2x8				2x10				2x12			
Size		12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"
Spacing o/c		12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"	12"	16"	19.2"	24"
Douglas Fir		9-10	8-9	8-0	7-2	14-10	12-10	11-9	10-6	18-9	16-3	14-10	13-3	22-11	19-10	18-2	16-3
Hem Fir		9-2	8-4	7-10	7-1	14-5	12-8	11-7	10-4	18-6	16-0	14-8	13-1	22-7	19-7	17-10	16-0
SPF		9-5	8-7	8-0	7-2	14-9	12-10	11-9	10-6	18-9	16-3	14-10	13-3	22-11	19-10	18-2	16-3

## DECK CONSTRUCTION REQUIREMENTS



*Any deviation or alternative methods to these requirements require approval by the Building Department prior to construction and may require additional plan submissions or engineering.*

This handout is intended only as a guide and is based in part on the 2015 Minnesota Residential Code, City ordinances, and good building practice. While every attempt has been made to insure the correctness of this handout, no guarantees are made to its accuracy or completeness. Responsibility for compliance with applicable codes and ordinances falls on the owner or contractor. For specific questions regarding code requirements, refer to the applicable codes or contact your local Building Department.

### DECK BUILDING PERMITS

Building permits are required for decks with the following exception: freestanding decks, regardless of size, if they are not more than 30 inches above adjacent grade. Freestanding decks do not require footings that extend below the frost depth.

Building permits are not required for patios made of concrete or pavers on grade.

Building permits can be obtained from the Building Department by filling out all application documents and submitting your construction documents.

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### PLANS

The Building Department has a handout illustrating what needs to be included on deck plans. It is very important that your plans depict exactly how your deck will be built. Plans must be neat and be of a scale of at least  $\frac{1}{4}'' = 1'$ . Computer generated plans from home stores are acceptable provided all additional required information is included. Also include any composite decking/rail system "Acceptance Reports" (see pages 4 and 19). Reports can be found on the manufacturers' website, or:

- [http://www.icc-es.org/Evaluation\\_Reports/](http://www.icc-es.org/Evaluation_Reports/) or,
- <http://www.10klakes.org/Uniformity/2013/PLASTICD.pdf>

\*Pay close attention to stair stringer spacing for composite stair treads.

**PLEASE REVIEW THE PLANS WHEN THEY ARE RETURNED TO YOU SO THAT YOU WILL BE AWARE OF ANY CORRECTIONS NEEDED.**

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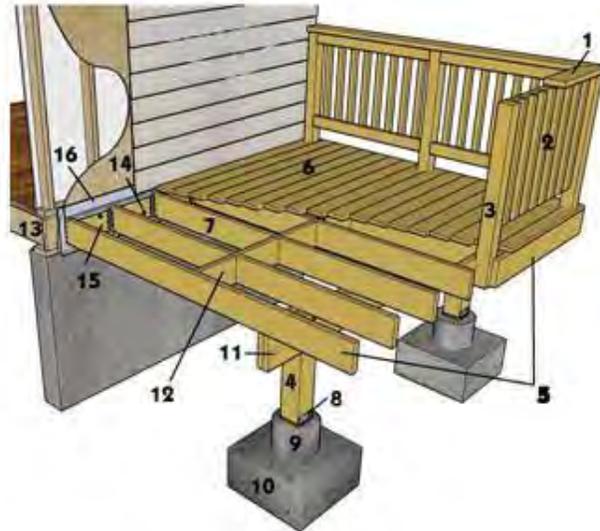
### INSPECTIONS

1. Call in advance
2. Have address, permit number, and type of inspection (ex. footing) ready
3. Footing Inspection - Holes dug, loose material/water removed. **Have plans and permit card on-site.**
4. Framing Inspection – Required if any portion of structural framing will be covered prior to Final Inspection, or, if permit holder requests framing inspection prior to installing decking.
5. Final Inspection - All work complete and all stairs, handrails, and guards in place. **Have plans and permit card on-site. Have installation instructions for composite decking/railing on site.**
6. If work is approved, the inspector will sign the record card and you may proceed with the next step
7. If corrections are noted, a correction notice will be left on the site. If a re-inspection is required it will be noted on the notice.

Please do not hesitate to call the Building Department at xxx-xxx-xxxx if you have questions. If necessary, we will be happy to meet with you on the site to help resolve any concerns or problems.

## TERMINOLOGY

1. RAIL TOP CAP
2. BALLUSTERS
3. RAIL POST
4. SUPPORT POST
5. RIM OR BAND JOIST
6. DECKING
7. JOISTS
8. POST BASE CONNECTOR
9. PIER
10. FOOTING
11. DROP BEAM
12. BLOCKING
13. HOUSE JOIST
14. 1/2" BOLTS
15. LEDGER BOARD
16. FLASHING



### THINK YOU MIGHT ENCLOSE YOUR DECK IN THE FUTURE?

Deck plans are approved on the assumption that the deck will be used only as a deck for the life of the structure. Because footing sizes, setbacks, structural supports, and a host of other deck components are different for enclosed spaces than they are for decks, it is important that you indicate on your plans the desire to convert the deck at a future date. You should then design your deck to carry future loads and meet setbacks and other rules.

### ZONING REGULATIONS

Decks are permitted as an addition to a dwelling in a side or rear yard or as a freestanding structure. An accurate site plan/survey showing the deck location must be submitted with the construction plans for review. Setbacks are routinely checked as a part of the plan review and again at the time of the footing inspection. Unless otherwise permitted by the Building department, lot lines must be marked and survey markers exposed. A site inspection may be required to verify actual deck/stair locations.

*Easements, wetland buffers and other lot restrictions may require greater setbacks than permitted by the zoning ordinance. The most restrictive setback applies. Questions regarding zoning regulations should be directed to the Planning and Zoning Office at*

#### Clearances:

<b>Well:</b>	<b>3 feet to footing or deck overhang</b>
<b>Septic Tank:</b>	<b>10 feet</b>
<b>Drainfield:</b>	<b>20 feet</b>
<b>Overhead Electrical:</b>	<b>10 feet including drip leg</b>
<b>Existing Intakes/Exhausts:</b>	<b>Maintain manufacturers clearances</b>

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Call Gopher State One Call for utility locations at least two working days before you dig – 1-800-252-1166 or 651- 454-0002.

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### ELECTRICAL

NEC 210.52(E)(3) Balconies, decks and porches, regardless of size, that are accessible from inside a dwelling unit shall have at least one receptacle installed within the perimeter.

R303.7 Exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway.

The illumination of exterior stairways shall be controlled from inside the dwelling unit.  
*Exception: Lights that are continuously illuminated or automatically controlled.*

### MATERIALS

#### Fasteners

Nails and other hardware must be hot-dipped zinc-coated (galvanized), stainless steel or equal. Screws should be either hot-dipped galvanized or electroplated with a polymer coating. 12d nails are recommended on nominal 2-inch decking. 10d nails are recommended for 5/4" decking.

With lag screws, use a flat washer under the head. Use washers under the nut and head of machine bolts and just under the nut of carriage bolts.

#### Lumber

All wood used in deck construction must be pressure treated lumber or wood that is naturally resistant to decay such as redwood or cedar.

Wood used above ground, in contact with the ground, or below ground requires different degrees of treatment. Check the labels of the material you are buying to determine where it can be used. *Because some preservative treatments are very corrosive, make sure that any fasteners or metal connectors used in the construction of your deck are approved by the manufacturer for use with treated wood.*

#### DECKING

Materials commonly used for decking include standard dimension lumber (either 2X4 or 2X6), radius-edged decking, or a manufactured decking product.

Radius-edged Patio Decking (5/4 decking) has been specifically developed for outdoor decks. *Redwood and cedar patio decking is intended to be used flat-wise in load-bearing applications where spans do not exceed 16" o.c. (12" o.c. when installed diagonally to joists). Southern pine decking may span 24" o.c. or 16" o.c. when installed diagonally to joists.*

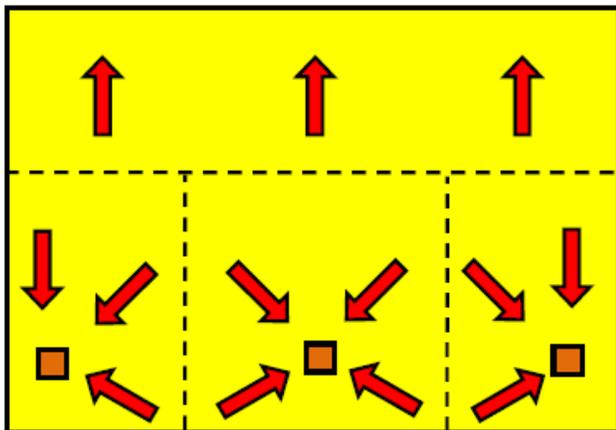
**Manufactured decking products may be used only when meeting ASTM D 7032 or when approved by the Building Department.** Approval is based on the material carrying an ICC Evaluation Services Report. Decking without a report will not be approved. Ask the decking supplier to provide you with a copy of the research report. The Building Department maintains a list of composite decking materials that meet US building codes that is available upon request. **Caution – some manufactured deck products are approved for decking but not for stair treads. In some cases where manufactured decking is approved for stairs, the spacing of supports may be significantly reduced compared to use on the deck itself. Read the research report for further information.**

MAXIMUM DECK BOARD SPANS	
2x6 OR 5/4 SOUTHERN PINE PERPENDICULAR TO JOIST	24" O.C.
5/4 CEDAR OR REDWOOD AND 2X4 PERPENDICULAR TO JOIST OR 5/4 SOUTHERN PINE OR 2X6 AT 45 DEGREES TO JOIST	16" O.C.
5/4 AND 2X4 AT 45 DEGRESS TO JOIST	12" O.C.

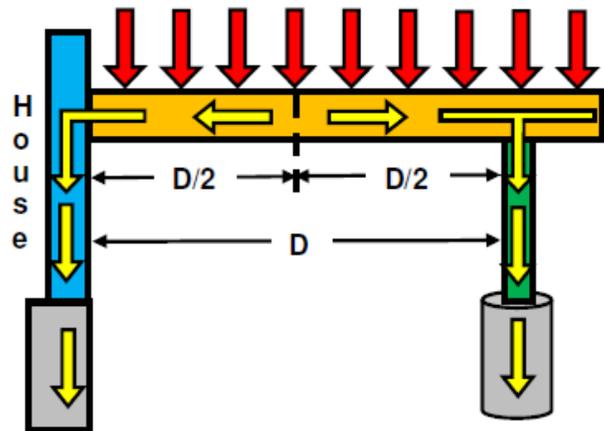
### FOOTINGS

Footings supporting a 4x4 column must be not less than 6-inch diameter. Post footings supporting columns larger than 4x4 must be 8-inch diameter or larger. The bottom of post footings may be "belled" to achieve the desired minimum bearing area. The base of the footing must be at least **42 inches** below finished grade. Rebar is recommended. Center the column on the footing secured by a pin or connector. Posts imbedded in the ground must be 60% C.C.A. or equal. Using a fiberboard tube will allow elevation of the top of the footing above finished grade to provide protection of the wood post from lawn mowers and trimmers.

### UNDERSTANDING LOAD PATHS



Loads are assumed to be uniform across the floor

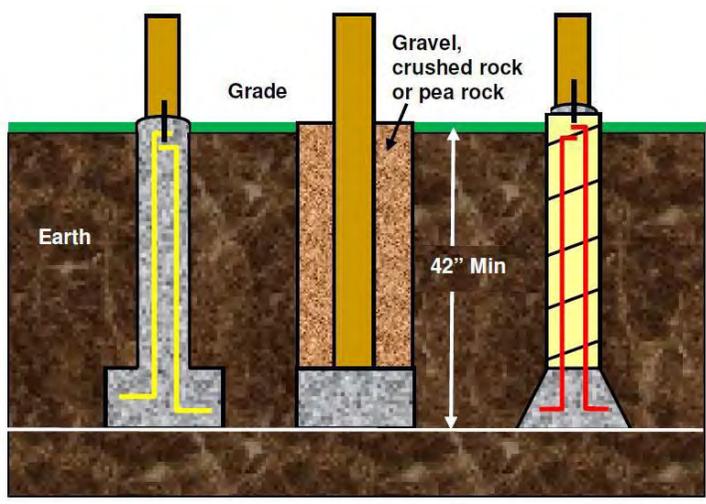
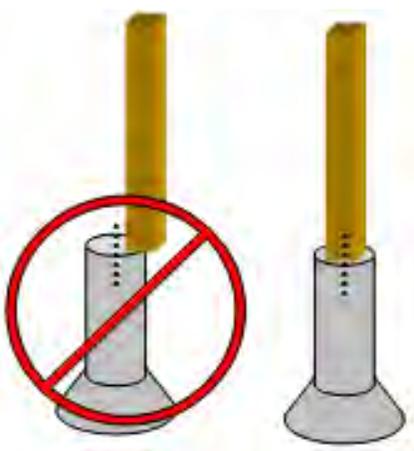


Deck footings should be sized according to the following table. Footings must extend **at least 42 inches below grade** (frost line) except for decks that are not connected to a dwelling. **The minimum compressive strength of concrete used for deck footings is 2500 psi.**

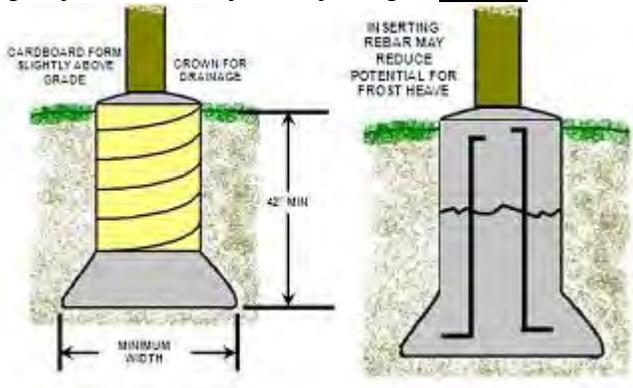
DECK FOOTING SIZES (1500 psf soils) – NOT FOR USE WITH HOT TUBS							
Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches	Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches	Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches	Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches
10	8	23	12	41	16	65	20
13	9	27	13	47	17	72	21
16	10	32	14	53	18	79	22
19	11	36	15	59	19	86	23

Required footing sizes are determined by calculating the area of the deck supported by each footing. Loads shall be assumed to be equally shared between the supporting elements. **Don't overlook cantilevers. The minimum compressive strength of concrete used for deck footings is 2500 psi.**

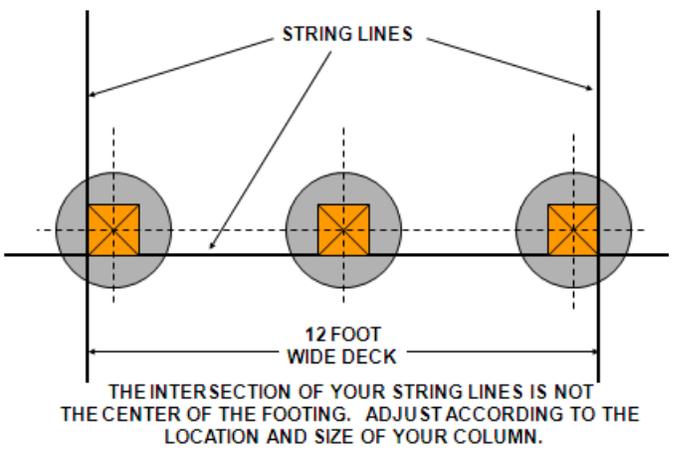
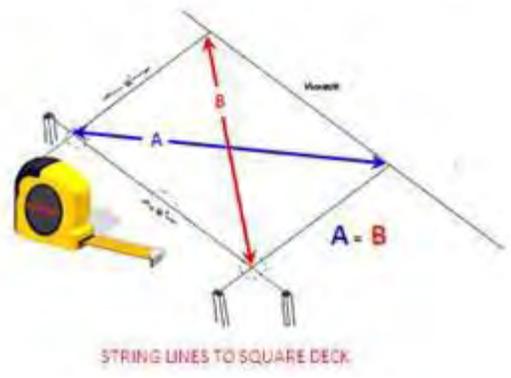
**THE REQUIRED AREA OF THE COLUMN SHOULD FULLY BEAR ON THE FOOTING**



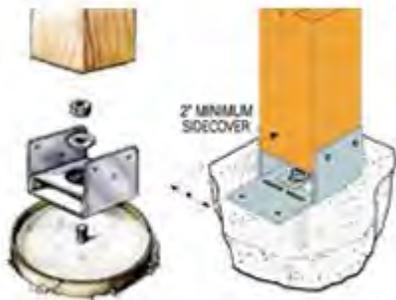
**The minimum compressive strength of concrete used for deck footings is 2500 psi.**



**WHERE DO I PUT MY FOOTINGS?**



# ANCHORING POST BASE



Follow manufacturers installation specifications.



Not allowed - connection must be made using a field inspectable means of connection.

## DECKFRAMING ATTACHMENT OF LEDGER BOARD TO WOOD JOISTS (2X6, 2X8, 2X10, 2X12) (Caution: 2x6 and 2x8 joists will require underside floor protection with 5/8" treated plywood)

Make sure the ledger is securely attached to the dwelling. Install metal flashing at top and caulk sides.

**TABLE R507.2**  
**FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER AND A 2-INCH-NOMINAL SOLID-SAWN SPRUCE-PINE-FIR BAND JOIST<sup>c, f, and g</sup>**  
(Deck live load = 40 psf, deck dead load = 10 psf)

JOIST SPAN	6' and less	6'1" to 8'	8'1" to 10'	10'1" to 12'	12'1" to 14'	14'1" to 16'	16'1" to 18'
<b>Connection details</b>	<b>On-center spacing of fasteners<sup>a and e</sup></b>						
½ inch diameter lag screw with 3/32 inch maximum sheathing <sup>a</sup>	30	23	18	15	13	11	10
½ inch diameter bolt with 3/32 inch maximum sheathing	36	36	34	29	24	21	19
½ inch diameter bolt with 3/32 inch maximum sheathing and ½ inch stacked washers <sup>b, h</sup>	36	36	29	24	21	18	16

- a. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- b. The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½ inch.
- c. Ledgers shall be flashed to prevent water from contacting the house band joist.
- d. Lag screws and bolts shall be staggered in accordance with Section R507.2.1.
- e. Deck ledger shall be minimum 2 x 8 pressure-preservative-treated No. 2 grade lumber, or other approved materials as established by standard engineering practice.
- f. When solid-sawn pressure-preservative-treated deck ledgers are attached to a minimum 1-inch-thick engineered wood product (structural composite lumber, laminated veneer lumber or wood structural panel band joist), the ledger attachment shall be designed in accordance with accepted engineering practice.
- g. A minimum 1 x 9½ Douglas Fir laminated veneer lumber rimboard shall be permitted in lieu of the 2-inch nominal band joist.
- h. Wood structural panel sheathing, gypsum board sheathing or foam sheathing not exceeding 1 inch in thickness shall be permitted. The maximum distance between the face of the ledger board and the face of the band joist shall be 1 inch.

**Capacity of lag or carriage bolts shall not exceed 400 lb's per bolt unless design provided.**

**TABLE 507.2.1**  
**PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS**  
**MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS**

Ledger <sup>a</sup> Band Joist <sup>c</sup>	TOP EDGE 2 inches <sup>s</sup> ¾ inches	BOTTOM EDGE ¼ inch 2 inches	ENDS 2 inches <sup>b</sup> 2 inches <sup>b</sup>	ROW SPACING 1 ½ inches <sup>es</sup> 1 ½ inches <sup>es</sup>
--	---	-----------------------------------	--	---

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.2.1(1).
- b. Maximum 5 inches.
- c. For engineered rim joists, the manufacturer's recommendations shall govern.
- d. The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).

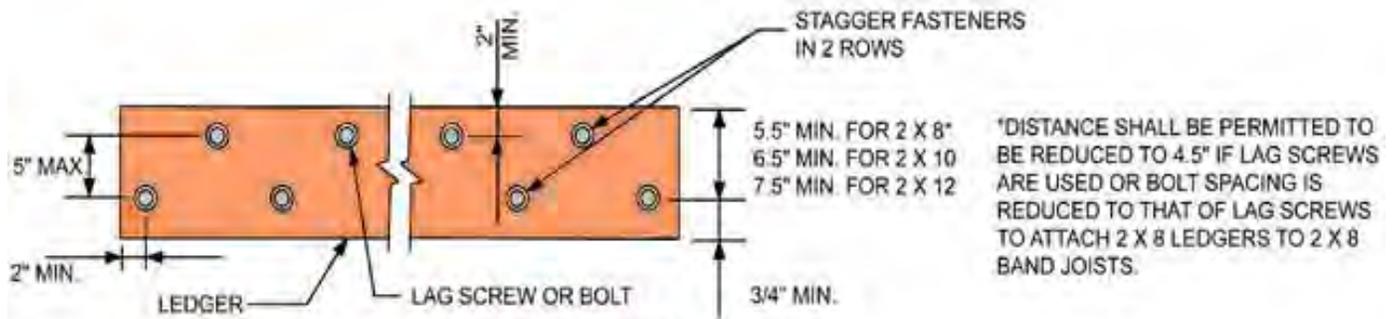
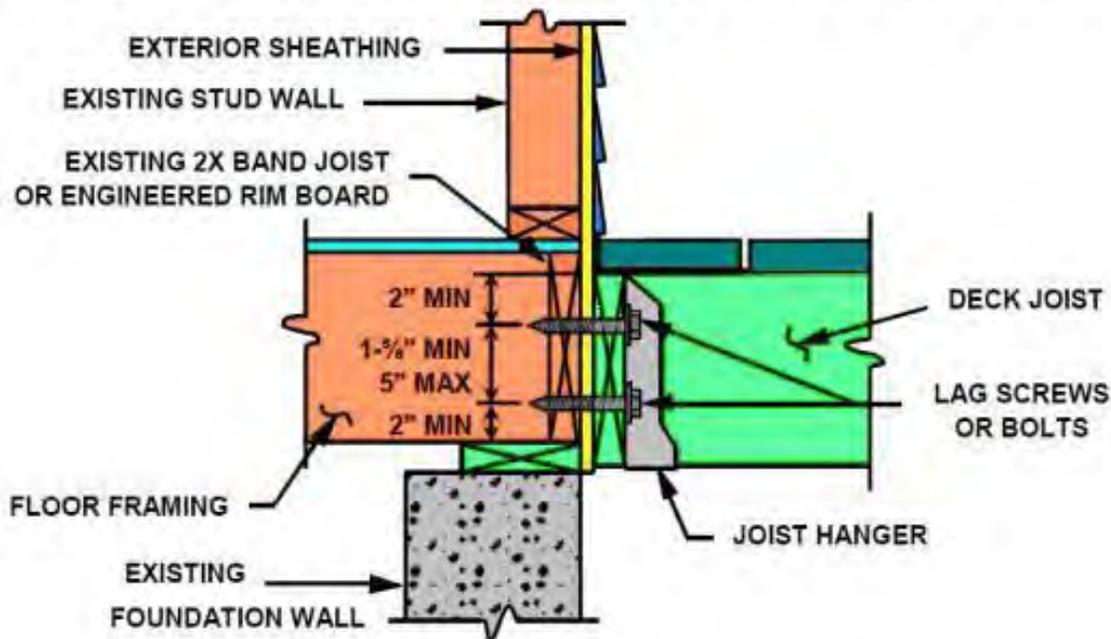
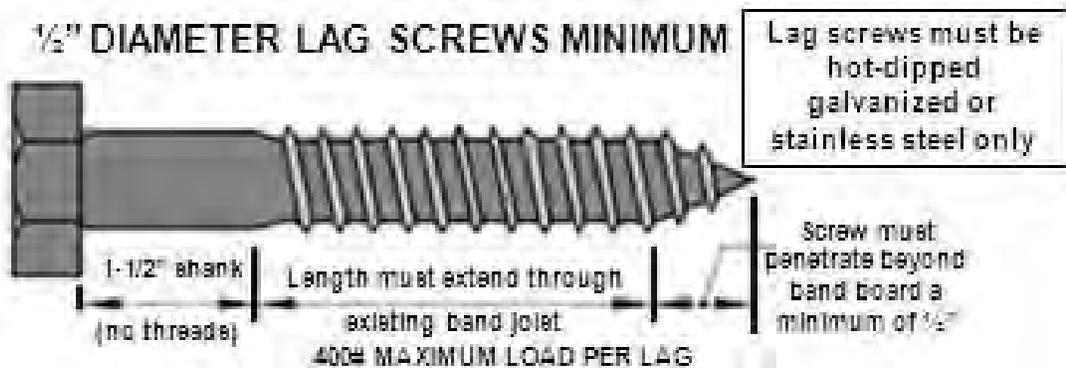


FIGURE R507.2.1(1)  
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

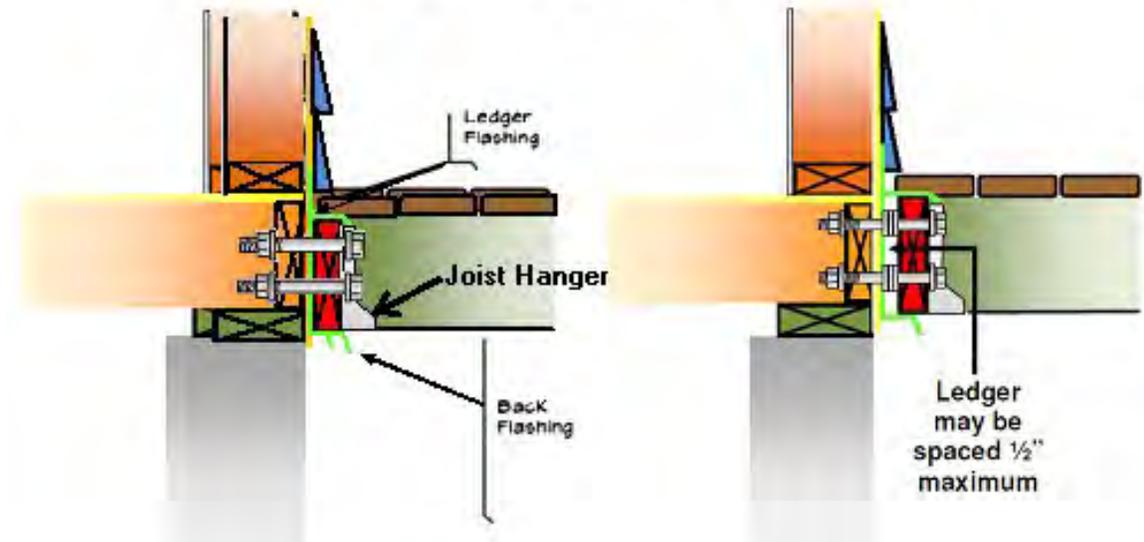
### PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS



### 1/2" DIAMETER LAG SCREWS MINIMUM

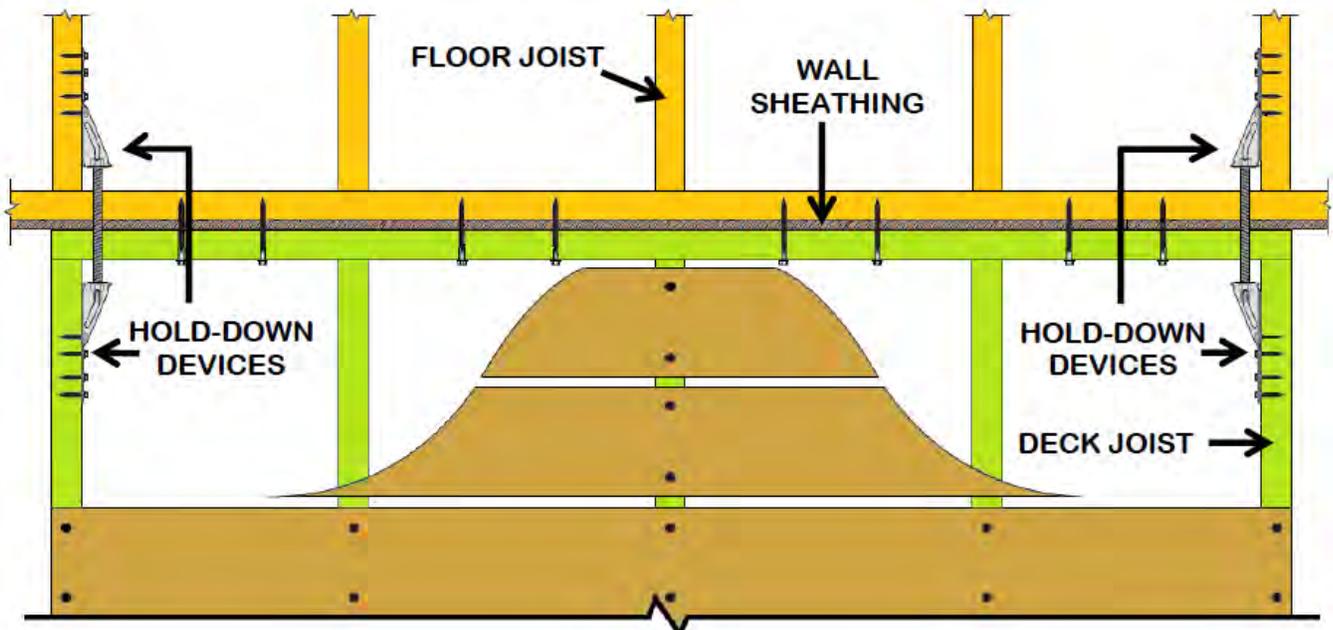


## LEDGER FLASHING DETAIL



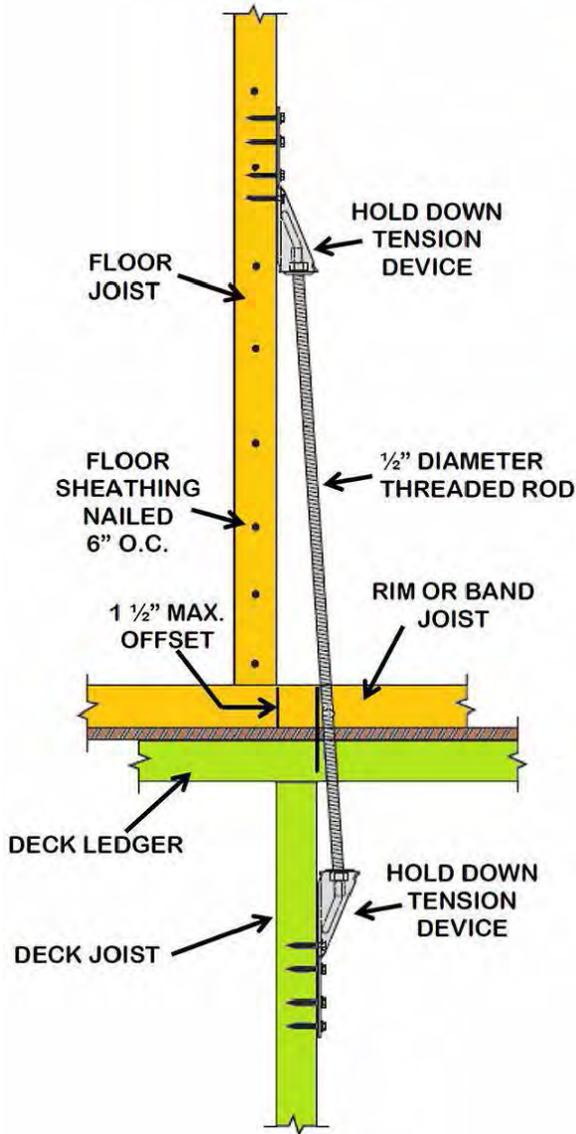
## LATERAL LOAD CONNECTIONS TWO MINIMUM PER DECK

*(See "Alternate Methods" page 10)*

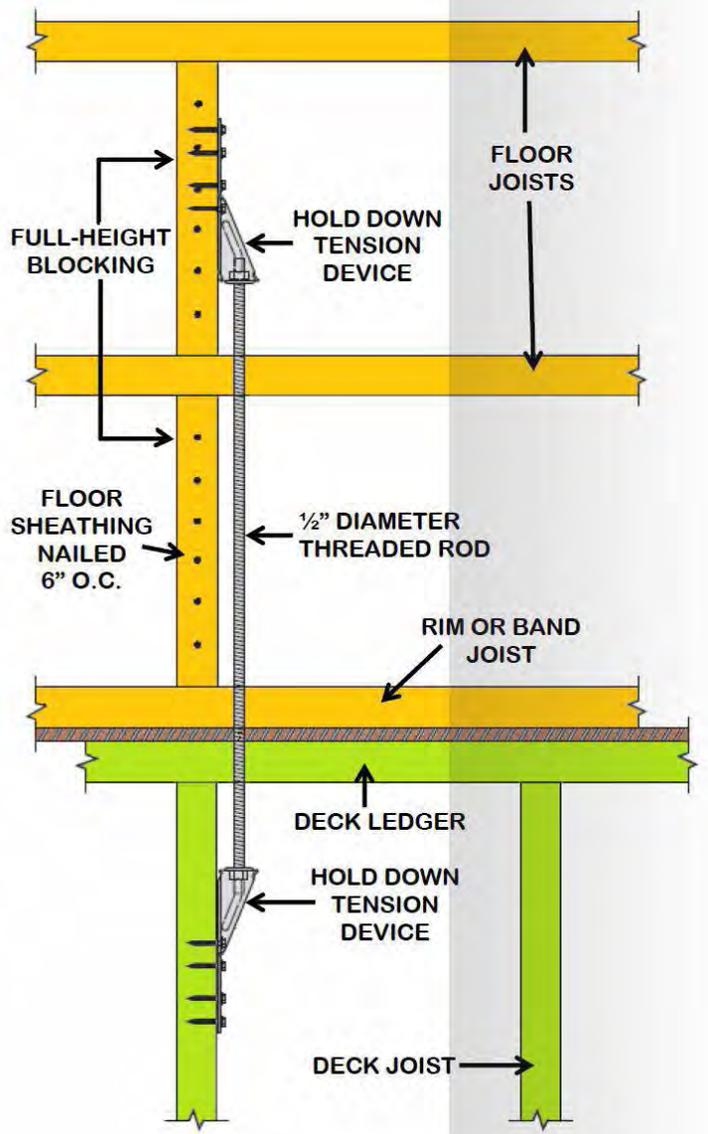


- HOLD-DOWN TENSION DEVICES MUST BE INSTALLED IN NOT LESS THAN TWO LOCATIONS PER DECK
- EACH DEVICE MUST HAVE AN ALLOWABLE STRESS DESIGN CAPACITY OF NOT LESS THAN 1500 POUNDS.
- FLOOR SHEATHING IN THE DWELLING MUST BE NAILED TO THE JOISTS TO WHICH HOLD DOWNS ARE CONNECTED AT 6" MAXIMUM O.C.
- ALTERNATIVELY THE DECK MAY BE DESIGNED TO BE SELF SUPPORTING OR A DESIGN MAY BE PROVIDED BY A LICENSED DESIGN PROFESSIONAL.

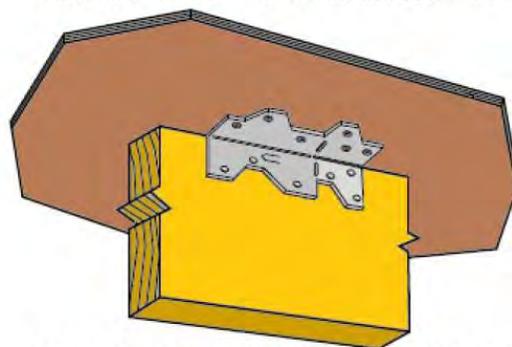
**FLOOR JOISTS  
PERPENDICULAR TO DECK  
LEDGER**



**FLOOR JOISTS  
PARALLEL TO DECK  
LEDGER**



**WHEN THERE IS NO ACCESS TO THE  
TOP OF THE FLOOR SHEATHING**



**INSTALL APPROVED CONNECTORS PER THE  
MANUFACTURER'S INSTALLATION INSTRUCTIONS**

**IN ALL CASES, MANUFACTURE'S INSTALLATION INSTRUCTIONS MUST BE FOLLOWED**

## ALTERNATIVE DECK LATERAL LOAD CONNECTORS (or approved equivalent)



### LTS19-TZ Deck Lateral Load Connector

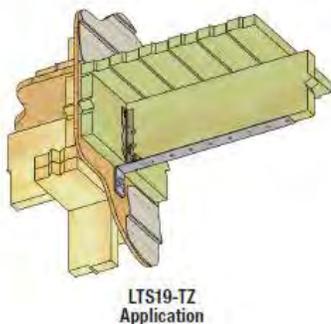
The LTS19-TZ holdown can be used to build stronger, safer, deck structures. It will meet the new lateral connection requirements outlined in the 2015 International Residential Code (IRC) by attaching deck floor joist members to the main structure. The LTS19-TZ can also be used for deck rail post reinforcement.

**Materials:** Strap: 16Ga G-185 galvanizing  
Washer - 3Ga USP primer

**Codes:** ER-200, FL14500

**Installation:**

- The LTS19-TZ must be installed flush to the surface of the outside wall of the home.
- Use the building code specified 3/8" lag screw and washer to secure the base of the LTS19-TZ to the main house structure. The minimum embedment depth for the lag screw is 3".
- Tighten lag screw until snug to the base of the LTS19-TZ, with a wrench or socket, to prevent loosening of the lag screw.
- Use all specified 10d common nails to attach the strap portion of the connector to the bottom of the deck floor joist.
- See additional installation instructions on detail drawing.



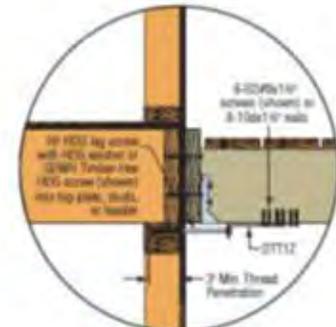
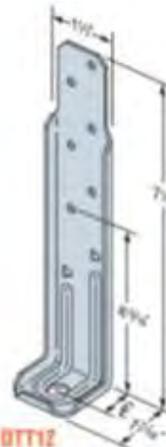
Decks & Fences

**DTT** Deck Tension Ties

DTT tension ties are safe, cost-effective connectors designed to meet or exceed code requirements for deck construction. These versatile DTT connectors are also load rated as a holdown for light-duty shearwalls and braced wall panel applications.

For new construction or to make an existing current deck code-compliant, the DTT1Z can be used as a tension-tie to satisfy the 2015 IRC provision for a 750 lbs. lateral load connection to the house at four locations per deck. This new code detail permits the lateral connection from the deck joists to be made to top plates, studs, or headers within the supporting structure, which eliminates the need to access to the floor joists inside the home.

The new DTT1Z fastens to the narrow or wide face of a single 2x with Simpson Strong-Tie® Strong-Drive® SD Connector screws or nails and accepts a 3/8" machine bolt, anchor bolt, or lag screw (*washer required*) or can be installed with the new Strong-Drive SDWH Timber-Hex HDG screw with an integral washer. The DTT2 fastens easily to the wide face of a single or double 2x using Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screws (included) and accepts a 1/2" machine bolt or anchor bolt.



**Typical DTT1Z Deck-to-House Lateral Load Connection**  
For more information on lateral load connections, see technical bulletin T-DECKLALOAD

**MATERIAL:** 14 gauge

**FINISH:** DTT1Z/DTT2Z—ZMAX® coating;

DTT2SS—Stainless steel; see Corrosion Information, pages 13-15.

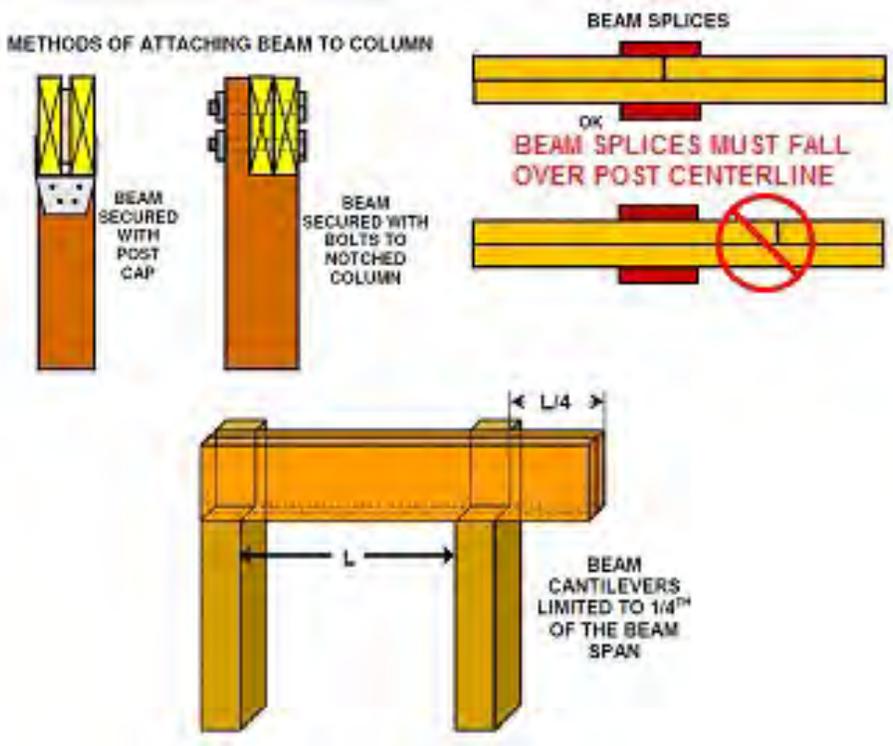
**INSTALLATION:**

- Use all specified fasteners. See General Notes.
- A standard cut washer (*included*) must be installed between the nut and the seat.
- Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screws install best with a low speed high torque drill with a 3/8" hex head driver.
- Strong-Drive SD Connector screws install with a 1/4" hex head driver.
- Strong-Drive SDWH Timber-Hex HDG screws install with a 1/2" hex head driver.

## BEAMS

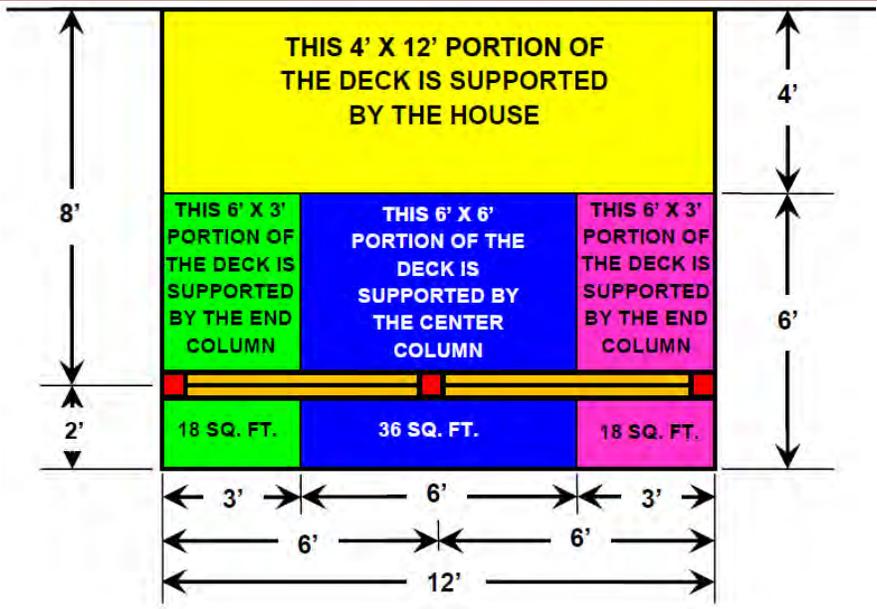
Construct beams using two or more 2 inch nominal pieces of lumber. Nail beams together using 10d nails at 32 inches o.c. along each edge of the beam and staggered. A spacer may be used to fir the beam to a 3½ -inch width. Beams should be installed with any arch or crown facing up. Attachments to columns should be with post caps designed for such use. Splices must occur over columns.

<b>BEAM SPANS (Wet Service)</b> (Center of one column to center of next) (Source AF&PA; rev. 8-17-10)								
Species	B e a m	Joist Spans						
		6'	8'	10'	12'	14'	16'	18'
Southern Pine	2-2X6	7'1"	6'2"	5'6"	5'0"	4'8"	4'4"	4'1"
	2-2X8	9'2"	7'11"	7'1"	6'6"	6'0"	5'7"	5'3"
	2-2X10	11'10"	10'3"	9'2"	8'5"	7'9"	7'3"	6'10"
	2-2X12	13'11"	12'0"	10'9"	9'10"	9'1"	8'6"	8'0"
	3-2X6	8'7"	7'8"	6'11"	6'3"	5'10"	5'5"	5'2"
	3-2X8	11'4"	9'11"	8'11"	8'1"	7'6"	7'0"	6'7"
	3-2X10	14'5"	12'10"	11'6"	10'6"	9'9"	9'1"	8'7"
	3-2X12	17'5"	15'1"	13'6"	12'4"	11'5"	10'8"	10'1"
Cedar, Redwood , Ponderosa Pine	2-2X6	5'5"	4'8"	4'2"	3'10"	3'6"	3'1"	2'9"
	2-2X8	6'10"	5'11"	5'4"	4'10"	4'6"	4'1"	3'8"
	2-2X10	8'4"	7'3"	6'6"	5'11"	5'6"	5'1"	4'8"
	2-2X12	9'8"	8'5"	7'6"	6'10"	6'4"	5'11"	5'7"
	3-2X6	7'4"	6'8"	6'0"	5'6"	5'1"	4'9"	4'6"
	3-2X8	9'8"	8'6"	7'7"	6'11"	6'5"	6'0"	5'8"
	3-2X10	12'0"	10'5"	9'4"	8'6"	7'10"	7'4"	6'11"
	3-2X12	13'11"	12'1"	10'9"	9'10"	9'1"	8'6"	8'1"



### COLUMNS

		MAXIMUM POST HEIGHT IN FEET													
SPECIES	SIZE	SQUARE FEET OF DECK SUPPORTED													
		36	48	60	72	84	96	108	120	132	144	156	165	180	192
SOUTHERN PINE	4X4	10	10	10	9	9	8	8	7	7	6	6	6	6	6
	4X6	14	14	13	12	11	10	10	9	9	8	8	8	7	7
	6X6	17	17	17	17	17	17	17	17	16	16	15	14	13	13
REDWOOD CEDAR	4X4	10	10	9	8	7	7	6	6	5	4				
	4X6	14	13	12	11	10	9	8	8	7	7	6	6	5	
	6X6	17	17	17	17	17	16	13	7						



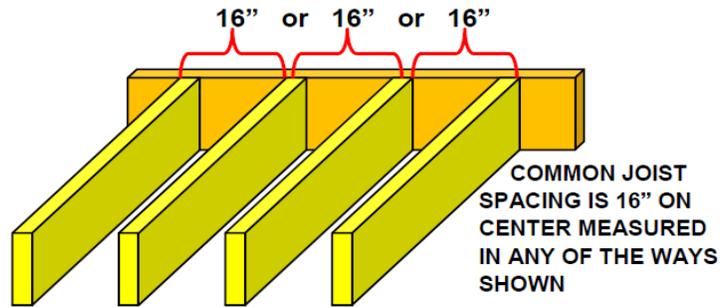
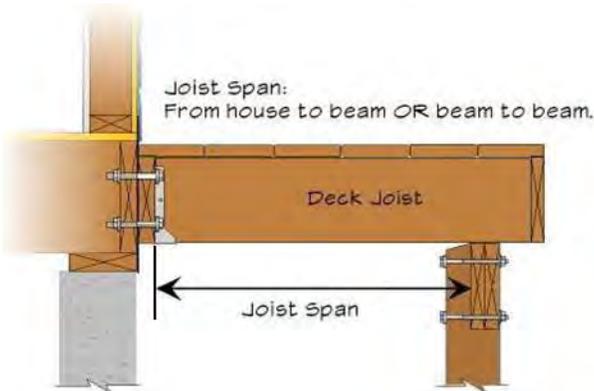
# JOISTS

## JOIST SPANS (Wet Service)

(Source AF&PA; rev. 8-17-10)

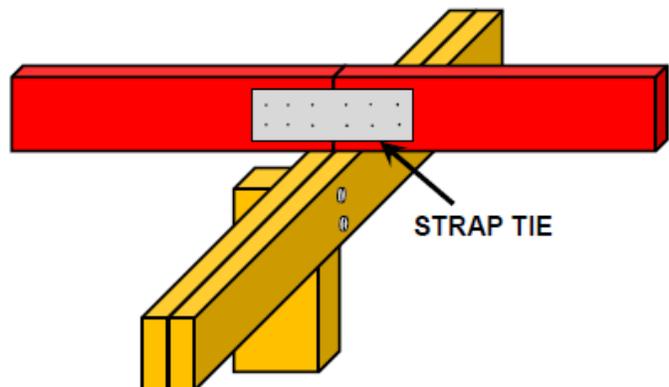
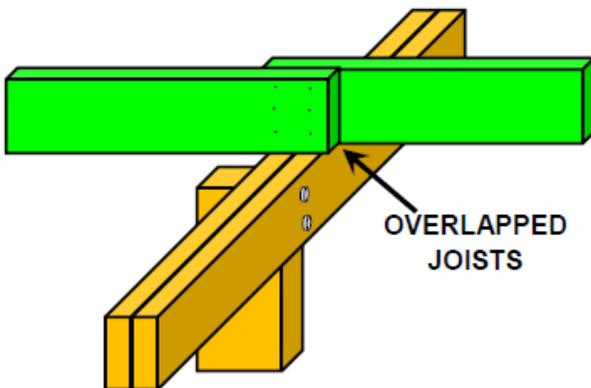
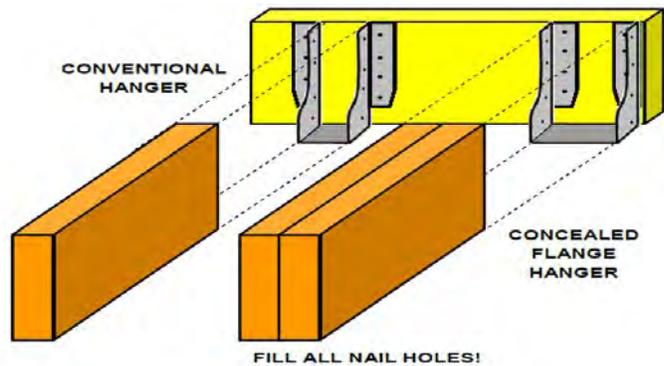
JOIST SIZE	SOUTHERN PINE			WESTERN CEDAR/PONDEROSA PINE		
	12" oc	16" oc	24" oc	12" oc	16" oc	24" oc
2X6	10'4"	9'5"	7'10"	8'10"	8'0"	7'0"
2X8	13'8"	12'5"	10'2"	11'8"	10'7"	8'8"
2X10	17'5"	15'10"	13'5"	14'11"	13'0"	10'7"
2X12	21'2"	18'10"	15'5"	17'5"	15'1"	12'4"

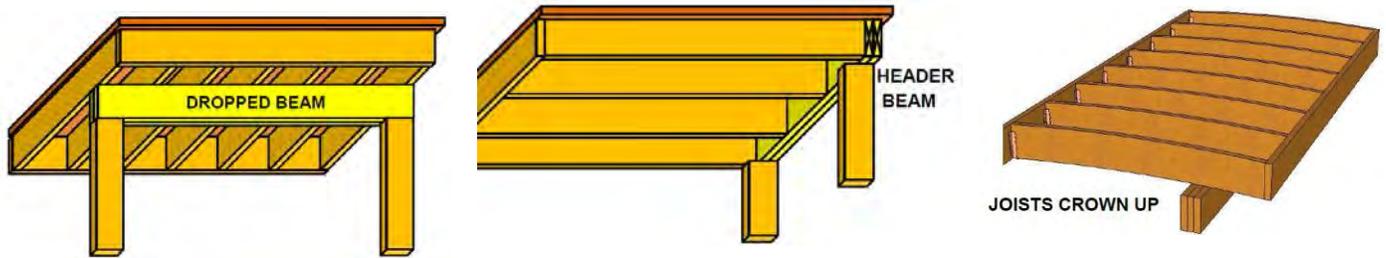
## JOIST DETAILS



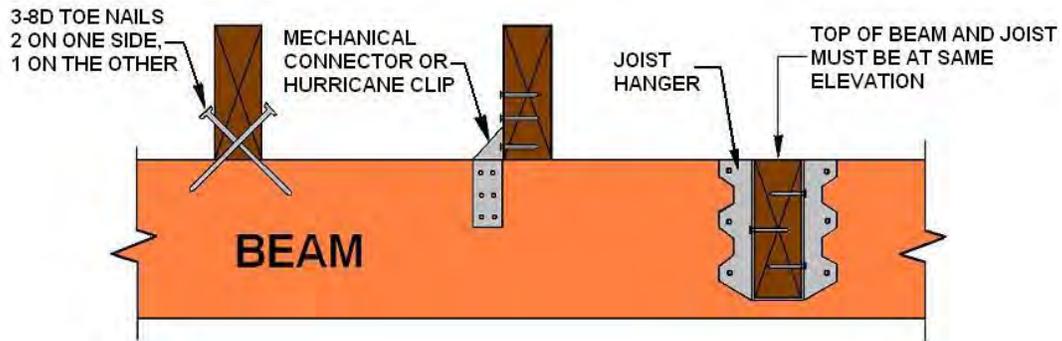
Joist spacing is determined by the type of decking used. 16" o.c. spacing must be used with 5/4 decking or when 2x6 or 2x4 decking is used at a 45° angle. 12" o.c. spacing required when 5/4 decking is used at a 45° angle.

## WOOD DECKING



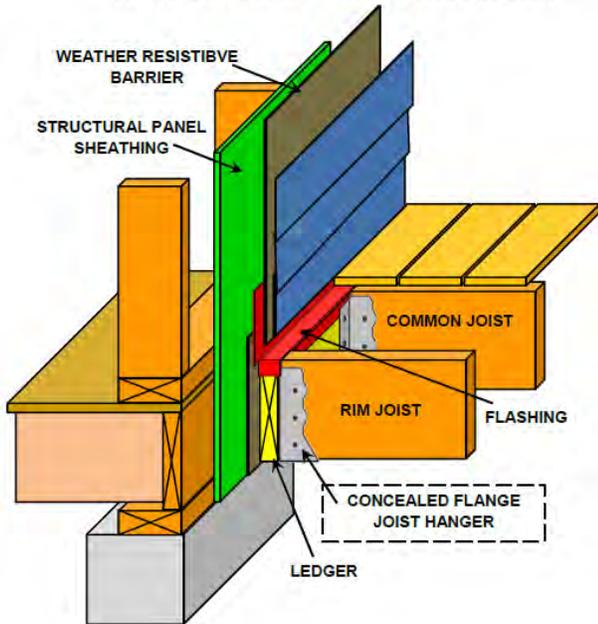


### JOIST TO BEAM ATTACHMENTS

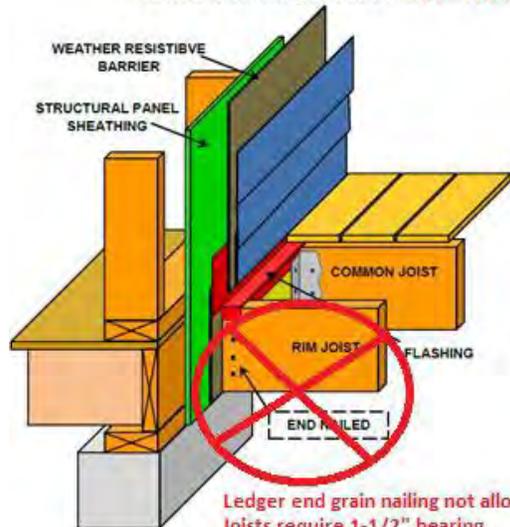


Joists must bear on a beam, ledger strip, or joist hangers. Joist hangers must be installed in accordance with the manufacturer's recommendations. **Fill all nail holes in joist hangers.**

### RIM JOIST ATTACHED TO LEDGER WITH CONCEALED FLANGE HANGER

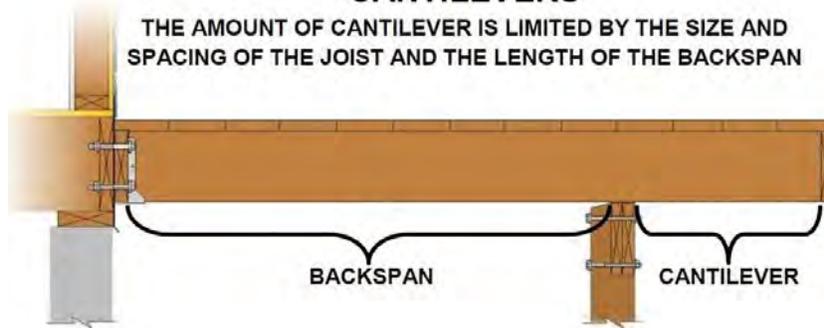


### RIM JOIST ATTACHED TO LEDGER BY END NAILING - NOT ALLOWED

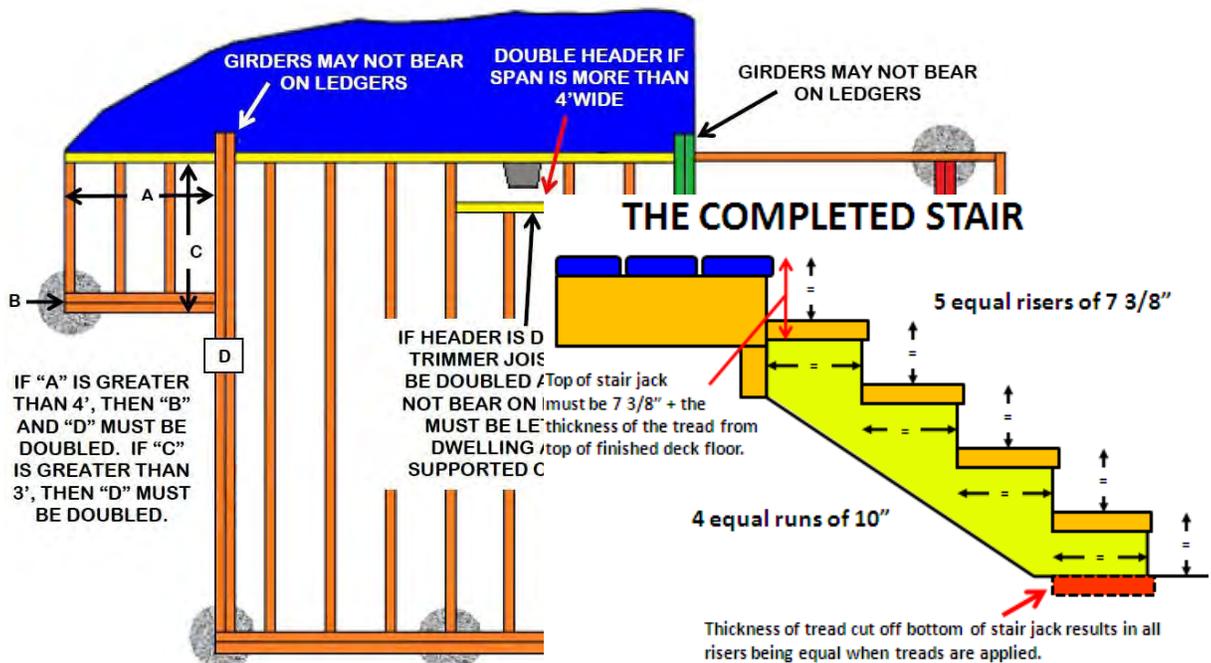
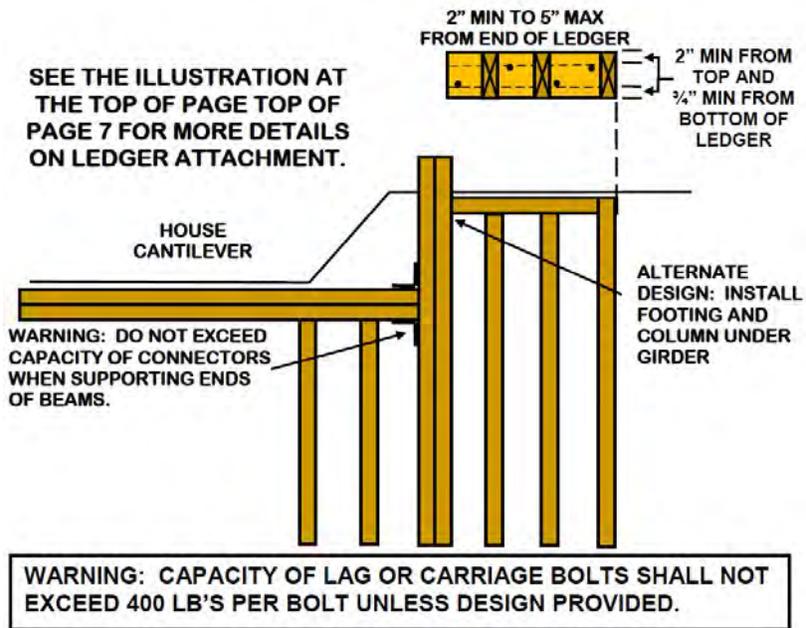


Ledger end grain nailing not allowed. Joists require 1-1/2" bearing. Use approved concealed flange hanger.

## CANTILEVERS



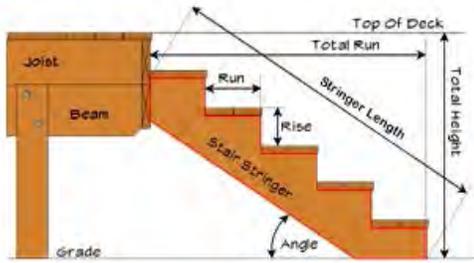
## SPECIAL FLOOR FRAMING DETAILS



Stairs must have a maximum rise of  $7 \frac{3}{4}$  inches and a minimum run of 10 inches measured as shown. The greatest riser height within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$  inch. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$  inch. **Open risers are permitted provided that a 4" diameter sphere will not pass between the treads.**

Stairs must be a minimum of 36 inches wide above the handrail and 31½ inches below the handrail.

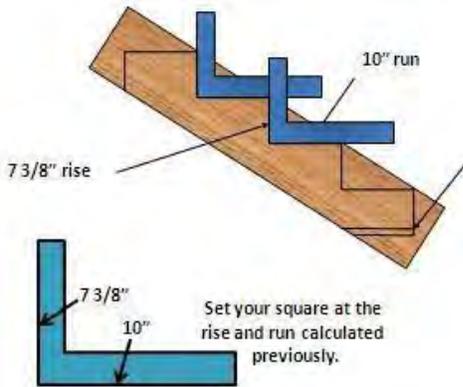
### STAIR TERMINOLOGY



Stair Basics

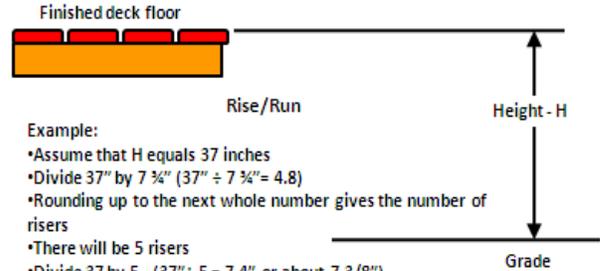
- The maximum riser height is  $7 \frac{3}{4}$  inches
- The minimum tread run is 10 inches
- Treads and risers should be approximately equal with the largest not exceeding the smallest by more than  $\frac{3}{8}$  inch.

### LAYING OUT STAIR JACKS



Cut an amount equal to the thickness of the tread from the bottom of the stair jack

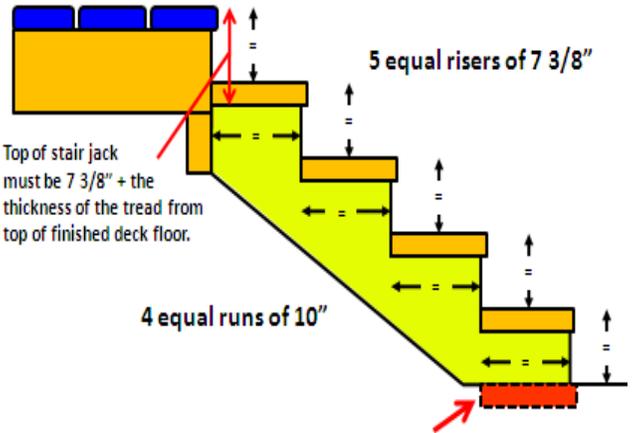
### DETERMINING RISE/RUN



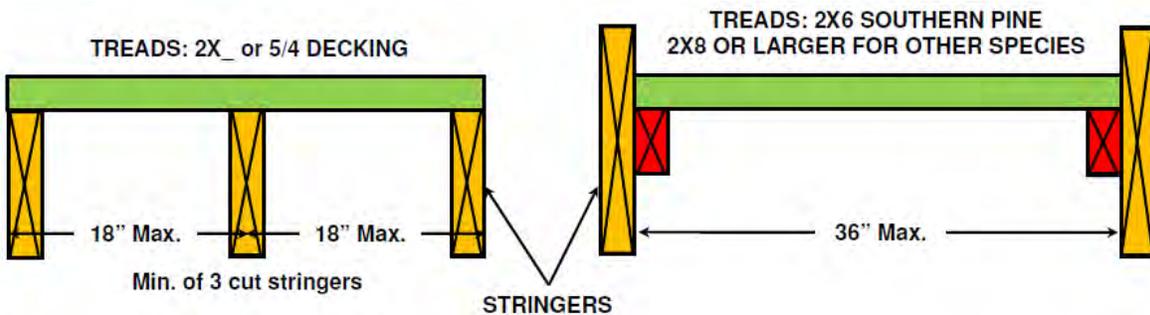
Example:

- Assume that H equals 37 inches
- Divide 37" by  $7 \frac{3}{4}$ " ( $37" \div 7 \frac{3}{4}" = 4.8$ )
- Rounding up to the next whole number gives the number of risers
- There will be 5 risers
- Divide 37 by 5. ( $37" \div 5 = 7.4"$  or about  $7 \frac{3}{8}"$ )
- Each riser will be  $7 \frac{3}{8}"$
- For 5 risers there will be 4 treads
- Since each tread must be at least 10", the length of the stair from the face of the deck to the face of the bottom riser will be at least 40" ( $10" \times 4 \text{ treads} = 40"$ )

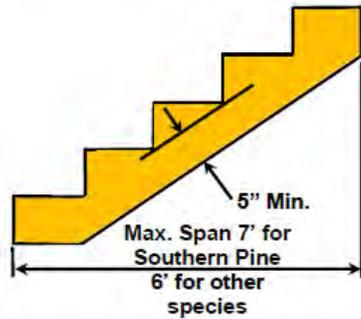
### THE COMPLETED STAIR



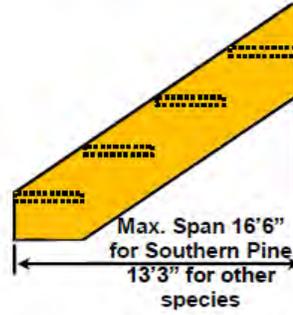
Thickness of tread cut off bottom of stair jack results in all risers being equal when treads are applied.



**STAIR STRINGER SPANS**  
LANDINGS OR COLUMNS AND BEAMS MAY BE USED TO SHORTEN STRINGER SPANS

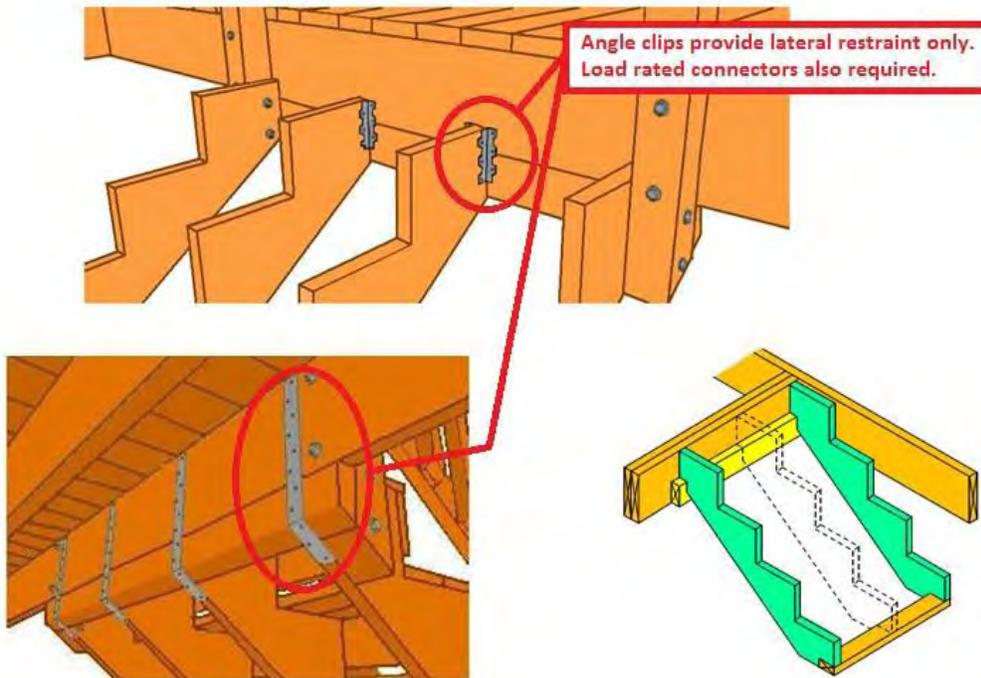


**CUT STRINGER**



**SOLID STRINGER**

**STAIR ATTACHMENTS**



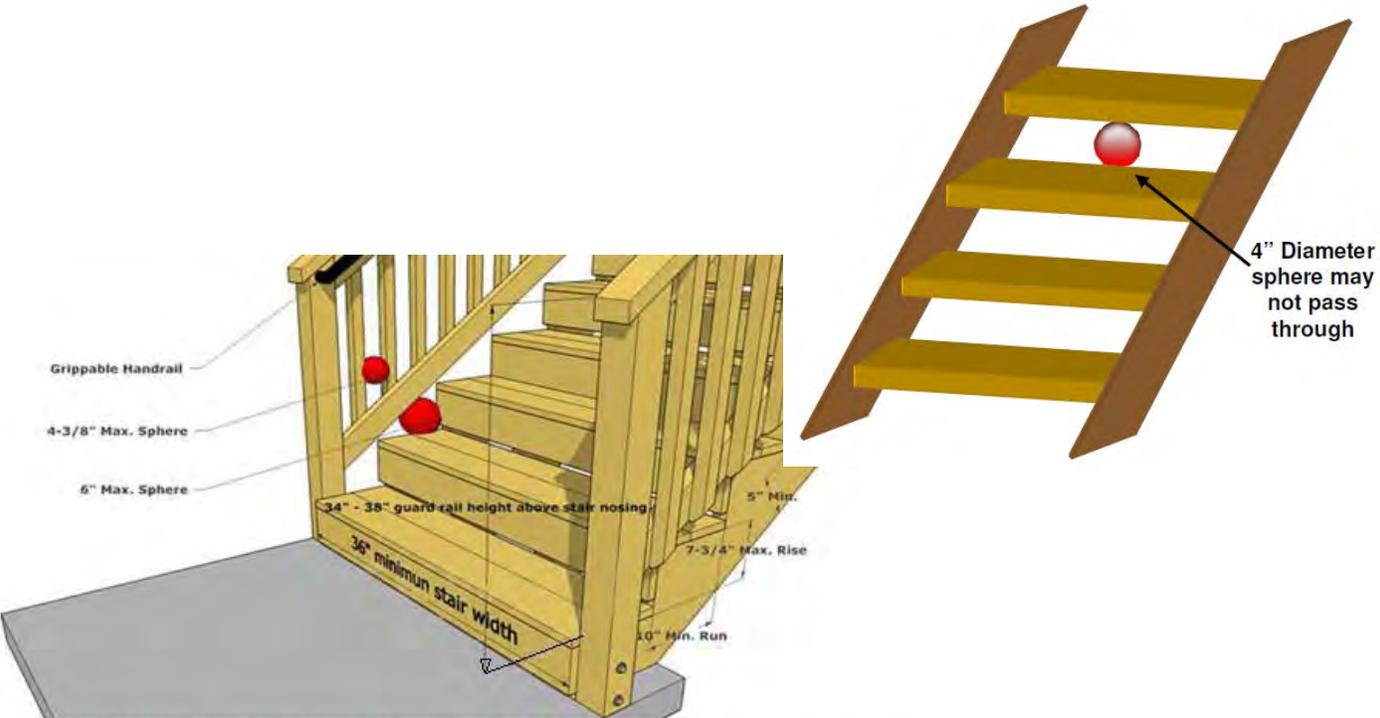
**GUARDS AND HANDRAILS**

Guards and handrails must be provided as shown on the following illustrations. Guards must continue down stairs where the stair is more than 30 inches above grade. The height of guards on stairs must be 34 inches minimum.

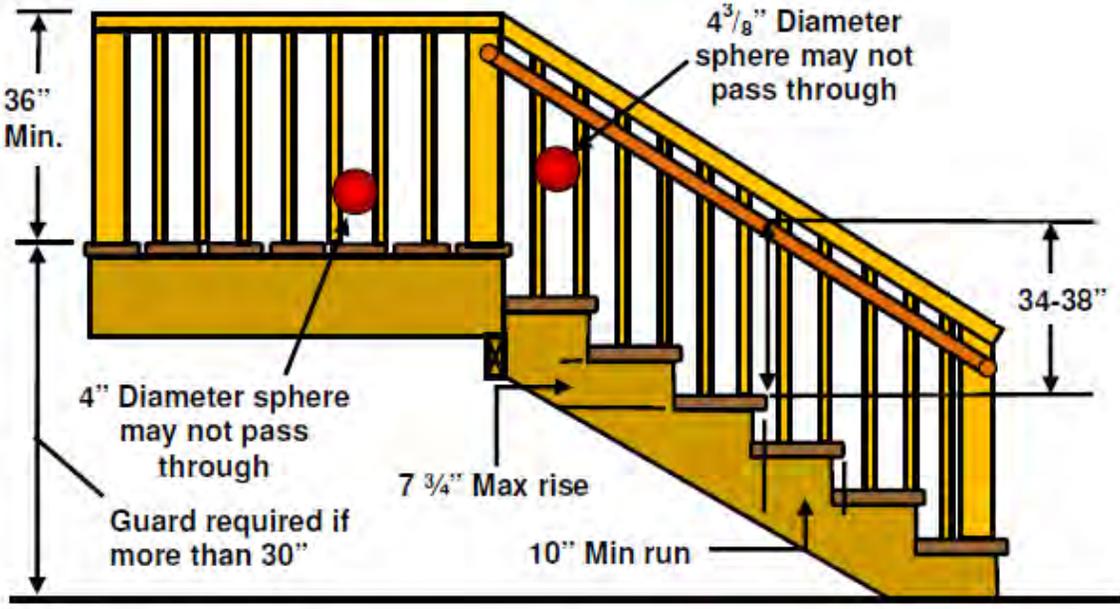
***Handrails must be provided on at least one side when there are four or more risers. Handrails must have returns on each end or terminate in a newel post.*** Other handrail shapes having an equivalent gripping shape may be used with prior approval of the Building Department.

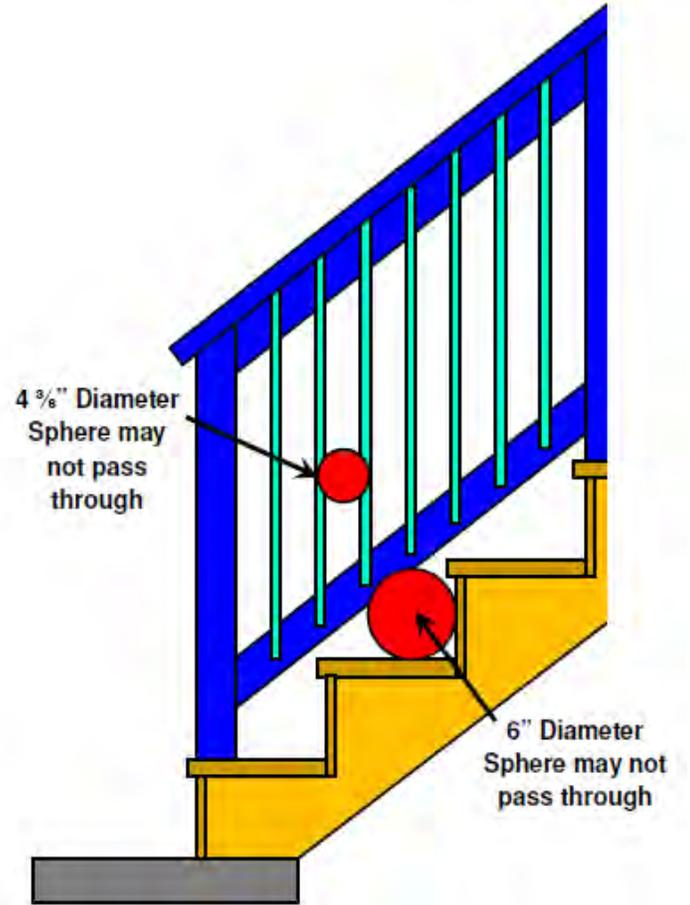
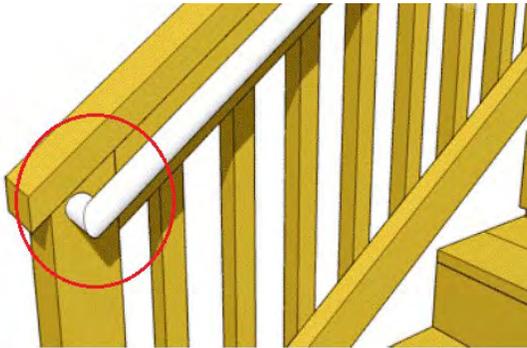
Handrails must be continuous for the entire length of the stairs and may not be interrupted by newel posts except at landings.

Handrails and guards must be designed to support a 200lb load applied in any direction at any point along the top of the guard or rail.

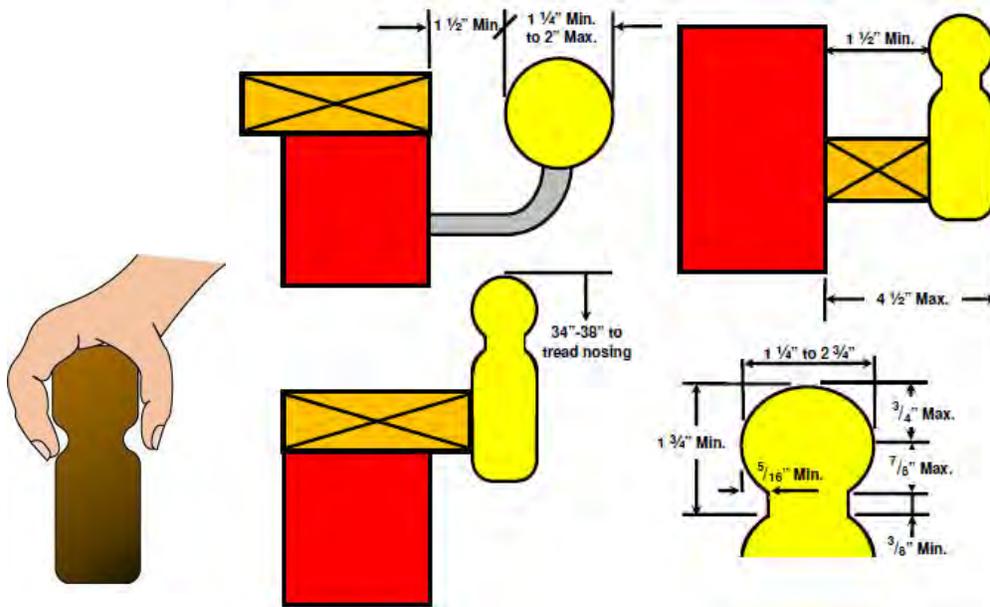


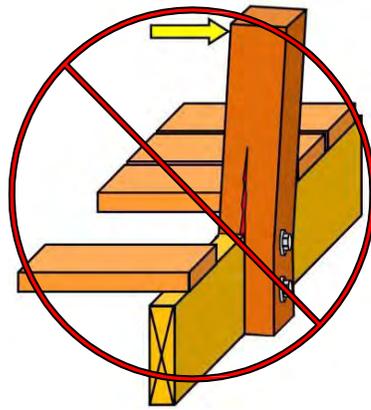
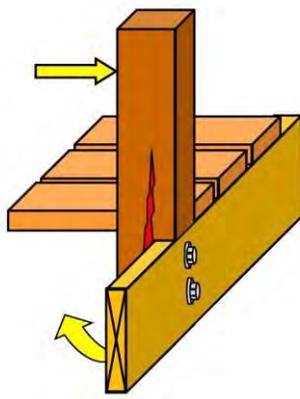
LANDING SHALL SPAN FULL WIDTH OF STAIRS & EXTEND A MINIMUM OF 36 INCHES IN THE DIRECTION OF TRAVEL.  
STAIRS MUST BEAR ON STRUCTURAL MATERIAL (i.e. treated lumber, concrete, gravel) AND BE PERMANENTLY RESTRAINED FROM LATERAL MOVEMENT.



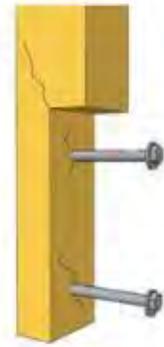


**HANDRAILS MUST RETURN TO NEWEL POST AND BE CONTINUOUS WITHOUT INTERRUPTION FOR THE LENGTH OF THE FLIGHT INTERUPTION FOR THE LENGTH OF THE FLIGHT**

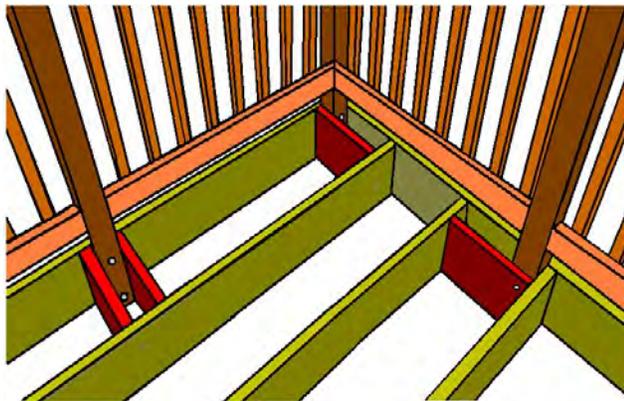




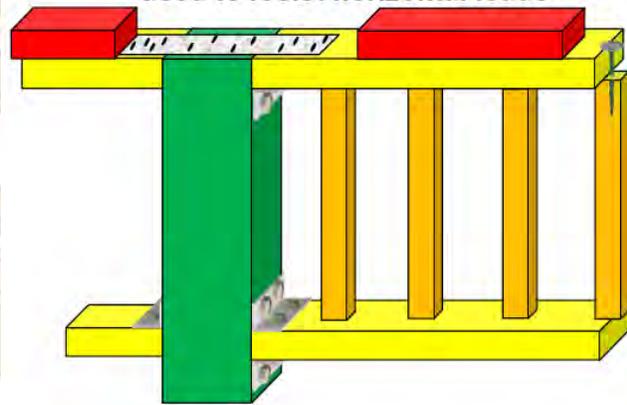
**AVOID NOTCHING  
GUARD POSTS**



**BLOCKING MAY BE ADDED TO  
STRENGTHEN POST ATTACHMENT**



**Examples of Devices that can be  
used to resist horizontal loads**



#### **COMPOSITES AND OTHER DECK/RAILING PRODUCTS**

**Wood/plastic composites used for exterior deck boards, stair treads, handrails and guardrail systems must bear labels indicating compliance with ASTM D 7031 or a current ICC Evaluation Services Report must be made available.**

**Wood/plastic composites complying with ASTM D 7031 must be installed in accordance with the manufacturer's written installation instructions.**

**Wood/plastic composites having an ICC ES Report must be installed in accordance with the manufacturer's installation instructions and the report.**

**READ THE INSTRUCTIONS AND THE REPORTS CAREFULLY. ALL PRODUCTS HAVE SPECIFIC REQUIREMENTS FOR STAIR TREADS. SOME ARE LIMITED TO INSTALLATION PERPENDICULAR TO JOISTS ONLY.**

**PRODUCTS MADE OF ALUMINUM, STEEL, GLASS, OR ANY OTHER MAN MADE PRODUCT MAY BE USED IF THE MANUFACTURER HAS A RESEARCH REPORT FROM THE INTERNATIONAL CODE COUNCIL AND THE PRODUCT IS INSTALLED IN STRICT ACCORDANCE WITH THAT REPORT OR SITE SPECIFIC ENGINEERING IS PROVIDED.**

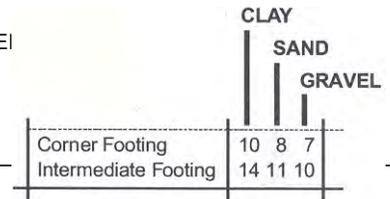
# Footing Sizes

		Posting Spacing											
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	
Joist Length	6"	Corner Footing	6 5 4	7 6 5	7 6 5	8 7 6	9 7 6	9 7 6	10 8 7	10 8 7	10 9 7	11 9 8	11 9 8
	Intermediate Footing	9 8 7	10 8 7	10 9 7	11 9 8	12 10 9	13 10 9	14 11 10	14 12 10	15 12 10	15 13 11	16 13 11	
	7"	Corner Footing	7 5 5	7 6 5	8 7 6	9 7 6	9 8 7	10 8 7	10 8 7	11 9 8	11 9 8	12 10 9	12 10 9
	Intermediate Footing	9 8 7	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	15 13 11	16 13 11	17 14 12	17 14 12	
	8"	Corner Footing	7 6 5	8 6 6	9 7 6	9 8 7	10 8 7	10 8 7	11 9 8	11 9 8	12 10 9	13 10 9	13 11 9
	Intermediate Footing	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	16 13 11	16 13 12	17 14 12	18 15 13	8 15 13	
	9"	Corner Footing	7 6 5	8 7 6	9 7 6	10 8 7	10 9 7	11 9 8	12 10 8	12 10 9	13 10 9	13 11 9	14 11 10
	Intermediate Footing	10 9 7	12 10 8	13 10 9	14 11 10	15 12 10	16 13 11	17 14 12	17 14 12	18 15 13	19 15 13	20 16 14	
	10"	Corner Footing	8 6 6	9 7 6	10 8 7	10 8 7	11 9 8	12 10 8	12 10 9	13 11 9	14 11 10	14 12 10	15 12 10
	Intermediate Footing	11 9 8	12 10 9	14 11 10	15 12 10	16 13 11	17 14 12	17 14 12	18 15 13	19 16 14	20 16 14	21 17 15	
	11"	Corner Footing	8 7 6	9 7 6	10 8 7	11 9 8	12 9 8	12 10 9	13 11 9	14 11 10	14 12 10	15 12 10	15 13 11
	Intermediate Footing	12 9 8	13 11 9	14 12 10	15 12 10	16 13 11	17 14 12	17 14 12	18 15 13	19 16 14	20 16 14	21 17 15	
	12"	Corner Footing	9 7 6	10 8 7	10 9 7	11 9 8	12 10 9	13 10 9	14 11 10	14 12 10	15 12 10	15 13 11	16 13 11
	Intermediate Footing	12 10 9	14 11 10	15 12 10	16 13 11	17 14 12	18 15 13	19 16 14	20 16 14	21 17 15	22 18 15	23 18 16	
	13"	Corner Footing	9 7 6	10 8 7	11 9 8	12 10 8	13 10 9	13 11 9	14 12 10	15 12 10	15 13 11	16 13 11	17 14 12
	Intermediate Footing	13 10 9	14 12 10	15 13 11	17 14 12	18 15 13	19 15 13	20 16 14	21 17 15	22 18 15	23 19 16	24 19 17	
14"	Corner Footing	9 8 7	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	15 13 11	16 13 11	17 14 12	17 14 12	
Intermediate Footing	13 11 9	15 12 10	16 13 11	17 14 12	18 15 13	20 16 14	21 17 15	22 18 15	23 18 16	24 19 17	21 20 17		
15"	Corner Footing	10 8 7	11 9 8	12 10 8	13 10 9	14 11 10	14 12 10	15 12 11	16 13 11	17 14 12	17 14 12	18 15 13	
Intermediate Footing	14 11 10	15 12 11	17 14 12	18 15 13	19 16 14	20 17 14	21 17 15	22 18 16	23 19 17	24 20 17	25 21 18		
16"	Corner Footing	10 8 7	11 9 8	12 10 9	13 11 9	14 11 10	15 12 10	16 13 11	16 13 12	17 14 12	18 15 13	18 15 13	
Intermediate Footing	14 11 10	16 13 11	17 14 12	18 15 13	20 16 14	21 17 15	22 18 16	23 19 16	24 20 17	25 21 18	26 21 18		

Notes :

1. Requirements for future 3-season porches or screen porches:
  - a . Increase corner footing size shown by 90%.
  - b . Increase center footing size shown by 55%.
  - c . Locate all footings at extremities of deck (no cantilevers) .

THREE



# Accessibility Summary

## **1341.0005 INCORPORATION OF CHAPTER 11 OF THE 2012 INTERNATIONAL BUILDING CODE BY REFERENCE.**

For purposes of this chapter, "IBC" means the 2012 edition of the International Building Code as promulgated by the International Code Council, Inc., Washington, D.C. Chapter 11 of the IBC is incorporated by reference and made part of the Minnesota State Building Code except as amended in this chapter. Portions of this rule chapter reproduce excerpts from the 2012 IBC, International Code Council, Inc., Washington, D.C., copyright 2012, reproduced with permission, all rights reserved. The IBC is not subject to frequent change and a copy of the IBC, with amendments for use in Minnesota, is available in the office of the commissioner of labor and industry.

### **Minnesota Rules 1341.0010 REFERENCED STANDARD.**

For purposes of this chapter, "ICC A117.1" means the 2009 edition of ICC/ANSI A117.1 as promulgated by the Accredited Standards Committee A117 on Architectural Features and Site Design of Public Buildings and Residential Structures for Persons with Disabilities. The ICC/ANSI A117.1-2009 edition is approved by the American National Standard Institute (ANSI) and owned by the International Code Council, Inc. ICC A117.1 is incorporated by reference in IBC chapter 11 and made part of the Minnesota State Building Code except as amended in this chapter. Portions of this chapter reproduce text and tables from the ICC A117.1. The ICC A117.1 is not subject to frequent change and a copy of the ICC A117.1, with amendments for use in Minnesota, is available in the office of the commissioner of labor and industry. The ICC A117.1 is copyright 2010 by the International Code Council, Inc., all rights reserved.

### **Alterations to an area containing a primary function.**

In addition to the requirements of Section 1112.1 through 1112.8, an alteration that affects or could affect the usability of or access to an area containing a primary function shall be made to ensure that, to the maximum extent feasible, the path of travel to the altered area and the toilet rooms, parking facilities, telephones, and drinking fountains serving the altered area are accessible. For the purpose of complying with this section, an area of primary function shall be defined as an area which provides a major activity for which the facility is intended. The alterations to the path of travel, toilet rooms, parking facilities, telephones, and drinking fountains serving the altered area need not exceed 20 percent of the cost of the alteration to the primary function area.

#### **Exceptions:**

1. This provision does not apply to alterations limited solely to the electrical, mechanical, or plumbing system, or to hazardous material abatement, or automatic sprinkler installation or retrofitting.

2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets, and signs.
3. This provision does not apply to alterations undertaken for the primary purpose of increasing accessibility.
4. This provision does not apply to alterations undertaken by the tenant where the accessible route, toilet facilities, parking facilities, telephones, and drinking fountains are outside the tenant space.

#### **1112.7.1 Priority for application.**

Priority for application of the 20 percent cost for the primary function area shall be as follows:

1. accessible path of travel to the primary function area, such as exterior route, building entrance, interior route, or elevator.
2. accessible toilet facilities:
3. accessible parking;
4. accessible telephones; and,
5. accessible drinking fountains.

#### **Summary of MN Accessibility Code Section 1112**

When an area of primary function is altered, consideration is given to the route of travel leading to the altered area and to the toilet rooms, parking facilities, telephones and drinking fountains, which are utilized by the occupants of the altered primary function area. **These elements (route, toilet rooms, parking, telephones and drinking fountains) must be made accessible providing the cost does not exceed 20% of the cost of the alteration.** The funds attributed to making these elements accessible are in addition to the original expenditure for the alteration. Whether the entire, a portion of, or none of the 20% cost is added to the project cost will be determined for each project based on the degree of alteration necessary to make any or all of the elements accessible. If, for example, all of the elements currently comply with the accessibility requirements for those elements, none of the additional funds must be applied to the project. The elements shall be made accessible according to the following priority; route, toilet room, parking, telephone, and drinking fountain. Only those elements, which are most likely to be used by the occupants of the primary function area, are required to be made accessible as a result of this section. Similar elements within the facility but not associated with the altered primary function area are not required to be made accessible due to this rule.

Buildings may have, and usually do have, multiple primary function areas. **When several primary function areas are combined into a single alteration project, the total cost of all of the altered primary function areas is used to calculate the 20% cost.** This entire cost can be applied to one or more of the primary function areas until the funds are exhausted.

**Alterations pertaining only to windows, building facades, HVAC systems, re-roofing, painting, etc. are not alterations to primary function areas and do not require upgrading accessibility to and elements in the building.** However, when an area of primary function is altered and it affects any of those elements (windows, building facades, HVAC systems, re-roofing, painting, etc.), the costs of modifying those elements are not deducted when calculating the 20% cost. Also alterations undertaken for the specific purpose of improving accessibility do not trigger these provisions.

When a tenant undertakes the alteration to a primary function area, neither the tenant nor the landlord is responsible to upgrade the route, toilet rooms, parking, telephones and drinking fountains, which are not within the control of the tenant. However, the tenant is responsible for those elements which are within the tenant space. When an alteration is undertaken by the

landlord, the landlord is subject to the additional 20% cost whether or not the elements subject to modification are within a lease space.

**This document provides basic and fundamental information for facilities and elements. It is not intended to replace or substitute for the requirements found in the Minnesota Accessibility Code**

### Parking

Each parking area shall provide accessible parking spaces in accordance with the following table. (Note: parking for apartments, hospitals and rehabilitation facilities do not use this table. See IBC Section 1106 for those facilities.)

Total Parking in Lot	Required Minimum Number of Accessible Spaces	Van Accessible Spaces Required
1 to 25	1	1
26 to 50	2	1
51 to 75	3	1
76 to 100	4	1
101 to 150	5	1
151 to 200	6	1
201 to 300	7	1
301 to 400	8	1
401 to 500	9	1
501 to 1,000	2 percent of total	2
1,001 and over	20 plus 1 for each 100 over 1,000	1 in every 8 accessible spaces

- Each accessible parking space must be 8 feet wide.
- All accessible parking spaces must have an adjacent 8 foot wide access aisle.
- Each access aisle shall be marked as “no parking”.
- Each access aisle shall connect to an accessible route.
- The slope of each accessible parking space and access aisle shall not exceed 1:48.
- Accessible spaces shall be located as near as possible to an accessible entrance.
- Each accessible space must have a sign showing the International Symbol of Accessibility and notification that violators are subject to a fine of up to \$200.
- Each sign shall be centered at the head end of the space and mounted between 60 inches to 66 inches above the parking surface.
- One in six accessible parking spaces shall be van accessible (having a height clearance of 98 inches minimum).
- Where not all accessible spaces have a 98 inch height clearance, van accessible spaces must provide a sign indicating "van accessible".

## **Exterior Access**

- An exterior accessible route connecting accessible parking with a building entrance shall be at least 4 feet wide with a slope not to exceed 1:20.
- An exterior accessible route connecting accessible building entrances shall be at least 4 feet wide with a slope not to exceed 1:20.
- Other exterior accessible routes can have a maximum slope of 1:12.
- The surface of the exterior accessible route shall be stable, firm and slip-resistant.
- The exterior accessible route shall be the shortest, most direct route possible and shall coincide with the general route of travel.

## **Curb Ramps**

- Curb ramps shall have a maximum slope of 1:12.
- A landing measuring at least 3 feet in length shall be provided at the top of the curb ramp.
- The slope of surfaces adjoining the curb ramp shall not exceed 1:20.
- The transition from curb ramp to adjoining surface shall be flush and free of abrupt changes in height.
- The minimum width of the curb ramp shall be 36 inches excluding flared sides.

## **Accessible Building Entrances**

- least 60% of public entrances shall be accessible.
- Accessible doors shall have a minimum clear opening of 32 inches measured with the door open 90 degrees.
- The threshold shall be no higher than 1/2 inch.
- Two doors in series must be separated by at least 48 inches plus the width of any door swinging into the space. A five foot diameter circle shall be provided between the doors.
- Door hardware shall be operable with one hand and not require tight grasping, pinching or twisting of the wrist.
- Level landings shall be provided on both sides of the door (exterior landings may slope 1/4 inch per foot).

## **Interior Circulation**

- Hallways shall have a minimum clear width of 36 inches (building code may require wider hallway depending on number of occupants).
- Public counters and service windows shall have a 36 inch long portion that is no more than 36 inches above the floor.
- Objects along the accessible route between 27 inches and 80 inches above the floor shall protrude no more than 4 inches from the wall.
- Accessible doors shall have a minimum clear opening of 32 inches measured with the door open 90 degrees.
- The threshold shall be no higher than 1/2 inch.
- Two doors in series must be separated by at least 48 inches plus the width of any door swinging into the space. A five foot diameter circle shall be provided between the doors.
- Door hardware shall be operable with one hand and not require tight grasping, pinching or twisting of the wrist.
- Level landings shall be provided on both sides of the door.

## **Elevator**

- Hall call buttons shall be located no more than 48 inches above the floor.
- Floor numbers shall be identified by raised and Brailled numbers provided on both hoistway jambs and located no more than 60 inches above the floor to the top of the number.
- Raised and Braille characters shall be located to the left of control panel buttons. Control panel buttons shall be mounted no higher than 48 inches above the floor; 54 inches if car serves more than 16 openings.
- **Interior Ramp**
  - The ramp slope shall not exceed 1:12.
  - The surface of the ramp shall be stable, firm and slip-resistant.
  - Intermediate landings at least 5 feet in length must be provided for every 30 inch rise.
  - Landings at least 5 feet in length must be provided at both the top and bottom of the ramp.
  - Handrails must be provided on both sides of the ramp when the rise is greater than 6 inches.
  - The minimum width of a ramp is 36 inches measured between handrails.

## **Signage**

- The International Symbol of Accessibility shall be displayed at: accessible toilet, bathing, dressing, fitting and locker rooms where not all such rooms are accessible; accessible entrances where not all entrances are accessible; accessible parking spaces; and areas of rescue assistance.
- Building entrances which are not accessible shall provide directional signage indicating the shortest route to an accessible entrance.
- Raised and Braille signage must be provided at toilet, bathing, dressing, fitting and locker rooms, room numbers or names, and adjacent to each door to an egress stairway, exit passageway and the exit discharge.
- Directional or informational signs shall have lettering which contrasts in color from the background (building directories are not included in this requirement).

## **Toilet Rooms**

All newly constructed and altered toilet rooms must be accessible (see the Minnesota Accessibility Code for multiple unisex toilet/bath rooms). At least one of each type fixture or element provided in the room must be accessible (see urinals below).

## **Entry**

- Entrance doors shall have a minimum clear opening of 32 inches measured with the door open 90 degrees.
- Two doors in series must have a minimum separation of 48 inches plus the width of the door swinging into the space. A five foot diameter circle shall be provided between the doors.
- Door hardware must be operable with one hand, not require tight grasping, pinching or twisting of the wrist.

- A door shall not swing over the floor space for any fixture unless the room is for individual use and a 30 inch by 48 inch clear floor space is provided within the room that is clear of the swing of the door.

### **Water Closet**

- The first accessible compartment in each accessible toilet room shall be a side transfer compartment.
- A side transfer compartment shall be 5 feet wide minimum.
- The depth of a side transfer compartment shall be 78 inches minimum measured from the wall behind the water closet to a wall or obstruction in front of the water closet, or 48 inches minimum of floor space shall be provided in front of the water closet.
- The water closet in a single use room shall have the same clear floor space as a water closet in a side transfer compartment.
- The water closet shall be centered 16 inches to 18 inches from a side wall or partition.
- The seat height shall be between 17 inches and 19 inches above the floor.
- The compartment door shall provide a 32 inch clear opening measured with the door open 90 degrees.
- Compartment door hardware shall be operable with one hand, not require tight grasping, pinching or twisting of the wrist.
- A horizontal grab bar shall be mounted along side of the water closet. The bar shall be a minimum of 42 inches long, mounted between 33 inches and 36 inches above the floor to the top of the gripping surface, beginning 12 inches from the rear wall.
- A vertical grab bar shall be mounted 39 inches to 41 inches above the floor to the side of the water closet. The vertical grab bar shall be a minimum of 18 inches in length and be centered between 39 inches and 41 inches from the rear wall.
- A 36 inch long horizontal grab bar shall be mounted behind the water closet, 33 inches to 36 inches above the floor to the top of the gripping surface, beginning 6 inches from the side wall.
- Operable parts of toilet paper dispensers and sanitary product receptacles shall be located within an area 12 inches minimum and 40 inches maximum from the rear wall, and 18 inches minimum above the floor and 1 ½ inches minimum below the horizontal grab bar.

### **Sink**

- The higher of the rim of the sink or the countertop shall be a maximum of 34 inches above the floor.
- A clear floor space 30 inches by 48 inches shall be positioned for a forward approach to the sink.
- Knee clearance at the front edge of the counter or lavatory shall be at least 27 inches above the floor and extend back a minimum of 8 inches.
- Plumbing beneath the sink shall be insulated or otherwise configured to avoid contact.
- Faucets shall be operable with one hand, not require tight grasping, pinching or twisting of the wrist, and operate with no more than 5 lbs. of force.

### **Urinal**

- Where more than one urinal is provided in a room, at least one shall be accessible.
- The rim of the urinal shall be no more than 17 inches above the floor.
- A clear floor space 30 inches by 48 inches shall be positioned for a forward approach to the urinal.

## **Accessories**

- Accessories such as towel, soap and product dispensers shall be mounted so that the highest operable part of the device is no more than 48 inches above the floor.
- Mirrors located above lavatories shall be mounted with the bottom edge of the reflecting surface no higher than 40 inches above the floor. Mirrors not located above lavatories, sinks or counters shall be mounted with the bottom edge of the reflecting surface 35 inches maximum above the floor.
- If a diaper changing table is provided, it shall be mounted no more than 34 inches above the floor to the working surface. Knee and toe clearance shall be provided beneath the open changing table.

## **Bathing Facilities**

See section on **Toilet Rooms** for fixtures and elements common to toilet rooms and bathing rooms.

### **Shower**

- A transfer type shower shall have a finished inside dimension of 36 inches by 36 inches.
- A roll-in type shower shall be 30 inches minimum by 60 inches minimum.
- Thresholds shall be 1/2 inch high maximum.
- A seat is required in an accessible shower.
- Horizontal grab bars, mounted between 33 inches and 36 inches above the floor to the top of the gripping surface, shall be located on the wall adjacent to the seat and on the wall opposite the seat. The grab bar located on the wall adjacent to the seat shall start at the front edge of the seat and extend to within 6 inches of the corner. The grab bar on the wall opposite the seat shall begin within 6 inches of the corner and extend the length of the wall.
- An 18 inch minimum length vertical grab bar shall be mounted in a transfer shower 3 inches to 6 inches above the horizontal grab bar on the wall opposite the seat and be centered 4 inches maximum from the entry of the shower.
- A shower spray unit with a hose at least 60 inches long that can be used both as a fixed shower head and as a hand-held shower head shall be provided.
- Faucets shall be operable with one hand, not require tight grasping, pinching or twisting of the wrist, and operate with no more than 5 lbs. of force.

### **Bathtub**

- A seat, capable of being securely mounted, shall be provided.
- Horizontal grab bars shall be mounted on all three walls surrounding the tub 33 inches to 36 inches above the bath room floor measured to the top of the gripping surface. A second horizontal grab bar shall be mounted on the rear wall 9 inches above the rim of the tub.
- An 18 inch minimum length vertical grab bar shall be mounted 3 inches to 6 inches above the horizontal bar at the foot end of the tub centered 4 inches maximum from the entry of the tub.
- The faucet control shall be mounted at the foot end of the tub below the horizontal grab bar near the entry side of the tub.
- Faucets shall be operable with one hand, not require tight grasping, pinching or twisting of the wrist, and operate with no more than 5 lbs. of force.
- A shower spray unit with a hose at least 60 inches long that can be used both as a fixed shower head and as a hand-held shower head shall be provided.

## Drinking Fountain

If only one drinking fountain location is provided on a floor, the drinking fountain shall provide a spout for wheelchair users and one for standing individuals.

If more than one drinking fountain location is provided on a floor, one-half of the fountains shall be mounted at the wheelchair accessible height and one-half at the standing height.

Wheelchair accessible height drinking fountains shall meet the following criteria:

- The spout shall be no more than 36 inches above the floor.
- Operating controls shall be at the front or near the front edge of the drinking fountain.
- A clear floor space positioned for a forward approach shall be provided and appropriate knee and toe clearance shall be provided.

Drinking fountains for standing persons shall meet the following criteria:

- The spout shall be located between 38 inches and 43 inches above the floor.
- Operating controls shall be at the front or near the front edge of the drinking fountain.

## Public Telephones

- One public telephone per floor, or one phone per phone bank, must be accessible.
- The highest operable part of the telephone shall be 48 inches maximum above the floor.
- The cord from the handset to the telephone shall be at least 29 inches long.
- All public telephone shall be equipped with volume control.
- Government buildings with public telephones shall provide at least one TTY on each floor providing a public telephone. In other buildings having four or more public telephones, at least one TTY shall be provided in the building and on each floor having four or more public telephones. See Minnesota Rules, chapter 1341 for hospitals, rest stops and transportation facilities.

## Assembly Seating

Wheelchair seating shall be provided in assembly areas according to the following table.

Capacity of Seating	of Seating ir Locations
4 to 25	1
26 to 50	2
51 to 100	4
101 to 300	5
301 to 500	6
501 to 5,000	6, plus 1 for each 150, or fraction thereof, between 501 through 5,000
5,001 and over	36, plus 1 for each 200, or fraction thereof, over 5,000

- A single wheelchair seating location shall have a minimum clear width of 36 inches.
- Two adjacent wheelchair seating locations shall have a minimum clear width of 66 inches.

- The depth of wheelchair seating locations entered from the front or from behind shall be 48 inches minimum.
- The depth of wheelchair seating locations entered from the side shall be 60 inches minimum.
- Wheelchair seating locations shall be level.
- Wheelchair seating locations shall provide for companion seating adjacent to the wheelchair seating.
- When the total seating capacity exceeds 150 persons, the wheelchair seating locations must be dispersed to more than one location.
- Assistive listening systems are required in assembly areas.

## **Building Plans, Specifications, Addenda's, Change Orders, etc.**

- Code record (Document of applicable codes, height, area and yard computations, type of construction, occupancies, etc.)
- Specification Manuals (arch/struct/mech/elec/specialties, etc. – signed by MN licensed design professionals)
- Survey (legal land survey)
- Civil (utilities & grading)
- Architectural site plan
- Architectural footing/foundation plan
- Architectural floor plans (each floor)
- Architectural reflected ceiling plans
- Architectural roof plan(s)
- Architectural building sections
- Architectural interior room-finish elevations (restrooms, special conditions, etc.)
- Architectural wall sections (exterior walls, interior walls, stairs, and other special conditions.)
- Architectural construction details (typical details and all special conditions)
- Architectural schedules (window/openings, door, room finish, etc.)
- Structural design plans (design specification, codes, material specs, schedules, special insp./testing, etc.)
- Structural footing/foundation plan(s)
- Structural floor plan(s)
- Structural roof framing plan(s)
- Structural building/wall section(s)
- Structural details (exterior walls, interior walls, stairs, columns, headers, special structural conditions, etc.)
- Plumbing plans (plans, drain-waste-venting diagrams, fixture schedules, domestic H2O piping, etc.)
- Mechanical plans (plans, ducting sizing/locations supply & return, equipment sizing/locations, schedules etc.)
- Fire protection piping plans (plans, riser diagram, piping sizes/layouts hydraulic calcs, head information, etc.)
- Electrical plans (power supply & lighting layout plans, panel configurations, and equipment schedules)
- Fire alarm plans (plans showing alarm indicator devices, activation devices, controls, specifications, etc.)
- All Addenda's, Change Orders, RFP's, etc. for entire project (signed by MN licensed design professionals)

### **Other Required/Necessary Submittals:**

- Roof and/or Floor truss shop drawings and engineering (by manufacturer – signed by MN Engineer)
- Precast concrete planks, beams, columns, etc. shop drawings and engineering (by manufacturer – signed by MN Engineer)
- Soils investigation reports (Geotechnical reports signed by MN Engineer)
- Sample structural calculations for entire building (signed by MN Engineer)
- Special Inspections & Testing Agreement (completed and signed by required parties)
- Septic system design and soils investigation information (signed by MN licensed ISTS designer)
- Alternative methods and/or materials request with supporting documentation (signed by MN Architect)
- Energy Code Thermal Compliance Worksheet(s) (signed by MN Architect or MN Mechanical Engineer)
- Energy Code Electrical (signed by MN Electrical Engineer)
- Heat loss - furnace sizing computations (signed by MN Mechanical Engineer) Commodity (storage) condition/classification reports, MSDS/hazardous materials reports, storage rack designs, bleacher/auditorium or assembly seating layout plans, special equipment testing/listing information, fire-resistive assembly testing information, furniture layout plans, etc.
- Permit Fee(s)

### **2012 IBC - Building Code Use and Application:**

#### **Classify the buildings' occupancies and special use conditions\*\***

- Determine Use and Occupancy of Building Groups A - B - E - F - H - I - M - R - S - U (IBC Chapter 3)
- MN Care Facilities (IBC 302.2)
- Special Uses (IBC Chapter 4)
- Identify specific Fire Code occupancy provisions (i.e., repair garages, hazardous occupancies, high piled storage/racking, temporary membrane structures, lumber yards, medical gas rooms, etc.) See the 2006 IFC

#### **Verify applicants design intent \*\***

- “Separated” or “Non-separated” uses? (IBC ,508.3, 508.4 Table 508.4)
- Incidental Uses (IBC 509 & Table 509)
- Special “use” conditions/operations within the building (IBC Chapter 4 & the IFC)

#### **Identify the type of construction \*\***

- Type of construction: I-A, I-B, II-A, II-B, III-A, III-B, IV, VA and V-B

(IBC Chapters 5 & 6)

- “Combustible” vs. “Non-combustible” and “Fire-resistance-rated” construction types (IBC 702)
- Combustible construction allowed in “non-combustible” buildings? Yes! (IBC 603.1 - 22 separate/specific locations)

Review construction plans and details to identify the materials used at exterior walls, roof/ceilings, floor/ceilings, interior walls, the structural frame, and other bearing conditions. Confirm occupancies within the building and apply the provisions of IBC Tables 503, 601 and 602. Review the number of stories and building height. Each has a contributing factor to the building. A building should be classified into the most appropriate yet least restrictive type of construction it fits into. However, if the designer has identified something more restrictive, there is usually a reason. Verify these conditions with the designer. (IBC 503, 508, 601, 602, 603 & 704)

- Special provisions – sprinkler substitution for fire-resistance (IBC Table 601, footnote d)

### **Check location on property \*\***

- Setback to property lines or public way(s) for frontage increases (IBC 506.2)
- Other buildings on same property (IBC 503.1.3, 508 & 705)
- Check “frontage increase” computation against survey information (IBC 506.2 & 507)
- Check exterior wall ratings/allowable opening areas (IBC Table 602, 705.2 & Table 705.8)
- Check access to building for frontage increase [minimum width of 20-feet to be “open”] (IBC 506.2)

### **Verify number of stories and building height \*\***

- Actual vs. allowable (IBC 502.1, 507 & 508)
- Basement level/Sub-levels (IBC 502.1, 503.1.1, 506.1.1 & 508)
- First floor (IBC 502.1, 507 & 508)
- Number of stories (IBC 503.1, 503.3, 504, 507, 508 & 1509)
- Mezzanines (IBC 505)
- Building height (IBC 503.1, 503.3, 504, 507, 508 & 1509)
- Special rooftop structure heights/penthouses (IBC 504.3 & 1509)

### **Identify number of buildings in question \*\***

- Each bldg. checks for height and area based on constraints (IBC 503.1, 503.2, 504, 506, 507, 508 and 705)
- Fire-walls/party walls - each bldg. complies for area & height (IBC 503.1, 503.2, 504, 506, 507, 508 and 705)
- Each building has access to a public way (IBC 506.2)
- Potential hazards due to proximity of buildings to property lines or other buildings (IBC Table 602, 705.2)
- Protection of openings and limiting factors for overhangs or projections (Table 705.8)
- Other building setbacks (local ordinances, MN DNR, MPCA, Fire Code, Pipeline Safety, Well/Septic, etc.)

## Check allowable area computations \*\*

- Mixed occupancy or single occupancy - separated use vs. non-separated use (508 Table 508.4)
- Yard increases [Perimeter method increase – max. increase 75%] (IBC 506.2 & 507)
- Fully sprinkled [What type of sprinkler system? - NFPA 13 or 13R?]
- Sprinkler allowable increases [200% for multi-story or 300% for single story] (IBC 506.3 for building area increases)
- Sprinkler allowable building height [normally one-story or 20-feet] (IBC 504.2 for story and height increases)
- First floor size determination vs. additional floor plate sizes for total area.
- Mixed occupancy - multi-story computations (IBC 506.5)
- Penthouse sizes & heights (IBC 1509.2)
- Special design features (IBC 510 sections?)
- Check building height in stories and feet from finished grade plane [Increased allowed? Limitations?]

## Determine Occupant Loads\*\*

- Compute the design occupant load within building [gross and net areas] (IBC 1004)
- Actual number of occupants (IBC 1004.1.1)
- Computed occupant loads per (IBC Table 1004.1.2)
- Increased/Modified occupant load (IBC 1004.2)

**\*\* Note: IBC Chapter 4 and the *International Fire Code* should be referenced for other special provisions and requirements for each building. Provisions of Chapter 4 and the *International Fire Code* may contain specific conditions that additionally regulate a buildings' height and number of stories, the allowable area, setbacks from other buildings and property lines, fire sprinkler or alarm requirements, exterior wall ratings, additional exiting, the type of construction, roof venting or explosion control, control areas, fire department access, etc. Refer to IBC Chapter 4 and the *International Fire Code* as required for each building condition.**

## Detailed Plan Review Requirements:

- Review building design and plans for required licensed design provisions of MN Rule 1800 & 1805
- Review building for conformity with its occupancy group requirements (IBC Chapter 3 and 4)
- Review special use conditions within building (IBC Chapter 4 & IFC)
- Review building for conformity with the type of construction requirements (IBC Chapter 6)
- Review building for conformity with exiting requirements (IBC Chapter 10 & IFC)
- Review building for conformity with the special construction conditions of Chapters 8 and 9 and 14 through 35.

- Review the building for conformity with structural engineering requirements of Chapter 16, 17 and 18
- Review mechanical, plumbing, electrical, fire protection, energy, and other life-safety issues of the building code (IBC Chapters 9, 12, 24, 27 & 33)
- Review required shop drawings and deferred submittals for compliance with applicable code sections
- Review the building for other miscellaneous building and zoning code regulations (local & state codes and the Fire Code)
- Review specification manual(s) for procedural conditions, material specifications, reference standards, installation methods, etc.
- Review plan addenda's, change orders, RFP's, etc., for necessary code compliance. Insert into plan set if feasible.
- Review all construction documents for technical errors and notify applicant as necessary. These may not necessarily be code violations.
- Coordinate other agency reviews/authorizations for final permitting

**Plan Review Tools – Tables – Guides – Gimmicks:**

Handouts, highlighters, calculators, red-pens, computer programs, scales, tables, reference documents, check-lists, tabs and other miscellaneous items can all be used to complete the plan review process. No “one” plan review process is the same. Each plans examiner works through a review using their own format. As long as that format is consistent, uniform, legible, accurate and well documented, it can be applied. Some examples of plan review reference tables and other miscellaneous handouts have been included herein.

Use any and all gimmicks/tools that make your job and life easier, as long as they are accurate, provide you with consistent answers and save you time.

Attached are some examples:

**Code Record Information:**

Addition to an Existing Building	(        )	Y/N ?
Addition and Exist. Remodel	(        )	Y/N ?
New Building Only	(        )	Y/N ?
Existing Building Remodel Only	(        )	Y/N ?
Yard Setbacks (N____ Ft.) (S____ Ft.) (E____ Ft.) (W____ Ft.)		
Actual Building Area – Per Floor	(        )	Sq. Ft.
Percent of Frontage Increase Allowed	(        )	%
Building Occupancies:	(        )	
Separated of Non-separated Design	(        )	Y/N ?
Number of Stories:	(        )	
Building Height	(        )	Feet
Proposed Special Uses:	(        )	
Proposed Type of Construction:	(        )	
Mixed Construction Types	(        )	Y/N ?
Fire Wall(s) Used	(        )	Y/N ?
Sprinkled Per NFPA (        ):	(        )	Y/N ?
Fully or Partially Sprinkled	(        )	
Sprinkler Substitution Used	(        )	Y/N ?

Sprinkler Height Increase Used	(        ) Y/N ?
Standpipes Required	(        ) Y/N ?
High Rack Storage Proposed	(        ) Y/N ?
Hazardous Materials Used/Stored	(        ) Y/N ?
Review Date:	(        )
Project Location:	(        )
Construction Value:	\$(        )
Construction Documents Dated:	(        )
Plan Set Number:	(        )
Specification Manuals:	(        ) Y/N ?
Addendum/RFP Number(s):	(        )

**Project Description:**

(Plans examiner to provide written/detailed project description for record purposes.)

**Area Modifications:**

**506.1 General:**

The areas limited by Table 503 shall be permitted to be increased due to frontage (If) and automatic sprinkler system protection (Is) in accordance with the following:

$$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s] \}$$

where:

A<sub>a</sub> = Allowable area per story (square feet).

A<sub>t</sub> = Tabular area per story in accordance with Table 503 (square feet).

I<sub>f</sub> = Area increase factor due to frontage as calculated in accordance with Section 506.2.

I<sub>s</sub> = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.

**506.2 Total Frontage Increase Allowed:**

$$I_f = [FIP - 0.25] \times W/30 = \text{Area Increase for Frontage}$$

P = Perimeter of entire building (feet).

F = Building perimeter that fronts on a public way or open space having 20 feet open minimum width (feet).

W = Width of public way or open space (feet) in accordance with Section 506.2.1. (W must be at least 20 feet).

**506.3 Automatic Sprinkler System Increase:**

The area limitation in Table 503 is permitted to be increased by an additional 200 percent (I<sub>s</sub> = 2) for buildings with more than one story above grade plane and an additional 300 percent (I<sub>s</sub> = 3) for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

## 506.4 Area Determination:

The maximum area of a building with more than one story above grade plane shall be determined by multiplying the allowable area of the first story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on the story.

### 506.4.1 Mixed Occupancies:

In buildings with mixed occupancies, the allowable area per story ( $A_a$ ) shall be based on the most restrictive for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separate occupancies, the maximum total building area shall be the sum of the ratios for each such area on all floors as calculated according to Section 508.3.3.2 shall not exceed 2 for two story buildings and 3 for buildings 3 stories or higher.

### Total Frontage Increase Allowed:

$I_f = 100 \times [F/P - 0.25] \times W/30 =$  Percentage of Frontage Increase Allowed

P = Perimeter of entire building = ( )

F = Perimeter of building having over 20 ft. open yards = ( )

W = Minimum width of public way or open space = ( )

$I_f =$  Allowable area increase due to frontage per IBC 506.2 = ( )

### “Per Floor” ( Multi-Story) Allowable Area Totals:

( ) Occupancy - Type ( ) Construction:

Total Allowable “Per Floor” Building Area – ( ) Square Feet Maximum.

Basic Allowable                      Open Yards ( %)

Sprinkled Throughout (x 2\*)

( ) Sq. Ft.                      ( ) Sq. Ft.

( ) Sq. Ft.

\*\* ( ) Occupancy Per Floor Building Actual Area = ( ) < ( ) =

Complies for total “Per Floor” allowable building area per IBC 506.1.

\* The x 2 would be x 3 in a single story building. See IBC 506.3.

### “Total” Allowable Building Area:

( ) Occupancy – Type ( ) Construction:

“Total” Allowable Building Area For Multi-Story – ( ) Square Feet Maximum.

Basic Allowable                      Open Yards ( %)                      Sprinkled Throughout (x - 2) Floor Plate (x2 or 3)

( ) Sq. Ft.                      ( ) Sq. Ft.                      ( ) Sq.

Ft.                      ( ) Sq. Ft.

\*\* ( ) Occupancy Total Building Actual Area = ( ) < ( ) = Complies

for “Total” building area Per IBC 503.3.

## **Plan Review Items for Code Consideration:**

### **Site Plan, Survey, Civil Utility and/or Grading Plans:**

- Signed Certificate of Survey - licensed land surveyor
- Detailed site plan indicating all buildings and structures on the site
- (existing, proposed and demo work)
- Property address and full legal description
- Lot dimensions, all property lines, utility easements, utilities, streets, lakes/ponds & OHW, etc.
- Scaled, north arrow, lot corner, street/curb and other spot elevations
- Proposed building/structure footprint and building/structure dimensions
- Proposed structure lowest floor and first floor (proposed) elevations
- Other structure benchmark/elevations and off-set hubs
- Locations of wells, septic systems, driveways, retaining walls, parking lots, signs, sidewalks, etc.
- Special conditions - natural & man made (swales, nerp ponds, etc.)
- Setback dimensions to all property lines and other buildings/structures on the same site
- Setback dimensions to septic systems, wells, lakes/ponds, OHW, etc.
- Grade contours/elevations and special drainage conditions
- Erosion control methods/details/procedures
- Utilities (domestic water/fire water lines, gas, electric, sanitary, storm sewer, storm swales/ponds, utility easements, etc.) and related details
- Site construction details (signs, curbs and curb cuts, drive entrances, erosion control, temporary drive accesses, etc.)
- Landscaping and tree planting plans
- Tree preservation plans
- Handicap parking, designated accessible routes on site, slopes, etc.
- Exterior trails, landings, sidewalks and related details
- Fire hydrants, fire access roads, fire signage, etc.
- Exterior site lighting
- Proposed or future site conditions and/or buildings or structures shown
- Other local developmental standards

### **Building Exterior Elevations:**

- Establish finished grade plane and average finish grade plane
- Determine the number of stories (see definition of first story)
- Determine building height and height of special conditions (steeple, penthouses, antenna's, etc.)
- Finished grade elevation and separations at building and "slope away/drainage" conditions
- Exterior retaining wall conditions/locations/guards, etc.
- Exterior exit courts/discharge/public way access
- Roof slopes, roof drainage conditions, roofing materials and roof venting
- Building projections and cantilevers - structural and non-structural
- Problem roof drainage (over walks/drives, etc.)

- Building siding/finish and fascia/soffit materials and installation conditions
- Weather exposed lumber
- Exterior stairs or ramps – guardrails, slopes, handrails, rise/run, width, accessibility, drainage, etc.
- Flashings and sealing at exterior wall openings
- Exterior window/door/mechanical opening locations (type, size, rating, distance to other openings, etc.)
- Mechanical and/or plumbing vent sizes and locations (adjacent to other building openings)
- Decks and porches (materials, existing, structural, life-safety, etc.)
- Skylights (quantity, size, materials, flashing, etc.)
- Veneer (structural support, fastening, weather barriers, flashing, weeps, height, etc.)
- Building signage/address

### **Building Foundation Plans:**

- Verify special loading conditions/bearing points (continuous transfer of loads)
- Footing/foundation design/materials (engineered, conventional, empirical)
- Sizes of strip footings, column pad sizes, piers, wall thicknesses, bearing pockets/pads, special conditions, etc.
- Masonry block sizes - number of courses - fire ratings - grouting conditions
- Re-bar conditions, sizes, placement, lapping, tying, clearances, etc.
- Step footing locations/conditions
- Proper frost depth protection (minimum and per geotech recommendations)
- Special foundation systems per approved research reports
- Drainage and waterproofing systems - exterior/interior/under slab
- Soil condition designs (compatible with geotech recommendations)
- Anchoring systems and foundation wall support - lateral blocking and anchor hold down angles
- Building dimensions
- Bearing wall stud sizes (steel, concrete or wood)
- Wood - exposed or in contact with concrete or masonry
- Foundation insulation and interior moisture barrier installation
- Basement egress windows and window wells
- Smoke detector/alarm locations
- Post/beam sizes, spans and bearing conditions
- Joist/truss sizes, spans and bearing conditions
- Shop drawings for manufactured floor trusses or precast members
- Concealed space fire blocking/draftstopping
- Utilities locations, access, combustion air, floor drains
- Parking garage minimum headroom
- Habitable space sizes/heights and light and ventilation
- Exiting
- Crawl space - heat, ventilation, access, poly over ground, insulation
- Plastics and insulation smoke/flame ratings and thermal separations
- Room/space identification/uses
- Minimum floor slab thickness

- Basement size/use conditions for fire sprinkler requirements
- Mechanical-Electrical-Plumbing-Fire Protection equipment access and clearances
- Fire resistance ratings for walls/floors/structural members/occupancy separations, etc.

### **Building Floor Plans:**

- Occupancy separations (ratings, opening protectives and continuity)
- Special use conditions (IBC Chapter 4)
- Special use conditions/requirements from the State Fire Code
- Exterior wall ratings due to location on property (opening protection, projections, exterior finishes, opening % per wall area, etc.)
- Fire-resistive rated wall/floor/structure - locations/types/installation conditions/penetrations/listings
- Fire area designations/separations
- Fire wall construction and terminations
- Fire sprinklers (fully sprinkled/partially sprinkled and type of sprinkler system)
- Standpipe requirements – locations and types of standpipes
- Draftstopping/Fire blocking installations and/or trade-offs
- Occupant loads (exiting and plumbing fixtures)
- Habitable room dimensions, heights, light and ventilation
- Exterior wall openings for fire sprinkler requirements of 903 (sizes, spacing, locations, types, etc.)
- Number of stories (for occupancy and type of construction requirements)
- Space use designations identified
- Exiting (number of exits, common path travel, total travel, exit width, door swing, enclosed stairs, exit discharge conditions, signage, lighting, etc.)
- Incidental use separations
- Sleeping room emergency egress windows
- Exit system designs (exit access, width, travel distances, number of exits, stairs/handrails, aisles, corridors, assembly seating, exits, exit discharge, hardware, etc.)
- Fireplaces/hot tubs/saunas/elevators and other special equipment locations and installations
- Safety tempered glass (hazardous locations)
- Alarm systems (smoke/fire alarms, indicating devices, pull stations, main panel location, etc.)
- Minimum number of plumbing fixtures (access to, travel distances, availability, quantity, etc.)
- Accessible plumbing fixtures, restrooms and other systems and facilities within building
- Accessible routes, clearances, signage, equipment, controls, etc.
- Attic accesses/crawl space access
- Fire blocking & draftstopping (also see trade-offs)
- Special rated separations per chapter 4, section 508 or 1509
- Joist/truss/beam/header/girder - size, span, bearing conditions and fastening/anchoring details
- Bearing wall/non-bearing wall - stud size, bracing, continuity, etc.
- Shaft requirements (continuity, dampers, access, termination, etc.)

- Stair enclosures (ratings, continuity, exiting conditions, width, storage under, openings into or through, etc.)
- Energy code criteria - "R" value, windwash, air seals, vapor barriers, insulation backing/support, etc.
- Guardrails/handrails - Stairs rise/run - Accessible stairs or not
- Area of refuge required per ( IBC 1007.6)
- Exposed lumber or on masonry or concrete or within 8" of grade to be treated for decay resistive.
- Combustibles or fire-retardant-treated wood installation locations
- Special frame requirements (cantilevers, bridging, blocking, bearing, nailing, double joists, etc.)
- Decks and porches (type of construction, materials, special connections, framing, insulation, sprinklers, etc.)
- Special systems (glass block, interior masonry veneer, plastics, skylights, wall & ceiling coverings)
- Interior finishes per chapter 8
- Special atrium or mall conditions
- Mech. smoke control, post smoke exhaust, smoke curtains, heat vents, etc.
- Special structural designs
- Opening protectives (ratings, sizes, locations, closing devices, activation, testing/listing information, etc.)
- Door hardware/locking
- Pedestrian walkways, penthouses, control rooms, high rack storage, etc. (special conditions)

#### **Mechanical – Plumbing – Electrical – Reviews:**

- Utilities - small rooms, ventilation, access, energy compliance, etc.
- Kitchen equipment and installations (special requirements)
- Heat and ventilation - supply/return and MAU
- Access to plumbing and heating utilities as required by the mechanical codes (not HC)
- Mechanical exhaust (restrooms, laundry rooms, hazardous materials, etc.)
- Hot and cold potable water supplies and installations
- Fixture clearances and locations per plumbing/mechanical/electrical codes
- Fireplaces/hot tubs/saunas/elevators and other special equipment installed per code/manufacture
- Fire fighting mechanical equipment access, clearances, installations, monitoring, etc.
- Testing and balancing, disinfecting, boiler start-ups, fuel burning (ORSAT), monometer, pressure testing, mechanical commissioning report, etc.
- Smoke control installations (special provisions, methods, testing, etc.)
- Elevators (shunt trips, emergency power, phase I signals, signs, draft curtains, lobbies, equipment room, etc.)
- Hazardous material venting, ductwork, exhaust terminations, dust sprinklers, etc.
- Smoke and Fire damper installation conditions, locations, listings, actuations, etc.
- Duct installations, sizing, materials, gauges, hangers, balancing, etc.
- Fueling burning equipment 18" above garage surfaces
- Piping insulation per mechanical and energy codes

- Plenum ceiling designs (non-combustibles, smoke/flame ratings, not in corridors, etc.)
- Special equipment installations per code and manufacturer installation instructions
- Tested/listed fuel burning equipment and electrical equipment
- Fuel piping installations (materials, testing, hangers, I.D. labeling, valves, regulators, etc.)

### **Building and Wall Sections and Details**

- Ceiling heights (IBC 1003.2)
- Energy code compliance (R-values, vapor barriers, air barriers, wind wash, insulation supports, etc.)
- Wall structure components/materials
- Exterior wall finishes/treatments (IBC 1404, 1405, 1406 & 1407)
- Interior wall & floor finishes (IBC Chapter 8)
- Number of stories and basements/crawlspace
- Structural framing conditions
- Stair construction (tread rise & run, width, landings, handrails, guards, headroom, etc.)
- Shafts, elevators and stair enclosures (continuity, construction, materials, fire-ratings, etc.)
- Roof construction and materials (slopes, venting, underlayments, materials, etc.)
- Roof system classification (IBC 1505)
- Crawl space ventilation, insulation, thermal separations, etc. (IBC 1201, Chapter 26 and Energy Code)
- Connection details (trusses, beams, columns, walls, etc.)
- Construction materials used throughout (IBC Chapter 6)
- Finished grade locations (IBC 502)
- Foundation designs/depths (IBC 1805.2 & MSBC 1303.1600)
- Flashings and waterproofing details and conditions (IBC 1403, 1404 & 1405)
- Special conditions, connections, projections, bearing, materials, installations, etc.

### **Special Submittal Requirements:**

- UL, Warnock Hersey, Gypsum Association (etc.) testing/listing information on specific assemblies or equipment such as rated membrane of through penetration firestop systems, rated wall, roof, floor-ceiling or shaft wall assemblies, etc.
- Certified shop drawings for bleachers, assembly seating, roof or floor truss construction, precast structural members, prefabricated mezzanines, etc.
- Prefabricated building designs/details and label certifications
- Energy computations for verification of thermal performance of the building envelope
- Energy computations evidencing lighting energy consumption and maximum usage condition
- Special equipment installation instructions from the manufacturer (prefab fireplaces, HVAC equipment, etc.)
- Special/new technology or material information or specification on products not specifically tested/listed or nationally recognized
- Alternate method requests and supporting information
- Heat loss computations
- Special Inspections Agreements/Contracts

- Sample structural calculations

#### **Final Reports and Reviews:**

- Final Fire Alarm System Report – Certification of Operation/Completion by Installer
- Final “Commercial Kitchen” Minnesota Health Department Approval (Including kitchen hoods)
- Final Fire Code Inspection Approval (State or local Fire marshal)
- Final Elevator/Escalator Approval (State Elevator Inspectors)
- Final Boiler Start-up Approval (State Boiler Inspectors)
- Final Mechanical Inspection Approval
- Final Electrical Inspection Approval
- Final MDH Plumbing Inspection Approval
- Fire Sprinkler System Approval (Building Inspector and/or Local or State Fire Marshal)
- Fire Pump Operation/Certification Report (By installer)
- Emergency Generator Operational/Certification Reports (By installer)
- On-site Utility Final Inspection Approvals (i.e., septic, sanitary sewer, domestic water, storm, etc.)
- HVAC/Fuel Burning Equipment ORSAT Test Report(s) (By installer)
- HVAC Ventilation Balancing Report (By installer or 3<sup>rd</sup> party testing company)
- Special Inspection Summary Report (By special inspection agencies involved or by engineer of record)

**Plan Review Checklist  
Non-Residential**

**Note: code references Minnesota Rules and the 2012 Minnesota Building Code**

The following is a partial summary of plan review for non-residential structures and should include, but not be limited to the following:

<b><u>Zoning:</u></b>	<b>Complies</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Site Plan -Submitted	_____	_____	_____
Front Yard Set Back:	_____	_____	_____
Rear Set Back:	_____	_____	_____
Side Set Back	_____	_____	_____
Conditional Use Permit	_____	_____	_____
New Building Size	_____	_____	_____
Location of Additional Buildings	_____	_____	_____
Location of Well	_____	_____	_____
Location of Septic	_____	_____	_____
Shoreland Setback	_____	_____	_____
High-water Elevation	_____	_____	_____
Notes _____	_____	_____	_____

**Construction Documents**

Complete Submittals <i>MN Rules 1300.0130</i>	_____	_____	_____
Permit Application Complete <i>1300.0120</i>	_____	_____	_____
Construction Submittals Signed By	_____	_____	_____
Design Professional <i>1300.0130 sub 1</i>	_____	_____	_____
Special Inspection Agreement Submitted	_____	_____	_____
Geotech Report	_____	_____	_____
Energy Calculations	_____	_____	_____
Notes _____	_____	_____	_____

**Code Overview**

**Use & Classification**

Building Classification <i>302.1</i>	_____	_____	_____
Incidental Use <i>509 &amp; Table 509</i>	_____	_____	_____
Mixed Occupancies <i>508.3</i>	_____	_____	_____
Separated or Non-Separated Use <i>508.3.1.3, 508.3.2</i>	_____	_____	_____
Occupancy Separations <i>Table 508.4</i>	_____	_____	_____

Code Overview <i>(cont.)</i>	Complies		N/A
	Yes	No	
<b>Building Occupancy Classifications</b>	_____	_____	_____
Assembly 303	_____	_____	_____
Business 304	_____	_____	_____
Educational 305	_____	_____	_____
Factory 306	_____	_____	_____
Hazardous 307	_____	_____	_____
Mercantile 309	_____	_____	_____
Residential 310 MN Rule 1305.0310	_____	_____	_____
Storage 311	_____	_____	_____
Utility 312	_____	_____	_____
Notes	_____		

**General Building Requirements**

Scope MN Rules 1300.0040	_____	_____	_____
Definitions 202	_____	_____	_____
Basements 202	_____	_____	_____
Basic Allowable Height & Area Table 503	_____	_____	_____
Height Modifications 504.2	_____	_____	_____
Multi Story Area Increase 506.4	_____	_____	_____
Area Modifications 506.1, 506.2, 506.3	_____	_____	_____
Unlimited Area 507	_____	_____	_____
Notes	_____		

**Types of Construction**

Minimum Requirements 602.1.1	_____	_____	_____
Combustible Material Allowed			
In Non Combustible Construction 603	_____	_____	_____
Fire Resistance Rating Table 601 w/footnotes		_____	_____
Exterior Wall Fire Resistance			
Table 602 w/footnotes	_____	_____	_____
Notes	_____		

**Fire Resistive Construction**

Fire Area Definition 202	_____	_____	_____
Fire Separation Distance Definition 202	_____	_____	_____
Exterior Walls 705	_____	_____	_____
Projections 705.2	_____	_____	_____

<b>Fire Resistive Construction</b> (cont.)	<b>Complies</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
<b>Combustible Projections</b>			
<i>MN Rules 1305.0704.2.3</i>	_____	_____	_____
Fire Resistance Rating Exterior Walls <i>705.5</i>	_____	_____	_____
Allowable Area of Openings- Exterior Walls <i>705.8 Table 705.8</i>	_____	_____	_____
Allowable Area of Openings- Sprinklered Exterior Walls <i>704.5.1 Table 705.8</i>	_____	_____	_____
Parapets <i>705.11</i>	_____	_____	_____
Opening Protection Doors, Shutters & Exterior Walls <i>716, Table 716.5</i>	_____	_____	_____
Fire Walls (Former Area Separation Wall) <i>706 Definition 202</i>	_____	_____	_____
Fire Walls Fire Resistance Rating <i>Table 706.4</i>	_____	_____	_____
Horizontal Continuity <i>706.5</i>	_____	_____	_____
Vertical Continuity <i>706.6</i>	_____	_____	_____
Opening Through Fire Walls <i>706.8</i>	_____	_____	_____
Fire Barrier (Former Occupancy Separation) <i>707.1 Definition 202</i>	_____	_____	_____
Fire Barrier Fire Resistance Rating <i>707.3</i>	_____	_____	_____
Fire Barrier Continuity <i>705.5</i>	_____	_____	_____
Openings Through Fire Barrier <i>707.6, 716</i>	_____	_____	_____
Fire Partitions Where Required <i>708.1</i>	_____	_____	_____
Fire Partition Fire Resistance Rating <i>708.3</i>	_____	_____	_____
Fire Partition Continuity <i>708.4</i>	_____	_____	_____
Horizontal Assemblies General <i>711.1</i>	_____	_____	_____
Horizontal Assemblies Fire Resistance Rating <i>711.3</i>	_____	_____	_____
Horizontal Assemblies Continuity <i>711.4</i>	_____	_____	_____
Penetrations – Definitions <i>202</i>	_____	_____	_____
penetrations <i>714</i>	_____	_____	_____
Opening Protective <i>716</i>	_____	_____	_____
Duct Openings General <i>717.1</i>	_____	_____	_____
Fire Dampers Fire Protection Rating <i>Table 717.3.1</i>	_____	_____	_____
Fire Damper Actuation <i>717.3.3.1</i>	_____	_____	_____
Smoke Damper Rating <i>716.3.2.2</i>	_____	_____	_____
Smoke Damper Actuation <i>716.3.3.2</i>	_____	_____	_____
Fire Damper Smoke Damper Where Required <i>717.5</i>	_____	_____	_____
Fire Blocking <i>718.2</i>	_____	_____	_____
Draftstopping Floors <i>718.3</i>	_____	_____	_____
Draftstopping Attics <i>718.4</i>	_____	_____	_____
Notes _____	_____	_____	_____

Fire Protection Systems	Complies		
	Yes	No	N/A
Sprinkler Supervising Station Definition 202	_____	_____	_____
Fire Area Definition 202.	_____	_____	_____
Sprinkler Systems Where Required 903.2	_____	_____	_____
Sprinkler Systems Required @ Bsmts 903.2.11.1.3	_____	_____	_____
Additional Required Suppression Systems Table 903.2.120	_____	_____	_____
Sprinkler Exempt Locations 903.1.1.1	_____	_____	_____
Fire Alarm & Detection System 907	_____	_____	_____
Notes	_____		

### Means of Egress

Occupant Load 1004, Table 1004.1.2	_____	_____	_____
Increased Occupant Load 1004.2	_____	_____	_____
Egress Sizing 1005, 1005.3.1	_____	_____	_____
Ceiling Height 1003.2	_____	_____	_____
Exit Signs Where Required 1011.1	_____	_____	_____
Means of Egress Illumination 1006.1	_____	_____	_____
Illumination Emergency Power 1006.3	_____	_____	_____
Guards 1013	_____	_____	_____
Doors 1008	_____	_____	_____
Size of Doors 1008.1.1	_____	_____	_____
Door Swing 1008.1.2	_____	_____	_____
_____	_____	_____	_____
Landings @ Doors 1008.1.5	_____	_____	_____
Locks & Latches MN Rules 1305.1008.1.9.3	_____	_____	_____
Stairways 1009	_____	_____	_____
Stairway Landings 1009.4	_____	_____	_____
Handrails 1012	_____	_____	_____
Handrail Height 1012.2	_____	_____	_____
Handrail Continuity 1012.4	_____	_____	_____
Handrail Extensions 1012.6	_____	_____	_____
Exit Access General 1014.1	_____	_____	_____
Exit or Exit Access Doorway Required MN Rules 1305.1015.1	_____	_____	_____
Separation of Exits or Doorways 1015.2	_____	_____	_____
Egress Through Intervening Rooms or Spaces 1014.2	_____	_____	_____
Exit Travel Distance 1016.1	_____	_____	_____
Common Path of Egress Travel Definition 1002	_____	_____	_____
Common Path of Egress Travel 1014.3	_____	_____	_____





Reset

## Initial Application

PROJECT INFORMATION				
PROJECT TITLE			PROJECTED CONSTRUCTION VALUATION	
PROJECT LOCATION (number and street name)			COUNTY	
PROJECT CITY or PROJECT TOWNSHIP (Enter only the city or township, not both) <input type="checkbox"/> Check if outside city limits				
OWNER (OR STATE AGENCY IF APPLICABLE) (OR ISD# IF APPLICABLE)			CONTACT PERSON	
ADDRESS			PHONE	
CITY	STATE	ZIP CODE	E-MAIL	
DESIGN FIRM			PROJECT CONTACT	
ADDRESS			PHONE	
CITY	STATE	ZIP CODE	E-MAIL	
PROJECT TYPE (As defined by MN Statute 326B.103 Subd. 11 and Subd. 13)				
<input type="checkbox"/> State Owned - A building and its grounds the cost of which are paid for by the state or state agency regardless of its cost.				
<input type="checkbox"/> Public School District - A school district building project or charter school building project, the cost of which is \$100,000 or more.				
State Licensed Facility - A building and its grounds that are licensed by the state as a:				
<input type="checkbox"/> hospital, <input type="checkbox"/> nursing home, <input type="checkbox"/> supervised living facility, <input type="checkbox"/> free-standing outpatient surgical center, <input type="checkbox"/> correctional facility, <input type="checkbox"/> boarding care, <input type="checkbox"/> residential hospice.				
If your project is not licensed specifically as listed above, the project is not under the jurisdiction of the Building Plan Review Unit.				
CLASS OF WORK				
<input type="checkbox"/> New Building Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Remodeling	Sprinklers <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partial	
<input type="checkbox"/> Permit Only (submit documentation from regional building official)			ANTICIPATED START DATE	
IBC OCCUPANCY CLASSIFICATION(S)			IBC TYPE OF CONSTRUCTION	
PROJECT DESCRIPTION				
APPLICANT INFORMATION				
Upon receiving this completed initial application, we will confirm proper jurisdiction for the project and assign a project number. We will notify you in writing of the project number, where to submit your documents for review, and how inspections will be handled. If delegated to the municipality, you will need to follow their procedures and fee schedule. Otherwise our standard application process will need to be followed.				
<i>I completed the information on this application and understand that it does not authorize the start of construction.</i>				
APPLICANT NAME (PRINT)		APPLICANT SIGNATURE		DATE
APPLICANT MAILING ADDRESS		CITY	STATE	ZIP
				E-MAIL
FOR OFFICE USE ONLY		<input type="checkbox"/> State <input type="checkbox"/> Local Insp. <input type="checkbox"/> Local Both		BLD-

This material can be made available in different forms. To request, call 1-800-342-5354 (DIAL-DLI).

**Attachment to**

Minnesota Department of Labor and Industry  
 Construction Codes and Licensing Division  
 Building Plan Review  
 443 Lafayette Road North  
 St. Paul, MN 55155  
 Phone: (651) 284-5857  
[www.dli.mn.gov/CCLD/PlanConstruction.asp](http://www.dli.mn.gov/CCLD/PlanConstruction.asp)



Reset

**Application for Plan Review**

PROJECT INFORMATION			
PROJECT TITLE		PROJECTED CONSTRUCTION VALUATION	
PROJECT LOCATION (number and street name)		INITIAL APPLICATION PROJECT NUMBER BLD -	
PROJECT CITY or PROJECT TOWNSHIP (Enter only the city or the township, not both)		COUNTY	
OWNER (OR STATE AGENCY IF APPLICABLE) (OR ISD# IF APPLICABLE)		CONTACT PERSON	
ADDRESS		PHONE	
CITY	STATE	ZIP CODE	E-MAIL
DESIGN FIRM		PROJECT CONTACT	
ADDRESS		PHONE	
CITY	STATE	ZIP CODE	E-MAIL

**PROJECT TYPE**  
 (As defined by MN Statute 326B.103 Subd. 11 and Subd. 13)

**State Owned** - A building and its grounds the cost of which are paid for by the state or state agency regardless of its cost.

**Public School District** - A school district building project or charter school building project, the cost of which is \$100,000 or more.

**State Licensed Facility** - A building and its grounds that are licensed by the state as a:

hospital,  nursing home,  supervised living facility,  free-standing outpatient surgical center,  
 correctional facility,  boarding care,  residential hospice.

If your project is not licensed specifically as listed above, the project is not under the jurisdiction of the Building Plan Review Unit.

**CLASS OF WORK**

New Building Construction   
  Addition   
  Remodeling   
  Other, specify:

IBC OCCUPANCY CLASSIFICATION(S)	IBC TYPE OF CONSTRUCTION(S)	SPRINKLED <input type="checkbox"/> I3 <input type="checkbox"/> I3R <input type="checkbox"/> I3D
---------------------------------	-----------------------------	---

PROJECT DESCRIPTION

**NOTE: The following materials shall be submitted (as applicable) with this Application for Plan Review;**  
**Failure to submit all required information will result in delay of project processing.**

1. Complete set of Plans and Specifications	4. Code Record	7. Soils Investigation Report
2. Addenda and/or Change Orders	5. Sample Structural Calculations	8. Energy Code Compliance Forms
3. Plan Review Fee	6. Special Inspection Program	

**APPLICANT INFORMATION**

APPLICANT NAME (PRINT)	APPLICANT SIGNATURE	DATE	PHONE
APPLICANT ADDRESS (IF NOT LISTED ABOVE)	CITY	STATE	ZIP
			E-MAIL

Calculated Plan Review Fee (By Applicant)	FOR OFFICE USE ONLY
Please see: <a href="http://www.dli.mn.gov/CCLD/PlanConstructionCalc.asp">www.dli.mn.gov/CCLD/PlanConstructionCalc.asp</a> for correct calculation of the required plan review fee.	Date
<b>Plan Review Fee:</b> <input type="checkbox"/> Check Enclosed	Invoice #
Invoice: <input type="checkbox"/> to Owner <input type="checkbox"/> to Design Firm	Check #
<b>Note:</b> Invoice option delays plan review until payment is received.	Returned Check
<input type="checkbox"/> 75% <input type="checkbox"/> 100%	<b>BLD-</b>

This material can be made available in different forms. To request, call 1-800-342-5354 (DIAL-DLI).

## Municipal Application for State Plan Review

There are 2 basic types of review the division will perform as a fee-for-service.

- One is an SBC (State Building Code) plan review. If an SBC review is requested, the division will perform a plan review using State Building Code chapters of Minnesota Rules including 1305, International Building Code; 1306, Special Fire Protection Systems; 1341, Accessibility Code; 1346, Mechanical Code and the State Energy Code.
- The other is an **NFPA 13** fire sprinkler review. If this review is requested, the division will perform a plan review using NFPA 13 and/or other relevant referenced standards.

The division can also provide plan review of other systems. Contact the section supervisor for more information.

**By completing and signing the *Municipal Application for State Plan Review*, the applicant and the division agree to the following:**

1. The applicant will provide a complete set of applicable contract documents for review. This may include plans, specifications, sample structural calculations; hydraulic calculations, soil report; exterior envelope energy code calculations; all associated addenda's; plan review fee calculated in accordance with the Division's fee schedule.
2. The application materials will be reviewed and evaluated by the division in accordance with the current Minnesota State Building Code as referred to above in either the SBC or NFPA 13 review.
3. Interpretations and applications of the code will be made by division plan review staff.
4. A plan review report will be prepared by the division and submitted to the building official identifying whether the materials appear to comply with the applicable provisions of the Code or if revisions to the contract documents are required. Deficiencies will be listed in the report and explained with reference to the applicable code sections.
5. Any proposed "alternate materials or methods" or "modifications" submitted with the contract documents will be evaluated and commented on in the plan review report. However, final approval rests with the building official.
6. The report will be mailed and e-mailed to the building official.
7. The division's plan review service is considered complete with the issuance of the plan review report. It is the building official's responsibility to perform any follow-up review of revised contract documents to determine final compliance with the State Building Code and ultimate issuance of the building permit. The division will, however, consult with the building official on any issues pertaining to the division's plan review or any follow-up responses submitted by the designer.
8. Although the division strives to complete plan reviews in as timely a manner as possible, the division makes no claim as to how long the process will take to complete on any given project. The division will provide as accurate an estimate as possible to the building official before and during the process.
9. The Division's fee for plan review is 65% of the building permit fee calculated in accordance with the fee schedule contained in Chapter 1302 of the State Building Code.
10. Other Conditions: \_\_\_\_\_

Minnesota Department of Labor and Industry  
 Construction Codes and Licensing Division  
 Plan Review/Inspections  
 443 Lafayette Road North  
 St. Paul, MN 55155-4341  
 Phone: (651) 284-5068 Fax: (651) 284-5749  
 www.doli.state.mn.us/buildingcodes



## Municipal Application for State Plan Review

To be used by municipalities requesting plan review services on buildings other than Public Buildings and State Licensed Facilities

PRINT IN INK or TYPE your responses.

### NAME OF MUNICIPALITY

STREET ADDRESS		CITY	STATE	ZIP CODE
CONTACT PERSON (if different from building official)		PHONE	E-MAIL ADDRESS	

### BUILDING OR PROJECT TO BE REVIEWED

ADDRESS		CITY	STATE	ZIP CODE
CONSTRUCTION VALUATION	TYPE OF WORK (check one)			
	<input type="checkbox"/> New Building <input type="checkbox"/> Addition <input type="checkbox"/> Alteration <input type="checkbox"/> Sprinkler			

TYPE OF REVIEW REQUESTED

SBC Review   
  NFPA 13   
  Other \_\_\_\_\_

### DESIGN FIRM

MAILING ADDRESS		CITY	STATE	ZIP CODE
CONTACT PERSON			PHONE	

***By requesting the Minnesota Building Codes and Standards Unit to Plan Review this project, I understand and agree to the conditions contained in the Attachment.***

BUILDING OFFICIAL MAKING APPLICATION (Print)	CERTIFICATION NO.	PHONE
SIGNATURE OF BUILDING OFFICIAL		DATE

**NOTE: We cannot accept applications for fire-sprinkler plan review unless you have been authorized for plan review by the State Fire Marshal's office.**

**This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI) Voice or TDD (651) 297-4198.**

#### Office Use Only

PROJECT NUMBER	PLAN REVIEW FEE	DATE INVOICED
DATE PAID	APPROVED FOR REVIEW BY	DATE

BCS 12 (4/07)

# Municipal delegation agreements for public buildings and state-licensed facilities

## *What is a municipal delegation agreement?*

A municipal delegation agreement is a written agreement or transfer of responsibility between the Minnesota Department of Labor and Industry (DLI) and a municipality. It identifies who is authorized to administer all or portions of the Minnesota State Building Code (MSBC) on these state building projects.

## *What are public buildings and state-licensed facilities?*

[View details about public buildings and state-licensed facilities here.](#)

## *What types of delegation agreements can a municipality request?*

There are three kinds of delegation agreements a municipality can request:

- [Reserved project inspections](#)
- [All state project inspections](#)
- [Both plan review and inspections](#)

## *How can my municipality obtain a delegation agreement to inspect reserved projects?*

- The municipality must have adopted the state building code.
- The municipality must have a certified building official or certified limited building official designated and on file with DLI.
- The building official cannot be under an active enforcement investigation by DLI.
- [Submit a completed Delegation Agreement Application](#) (PDF).

## *How can my municipality obtain a delegation agreement to inspect all state projects?*

- The municipality must have adopted the state building code.
- The municipality must have a certified building official designated and on file with DLI.
- The building official cannot be under an active enforcement investigation by DLI.
- Submit a completed [Delegation Agreement Application and Resume of Qualifications](#) (PDF) for each person who wants to provide these services.
- [View the next steps in the process after documents are submitted.](#)

## ***How can my municipality obtain a delegation agreement for both plan review and inspections of all state projects?***

The municipality must have adopted the state building code.

The municipality must have a certified building official designated and on file with DLI.

The building official cannot be under an active enforcement investigation by DLI.

Submit a completed **Delegation Agreement Application and Resume of Qualifications** (PDF) for each person who wants to provide these services.

**View the next steps in the process after documents are submitted.**

## ***What qualifications and experience are required to be considered for a delegation agreement to inspect or plan review and inspect all state projects?***

A person wishing to perform delegation services must satisfy A, B and C below:

**A.** Minimum five years of experience in performing inspections or plan review and inspections to assure compliance with the Minnesota State Building Code on schools, hospitals, nursing homes, colleges, dormitories, correctional facilities **or** other buildings having elements in at least five of the following component categories:

**Structural:** cast-in-place reinforced concrete [composite] floors, walls and structural members, structural masonry, structural steel and connections, precast concrete, pilings (all with evidence of completed Special Inspection)

**Fire-resistance:** walls, floors, structural members, penetrations, spray-applied fire-proofing, shafts, smoke barriers, smoke compartments, smoke and fire dampers

**Egress:** exit enclosures, horizontal exits, elevator lobbies, exit passageways, areas of refuge, alternate locking devices

**Mechanical:** type 1 hoods, hazardous-exhaust systems, process piping, ventilation systems with make-up-air

**Fire protection:** alarm systems, alternate fire-protection-system designs, smoke control systems

**Miscellaneous:** hazardous materials storage or control rooms, atriums, auditoriums, stages, grandstand-type bleacher seating structures, pedestrian walkways, emergency power systems

Relevant certifications or training courses may substitute for a maximum of one year of experience. Relevant certifications or training courses must have been completed within the past five years.

**B.** Performed inspection or plan review and inspection of at least five buildings in the past five years that meet the criteria in "A."

**C.** Minimum five years of experience in performing inspections or plan review and inspections of fire protection system installations to determine compliance with the Minnesota State Building Code, Minnesota State Fire Code, and National Fire Protection Association (NFPA) standards.

### ***What can I expect after I apply?***

A staff member from CCLD will review the application and resume(s).

If the application and resume(s) appear to qualify the municipality for a delegation agreement, a CCLD staff member will contact the applicant to set up an on-site interview.

If the application and resume(s) do not appear to qualify the municipality for a delegation agreement, a CCLD staff member will send a letter to the municipality detailing the reasons why the delegation cannot be granted and the process for reconsideration.

### ***What will the on-site interview involve?***

A staff member from CCLD will verify the information provided on the application and resume(s). You'll need to provide, for each project listed on the application:

- permit applications, plans and plan review correspondence, inspection records, compliance testing, special inspection reports and certificate of occupancy,
- proof of any inspector certification and training listed on the resume. Certificates of attendance must be provided.

If delegation authority cannot be granted after the on-site interview, a CCLD staff member will send a letter to the municipality detailing the reasons why the delegation agreement was not granted and the process for the municipality to request reconsideration.

### ***How long will the process take?***

The initial review of the application and resume(s) should take about one week.

CCLD staff will try to perform the on-site interview within two weeks of reviewing an application and resume(s) that appear to qualify for a delegation agreement.

If the applicant is able to provide all the required information at the on-site interview, then:

- the on-site interview should not take longer than two hours of each applicant's time;
- the entire process should not take longer than 30 days, although this may vary depending on CCLD staff availability.

### ***What if I disagree with the determination?***

The municipality must be provided an opportunity to correct any deficiencies listed by DLI and request reconsideration in writing. [See statute](#) (PDF).

The commissioner must then issue a final determination.

If DLI denies issuance of a delegation agreement based upon the request for reconsideration, a CCLD staff member will send a letter to the municipality detailing the reasons why the delegation agreement was not granted and the process for appealing the final determination.

## ***Plan review policies and opinions***

**Plan review policies** (background, purpose, applicability, format and use)

**PR-01: Smoke Resistant Construction**

**PR-02: Downgrading Existing Buildings**

**PR-03: Group I-3 Corridor Ratings**

**PR-04: Fire Walls**

**PR-05: Group I-3 Cell Ventilation**

**PR-06: Fire Wall Opening Protectives**

**Policy for plan review of similar building plans for state-owned buildings**

**Building code unit philosophy regarding substituting sprinklers for passive fire protection**

**Other code opinions and policies**

**Building plan review archive opinions**

# Pressure Treated Wood Contact Links

International Code Council  
Evaluation Service  
[www.icc-es.org](http://www.icc-es.org)

American Wood Preservers  
Association (AWPA)  
[www.awpa.com](http://www.awpa.com)

Chemical Specialties, Inc (developer  
Of ACQ wood preservative)  
[www.treatedwood.com](http://www.treatedwood.com)

Wolmanized Wood Lumber  
[www.wolmanizedwood.com](http://www.wolmanizedwood.com)

Osмосе (wood preservatives)  
[www.osmosе.com](http://www.osmosе.com)

Southern Pine Council (wood  
Foundations)  
[www.southernpine.com](http://www.southernpine.com)

American Wood Preservers Institute  
[www.preservedwood.com](http://www.preservedwood.com)

USP Structural Connectors  
<http://www.uspconnectors.com>

Simpson Strong Tie  
[www.strongtie.com](http://www.strongtie.com)

American Forest & Paper Association  
[www.afandpa.org](http://www.afandpa.org)

American Wood Council  
[www.awc.org](http://www.awc.org)

Canadian Institute of Treated Wood  
[www.citw.org](http://www.citw.org)

Western Wood Preservers Institute  
[www.wwpinstitute.org](http://www.wwpinstitute.org)

United States Environmental  
Protection Agency (EPA)  
[www.epa.gov/pesticides/factsheets/  
chemicals/1file.ht](http://www.epa.gov/pesticides/factsheets/chemicals/1file.ht)

United States Consumer Product  
Safety Commission  
<http://www.cpsc.gov/>

Environmental Working Group  
(EWG)  
[www.ewg.org](http://www.ewg.org)

Permanent Wood Foundations  
<http://permanentwoodfoundation.com>

## NEWS RELEASE

March 23, 2004

For Immediate Release

Contact: Tom Anderson, Assistant Director,  
Building Codes and Standards Division  
651/205-4706

### Select proper hardware when building with treated lumber

(ST. PAUL) – With warmer weather on the way, Minnesota construction code officials are cautioning people about the need to properly select hardware for decks and other projects that utilize treated lumber.

“According to the lumber and hardware industries, the newer chemicals being used to treat wood approved for outdoor use may be considerably more corrosive to metal than wood previously treated with chromated copper arsenate (CCA),” said Tom Joachim, State Building Official in the Department of Administration. “Builders, suppliers, homeowners and others need to be aware that there are specific recommendations by the manufacturers of these products for nails, fasteners, hangers and other hardware that comes into contact with the wood. In addition, metal surfaces such as flashing, windows and doors, which may be in contact with treated wood products, need to be carefully selected because of the potential for corrosion,” Joachim added.

The U.S. Environmental Protection Agency in early 2002 announced a voluntary decision by the lumber industry for transitioning to arsenic-free products. The most common treatments today are alkaline copper quaternary (ACQ), copper azole and sodium borate. The transition addresses virtually all residential uses of treated wood, including play structures, decks, lawn furniture, landscaping, fencing and boardwalks.

The Building Codes and Standards division website ([www.buildingcodes.admin.state.mn.us](http://www.buildingcodes.admin.state.mn.us)) includes a resource web link contact list and an updated brochure outlining guidelines for deck planning. The information is also accessible from the Department of Administration web site, [www.admin.state.mn.us](http://www.admin.state.mn.us). The Minnesota State Building Code references the American Wood Preservers Association ([www.awpa.com](http://www.awpa.com)), which has published information about the issue and includes links on its web site to several wood products companies.

<END>

# Minnesota State Building Code

## Field Inspections

### 1300.0210 INSPECTIONS.

**Subp. 1. General.** Construction or work for which a permit is required shall be subject to inspection by the building official and the construction or work shall remain accessible and exposed for inspection purposes until approved. Approval as a result of an inspection is not approval of a violation of the code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of the code or of other ordinances of the jurisdiction are not valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the building official nor the jurisdiction is liable for expense entailed in the removal or replacement of any material required to allow inspection.

**Subp. 2. Preliminary Inspection.** Before issuing a permit, the building official may examine, or cause to be examined, buildings, structures, and sites for which an application has been filed.

**Subp. 3. Inspection Record Card.** The building official shall identify which inspections are required for the work requiring a permit. Work requiring a permit shall not be commenced until the permit holder or an agent of the permit holder has posted or otherwise made available an inspection record card that allows the building official to conveniently make the required entries regarding inspection of the work. This card shall be maintained and made available by the permit holder until final approval has been granted by the building official.

**Subp. 4. Inspection Requests.** The building official shall provide the applicant with policies, procedures, and a timeline for requesting inspections. The person doing the work authorized by a permit shall notify the building official that the work is ready for inspection. The person requesting an inspection required by the code shall provide access to and means for inspection of the work.

**Subp. 5. Approval Required.** Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the building official. The building official, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed or notify the permit holder or an agent of the permit holder of any failures to comply with the code. Any portion that does not comply shall be corrected and the portion shall not be covered or concealed until authorized by the building official.

**Subp. 6. Required Inspections.** The building official, upon notification, shall make the inspection in this part. In addition to the inspections identified in this subpart, see applicable rule chapters in part 1300.0050 for specific inspection and testing requirements.

- A. Footing Inspections** shall be made after excavation for footings are complete and any required reinforcing steel is in place. Materials for the foundation shall be on the

job, except that concrete need not be on the job if the concrete is ready mixed according to approved nationally recognized standards.

## **B. Foundations**

- (1) Foundation inspections for poured walls shall be made after all forms are in place with any required reinforcing steel and bracing is in place, and prior to pouring concrete.
- (2) Masonry foundation walls shall be inspected while under construction to verify reinforcement size, spacing, lap, and placement (clearances for grouting) and during grout placement.
- (3) All foundation walls shall be inspected prior to backfill for specific code requirements.
  - a. Foundation walls that retain earth and enclose habitable or usable spaces, located below grade, shall be waterproofed per R406.2. Foundation drainage system shall be installed per R405.1
  - b. Exterior foam plastic foundation insulation materials shall be covered with a 6-mil polyethylene slip sheet over the entire exterior surface and shall be protected to a minimum 6 inches below grade by a ridge opaque weather resistive covering.
- (4) The foundation inspection shall include excavations for thickened slabs intended for the support of bearing walls, partitions, structural supports, or equipment.

**C. Concrete Slab and Under-Floor Inspections** shall be made after in-slab or under-floor reinforcing steel, radon system or vapor retarder, and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the sub-floor.

**D. Rough-In Inspection of Plumbing, Mechanical, Gas, and Electrical Systems** shall be made before covering or concealment, before fixtures or appliances are set or installed, and before framing inspection.

**1346.0106 Section 106 Required (Mechanical) 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.
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 completed, and prior to the installation of walls and ceiling membranes.

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

**Plumbing Inspections: (1300.0215).** New plumbing systems and parts of existing systems which have been altered, extended, or repaired shall be inspected and tested and approved by the administrative authority before the plumbing system is put into use.

**Rough Plumbing Testing: (2012 Uniform Plumbing Code 712.2 and 712.3).** The piping of plumbing drainage and venting systems shall be tested with water or air upon completion of the rough piping. When using the water test method, openings (except for the highest opening) in the piping system shall be tightly plugged. The highest opening shall then be filled with water to a point of overflow. The **water shall remain on the piping system for a period of not less than 15 minutes without leak.** When using the air test method, openings in the piping systems shall be tightly plugged, and then air shall be forced into the system to a **minimum gauge pressure of five (5) pounds per square inch.** The **air pressure shall remain constant** without the introduction of additional air for a **period of not less than m 15 minutes.**

**Electrical Rough-In: (MN. Department of Labor and Industry 326B.36).** Except where any political subdivision has by ordinance provided for electrical inspections, every new electrical installation in any construction, remodeling, replacement, or repair, shall be inspected by the board for compliance with accepted standards of construction for safety to life and property.

- E. Framing and Masonry Inspections** shall be made after the roof, masonry, all framing, firestopping, draftstopping, and bracing are in place and after the plumbing, mechanical, and electrical rough inspections are approved.
- F. Energy Efficiency Inspections** shall be made to determine compliance with Minnesota Energy Code requirements.
- G. Lath or Gypsum Board Inspections** shall be made after all lathing and gypsum board, interior and exterior, are in place, but before any plastering is applied or before gypsum board joints and fasteners are taped or finished.

**Exception:** Gypsum board that is not part of a fire-resistive assembly or a shear assembly.

*Comment: For exterior plaster applications, lath, weather-resistant barrier and, where applied over wood-based sheathing, shall include a weather-resistant vapor permeable barrier with a performance at least equivalent to two layers of grade D paper and weep screeds shall be inspected prior to placement of the first coat of plaster.*

- H. Protection of Joints and Penetrations** in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved.
- I. Installation of Manufactured Homes** (mobile homes) shall be made after the installation of the support systems and all utility service connections are in place,

but before any covering material or skirting is in place. Evaluation of an approved anchoring system and testing of the gas piping is part of the installation inspection.

**J. Fireplaces** must be inspected for compliance with applicable requirements of the code and the manufacturer's installation instructions.

**K. A Final Inspection** shall be made for all work for which a permit is issued.

**Mechanical Final Inspection:** 1346.0106 Section 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. The final inspection shall be made upon completion of the mechanical system.

*Comment: The building official may require additional testing of the gas piping system during the final inspection. Examples: soap test, manometer test, etc.*

**Finished (Final) Plumbing Inspection: (MN Rule 4714.0712.5).** After the plumbing fixtures have been set and their traps filled with water, their connection shall be tested and proven gas and water tight by plugging the stack opening on the roof and the building drain where it leaves the building, and air introduced into the system equal to the pressure of a one-inch water column. Such pressure shall remain constant for the period of the inspection without the introduction of additional air.

**Electrical Final Inspection: (MN. Department of Labor and Industry 326.36).** After the electrical fixtures have been set and before the system is put into use, the system shall be given a final inspection and tested by the proper authority.

*Comment: The building official may use the final inspection to look at any items of concern that haven't been addressed yet and are in need of approval. The final inspection may include such items as: If required, accessibility signage, restroom grab bars and room configurations, parking areas, posting of building address, exit signage, etc.*

**L. Special Inspections** shall be as required by the code.

Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the type of work listed under Section 1704.

Note: The special inspection reports shall be provided to the building official for review and record keeping.

**M. In addition to the inspections in Items A to L,** the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the code and other laws that are enforced by the Department of Building Safety.

## **Other Required Inspections:**

**Elevator and Related Devices Inspection and Testing: (1307.0035).** No person, firm, or corporation may put into service any installation covered by Parts 1307.0010 to 1307.0100 whether the installation is newly installed, relocated, or altered materially, without the installation being inspected and approved by the authority having jurisdiction. Where applicable, the elevator must be inspected by a state elevator inspector before putting the elevator into use.

**Prefabricated Buildings On-site Inspection: (1360.1000).** Local code enforcement agencies are **required** to inspect the installation of prefabricated buildings and are responsible for determining that each installation is completed in accordance with its certification.

**Industrialized/Modular Buildings or Building Components Installation Inspections (1361.0500).** Industrialized/modular **buildings** and building components must be installed in compliance with the Minnesota State Building Code, which incorporates by reference the Model Rules and Regulations for Industrialized/Modular Buildings.

**Model Rules and Regulations for Industrialized/Modular Buildings, Uniform Administrative Procedures, Part IV: (Administration Sec. 6, Local Enforcement Agency Procedures and Inspections):**

**(B)** Local enforcement agencies shall inspect work performed on-site, including foundations and the structural, mechanical, plumbing, and electrical connections, for compliance with the Uniform Administrative Procedures.

**(C)** Local enforcement agencies shall inspect all industrialized/modular buildings or building components upon, or promptly after, installation at the building site to determine whether all site built work is in accordance with the permit application, the installation instructions, and the conditions listed on the manufacturer's data plate. This may include tests for tightness of plumbing connections done on-site and for malfunctions in the electrical systems, and visual inspection for obvious nonconformity with the approved plans or the code.

- 1) Destructive disassembly of certified industrialized/modular buildings and building components shall not be performed in order to conduct such tests or inspections, nor shall there be imposed standards or test criteria different from those adopted by the participating State having jurisdiction.
- 2) Non-destructive disassembly may be performed only to the extent of opening access panels and cover plates.
- 3) Systems testing during manufacture shall not be subject to retesting at the building site.

**Optional Other Inspections: Inspections that may be required by the building official.**

## Corrective Actions

There are a number of ways to achieve corrective action on a job-site. Methods can include verbal notification, notification in written format, notification via computer e-mail messages, or notification by phone.

Methods outlined are not necessarily the only way to gain compliance on a job site, they are simply tools that one should consider when trying to resolve required corrective jobsite actions.

### **Written Correction Orders:**

As referenced, these types of correction orders are always provided in written format. Duplicates or carbon copies of written correction orders should always be considered. When writing a correction order, one should always consider the following:

- Clearly itemize all violations
- Specify exact code section(s)
- Contact the contractor or owner immediately
- Explain your orders completely
- Provide a specific timeline/deadline for corrective action
- Follow up on orders and timeline promptly (in writing)
- Copy all orders for department records and site records
- Issue “stop work” orders only when necessary or as a last resort

# Stop Work Orders

## 1300.0170 Stop Work Orders.

A stop work order must always be in written format. Duplicates should be considered for proper record purposes. One should also bear in mind that legal action may be pursued as a result of this action. In addition, the code official is almost always affected by the “trickle-down effect” of local politics once a stop work order is issued. In writing a stop work order, one should always consider the following:

- Should only be used as a last resort – for most severe action after documented verbal and/or written warnings if - or when - possible.

- Bear legal action (and political effects) in mind when writing corrections.

- Contact the contractor or owner immediately if/when issued

- Post in a conspicuous location (main site entrance or building entry)

- Clearly itemize all violations point by point

- Specify exact code section(s)

- Explain your orders clearly and completely

- Offer alternatives if appropriate

- Provide a specific timeline/deadline for required corrective action

- Follow up on orders and timeline promptly (in writing also)

- Copy all stop work orders for department and site records

- When called to verify corrective action/resolution, document inspection thoroughly for file.

- Try and be flexible in working towards a quick resolution. Make yourself available.

Regardless of the type of inspection format or notice that is used, one should always be cognitive of the cause and effect factor of each option. In that respect, one needs to understand that differing degrees of corrective order(s) will result in different responses by the violator. To that end, the primary purpose of each is to get the violator back into compliance with the code.

"Sample"

# STOP WORK ORDER

The following work **HAS NOT BEEN APPROVED AT**

**Address:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Reasons:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**This tag is a legal notice to stop all work until all proper corrections have been made.**

**Inspector:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Call Municipal Building Department at** \_\_\_\_\_

**Between the hours of 7:30 AM – 4:00 PM**

**DO NOT REMOVE THIS TAG**



"Sample"

Municipality of  
**INSPECTION REPORT**

PIN #: \_\_\_\_\_  
Phone: \_\_\_\_\_  
FAX: \_\_\_\_\_

Date \_\_\_\_\_  
Scheduled \_\_\_\_\_  
Completed \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
OWNER: \_\_\_\_\_  
CONTRACTOR: \_\_\_\_\_

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> SITE INSPECTION     | <input type="checkbox"/> FRAMING                    | <input type="checkbox"/> PLUMBING FINAL                |
| <input type="checkbox"/> FOOTING             | <input type="checkbox"/> ABV GRADE STRUCT MASON     | <input type="checkbox"/> MECHANICAL FINAL              |
| <input type="checkbox"/> FOUNDATION          | <input type="checkbox"/> STRUCTURAL STEEL           | <input type="checkbox"/> FIREPLACE/CHIMNEY FINAL       |
| <input type="checkbox"/> RADON MANAGEMENT    | <input type="checkbox"/> WINDOW/DOOR INSTALLATION   | <input type="checkbox"/> SPRINKLER SYSTEM FINAL        |
| <input type="checkbox"/> CONCRETE SLAB       | <input type="checkbox"/> ENERGY EFFICIENCY          | <input type="checkbox"/> ALARM SYSTEM FINAL            |
| <input type="checkbox"/> PLUMBING ROUGH-IN   | <input type="checkbox"/> LATH/GYPSUM MECHANICAL     | <input type="checkbox"/> SIDING/EIFS/EXTERIOR FINISHES |
| <input type="checkbox"/> ROUGH-IN            | <input type="checkbox"/> SPRINKLER SYSTEM ROUGH-IN  | <input type="checkbox"/> BUILDING FINAL                |
| <input type="checkbox"/> ROOFING             | <input type="checkbox"/> SPRAY APPLIED FIREPROOFING | <input type="checkbox"/> REINSPECTION                  |
| <input type="checkbox"/> ELECTRICAL ROUGH-IN | <input type="checkbox"/> PROTECT JOINTS/PENETRATION | <input type="checkbox"/> COMPLAINT                     |
| <input type="checkbox"/> GAS PIPING          | <input type="checkbox"/> FIREPLACE ROUGH-IN         | _____  |
| <input type="checkbox"/> GAS LINE PRESSURE   | <input type="checkbox"/> ALARM SYSTEM ROUGH-IN      | _____  |

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

- |   |   |
|---|---|
| <input type="checkbox"/> WORK SATISFACTORY; PROCEED.  | <input type="checkbox"/> Photo/Video Taken. |
| <input type="checkbox"/> CORRECT WORK AND PROCEED.  |   |
| <input type="checkbox"/> CORRECT WORK, CALL FOR REINSPECTION BEFORE COVERING.                     |   |
| <input type="checkbox"/> CORRECT UNSAFE CONDITION WITHIN _____ HOURS, AND CALL FOR REINSPECTION . |   |
| <input type="checkbox"/> STOP-WORK ORDER POSTED. CALL INSPECTOR.                                  |   |
| <input type="checkbox"/> INSPECTION REQUIRED. CALL TO ARRANGE ACCESS.                             |   |

BUILDING INSPECTOR: \_\_\_\_\_ Phone: \_\_\_\_\_

Call for the next inspection 24 hours in advance.

Owner/Contractor On -Site: \_\_\_\_\_  
Inspector: \_\_\_\_\_

Note: The jurisdiction may want this form on carbonless, duplicate paper to generate an office copy for the file and a field copy for the contractor.

SAMPLE

Permit # \_\_\_\_\_

# (Municipal Logo)

BUILDING PERMIT *and/or*

## SITE INSPECTION RECORD

*For all inspections call (XXX) XXX-XXXX 24 hours in advance.*

Date Issued: \_\_\_\_\_ Permit \_\_\_\_\_ Type: \_\_\_\_\_  
 \_\_\_\_\_ Property Owner: \_\_\_\_\_  
 \_\_\_\_\_ Project Address: \_\_\_\_\_  
 \_\_\_\_\_ General Contractor: \_\_\_\_\_  
 \_\_\_\_\_ License #: \_\_\_\_\_

**(X)** in left column indicates which inspections are required.

X	INSPECTION	INSPECTOR	DATE	COMMENTS
	Footing			
Do not place any concrete until the footing inspection is signed off.				
	Foundation			
Do not backfill until foundation inspection is signed off				
	R-Plumb. (above grade)			
	R-Plumb. (below grade)			
	Rough Mechanical			
	Rough Electrical			
	Gas Piping Test			
	Fireplace Rough-In			
	Framing			
Do not insulate until the above inspections are signed off.				
	Energy/Insulation			
Do not sheetrock or cover until the insulation/energy inspection is signed off.				
	Lath			
Do not plaster until lath inspection is signed off (if applicable).				
	Final Plumbing			
	Final Mechanical			
	Sewer/Septic			
	Final			

**A CERTIFICATE OF OCCUPANCY IS REQUIRED BEFORE BUILDING IS OCCUPIED**



# Certificate of Occupancy Requirements

No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure shall be made until the building official has issued a certificate of occupancy.

Exception: A municipality has the option of requiring a certificate of occupancy for Group U occupancies; and used manufactured homes.

After the building official has inspected the building or structure and finds no violations of the provisions of the Minnesota Building Code or other laws that are enforced by the code enforcement agency, **the building official shall issue a certificate of occupancy that shall contain the following:**

- The building permit number.
- The address of the building.
- The name and address of owner.
- A statement that the described portion of the building has been inspected for compliance with the requirements of the Code for the occupancy and division of occupancy and the use for which the proposed occupancy is classified.
- The name of the building official.
- The edition of the code under which the permit was issued.
- The use and occupancy classification.
- The type of construction.
- If an automatic sprinkler system is provided.
- Any special stipulations and conditions of the building permit.

**Temporary Certificate of Occupancy:** The building official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that the portion or portions shall be occupied safely. The building official shall set a time period during which the temporary certificate of occupancy is valid.

# ***Certificate of Occupancy***

I, \_\_\_\_\_, acting on behalf of the of \_\_\_\_\_ (City Name) \_\_\_\_\_ in the capacity of \_\_\_\_\_ (Title) \_\_\_\_\_ hereby certify that the described premises and project have been inspected by myself and that the permit or use as authorized by the referenced permit has been completed in compliance with all applicable codes and ordinances and is not in variance with said application and supporting data as of the date of said inspection.

Permit # \_\_\_\_\_ Use and Occupancy Classification: \_\_\_\_\_ Type of Construction: \_\_\_\_\_

Building sprinkler system provided: \_\_\_ yes \_\_\_ no Code edition in effect during permit issuance: \_\_\_\_\_

PID # \_\_\_\_\_ Property Address: \_\_\_\_\_

Owner's Name: \_\_\_\_\_ Street Address: \_\_\_\_\_

Special stipulations and conditions: \_\_\_ none \_\_\_ see attached

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **TYPE OF CERTIFICATE**

Temporary Certificate of Occupancy: Yes \_\_\_\_\_ No \_\_\_\_\_ Number of items requiring completion \_\_\_\_\_

[see attached inspection record]. Expiration Date: \_\_\_\_\_ A reinspection must be scheduled; provide access for inspection(s). All items requiring completion need to be inspected and approved prior to the expiration date.

Final Approval: Yes \_\_\_\_\_ No \_\_\_\_\_ Owner or Contractor's Signature: \_\_\_\_\_

# Chronology of the Minnesota Manufactured Home Code and Rules

July 2, 1972 – Law and Rules in effect for the adoption of ANSI 501B 1972 Standard for mobile homes, including interim amendments requiring egress window or door in bedrooms. State seals required on all manufactured homes manufactured after July 1, 1972.

November 1972 – Reciprocity agreement to accept State of Indiana manufactured home seals.

September 1, 1974 – Adoption of ANSI 501B 1974 and requirement for support and anchoring systems regulation and installer registration.

November 1974 – Reciprocity agreement to accept State of Wisconsin manufactured home seals.

January 1, 1975 – Transfer of manufactured home manufacturer and dealer licensing to Department of Administration, Building Codes and Standards Division.

June 15, 1976 – State of Federal Manufactured Home Standards and Regulations. HUD Labels required on all new manufactured home nationwide.

June 1, 1977 – Rules amended to include support and anchoring systems and installer registration.

June 1, 1981 – State Building Code amended to require building official to inspect manufactured home installation.

August 1, 1981 – Adoption of Federal Manufactured Home Construction and Safety Standards by state law including consumer complaint handling procedures.

August 1982 – Rules revised to include HUD regulations, consumer complaint handling, and the requirements for the installation of utility connections.

December 1982 – Rules adopted for Licensing of Manufactured Home Manufacturers and Dealers.

March 1993 – Adoption of Manufactured Home Installer License and Bond Requirements.

March 16, 1998 – Limited Dealer License Law for manufactured home park owners, passed, 327B.04 subd. 8.

April 1, 1998 – All Manufactured Home Installers required to be Licensed and Bonded by the Minnesota Department of Commerce. No manufactured home installer license exemption can be issued after March 31, 1998.

April 10, 2000 Laws modified for Limited Dealer License passed, 327B.04, subd. 8.

June 26, 2000 Chapter 1350 Rules for Limited Dealer License and Installation Amended

February 8, 2008 - HUD Code of Federal Regulations (CFR) 3288, “Manufactured Home Dispute resolution Program” became effective throughout the United States. State of MN fully approved for enforcement and administration of the CFR 3288 program by HUD as of February 6, 2008.

2007 and 2008- Minnesota Statutes amended 327B.10 added to adopt rules for continued education programs for installers, 326B.885 language added for licensed installer renewal required every three years, and 326B.46 added to allow plumbing rules to permit licensed manufactured home installers to connect the plumbing to the manufactured home at the site of occupancy.

January 1, 2009 – HUD Code of Federal Regulations (CFR) 3285, “Model Manufactured Home Installation Standards” and CFR 3286, “Model Manufactured Home Installation Program Rules and Regulations” became effective throughout the United States. State of MN submitted for approval of qualifying state programs in accordance with CFR 3285 and CFR 3286 in October of 2008 (As of January of 2009 HUD approval pending for MN).

December 29, 2009- Minnesota Chapter 1350 revisions became effective; were amended to include requirements for installation of new manufactured homes for compliance with minimum requirements of HUD CFR 3285: installation inspections for all new and used manufactured home installations; continued education requirements for licensed manufactured home installers; and dispute resolution in accordance with HUD CFR 3288. The requirements for used home sales were also changed—see MS 327.32. This change requires an agreement between the buy and seller defining who is responsible to correct non-compliances for the 9-life health safety items listed in the statute.

February 23, 2010- State of Minnesota approved by HUD as having a fully acceptable state plan for installation of manufactured homes in accordance with HUD CFR 3286.

July 21, 2011- Changes to installation requirements for new and used manufactured homes in MS 327.32 and 327.33. Allows single and multi-section used manufactured homes to be installed as ground sets (this is in violation of manufacturer’s DAPIA approved engineered installation instructions if frost depth footings are required by manufacturers and requires the seller/installer to provide the purchaser a “notice” of non-compliance with the manufacturer’s installation requirements and the potential effects of installing the home on a support system with footings placed above the local frost line). Allows plan review and inspection of all new and used manufactured homes by MN certified building officials outside of the building officials designed jurisdiction. (New manufactured home installation inspection and approval by building officials without ICC certification is non-compliance of CFR 3286.)

## Manufactured Structures

Type of Structure			
CODE ACTIVITY	Manufactured Homes MSBC Chapter 1350	Prefabricated Buildings MSBC Chapter 1360	Industrialized Modular Buildings MSBC Chapter 1361
<b>APPLICATION</b>	“USE” Single Family Residence Only	“USE” Single Family Residence and/or Garage	“USE” All Occupancy Types
	Applicant must provide manufacturers plans, certifications along with the manufacturers requirements for installation and site work for the building. This information is required prior to plan review and permit issuance. The seal numbers may or may not be available at the time of permit application but are required to be on the unit when the unit arrives at the job site.		
<b>PERMIT FEE VALUATION</b>	Based on the value of the work being done at the site.	Based on the value of the work being done at the site.	Based on the value of the work being done at the site.
<b>PLAN REVIEW and INSPECTION STRUCTURAL</b>	Pier pad sizing soil type concentrated loads anchoring or attachment of house to foundation.	Location of concentrated loads, bearing locations. Attachment of home to the foundation.	Location of concentrated loads, bearing locations. Attachment of the building to the foundation.
<b>PLAN REVIEW MECHANICAL</b>	Location of crossover ducts or sleeves	Usually the mechanical system is done on site.	Will vary greatly. Homes will be similar to prefab, except two-story units. Commercial buildings will have the air handling system completed.
<b>PLAN REVIEW PLUMBING</b>	Diagram to bring DWV to a single drop. Gas line connection from meter to house inlet.	DWV is stubbed through the floor. Water supplies may or may not be installed other than the shower supply. No gas lines run.	Residential ranch style stubbed thru the floor. Two-story tied together at floors. Commercial units typically brought to one DWV drop as well as one water hook up. Gas lines run on site.
<b>PLAN REVIEW ELECTRICAL</b>	Disconnect location and house sub panel, size 100, 150, or 200 amps junction between units. Fixture installation.	Panel is usually designed to be located in basement. Circuit leads are brought to one location. Service and basement wiring is completed onsite.	Residential - panel is usually supplied for basement installation with home-runs to be wired into the service panel onsite. Commercial projects - the panel is installed in the building. Check if designated as a building service disconnect or subpanel.
<b>PLAN REVIEW ENERGY</b>	Inclusive of the label. If installed on a basement the Minnesota energy code applies to the basement only.	Complies with MN Energy Code MR 1322. Check sill area for insulation and sealing. Basement must comply with the MN Energy Code.	Complies with MN Residential or Commercial Energy Codes MR 1323.

Type of Structure			
CODE ACTIVITY	Manufactured Homes MSBC Chapter 1350	Prefabricated Buildings MSBC Chapter 1360	Industrialized Modular Buildings MSBC Chapter 1361
APPLICATION	"USE" Single Family Residence Only	"USE" Single Family Residence and/or Garage	"USE" All Occupancy Types
Tests	<p>The manufacturer require the following tests:</p> <ul style="list-style-type: none"> <li>• Gas piping: <ul style="list-style-type: none"> <li>– Without appliances 3 psi 10 minutes</li> <li>– With appliances 10-14 water column</li> <li>– With applied bubble solution</li> </ul> </li> <li>• Drain Waste and Vent: flood rim 15 minutes</li> <li>• Water supply: 100 psi 15 minutes – <b>(not to include the water heater)</b></li> <li>• Electrical: <ul style="list-style-type: none"> <li>– Before service connect bonding of metal parts</li> <li>– check for shorts</li> <li>– after service connection polarity &amp; gfci</li> </ul> </li> </ul>	Perform tests on-site as are required by the Minnesota Residential Code.	Perform tests on-site as are required by the Minnesota Building Code.

# Manufactured Home Requirements

Minnesota Statutes 326B.133: The Building official shall be responsible for all aspects of code administration for which they are certified, including the issuance of all building permits and the inspection of all manufactured home installations.

A permit is required for:

- Installation of new and used homes;
- Remodeling of homes involving the installation or replacement of windows, interior walls, roofing, siding, etc.;
- Alterations of homes (see 1350.3800);
- Additions to the home of porches, decks, garages, etc.; and
- Installation of furnaces and water heaters.

The required inspections for the installation of a new manufactured home would include the footings, anchoring and support system, gas piping test and final.

The required inspections for a manufactured home that is installed on a partial or full basement would be footings, foundation, anchoring, any new plumbing rough-in and manometer, mechanical, energy, electrical and related inspections.

For specific requirements for Manufactured Homes see Minnesota Rule 1350, Prefabricated Buildings, Minnesota Rule 1360, Industrialized/Modular Buildings Minnesota Rule 1361 and Minnesota Rule 1370 for Storm Shelters (Manufactured Home Parks).

For approved anchoring systems visit the Department of Labor and Industry website [http://www.dli.mn.gov/CCLD/PDF/ms\\_anchor\\_supplier\\_list.pdf](http://www.dli.mn.gov/CCLD/PDF/ms_anchor_supplier_list.pdf)

Minnesota Department of Labor and Industry  
 Construction Codes and Licensing Division  
 Building Plan Review/Inspections  
 443 Lafayette Road North  
 St. Paul, MN 55155-4341  
 Phone: (651) 284-5068 Fax: (651) 284-5749  
 www.doli.state.mn.us/buildingcodes  
 TTY: (651) 297-4198



## Manufactured Home Plan Review and Inspection Form

PRINT IN INK or TYPE your responses.

PROJECT ADDRESS	PLAN REVIEWED BY	DATE
-----------------	------------------	------

COMMENTS:

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**INSTALLATION:**

<b>Seals/Certificates #</b>	<b>Anchoring #</b>	(Anchoring may be required by municipal ordinance park rule for pre-code and state code homes. Anchoring is required for HUD code homes.)
<b>Instructions used:</b> <input type="checkbox"/> Manufacturers <input type="checkbox"/> State Chapter 1350		(Homes constructed after June 14, 1976, requires manufacturers instructions to be used).
<b>Foundation to State Building Code</b>		(May be required by manufacturer's instructions in a park set or by code adopting or zoning ordinance in a private property set.)

**Foundation Type:**

Piers below frost depth    Full depth basement (treated wood or concrete block or poured concrete or other) \_\_\_\_\_  
 Crawlspace    Engineered slab on grade (signed approval by DAPIA or Minnesota engineer)

<b>Support Footings:</b>		<b>Soil Conditions:</b>	<b>Pier Material:</b>
Type	Size	PSF	

<b>Pier Spacing:</b> (calculations should be submitted for review prior to inspection.)		<b>Shims:</b>	
Feet	Inches on Center	Material Used	Size (minimum 4" x 6" hardwood)

**GENERAL ITEMS:**

<b>Skirting material used</b> (resistant to decay)	<b>Access to Crawlspace Area</b> (18" x 24" minimum)	<b>Ground Cover Crawlspace Area</b>
<b>Venting for Skirted or Crawlspace Area:</b> sq, ft of vents		(manufacturer's instructions or other: usually 1sq ft./150 sq. ft. of floor area).

Yes    No   **Clothes dryer vented to outside crawlspace or skirted area:**

**Material used:** \_\_\_\_\_

Yes    No   **Fresh air intakes to outside crawlspace or skirted area** (if required for fireplace or furnace or water heater)

Yes    No   **Cross-over heat ducts of multi-section homes installed to manufacturers requirements:**

**Anchoring Equipment** (if applicable)

Anchors Used (manufacturers model numbers) \_\_\_\_\_

Soil test probe torque value \_\_\_\_\_ inch pounds

Yes    No   **Connection and mating of multiple sections:** (manufacturers installation instructions)

This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI) Voice or TDD (651) 297-4198.

**UTILITIES AND TESTING:**

**Water:**

Yes  No Correct materials and fittings used:  
Comments

Yes  No **Water lines protected from freezing:**

Yes  No **Correct support: Spacing:** \_\_\_\_\_ O.C.

**Pressure test** (maximum 80 lbs.)

**Water heater:**

Gas  Electric

**Installed by:**

**Drain/Waste Lines:**

Yes  No Correct materials and fittings used:  
Comments

(If manufacturer ships materials loose to complete on-site, material list and DAPIA approved design drawings must e with the home).

Slope to drain: \_\_\_\_\_ " per foot support \_\_\_\_\_ O.C.  
spacing

Yes  No Main sewer connection gasketed:

Pressure test or flood level test:

Date:

Installer name: (plumbing contractor or other)

**Gas Service:**

Yes  No Correct materials and fittings used:  
Comments

Pressure test (6 to 8 oz. 1350.3400)

Date:

Installer:

Correct connection between halves: (HUD Code

Yes  No 3280.705): Support spacing and type: \_\_\_\_\_

Yes  No Service to home correct materials and installation: (for manufactured home parks reference UMC Appendix B, Section 221)

Gas line shutoffs:  Furnace  Range  Clothes Dryer  Water Heater  Fireplace

**Electrical:**

Installers name:

License number:

Service to home:  50 amp  100 amp  200  
amp  Other \_\_\_\_\_

(Note: In a manufactured home park the service must match the design rating of the home and all wiring must be completed by a licensed Minnesota electrical contractor.)

Yes  No Heat tape receptacle under home: (HUD 3280.603, must be within 2 feet of main water entry, requires a weather proof cover, shall not be on a GFIC circuit.)

**Miscellaneous:**

Egress window (each bedroom):  1  2  3  4  5

Yes  No Smoke detectors: Location Comply: Type:  Electric  Battery  Combination

(HUD code 6/14/76 and newer requires electric, State code 7/1/72 to 6/14/76 allowed battery operated.

Yes  No Working at time of inspection Date \_\_\_\_\_

Yes  No Fireplace or wood-burning stove: Make and  
Model

Yes  No Approved for Use:

Yes  No Fresh air intake correctly installed

Chimney/flue (materials and type) \_\_\_\_\_

Furnace:  Original  Replacement  Gas  Electric  Fuel

Oil  Other:

Yes No Entry stairs front and rear of home to code: (check stair rise and run, and landing size, and handrail or guardrail)

**INSPECTIONS:**

---

1. Inspector	Date
2. Inspector	Date
3. Inspector	Date

---

Comments:

"Sample"  
**Manufactured (Mobile) Home Permit/Application**

DATE RECEIVED	RECEIVED BY	PERMIT #
---------------	-------------	----------

**Applicant Complete Information Below**

PROJECT ADDRESS		OR PID#	
PROPERTY OWNER		PHONE #	
ADDRESS		CITY	STATE ZIP CODE
INSTALLER NAME		LICENSE #	PHONE #
GAS PIPING TEST CONTRACTOR	PHONE #	PARK NAME (if applicable)	Lot #
BRAND NAME	MODEL NAME	SERIAL NUMBER	DATE OF MANUFACTURE
CONSTRUCTION LABEL NUMBER	DESIGN ROOF LOAD	IS THIS HOME AN "ALTERNATE CONSTRUCTION" DESIGN: <input type="checkbox"/> YES <input type="checkbox"/> NO If yes, contact the Building Official for additional submittal information.	HEATING/COOLING ZONE
DEALERS NAME		PHONE #	
ADDRESS		CITY	STATE ZIP CODE
TYPE OF FOOTINGS & FOUNDATION	DIMENSIONS OF HOME	LOT SIZE	ESTIMATED VALUE OF HOME VALUE OF SITE WORK

This permit becomes null and void if work or construction authorized is not commenced within 180 days, or if construction or work is suspended or abandoned for a period of 180 days at any time after work has commenced. I hereby certify that I have read and examined this application and know the same to be true and correct. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or the performance of construction.

NAME [please print]	ADDRESS	STATE	ZIP CODE	CITY
SIGNATURE	DATE	PHONE #		

**City Use Only**

**PLANNING:**

ZONING DISTRICT	MINIMUM SETBACKS REQUIRED			
	Front _____	Side _____	Rear _____	
	Road Right of Way _____	Other: _____		

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS:

**BUILDING:**

REVIEWED BY	DATE
-------------	------

SUBJECT TO THE FOLLOWING CONDITIONS:

**Fees**

Building Permit _____	Plan Review _____	State Surcharge _____
Plumbing Permit _____	Plan Review _____	State Surcharge _____
Mechanical Permit _____	Plan Review _____	State Surcharge _____
Other: _____		
<b>TOTAL DUE:</b> _____		
Date Issued: _____	Issued By: _____	Receipt # _____

*Sample*  
**MANUFACTURED [MOBILE] HOME  
PERMIT REQUIREMENTS**

The following information must be submitted to the Building Department before a building permit can be processed and approved. A more detailed description of items 1-5 is listed below.

- |   |   |
|---|---|
| <b>Application form.</b><br><br><br><br><b>copies].</b> | <ol style="list-style-type: none"><li>1. <b>Manufactured Home Permit</b></li><li>2. <b>Site Plan <u>or</u> Survey [two copies].</b></li><li>3. <b>Plans/Installation Instructions [two</b></li><li>4. <b>Contractor[s] License Number.</b></li><li>5. <b>Gas Piping Air Test.</b><br/>* <b>Miscellaneous as required.</b></li></ol> |
|---|---|

After a preliminary review additional information may be required.  
Allow **xxxxx** working days for processing.

1. **Permit Application:** Complete a building permit application form.
2. **Site Plan or Survey:** Provide an updated plan of the property showing the direction north, all property lines, road right of ways, easements, existing buildings [with dimensions] and project address or PIN number. Diagram the proposed building location, dimensions and proposed setbacks from property lines, existing buildings and all topographical features. A registered survey may be required if deemed necessary by the department.
3. **Plans/Installation Instructions [two copies]:**
  - A. Floor Plans of the home showing the length and width of the home, room layout and use of rooms [bedroom, bathroom etc.]. If a basement is being installed include floor plans of the basement.
  - B. Installation Instructions showing the anchoring and support system designed by the manufacturer. If the manufacturers instructions are not available the home must be anchored and supported per section 1350 of the MN State Building Code.
  - C. A Cross Section of the footings and foundation is required if a basement or frost footing foundation is being installed. Provide the manufacturers design for the foundation including footing size, foundation type, anchoring system, center bearing wall design, dampproofing/waterproofing and foundation insulation.
4. **The Installers License Number and the General Contractors** license number must be provided on the permit application.
5. **Gas Piping Air Test:** Provide the name and phone number of the contractor performing the air test on the gas piping inside the home. All piping must be of approved material; from the

meter to the main connection at 25psig for 30 minutes, can be reduced to 10 minutes with prior approval. Inside the home with an air test of ten to fourteen inches water column for ten minutes and soap tested. Support the gas piping in accordance with the 2015 Minnesota Fuel Gas Code (MNFGC) Section 415 using approved connectors. The tests must be witnessed by an inspector before the home can be occupied. Refer to the manufacturers installation instructions for additional requirements.

**Miscellaneous: Alternate Construction:** If your manufactured home was designed and built under an alternative construction technique, additional information will be required.

**Zoning:** A zoning permit application is required if a variance, conditional use permit or special evaluation is required. Zoning approval is required for all building permits

**Electrical:** Electrical permits are issued by the State Electrical Inspector, for permit and inspection requirements call xxx-xxx-xxxx, 7:00 - 8:30 A.M., Monday through Friday.

**Permit Fees:** Building and zoning fees will be determined after the application and required plans have been approved. Fees must be paid in full before a permit can be issued or work can begin.

## General Information

### **\*\*Required Inspections:**

1. Footing inspection [if concrete is being placed].
2. Setup inspection of anchoring and support system.
3. Gas piping air test.
4. Plumbing manometer or flood level of the water closet.
5. Final [before occupied], when all inspections are complete and code complying landings and stairs are in place.

\*Misc. as needed.

\*\*If a basement is being installed the foundation must be inspected prior to backfill.

For all inspections call **xxx-xxx-xxxx** 24 hours in advance.

**Certificate of Occupancy:** Before the home can be occupied a Certificate of Occupancy may be required by the municipality. All work must be completed and the required inspections approved before the home can be occupied.

**Licensed Installers:** All homes are required to be installed by a licensed installer or the owner/occupant. Installers must attach a support and anchoring seal to the home. Because of frost conditions homes installed after November 15 require a temporary installation seal before occupancy. The installer/owner must provide a copy of the temporary installation seal before occupancy and contact the building department when the final seal is installed.

**Construction Seals:** Include on the application form the MN State Construction Seal or the HUD Serial Number, manufacturer and year built.

**Water Piping:** All water piping must be of approved material and fittings. Piping under the home must be insulated, heat tape installed, and supported in accordance with MR 4715.1430, <https://www.revisor.mn.gov/rules/?id=4715.1430>.

**Gas Water Heaters/Furnaces:** Gas water heaters and furnaces must be listed specifically for manufactured homes and be installed to the manufacturer's specifications and the State Building Code. All gas water heaters and furnaces require outside combustion air and proper venting.

**Fireplaces:** Fireplaces must be listed for manufactured homes and installed per manufacturer's instructions and the State Building Code.

**Gas and Electric Utilities:** Contact your local supplier for specific requirements.

**Electrical Wiring** must be inspected and approved by a State Electrical Inspector. To request an inspection or to answer electrical questions call: xxx-xxx-xxxx between 7am and 8:30 am, Monday through Friday.

**Excavations:** Before excavating call Gopher State One 48 hours in advance at 651-454-0002 or for greater Minnesota 1-800-252-1166 to verify the location of underground utilities, etc..

If you have any questions, please contact the Building Department Monday - Friday, 8 AM to 4:30 PM at:

**Name**  
**Address**  
**City, State, Zip**  
**Phone**

# Egress Windows for Manufactured Homes

1. **ANSI A119. STANDARDS:** Clear opening of not less than 22 inches in least dimensions and 5 square feet in area with bottom of the opening not more than 4 feet above the floor. (ANSI A119.1 effective July 1, 1972 thru June 14, 1976.)
2. **HUD CFR 3280.106:** Clear opening of not less than 20 inches width and 24 inches height in least dimensions and 5 square feet in area with bottom of the opening not more than 36 inches above the floor. Locks, latches, operating handles, tables, and other devices, which need to be operated in order to permit existing, shall not be located in excess of 54 inches from the finished floor. (HUD Standards effective July 15, 1976 to present.)
3. **2006 International Residential Code (IRC) Sec. 310:** All escape or rescue windows shall have a minimum clear open able area of 5.7 square feet with minimum clear height of 24 inches and minimum clear width of 20 inches and finished sill height of not more than 44 inches above the floor. (see exception in R310.1.1 for 5 square feet)

Options #2 and #3 may be acceptable for municipalities, which adopt Ordinances for “Pre-Code Manufactured Homes”; (Homes built prior to July 1, 1972).

Note manufactured homes built from July 1, 1972 thru June 14, 1976 shall have egress windows in compliance with ANSI A119.1 or HUD windows in compliance with HUD CFR 3280.106 in every bedroom. All basements when installed under manufactured homes shall meet the egress requirements of the Minnesota State Building Code, 2000 IRC Section 310.

## **Correct Appliance Installations for Manufactured Homes**

The Construction Codes and Licensing Division has evidenced a misconception causing noncompliance in manufactured homes when replacement and/or retrofit water heaters and furnaces are installed. The misconception is persons see the listing for use which states "listed for Manufactured Home Use" and they believe that is all that is necessary. A water heater and/or furnace may be listed for use, however, care must be taken in choosing the correct appliance for its use and listing.

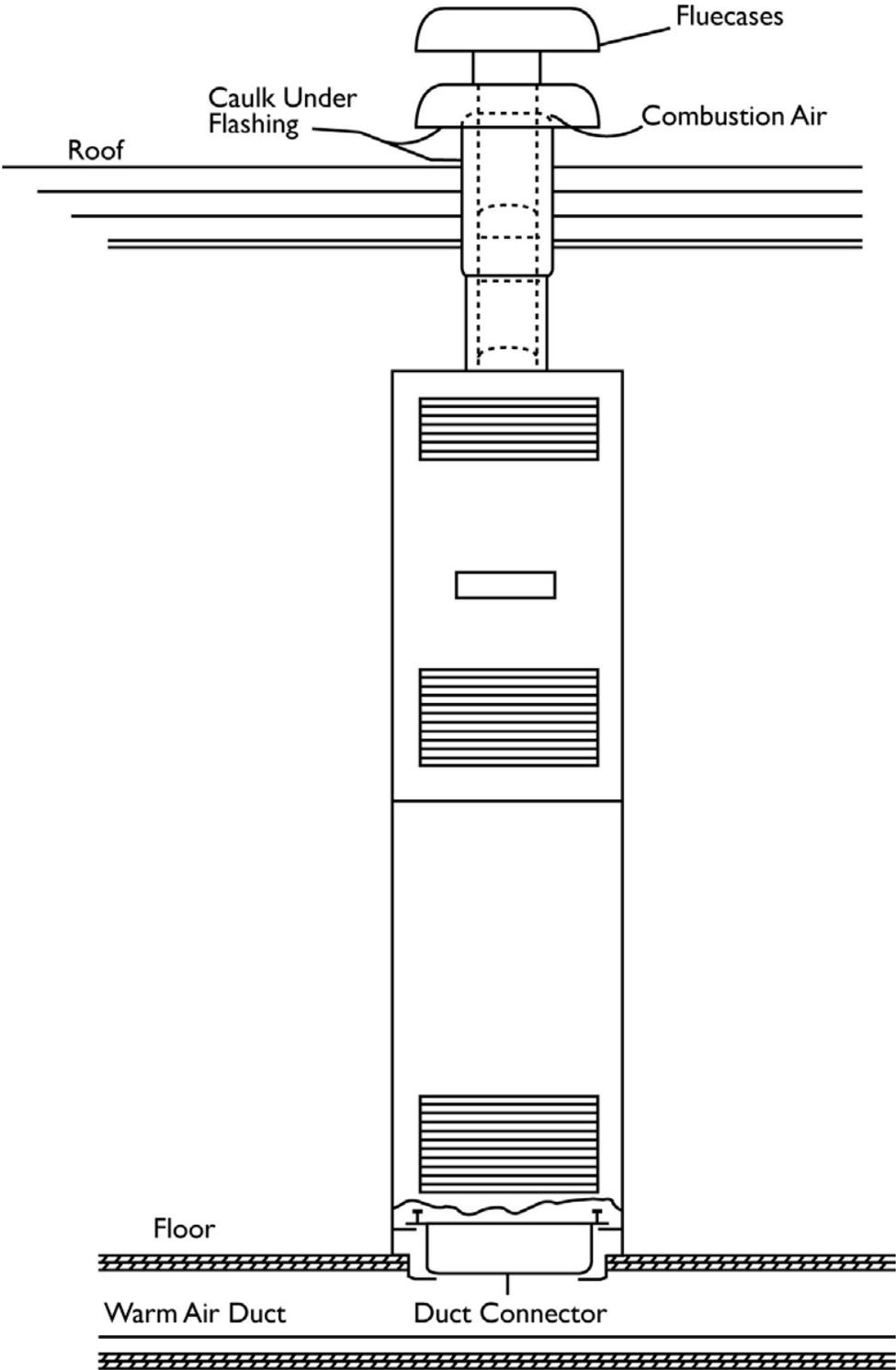
HUD CFR 3280.709 standards recognize two methods in which compliance may be achieved for the required "Complete separation of the combustion systems from the interior atmosphere of the manufactured home." Method One is the installation of direct vent system (sealed combustion system). Method Two is the installation of appliances within enclosures so as to separate the appliance combustion system and venting system from the interior atmosphere of the manufactured home.

There shall not be any door, removable access panel, or other opening into the enclosure housing the furnace or water heater from inside of the manufactured home. Any opening for ducts, piping, wiring, etc. shall be sealed.

Please be advised that under Minnesota Statutes 327.31 through 327.35 it is a violation of state law to alter and/or sell or lease, or offer to sell or lease any manufactured home built after July 1, 1972, which does not comply with the manufactured home building code. In the future, all personnel involved in replacing water heaters and furnaces or selling manufactured homes in Minnesota should not only note that the appliance is listed for use in a manufactured home, but also that the installation conforms to the appliance manufacturer's installation instructions.

# METHOD ONE

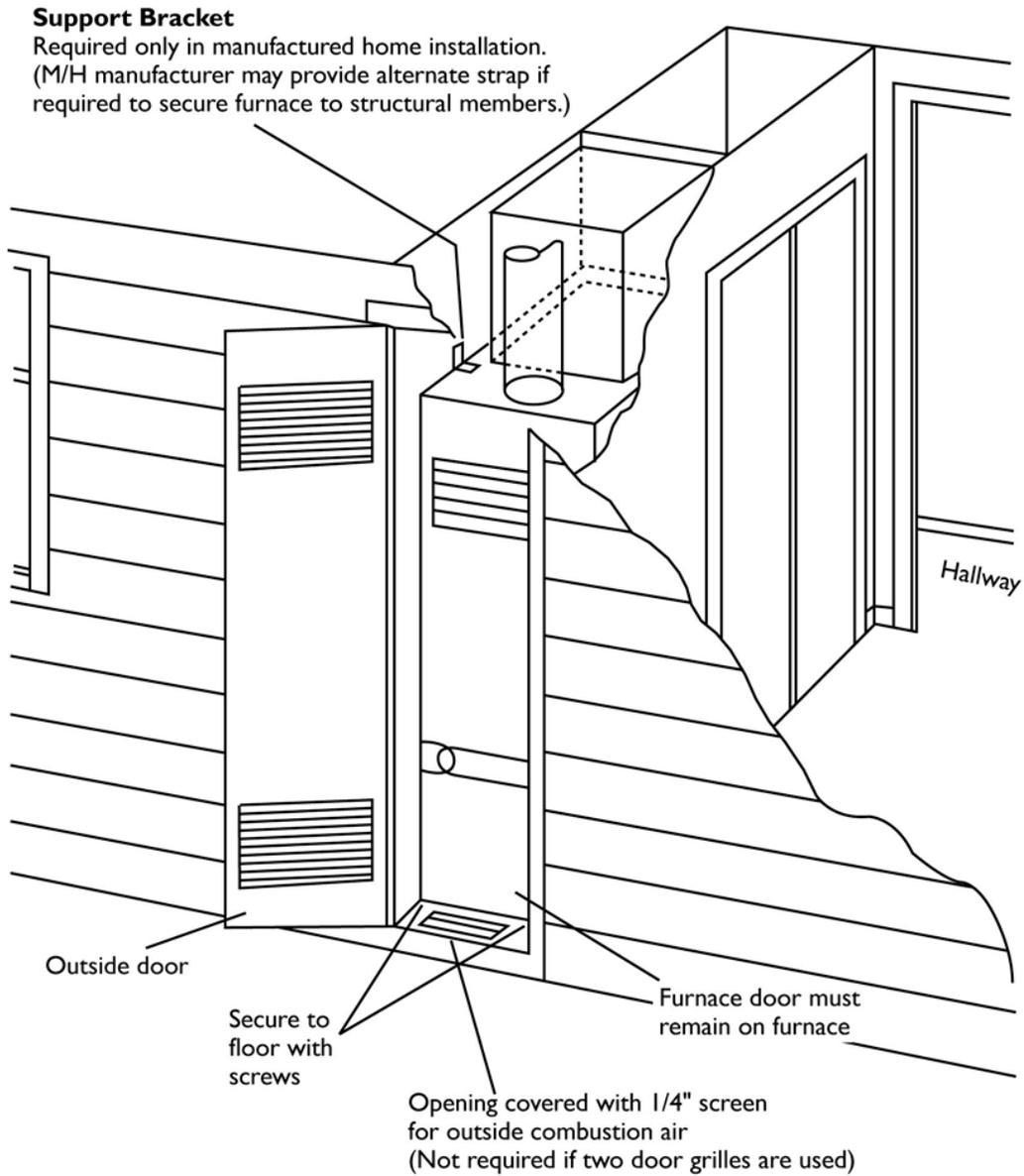
## Direct Vent



# METHOD TWO

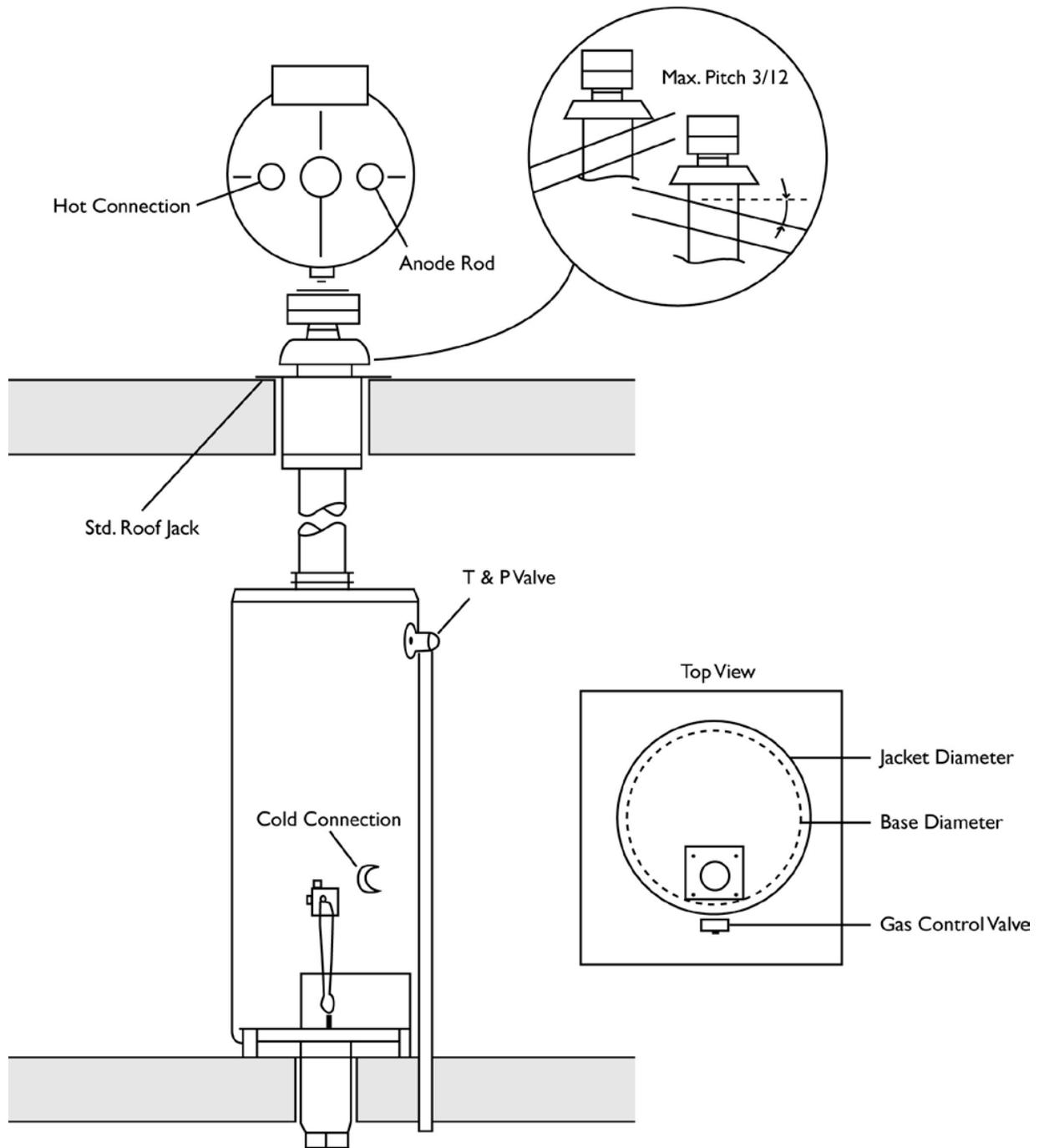
## Separate Enclosure

### *Typical Closet Installation*



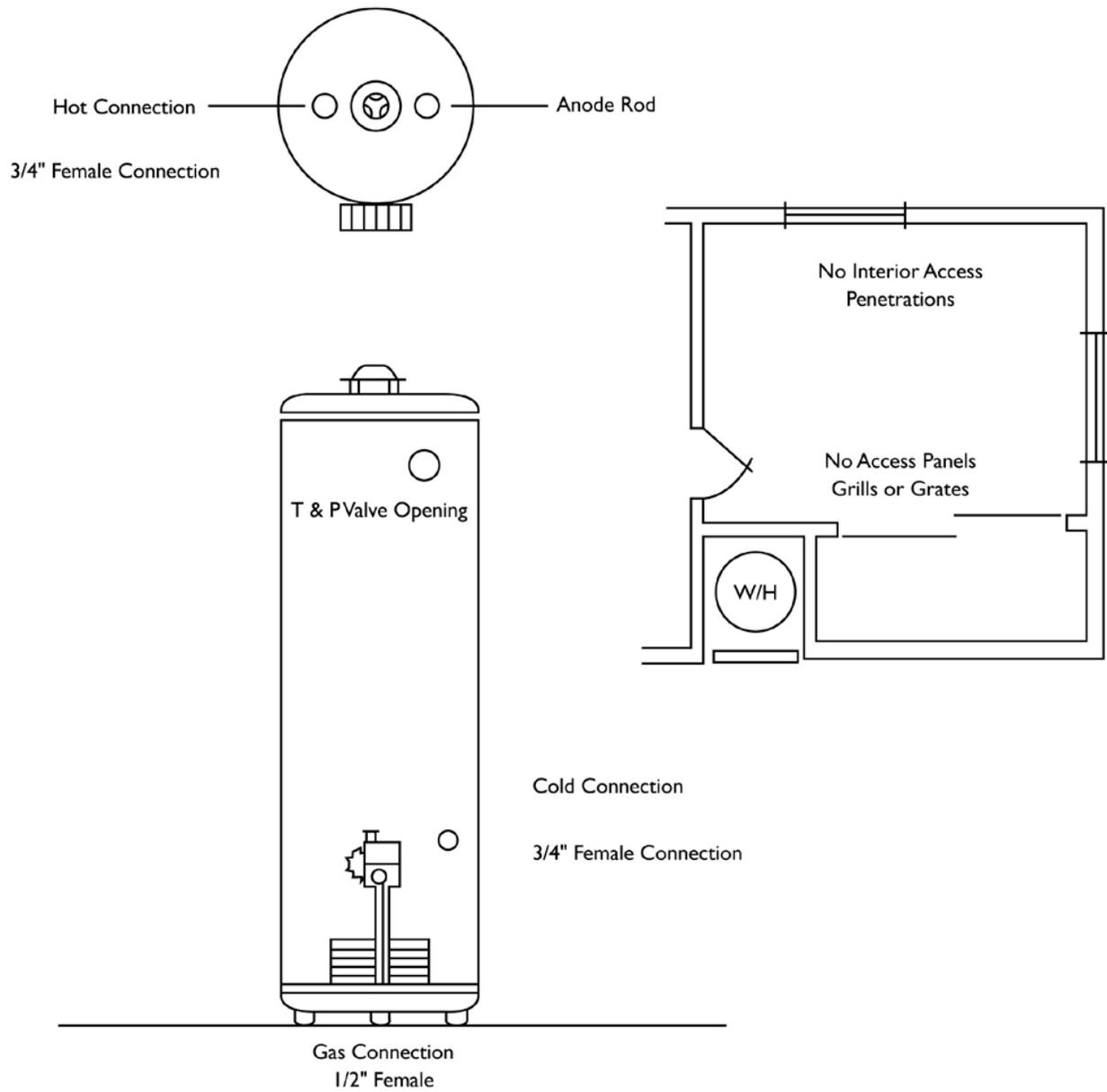
# METHOD ONE

## Direct Vent Water Heater



# METHOD TWO

## Separate Enclosure



# Code Verification Sign-off

Following is a list of the most common manufactured home code non-compliant items found in used or altered manufactured homes. These are only the most commonly found items and non-compliances are not limited to the items in this list. The items listed usually happen after the home was labeled/certified and left the manufacturers production facility.

This form must be completed by a certified building inspector or a licensed manufactured home dealer in the State of Minnesota. Dates should be entered in areas of compliance, correction required, correction completed for each item. This form is required to be completed and submitted with application for a manufactured replacement construction label in the State of Minnesota.

## Code item

1. Exterior receptacles require weatherproof protector covers; this includes heat tape receptacles mounted under the home. CFR 3280.808 (a) and NEC 406.9.  
Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_
2. NM-cable type wiring that is added under or on the exterior of the home shall be protected by rigid metal conduit and the conductors shall be suitable for wet locations. CFR 3280.808 (k) and NEC 550.15 (H).  
Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_
3. Electrical boxes, fittings, and cables shall be securely fastened in place and supported by a structural member or a substantial brace. Common examples are duplex receptacle boxes, electric range and clothes dryer receptacles that have been added and not secured to anything. CFR 3280.808 (n) and NEC 550.15 (I).  
Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_
4. NM-type cable located within 15-inches or less above the floor or in areas where storage is used shall be protected from physical damage. Common examples are wiring added for range or clothes dryer, and NM-type cable run in closets or cabinet storage areas. CFR 3280.808 (c) and NEC 550.15 (B).  
Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_
5. Electric ranges and clothes dryers shall have 4 conductor cord and 4 wire grounding type plugs. CFR 3280.809 (b) (2) and NEC 250.140.  
Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_
6. Solid fuel-burning fireplaces or stoves shall be listed for use in manufactured homes and installed in accordance with the listing or standards (i.e. chimney, doors, hearth, combustion air intake, etc.). CFR 3280.707 and CFR 3280.709 (g).  
Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

7. Replacement gas water heaters or furnaces must be listed for use in manufactured homes. If listed for use, verify compliance for separation of combustion system from the interior atmosphere of the home. (This includes the vents, roof jacks, and chimneys) and installed according to the listings. CFR 3280.707 (a), CFR 3280.709 (a & d), and CFR 3280.710 (a).  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
8. Clothes dryer ducts shall not terminate beneath the manufactured home and shall be constructed of metal and shall not be connected with screws or other fasteners which extend into the interior of the duct. CFR 3280.708 (a)(3 & 4) and IMC 504.6.  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
9. Gas appliances (i.e. range, furnace, clothes dryer, water heater, etc.) are required to have shutoff valves upstream of the union or connector. Shutoff within 6' of any cooking appliance and within 3' of any other appliance. CFR 3280.705 (k) (3).  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
10. Plastic pipe materials and fittings used for drain lines must be of approved materials and correctly installed. Commonly found code non-compliant item is ABS drain materials/fittings glued together with PVC drain material/fittings. CFR 3280.610 (b).  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
11. Exterior hose bibs (water faucets) must be installed with a backflow prevention device (vacuum breaker). The installation of potable water supply piping or fixture or appliance connections shall be made in a manner to preclude the possibility of backflow. CFR 3280.609 (b) (2 & 7).  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
12. Water heaters must have a pressure-temperature relief valve which will activate at 150 p.s.i. and at or below a water temperature of 210 degrees F. There must also be a full size drain line with a cross section area equal to that of the relief valve, extended to discharge beneath the manufactured home. CFR 3280.609 (c) (ii & iii). Homes manufactured after May 31, 2006, are required to have a drip pan under the water heater (CFR 3280.709 (h)) and the line may empty into the pan on those homes.  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
13. Fire blocking (fire stop collars) must be installed around all openings for pipes, vents, flue stacks, and other penetrations in walls, floors, and ceilings of furnace and water heater spaces. CFR 3280.206 (c). Common areas found that are non-compliant are flue locations at the ceiling line.  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_
14. Cooking appliances shall be ventilated by a metal duct not less than 12.5 square inches in area located above the appliance and terminating outside of the home, or by listed mechanical ventilating equipment installed in accordance with the listing installed not more than 10' horizontal distance from the appliance. CFR 3280.710 (e) and NFPA 501B section 6.4.5.  
Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

15. Vertical clearance of 24" to the bottom of combustible cabinets must be maintained above the cooking top. CFR 3280.204 (e).

Complies\_\_\_\_\_ Correction required\_\_\_\_\_ Correction Completed\_\_\_\_\_

16. Smoke alarms must be installed in manufactured homes.

Homes manufactured after July 31, 2002, must have hard wired alarms in each sleeping room and in an area to protect the living area and kitchen space. CFR 3280.208 (b).

Homes manufactured from June 14, 1976 to July 31, 2002, must have hard wired alarms located between the bedroom areas and living areas of the home. CFR 3280.208 (b). If homes have bedrooms at each end of the home two alarms minimum are required.

Homes manufactured from July 1, 1972 to June 14, 1976, must have either hard wired or battery operated alarms located between the bedroom areas and living areas of the home. NFPA 501B, sections 9.1 & 9.2. If homes have bedrooms at each end of the home two alarms minimum are required.

Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

17. Floors are required to support 40# per square foot live load and a 200# concentrated load on a 1' diameter disk where deflection is not to exceed 1/8". CFR 3280.305 (g). Common examples of not code compliant locations are in bathroom, laundry areas, water heater rooms, and by front or rear entry doors where floor decking is been exposed to water and softened the decking.

Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

18. Floor decking in kitchens, bathrooms, laundry areas, water heater compartments is required to be protected from moisture. CFR 3280.305 (g) (2) allows for protection by sealing with an approved sealer or an overlay of nonabsorbent material and all penetrations are to be protected with a sealant.

Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

19. Homes manufactured after November 30, 2005 (see data plate-date of manufacture) are required to have corrosion-resistant water drip collection and drain pan installed under each water heater CFR 3280.709 (h).

Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

20. Bottom board materials (belly board) must be sealed to resist the entrance of rodents around pipes, ducts, repairs, etc. CFR 3280.307 (d) and 3280.705 (a).

Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

21. Exterior coverings and exterior doors/windows shall prevent allowing the elements (rain, snow, etc.) from exposed interior materials. CFR 3280.307 (a & b). This would include joints between dissimilar materials.

Complies\_\_\_\_\_ Correction Required\_\_\_\_\_ Correction Completed\_\_\_\_\_

22. Rooms in homes are required to have windows for minimum natural light and ventilation.

Each habitable room shall have 8% light and 4% ventilation on HUD label units built after June 14, 1976. CFR 3280.103.

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

- Each habitable room shall have 10% light and 5% ventilation on State labeled units built from July 1, 1972, through June 14, 1976. NFPA 501B section 8.1

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

Kitchen and bathrooms may be provided with artificial light and mechanical ventilation. NFPA 501B section 8.1 and CFR 3280.103.

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

Each bathroom must have ventilation by either mechanical method 1 air change every 12 minutes or by means of 1.5 square foot of open able window in State labeled homes (7/1/72 – 6/14/76) and HUD labeled homes (6/15/76 – 10/25/93). NFPA 501B section 8.1.2 and CFR 3280.103

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

Each bathroom must have a mechanical ventilation system capable of exhausting 50 cfm to the outside of the home on HUD labeled units (1026/93 – current date of manufacture). CFR 3280.103 (c) (3).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

23. Homes must have one egress window in each bedroom.

State labeled homes 7/1/1972 through 6/14/1976, clear opening of 22 inches in width and height and 5 square foot in area. Sill height not more than 48' above the floor. NFPA 501B section 8.3.1 (c).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

HUD labeled homes 6/14/1976 to the current date of manufacture, net clear opening of 20" wide and 24" high, 5 square foot in area, with sill height of window opening no more than 36" above the floor, and tabs or other operational devices shall not be located more than 54" above the finished floor. CFR 3280.106

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

HUD labeled homes located in Minnesota shall be equipped with storm windows or insulated glass. CFR 3280.506 (c).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

24. Manufactured homes shall have 2 exit doors located remote from each other. NFPA 501B section 8.3.1 (a) and CFR 3280.105 (a). Manufactured homes exterior exit doors must be at least 12' from each other in single section homes and must be at least 20' from each other in multi-section homes. CFR 3280.105 (a) (2).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

25. In HUD label homes (6/15/76 to present date of manufacture) an exit doors shall not be more than 35' from each bedroom doorway. CFR 3280.105 (a) (2) (IV).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

26. Glazing in all entrance doors, sliding glass doors, unbacked mirrored wardrobe doors, shower and bathtub enclosures to a height of 6' above the floor, and sidelights within 12" of either side of an entrance door must be safety glazing materials which comply with ANSI Z97.1-1984.

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

27. Gas line piping shall not be used for electrical ground. CFR 3280.705 (I) (5).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

28. Electrical distribution panel boards shall not be located in Bathrooms. They shall be 6" of clearance from easily ignitable materials maintained in front of the panel board. There shall be a clear working space of 30" wide and 30" in front of the panel board. CFR 3280.804 (f).

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

29. Manufactured homes built and labeled under the State program (7/1/1972 through 6/14/1976) must have a State issued construction label on the exterior of the home. MSBC 1350.0400 subpart 1.

Complies \_\_\_\_\_ Correction Required \_\_\_\_\_ Correction Completed \_\_\_\_\_

30. Manufactured homes built and labeled in accordance with the HUD program June 15, 1976 and to present date of manufacture must have a construction label on each exterior section of the home. CFR 3280.11. Each manufactured home with HUD certification labels must have a data plate permanently located in the home. CFR 3280.5. The data plate must contain the manufacturer's name and production address, date of manufacture of the home, roof design load, wind design load, heating design, and list all major factory installed appliances.

Complies \_\_\_\_\_ Correction required \_\_\_\_\_ Correction Completed \_\_\_\_\_

31. Manufactured homes with proposed alterations or additions added on must have plans/specifications approved by LAHJ or CCLD with all permits and inspections required. MSBC 1350.3800. If the home is a new manufactured home covered under warranty (MS 327B.02 and 327B.03) written permission from the manufacture for the alteration or addition must also be obtained.

Complies \_\_\_\_\_ Correction required \_\_\_\_\_ Correction Completed \_\_\_\_\_

I have inspected the above items to verify compliance of the items to the manufactured home construction codes that the home was required to be constructed to.

\_\_\_\_\_  
Signature of Certified Building Official/Inspector

\_\_\_\_\_  
Date

OR

\_\_\_\_\_  
Signature of Licensed Manufactured Dealer

\_\_\_\_\_  
Date

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## Mechanical Information

This handout is not intended to cover all code issues relating to the mechanical code whether pertaining to plan review or the inspection process, but merely for informational use. See attached pages for selective code information.

Note:



Text in Red, indicates state changes or deletions



Text in Blue, indicates ICC changes or deletions

**2015 Minnesota Mechanical and Fuel Gas Code with ANSI / ASHRAE Standard 154-2011**

**Or;**

**2012 International Mechanical Code**

**2012 International Fuel Gas Code**

The following is an example of some of the requirements that would pertain to the mechanical plan review, inspections and general overall information for application, combustion air, ventilation and make up air for the mechanical systems within a commercial or residential application. The references are generalized in nature and should be followed with more research within documents that pertain to the subject matter specific to the project.

### **Mechanical Submittal/Plan Review Information**

#### **Required Submittal Documents**

The following would be required submittal documents that will need to be completed, submitted, reviewed and approved prior to any mechanical work being permitted to start.

**NOTE: SEE SUBMITAL DOCUMENTS WITHIN CHAPTER IV.**

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### **Mechanical or Combination Building Permit Application Minnesota Rules 1300.0120 PERMITS.**

#### **Subpart 1. Required.**

An owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert, or replace any gas, mechanical, electrical, plumbing system, or other equipment, the installation of which is regulated by the code; or cause any such work to be done, shall first make application to the building official and obtain the required permit.

#### Subp. 4. **Work exempt from permit.**

Exemptions from permit requirements of the code do not authorize work to be done in any manner in violation of the code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

##### **B. Gas:**

- (1) Portable heating, cooking, or clothes drying appliances; and
- (2) Replacement of any minor part that does not alter approval of equipment or make the equipment unsafe; and
- (3) Portable fuel cell appliances that are not connected to a fixed piping system and are not interconnected to a power grid.

##### **C. Mechanical:**

- (1) Portable heating appliances;
- (2) Portable ventilation appliances and equipment;
- (3) Portable cooling units;
- (4) Steam, hot, or chilled water piping within any heating or cooling equipment regulated by this code;
- (5) Replacement of any part that does not alter approval of equipment or make the equipment unsafe;
- (6) Portable evaporative coolers;
- (7) Self-contained refrigeration systems containing ten pounds (4.5 kg) or less of refrigerant or that are actuated by motors of one horsepower (0.75 kW) or less.
- (8) Portable fuel cell appliances that are not connected to a fixed piping system and are not interconnected to a power grid.

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#### **Definitions:**

**The following are definitions related to appliances typically seen in a residential application that will require combustion air from the exterior of the building.**

##### **Atmospherically Vented Gas or Oil Appliance.**

An appliance, also known as natural draft, that utilizes a venting system designed to remove flue or vent gases under non-positive static vent pressure entirely by natural draft.

##### **COMBUSTION AIR.**

Air necessary for complete *combustion* of a fuel, including *theoretical air* and excess air.

##### **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.

##### **DECORATIVE SOLID-FUEL-BURNING APPLIANCE.**

A natural draft *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 APPLIANCES.** Appliances that are constructed and installed so that all air for *combustion* is derived from the outdoor atmosphere and all flue gases are discharged to the outdoor atmosphere.

**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.

**Powered Make Up 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.

**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 pressure.

**Solid Fuel Appliance.**

A natural draft *appliance* that is either a closed *combustion* solid-fuel-burning *appliance* or a decorative solid-fuel-burning *appliance*.

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**When addressing combustion air requirements for appliances you will need to reference one of the following documents:**

- **2012 International Mechanical Code (IMC)**
- **2012 International Fuel Gas Code (IFGC)**
- **2015 Chapter 1346 Minnesota Mechanical and Fuel Gas Code (MMFGC)**

**Solid Fuel and Oil appliances can be found in the 2012 IMC Chapter 7  
Combustion Air**

**701.1 Scope.**

Solid fuel-burning *appliances* shall be provided with *combustion air* in accordance with the appliance manufacturer's installation instructions. Oil-fired *appliances* shall be provided with *combustion air* in accordance with [NFPA 31](#). The methods of providing *combustion air* in this chapter do not apply to fireplaces, fireplace stoves and direct-vent *appliances*. The requirements for combustion and dilution air for gas-fired *appliances* shall be in accordance with the *International Fuel Gas Code*.

**Gas Burning Appliances can be found in 2015 Minnesota Fuel Gas Code  
Administration and Chapter 3 of the International Fuel Gas Code:**

**1346.5101  
ADMINISTRATION:**

- **Subpart 1. Scope.**

This code shall apply to the installation of fuel gas piping systems, fuel gas appliances, gaseous hydrogen systems, and related accessories in accordance with this code.

• **304.1 General.**

Air for combustion, ventilation and dilution of flue gases for appliances installed in buildings shall be provided by application of one of the methods prescribed in Sections 304.5 through 304.9. Where the requirements of Section 304.5 are not met, outdoor air shall be introduced in accordance with one of the methods prescribed in Sections 304.6 through 304.9. *Direct-vent appliances*, gas appliances of other than natural draft design and vented gas appliances other than Category I shall be provided with combustion, ventilation and dilution air in accordance with the *appliance* manufacturer’s instructions. Refer to IFGC Appendix E for Worksheet E-1, “Residential Combustion Air Calculation Method,” and Table E-1, “Residential Combustion Air Required Volume,” in part 1346.6012 and 1346.6014.

**Note: See table E-1 on pages 32 and 33 for example.**

**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 a fuel gas utilization *appliance* that complies with all of the following conditions:
  - 3.1. Replacement *appliance* has a Btu/hr (kW) input rating not greater than 30 percent above the original *appliance* input rating.
  - 3.2. *Combustion air* provisions meet the code requirements in effect at the time of the original installation.
  - 3.3. Replacement *appliance* shall not cause an existing mechanical system to become unsafe, hazardous, or overloaded.
4. Combustion air may be determined using Table 304.1 for gas-fired appliances when combustion air is provided from a single opening from the outdoors, commencing within 12 inches of the bottom of the enclosure.
5. Combustion air for power burner appliances equipped with a draft control device and having an input above 400,000 Btu/hr shall have a net free area of 0.2 square inches per 1,000 Btu/hr. Combustion air shall be provided from a single opening from the outdoors, terminating within 12 inches of the bottom of the enclosure. In lieu of this requirement, combustion air requirements specified by the manufacturer for a specific power burner appliance may be approved by the building official.
6. Combustion air for power burner appliances not equipped with a draft control device and having an input above 400,000 Btu/hr shall have a net free area of 0.1 square inches per 1,000 Btu/hr. Combustion air shall be provided from a single opening from the outdoors, terminating within 12 inches of the bottom of the enclosure. In lieu of this requirement, combustion air requirements specified by the manufacturer for a specific power burner appliance may be approved by the building official.

**TABLE 304.1  
COMBUSTION AIR REQUIREMENTS FOR GAS-FIRED APPLIANCES WHEN THE COMBINED  
INPUT IS UP TO AND INCLUDING 400,000 Btu/hr**

TOTAL INPUT OF	REQUIRED FREE AREA OF	ACCEPTABLE APPROXIMATE
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<b>APPLIANCES<sup>1</sup>, THOUSANDS OF Btu/hr (kW)</b>	<b>AIR-SUPPLY OPENING OR DUCT, SQUARE INCHES (sq mm)</b>	<b>ROUND DUCT EQUIVALENT DIAMETER<sup>2</sup>, INCH (mm)</b>
25 (8)	7 (4,500)	3 (75)
50 (15)	7 (4,500)	3 (75)
75 (23)	11 (7,000)	4 (100)
100 (30)	14 (9,000)	4 (100)
125 (37)	18 (12,000)	5 (125)
150 (45)	22 (14,000)	5 (125)
175 (53)	25 (16,000)	6 (150)
200 (60)	29 (19,000)	6 (150)
225 (68)	32 (21,000)	6 (150)
250 (75)	36 (23,000)	7 (175)
275 (83)	40 (26,000)	7 (175)
300 (90)	43 (28,000)	7 (175)
325 (98)	47 (30,000)	8 (200)
350 (105)	50 (32,000)	8 (200)
375 (113)	54 (35,000)	8 (200)
400 (120)	58 (37,000)	9 (225)

## Ventilation:

### The following are requirements related to ventilation found within residential and commercial applications within Chapter 4 of the 2012 (IMC) and 2015 (MMFGC).

#### 401.1 Scope.

This chapter shall govern the ventilation of spaces within a building intended to be occupied. Mechanical exhaust systems, including exhaust systems serving clothes dryers and cooking appliances; hazardous exhaust systems; dust, stock and refuse conveyor systems; subslab soil exhaust systems; smoke control systems; energy recovery ventilation systems and other systems specified in Section 502 shall comply with Chapter 5.

**Exception:** Residential buildings complying with the ventilation requirements in Minnesota Rules, Chapter 1322.

#### 401.2 Ventilation required.

Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

#### 401.3 When required.

Ventilation shall be provided during the periods that the room or space is occupied.

#### 401.4 Intake opening location.

Air intake openings shall comply with all of the following:

- A. Intake openings 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.
- B. Mechanical outdoor 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, intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking lots, and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way.
- C. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening.

## Ventilation:

#### Natural ventilation.

*Natural ventilation* of an occupied space shall be through windows, doors, louvers or other Openings to the outdoors. The operating mechanism for such openings shall be provided with

ready access so that the openings are readily controllable by the building occupants.

**Note: reference Minnesota energy code (1322) for new construction**

**Ventilation area required.**

The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

**Adjoining spaces.**

Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining rooms shall be unobstructed and shall have an area not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m<sup>2</sup>). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

**Exception:** Exterior openings required for ventilation shall be permitted to open into a thermally isolated sunroom addition or patio cover, provided that the openable area between the sunroom addition or patio cover and the interior room has an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet (1.86 m<sup>2</sup>). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

**402.4 Openings below grade.**

Where openings below grade provide required *natural ventilation*, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

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**Mechanical Ventilation:**

**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 shall not be prohibited from producing negative or positive pressure. The system to convey *ventilation air* shall be designed and installed in accordance with Chapter 6.

**Outdoor air required.**

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

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

**Recirculation of air.**

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

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

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.

3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

4. Where mechanical exhaust is required by Note g in Table 403.3, mechanical exhaust is required and recirculation is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.

**TABLE 403.3 MINIMUM VENTILATION RATES**

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT <sup>2a</sup>	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, <i>R<sub>p</sub></i> CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, <i>R<sub>a</sub></i> CFM/FT <sup>2a</sup>	EXHAUST AIRFLOW RATE CFM/FT <sup>2a</sup>
<b>Correctional facilities</b>				
Cells				
without plumbing fixtures	25	5	0.12	—
with plumbing fixtures <sup>g</sup>	25	5	0.12	1.0
Dining halls (see food and beverage service)	—	—	—	—
Guard stations	15	5	0.06	—
Day room	30	5	0.06	—
Booking/waiting	50	7.5	0.06	—
<b>Dry cleaners, laundries</b>				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	0.06	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	25	—	—
Storage, pick up	30	7.5	0.12	—
<b>Education</b>				
Auditoriums	150	5	0.06	—
Corridors (see public spaces)	—	—	—	—
Media center	25	10	0.12	—
Sports locker rooms <sup>g</sup>	—	—	—	0.5
Music/theater/dance	35	10	0.06	—
Smoking lounges <sup>b</sup>	70	60	—	—

Day care (through age 4)	25	10	0.18	—
Classrooms (ages 5-8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Art classroom <sup>g</sup>	20	10	0.18	0.7
Science laboratories <sup>g</sup>	25	10	0.18	1.0
Wood/metal shops <sup>g</sup>	20	10	0.18	0.5
Computer lab	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Locker/dressing rooms <sup>g</sup>	—	—	—	0.25
<b>Food and beverage service</b>				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking) <sup>b</sup>	—	—	—	0.7
<b>Hospitals, nursing and convalescent homes</b>				
Autopsy rooms <sup>b</sup>	—	—	—	0.5
Medical procedure rooms	20	15	—	—
Operating rooms	20	30	—	—
Patient rooms	10	25	—	—
Physical therapy	20	15	—	—
Recovery and ICU	20	15	—	—

TABLE 403.3—continued MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT <sup>2a</sup>	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R <sub>p</sub> CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R <sub>a</sub> CFM/FT <sup>2a</sup>	EXHAUST AIRFLOW RATE CFM/FT <sup>2a</sup>
<b>Hotels, motels, resorts and dormitories</b>				
Multipurpose assembly		5	0.06	—
Bathrooms/toilet—private <sup>g</sup>		—	—	25/50 <sup>f</sup>
Bedroom/living room		5	0.06	—
Conference/meeting		5	0.06	—
Dormitory sleeping areas		5	0.06	—
Gambling casinos		7.5	0.18	—
Lobbies/prefunction		7.5	0.06	—
<b>Offices</b>				
Conference rooms	50	5	0.06	—
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Main entry lobbies	10	5	0.06	—
<b>Private dwellings, single and multiple</b>				
Garages, common for multiple units <sup>b</sup>	—	—	—	0.75
Garages, separate for each dwelling <sup>b</sup>	—	—	—	100 cfm per car
Kitchens <sup>b</sup>	—	—	—	25/100 <sup>f</sup>
Living areas <sup>c</sup>	Based upon number of bedrooms.	0.35 ACH but not less than 15 cfm/person	—	—
	First bedroom, 2; each additional bedroom, 1			
Toilet rooms and bathrooms <sup>g</sup>	—	—	—	20/50 <sup>f</sup>
<b>Public spaces</b>				
Corridors	—	—	0.06	—
Elevator car	—	—	—	1.0
Shower room (per shower head) <sup>g</sup>	—	—	—	50/20 <sup>f</sup>
Smoking lounges <sup>b</sup>	70	60	—	—
Toilet rooms — public <sup>g</sup>	—	—	—	50/70 <sup>e</sup>
Places of religious worship	120	5	0.06	—
Courtrooms	70	5	0.06	—

Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
<b>Retail stores, sales floors and showroom floors</b>				
Sales (except as below)	15	7.5	0.12	—
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Shipping and receiving	—	—	0.12	—
Smoking lounges <sup>b</sup>	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see storage)	—	—	—	—

TABLE 403.3—continued MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT <sup>2a</sup>	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R <sub>p</sub> CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R <sub>a</sub> CFM/FT <sup>2a</sup>	EXHAUST AIRFLOW RATE CFM/FT <sup>2a</sup>
<b>Specialty shops</b>				
Automotive motor-fuel dispensing stations <sup>b</sup>	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons <sup>b</sup>	25	20	0.12	0.6
Nail salons <sup>b, h</sup>	25	20	0.12	0.6
Embalming room <sup>b</sup>	—	—	—	2.0
Pet shops (animal areas) <sup>b</sup>	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
<b>Sports and amusement</b>				
Disco/dance floors	100	20	0.06	—
Bowling alleys (seating areas)	40	10	0.12	—
Game arcades	20	7.5	0.18	—
Ice arenas without combustion engines	—	—	0.30	0.5
Gym, stadium, arena (play area)	—	—	0.30	—
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
<b>Storage</b>				
Repair garages, enclosed parking garages <sup>b, d</sup>	—	—	—	0.75
Warehouses	—	—	0.06	—
<b>Theaters</b>				
Auditoriums (see education)	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
<b>Transportation</b>				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
<b>Workrooms</b>				
Bank vaults/safe deposit	5	5	0.06	—
Darkrooms	—	—	—	1.0
Copy, printing rooms	4	5	0.06	0.5
Meat processing <sup>c</sup>	10	15	—	—

Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Computer (without printing)	4	5	0.06	—

For SI: 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m<sup>3</sup>/(s • m<sup>2</sup>),

°C = [(°F) -32]/1.8, 1 square foot = 0.0929 m<sup>2</sup>.

a. Based upon *net occupiable floor area*.

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see [Section 403.2.1](#), Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with [Section 404](#).

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces (see [Section 403.2.1](#), Items 2 and 4).

h. For nail salons, each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station.

#### **Transfer air.**

Except where recirculation from such spaces is prohibited by Table [403.3](#), air transferred from occupiable 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 Section [403.3](#). The required outdoor airflow rates specified in Table [403.3](#) shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

#### **Outdoor airflow rate.**

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

With the exception of smoking lounges, the ventilation rates in Table 403.3 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3 in accordance with accepted engineering practice.

**Exception:** The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3 where *approved* statistical data document the accuracy of an alternate anticipated occupant density.

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## Make Up Air

### The following are requirements related to make up air found within residential and commercial applications within Chapter 5 of the 2012 (IMC) and 2015 (MMFGC).

#### 501.1 Scope

This chapter shall govern the design, construction and installation of mechanical exhaust systems, including exhaust systems serving clothes dryers and cooking appliances; hazardous exhaust systems; dust, stock and refuse conveyor systems; subslab soil exhaust systems; smoke control systems; energy recovery ventilation systems and other systems specified in Section 502.

#### 501.2 Independent system required

Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer exhaust shall be independent of all other systems. Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. Kitchen exhaust systems shall be constructed in accordance with Section 505 for domestic equipment and Sections 506 through 509 for commercial equipment.

#### 501.3 Exhaust discharge.

The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in IMC Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawl space and the exhaust system shall be equipped with a backdraft damper at the point of discharge.

**Exception:** Commercial cooking recirculating systems.

#### 501.3.1 Location of exhaust outlets.

The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. For all *environmental air* exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all occupancies other than Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.
4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment.

5. For specific systems see the following sections:

5.1. Clothes dryer exhaust, Section [504.4](#).

5.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.13, [506.4](#) and [506.5](#).

5.3. Dust stock and refuse conveying systems, Section [511.2](#).

5.4. Subslab soil exhaust systems, Section [512.4](#).

5.5. Smoke control systems, Section [513.10.3](#).

5.6. Refrigerant discharge, Section [1105.7](#).

5.7. Machinery room discharge, Section [1105.6.1](#).

#### **501.3.1.1 Exhaust discharge.**

*Exhaust air* shall not be directed onto walkways.

#### **501.3.2 Exhaust opening protection.**

Exhaust openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles. Openings in screens, louvers and grilles shall be sized not less than  $\frac{1}{4}$  inch (6 mm) and not larger than  $\frac{1}{2}$  inch (13 mm). Openings shall be protected against local weather conditions. Louvers that protect exhaust openings in structures located in hurricane-prone regions, as defined in the *International Building Code*, shall comply with AMCA Standard 550. Outdoor openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

### 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 dwelling units.

*Makeup air* quantity for new dwelling units shall be determined by using IMC 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 test is performed according to ASTM Standard E1998-02, *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*.

### MAKE UP AIR TABLES WITH EXAMPLES:

**TABLE 501.4.1  
PROCEDURE TO DETERMINE MAKEUP AIR QUANTITY FOR EXHAUST APPLIANCES IN  
DWELLING UNITS**

	ONE OR MULTIPLE POWER VENT OR DIRECT VENT APPLIANCES OR NO COMBUSTION APPLIANCES <sup>A</sup>	ONE OR MULTIPLE FAN-ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES <sup>B</sup>	ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE <sup>C</sup>	MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES <sup>D</sup>
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 × 1b]	—	—	—	—
2. Exhaust Capacity				
a) clothes dryer	135	135	135	135
b) 80% of largest exhaust rating (cfm):	—	—	—	—
(not applicable if recirculating system or if powered <i>makeup air</i> is electrically interlocked and matched to exhaust)				
c) 80% of next	not applicable	—	—	—

largest exhaust rating (cfm):				
(not applicable if recirculating system or if powered <i>makeup air</i> is electrically interlocked and matched to exhaust)				
Total Exhaust Capacity (cfm): [2a+2b+2c]	—	—	—	—
<b>3. Makeup Air Requirement</b>				
a) Total Exhaust Capacity (from above)	—	—	—	—
b) Estimated House Infiltration (from above)	—	—	—	—
Makeup Air Quality (cfm): [3a - 3b]	—	—	—	—
(if value is negative, no makeup air is needed)				
4. For <i>Makeup Air</i> 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*.

#### **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 IMC 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 IMC 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 IMC 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.

▪ **TABLE 501.4.2**  
**MAKEUP AIR OPENING SIZING TABLE FOR NEW AND EXISTING DWELLING UNITS**

TYPE OF OPENING OR SYSTEM	ONE OR MULTIPLE POWER VENT OR DIRECT VENT APPLIANCES OR NO COMBUSTION APPLIANCES <sup>A</sup>	ONE OR MULTIPLE FAN-ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES <sup>B</sup>	ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE <sup>C</sup>	MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES <sup>D</sup>	PASSIVE MAKEUP AIR OPENING DUCT DIAMETER <sup>E</sup> <small>F, G</small>
	(cfm)	(cfm)	(cfm)	(cfm)	(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 <sup>H</sup>	> 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 *appliances*.

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.

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#### **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 401.4 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<sup>3</sup>/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 appliance 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, subject 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 where they are reasonably equivalent in terms of health, safety, and durability.

#### **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 appliances.

#### **501.4.3 Additions, alterations, or installations of mechanical systems in existing dwelling units.**

*Make air* shall be supplied to existing dwelling units when any of the following conditions occur:

1. If a *dwelling unit* was constructed after 2003 using the *makeup air* provisions of Section 501.4.2 *makeup air* quantity shall be determined by using IMC Table 501.4.1 and shall be supplied according to 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 unit was constructed after 1999 using the provisions of the Minnesota Energy Code, Minnesota Rules, Chapter 7672, *makeup air* quantity shall be determined by using Table 501.4.1 and shall be supplied in accordance with 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 appliance is installed in a dwelling unit constructed during or after 1994 under the Minnesota Energy Code, Minnesota Rules, Chapter 7670, *makeup air* quantity shall be determined by using Table 501.4.1 and shall be supplied according to 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 (0.144m<sup>3</sup>/s) is installed in a *dwelling unit* constructed during or after 1994 under the *Minnesota Energy Code*, Minnesota Rules, Chapter 7670, *makeup air* quantity shall be determined by using Table 501.4.3(1) and shall be supplied according to 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<sup>3</sup>/s) is installed in a *dwelling unit* constructed prior to 1994, *makeup air* quantity shall be determined by using Table 501.4.3(2) and shall be supplied according to 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 *appliance* is installed in a *dwelling unit* constructed prior to 1994, *makeup air* quantity shall be determined by using Table 501.4.3(3) and shall be supplied according to Section 501.4.2.
7. **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 E1998-02, *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*.
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**TABLE 501.4.3(1)**  
**PROCEDURE TO DETERMINE MAKEUP AIR QUANTITY FOR EXHAUST APPLIANCES IN EXISTING DWELLING UNITS (Refer to Item 4 in Section 501.4.3 to determine applicability of this table)**

	<b>ONE OR MULTIPLE POWER VENT OR DIRECT VENT APPLIANCES OR NO COMBUSTION APPLIANCES<sup>A</sup></b>	<b>ONE OR MULTIPLE FAN-ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES<sup>B</sup></b>	<b>ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE<sup>C</sup></b>	<b>MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES<sup>D</sup></b>
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 × 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 quality (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*.

**TABLE 501.4.3(2)**  
**PROCEDURE TO DETERMINE MAKEUP AIR QUANTITY FOR EXHAUST APPLIANCES IN EXISTING DWELLING UNITS (Refer to Item 5 in Section 501.4.3 to determine applicability of this table)**

	<b>ONE OR MULTIPLE POWER VENT OR DIRECT</b>	<b>ONE OR MULTIPLE FAN-ASSISTED</b>	<b>ONE ATMOSPHERICALLY VENTED GAS OR</b>	<b>MULTIPLE APPLIANCES THAT ARE</b>
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	VENT APPLIANCES OR NO COMBUSTION APPLIANCES <sup>A</sup>	APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES <sup>B</sup>	OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE <sup>C</sup>	ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES <sup>D</sup>
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 × 1b]	—	—	—	—
or Alternative calculation (by using blower door test) <sup>E</sup>				
c) conversion factor	0.75	0.45	0.30	0.15
d) CFM50 value (from blower door test)	—	—	—	—
Estimated House Infiltration (cfm): [1c × 1d]	—	—	—	—
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 quality (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.
-

**TABLE 501.4.3(3)**  
**PROCEDURE TO DETERMINE MAKEUP AIR QUANTITY FOR EXHAUST APPLIANCES IN EXISTING DWELLING UNITS (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 <sup>A</sup>	ONE OR MULTIPLE FAN-ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES <sup>B</sup>	ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE <sup>C</sup>	MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES <sup>D</sup>
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 × 1b]	—	—	—	—
or Alternate calculation (by using blower door test) <sup>E</sup>				
c) conversion factor	0.75	0.45	0.30	0.15
d) CFM50 value (from blower door test)	—	—	—	—
Estimated House Infiltration (cfm): [1c × 1d]	—	—	—	—
2. Exhaust capacity				
a) clothes dryer (cfm)	135	135	135	135
b) 80% of largest exhaust rating (cfm):	—	—	—	—
(not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)				
c) 80% of next largest exhaust rating	Not applicable	—	—	—

(cfm)				
(not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)				
Total Exhaust Capacity (cfm): [2a+2b+2c]	—	—	—	—
3. Makeup air requirement				
a) Total Exhaust Capacity (from above)	—	—	—	—
b) Estimated House Infiltration (from above)	—	—	—	—
Makeup air quality (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.

**EXAMPLES:**  
**Makeup Air for**  
**New Homes**  
**Tables 501.4.1 and 501.4.2**

3000 Square feet area including basement  
 Balanced with 60 CFM HRV  
 (3) Bedrooms  
 160 CFM Kitchen exhaust  
 60 CFM Bathroom exhaust

The following page contains examples of makeup air requirements for a starter home with multiple types of water heater and furnace appliance combinations:

Table 501.4.1 Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling				
	One or multiple power vent or direct vent appliances or no combustion appliances <sup>9</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>1</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>2</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>3</sup>
1. a) pressure facture (CFM/SF)	0.15	0.09	0.06	0.03
b) conditioned floor area (sf) (includes unfinished basements)	3000	3000	3000	3000
Estimated House Infiltration (cfm) [ 1a x 1b ]	450	270	180	90
2. Exhaust Capacity				
a) continuous exhaust-only ventilation system (cfm): (not applicable to balanced ventilation systems such as HRV)	0	0	0	0
b) clothes dryer (cfm)	135	135	135	135
c) 80% of largest exhaust rating (cfm)	128	128	128	128
d) 80% of next largest exhaust rating (cfm): (Not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)	Not applicable	48	48	48
Total exhaust capacity (cfm): [2a + 2b + 2c + 2d]	263	311	311	311
3. Makeup Air Requirements				
a) total exhaust capacity (from above)	263	311	311	311
b) estimated house infiltration (from above)	450	270	180	90
Makeup Air Quantity (cfm)				

[3a – 3b] (if value is negative, no makeup air is needed)	0	41	131	221
4. For Makeup Air Opening Sizing. Refer to Table 501.4.2	0	4"	7"	11" + 42CFM

<sup>0</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances

<sup>1</sup> Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

<sup>2</sup> Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting systems or one solid fuel appliance.

<sup>3</sup> 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.

# Makeup Air

## New Exhaust Fan, >300 CFM

### Before 1994 Construction

### Tables 501.4.3(2) and 501.4.2

3000 Square feet area including basement

(3) Bedrooms

600 Kitchen exhaust

The following page contains examples of makeup air requirements for a home with multiple types of water heater and furnace appliance combinations:

Table 501.4.3(2)				
Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling				
	One or multiple power vent or direct vent appliances or no combustion appliances <sup>o</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>1</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>2</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>3</sup>
1. a) pressure factor (CFM/SF)	0.25	0.15	0.10	0.05
b) conditioned floor area (sf) (includes unfinished basements)	3000	3000	3000	3000
Estimated House Infiltration (cfm) [ 1a x 1b ]	750	450	300	150
Or Alternate calculation (by blower door test)				
c) conversion factor	0.75	0.45	0.30	0.15
d) CFMSO 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 and matched to exhaust)	480	480	480	480
3. Makeup Air Requirements				
a) exhaust capacity (from above)	480	480	480	480
b) estimated house infiltration (from above)	750	450	300	150
Makeup Air Quantity (cfm) [3a – 3b] (if value is negative, no makeup air is needed)	0	30	180	330

4. For Makeup Air Opening Sizing. Refer to Table 501.4.2	0	4"	10"	11" + 151 CFM
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<sup>0</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances

<sup>1</sup> Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included. <sup>2</sup>

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

<sup>3</sup> 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.

<sup>4</sup> As an alternate, the Estimated House Infiltration may be calculated by performing a blower door test and multiplying the conversion factor by the CFMSO value.

# Makeup Air for New Exhaust Fan, >300 CFM During 1994 & After 1994 using 7670 Tables 501.4.3(1) and 501.4.2

3000 Square feet area including basement

(3) Bedrooms

600 Kitchen exhaust

The following page contains examples of makeup air requirements for a home with multiple types of water heater and furnace appliance combinations:

Table 501.4.3(1) Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling				
	One or multiple power vent or direct vent appliances or no combustion appliances <sup>9</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>1</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>2</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>3</sup>
1. a) pressure factor (CFM/SF)	0.15	0.09	0.06	0.03
b) conditioned floor area (sf) (includes unfinished basements)	3000	3000	3000	3000
Estimated House Infiltration (cfm) [ 1a x 1b ]	450	270	180	90
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)	480	480	480	480
3. Makeup Air Requirements				
a) exhaust capacity (from above)	480	480	480	480
b) Estimated house infiltration (from above)	450	270	180	90
Makeup Air Quantity (cfm) [3a – 3b] (if value is negative, no makeup air is needed)	30	210	300	390
4. For Makeup Air Opening Sizing. Refer to Table 501.4.2	3"	9"	11" + 10 CFM	11" + 211 CFM

<sup>9</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances

- <sup>1</sup> Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.
- <sup>2</sup> Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting systems or one solid fuel appliance.
- <sup>3</sup> 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.
-

# Makeup Air

## New Exhaust Fan, >300 CFM

### After 1999 using 7670, & New Construction

### Use Tables 501.4.1 and 501.4.2

3000 Square feet area including basement

(3) Bedrooms

600 CFM Kitchen exhaust

60 CFM bathroom exhaust

The following page contains examples of makeup air requirements for a home with multiple types of water heater and furnace appliance combinations:

Table 501.4.1 Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling				
	One or multiple power vent or direct vent appliances or no combustion appliances <sup>9</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>1</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>2</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>3</sup>
1. a) pressure facture (CFM/SF)	0.15	0.09	0.06	0.03
b) conditioned floor area (sf) (includes unfinished basements)	3000	3000	3000	3000
Estimated House Infiltration (cfm) [ 1a x 1b ]	450	270	180	90
2. Exhaust Capacity				
a) continuous exhaust-only ventilation system (cfm): (not applicable to balanced ventilation systems such as HRV)	0	0	0	0
b) clothes dryer (cfm)	135	135	135	135
c) 80% of largest exhaust rating (cfm)	480	480	480	480
d) 80% of next largest exhaust rating (cfm): (Not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)	48	48	48	48
Total exhaust capacity (cfm): [2a + 2b + 2c + 2d]	663	663	663	663
3. Makeup Air Requirements				
a) total exhaust capacity (from above)	663	663	663	663

b) estimated house infiltration (from above)	450	270	180	90
Makeup Air Quantity (cfm) [3a – 3b] (if value is negative, no makeup air is needed)	213	393	483	573
4. For Makeup Air Opening Sizing. Refer to Table 501.4.2	7"	11"	11"+193 cfm	11" + 394CFM

<sup>1</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances  
Use this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

<sup>2</sup> Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting systems or one solid fuel appliance.

<sup>3</sup> 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.

**Makeup Air**  
**New Solid Fuel Appliance Installation**  
**Before 1994**  
**Tables 501.4.3(3) & 510.4.2**  
**All Others**  
**Tables 501.4.1 and 501.4.2**

3000 Square feet area including basement

60 CFM exhaust only ventilation

(3) Bedrooms

Solid fuel burning appliance

60 CFM Bathroom exhaust

160 CFM Kitchen exhaust

The following page contains examples of makeup air requirements for a home with multiple types of water heater and furnace appliance combinations:

(See section 1346.0501.4.3 #6 exception for construction before 1994 and section 1346.501.4.3 #3 exception for all others)

Table 501.4.3(3) Procedures to Determine Makeup Air Quantity for Exhaust Equipment in Dwelling (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 <sup>o</sup>	One or multiple fan-assisted appliances and power vent or direct vent appliances <sup>1</sup>	One atmospherically vented gas or oil appliance or one solid fuel appliance <sup>2</sup>	Multiple atmospherically vented gas or oil appliances or solid fuel appliances <sup>3</sup>
1. a) pressure factor (cfm/sf)	0.25	0.15	0.10	0.05
b) conditioned floor area (sf) (includes unfinished basements)	3000	3000	3000	3000
Estimated House Infiltration (cfm) [ 1a x 1b ]	750	450	300	150
Or Alternate calculation (by blower door test)				
c) conversion factor	0.75	0.45	0.30	0.15
d) CFMSO 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)	60	60	60	60
<b>b) clothes dryer (cfm)</b>	135	135	135	135
c) 80% of largest exhaust rating (cfm) (Not applicable if recirculating system or if power makeup air is electrically interlocked and with exhaust)	128	128	128	128
d) 80% of next largest exhaust rating (cfm) (Not applicable if recirculating system or if power makeup air is electrically interlocked and with exhaust)	48	48	48	48
Total Exhaust Capacity (cfm) [2a+2b+2c+2d]	371	371	371	371
3. Makeup Air Requirements				
a) exhaust capacity (from above)	371	371	371	371
b) estimated house infiltration (from above)	750	450	300	150
Makeup Air Quantity (cfm) [3a – 3b] (if value is negative, no makeup air is needed)	0	0	71	221
4. For Makeup Air Opening Sizing. Refer to Table 501.4.2	0"	0"	7"	11"+42 CFM

<sup>1</sup> Use this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances

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

<sup>2</sup> Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting systems or one solid fuel appliance.

<sup>3</sup> 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.

4 As an alternate, the Estimated House Infiltration may be calculated by performing a blower door test and multiplying the conversion factor by the CFMSO value.

# Combustion Air for New Home

## IFGC Appendix E

### Worksheet E-1 and Table E-1

Direct vent furnace, 80,000 Btu/hr

Power vent water heater, 40,000 Btu/hr

8'X8'X8' Combustion appliance space

3000 Square feet area including basement

Balanced with 60 CFM HRV

(3) Bedrooms

160 CFM Kitchen exhaust

60 CFM Bathroom exhaust

IFGC Appendix E, Worksheet E-1 Residential Combustion Air Calculation Method (for Furnace, Boiler, and/or Water Heater in the Same Space)			
<b>Step 1: Complete vented combustion appliance information.</b>			
Furnace/Boiler:	___ Draft Hood	Fan Assisted	<input checked="" type="checkbox"/> Direct Vent
80,000	Btu/hr	& Power Vent	Input:
(Not fan assist)			
Water Heater:			
___ Draft Hood			
<input checked="" type="checkbox"/> Fan Assisted			
Direct Vent			
Input:			
40,000 Btu/hr			
(Not fan assist) & Power Vent			
<b>Step 2: Calculate the volume of the Combustion Appliance Space (CAS) containing combustion appliances.</b>			
The CAS includes all spaces connected to one another by code compliant openings			CAS volume:
512 ft <sup>3</sup>			
<b>Step 3: Determine Air Changes per Hour (ACH)<sup>1</sup></b>			
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).			
<b>Step 4: Determine Required Volume for Combustion Air.</b>			
<b>4a. Standard Method</b>			
Total Btu/hr input of all combustion appliances			Input:
Btu/hr			
(DO NOT COUNT DIRECT VENT APPLIANCES)			
Use Standard Method column in Table E-1 to find Total Required Volume (TRV)			TRV:

ft<sup>3</sup>

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 and power vent appliances

Input:

40,000 Btu/hr

(DO NOT COUNT DIRECT VENT APPLIANCES)

Use fan-Assisted Appliances column in table E-1 to find

Required Volume Fan Assisted (RVFA)

RVFA: 3,000 ft<sup>3</sup>

Total Btu/hr input of all non-fan-assisted appliances

Input:

0 Btu/hr

Use Non-Fan-Assisted Appliances column in Table E-1 to find

Required Volume Non-Fan-Assisted (RVNFA)

RVNFA: 0 ft<sup>3</sup>

Total Required Volume (TRV) = RVFA + RVNFA

TRV = 3000 + 0 =

3000 ft<sup>3</sup>

If CAS Volume (Step 2) is **greater than** TRV, then no outdoor openings are needed.

If CAS Volume (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 = 521 / 3000 = 0.174.

**Step 6: Calculate Reduction Factor (RF).**

RF = 1 minus Ratio

RF = 1 - .174 = 0.826

**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

Input:

40000 Btu/hr

(EXCEPT DIRECT VENT)

Combustion Air opening Area (CAOA):

Total Btu/hr **divided by** 3000 Btu/hr per in<sup>2</sup>

CAOA = 40000 / 3000

Btu/hr per in<sup>2</sup> = 13.33 in<sup>2</sup>

**Step 8: Calculate Minimum CAO A.**

Minimum CAO A = CAO A **multiplied by** RF

Minimum CAO A =

13.33 x 0.826 = 11 in<sup>2</sup>

**Step 9: Calculate Combustion Air Opening Diameter (CAOD)**

CAOD = 1.13 **multiplied by the square root of** minimum CAO A

CAOA = 1.13 x √ Minimum CAO A =

3.75"

<sup>1</sup> If desired, ACH can be determined using ASHRAE calculation or blower door test. Follow procedures in Section 304.

<b>IFGC Appendix E, Table E-1</b>					
Residential Combustion Air (Required Interior Volume Based on Input Rating of Appliance)					
Input Rating (Btu/hr)	Standard Method (ft <sup>3</sup> )	Known Air Infiltration Rate (KAIR) Method (ft <sup>3</sup> )			
		Fan Assisted		Non-Fan-Assisted	
		1994 <sup>1</sup> to Present	Pre 1994 <sup>2</sup>	1994 <sup>1</sup> to Present	Pre 1994 <sup>2</sup>
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	1,675	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

<sup>1</sup> The 1994 data refers to dwelling construction under the Minnesota Energy Code. The default KAIR used in this section of the table is 0.20 ACH.

<sup>2</sup> This section of the table is to be used for dwelling constructed prior to 1994. The default KAIR used in this section of the table is 0.40 ACH.

### Duct Construction and Installation

Duct construction is represented within the 2015 Minnesota Mechanical Code unless otherwise noted.

### **601.1 Scope.**

Duct systems used for the movement of air in air-conditioning, heating, ventilating and exhaust systems shall conform to the provisions of this chapter except as otherwise specified in Chapters 5 and 7.

**Exception:** Ducts discharging combustible material directly into any *combustion* chamber shall conform to the requirements of NFPA 82.

### **[B] 601.2 Air movement in egress elements.**

Corridors shall not serve as supply, return, exhaust, relief or *ventilation air* ducts.

#### **Exceptions:**

1. Use of a corridor as a source of *makeup air* for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of *makeup air* taken from the corridor.
2. Where located within a *dwelling unit*, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m<sup>2</sup>) or less in area, use of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.

### **[B] 601.2.1 Corridor ceiling.**

Use of the space between the corridor ceiling and the floor or roof structure above as a return air *plenum* is permitted for one or more of the following conditions:

1. The corridor is not required to be of fire-resistance-rated construction;
2. The corridor is separated from the *plenum* by fire-resistance-rated construction;
3. The air-handling system serving the corridor is shut down upon activation of the air-handling unit smoke detectors required by this code;
4. The air-handling system serving the corridor is shut down upon detection of sprinkler waterflow where the building is equipped throughout with an automatic sprinkler system; or
5. The space between the corridor ceiling and the floor or roof structure above the corridor is used as a component of an *approved* engineered smoke control system.

### **601.4 Contamination prevention.**

Exhaust ducts under positive pressure, chimneys and vents shall not extend into or pass through ducts or plenums.

#### **Exceptions:**

1. Exhaust systems located in ceiling return air plenums over spaces that are permitted to have 10 percent recirculation in accordance with Section 403.2.1, Item 4. The exhaust duct joints, seams and connections shall comply with Section 603.9.

2. This section shall not apply to chimneys and vents that pass through plenums where such venting systems comply with one of the following requirements:

- 2.1. The venting system shall be listed for positive pressure applications and shall be sealed in accordance with the vent manufacturer's instructions.
- 2.2. The venting system shall be installed such that fittings and joints between sections are not installed in the above ceiling space.
- 2.3. The venting system shall be installed in a conduit or enclosure with sealed joints separating the interior of the conduit or enclosure from the ceiling space.

#### **602.2.1 Materials within plenums.**

Except as required by Sections [602.2.1.1](#) through [602.2.1.5](#), materials within plenums shall be noncombustible or shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with [ASTM E84](#) or [UL 723](#).

#### **Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section [603](#).
2. Duct coverings, linings, tape and connectors shall conform to Sections [603](#) and [604](#).
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
  - 5.1. Continuous noncombustible raceways or enclosures.
  - 5.2. Approved gypsum board assemblies.
  - 5.3. Materials listed and labeled for installation within a plenum.
6. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

#### **602.2.1.5 Foam plastic insulation.**

Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with [ASTM E84](#) or [UL 723](#) and shall also comply with one or more of Sections [602.2.1.5.1](#), [602.2.1.5.2](#) and [602.2.1.5.3](#).

##### **602.2.1.5.1 Separation required.**

The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section [2603.4](#) of the *International Building Code* and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with [ASTM E84](#) or [UL 723](#) at the thickness and density intended for use.

##### **602.2.1.5.2 Approval.**

The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with [ASTM E84](#) or [UL 723](#) at the thickness and density intended for use and shall meet the acceptance criteria of Section [803.1.2](#) of the *International Building Code* when tested in accordance with [NFPA 286](#).

The foam plastic insulation shall be approved based on tests conducted in accordance with Section [2603.10](#) of the *International Building Code*.

**602.2.1.5.3 Covering.**

The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with [ASTM E84](#) or [UL 723](#) at the thickness and density intended for use.

**602.2.1.7 Piping in plenums.**

Piping carrying flammable or combustible gases or liquids in a plenum must have all connections made by welding or brazing. No flanges, valves, threaded fittings, unions, or connectors are permitted.

### 603.4 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 IMC Table 603.4 as amended in this part.

**TABLE 603.4  
DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS**

DUCT SIZE	GALVANIZED		ALUMINUM MINIMUM THICKNESS (gauge)
	Minimum thickness (in.)	Equivalent galvanized gage no.	
Round ducts and enclosed rectangular ducts 14 inches or less	0.013	30	26
Over 14 inches	0.016	28	24
Exposed rectangular ducts 14 inches or less	0.016	28	24
Over 14 inches	0.019	26	22

For SI: 1 inch = 25.4 mm, 1 inch water gage =  
249 Pa.

#### 603.4.1 Minimum fasteners.

Round metallic ducts shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint.

**Exception:** Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion so as to prevent a hinge effect.

#### 603.4.2 Elbows.

Radius elbows with velocities exceeding 1,000 feet per minute (fpm) (5 m/sec) 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) (5 m/sec) shall have turning vanes.

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

#### 603.4.3 Transition fittings.

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

#### 603.4.4 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.

#### 603.5 Nonmetallic ducts.

Nonmetallic ducts shall be constructed with Class 0 or Class 1 duct material and shall comply with [UL 181](#). Fibrous duct construction shall conform to the [SMACNA Fibrous Glass Duct Construction Standards](#) or [NAIMA Fibrous Glass Duct Construction Standards](#). The air temperature within nonmetallic ducts shall not exceed 250°F (121°C).

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## Underground Duct Installation

### 603.8 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.

#### 603.8.1 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.

#### 603.8.2 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.

#### 603.8.3 Plastic ducts and fittings.

Plastic ducts shall be constructed of PVC or high-density polyethylene having a minimum pipe stiffness of 8 psi (55 kPa) at 5-percent deflection when tested in accordance with [ASTM D2412](#). Plastic duct fittings shall be constructed of either PVC or high-density polyethylene. Plastic duct and fittings shall be utilized in underground installations only. The maximum design temperature for systems utilizing plastic duct and fittings shall be 150°F (66°C).

#### 603.8.4 Drainage and insulation.

Underground ducts shall be insulated in accordance with amended IMC Section [604.1](#) and 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.

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## Duct Insulation

**The sections represented for duct insulation are within the 2015 Minnesota Residential Energy Code.**

### [R403.2 Ducts.](#)

[Ducts and air handlers shall be in accordance with Sections R403.2.1 through R403.2.3.](#)

#### **R403.2.1 Insulation (prescriptive).**

All exhaust, supply, and return air ducts and plenums shall be insulated according to Table [R403.2.1](#).

For the purposes of Table [R403.2.1](#), the following applies:

- a. Insulation is only required in the conditioned space for a distance of 3 feet (914 mm) from the exterior or unconditioned space.
- b. V means the vapor retarder 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.
- c. W means an approved weatherproof barrier.

○ **TABLE R403.2.1**  
**MINIMUM REQUIRED DUCT AND PLENUM INSULATION FOR DWELLING UNITS**

DUCT TYPE/LOCATION	REQUIREMENTS
Exterior of building	R-8, V and W
Attics, garages, and ventilated crawl spaces	R-8 and V
Outdoor air intakes within conditioned spaces	R3.3 and V
Exhaust ducts within conditioned spaces	R3.3 and V
Within concrete slab or within ground	R3-5 and V
Within conditioned spaces and in basements with insulated walls	None Required

## Duct Sealing

**The sections representing duct sealing for residential applications are within the 2015 Minnesota Residential Energy Code**

### R403.2.2 Sealing (Mandatory).

Ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with either the *International Mechanical Code* or *International Residential Code*, as applicable.

#### Exceptions:

1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Duct tightness shall be verified by either of the following:

1. Post construction test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area.

**Exception:** The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.

## Minimum Duct Sizes

### 918.2 Minimum duct sizes.

The minimum unobstructed total area of the outdoor and return air ducts or openings to a forced-air warm-air furnace shall be not less than 2 square inches per 1,000 Btu/h (4402 mm<sup>2</sup>/kW) output rating capacity of the furnace and not less than that specified in the furnace manufacturer's installation instructions. The minimum unobstructed total area of supply ducts from a forced-air warm-air furnace

shall not be less than 2 square inches for each 1,000 Btu/h (4402 mm<sup>2</sup>/kW) output rating capacity of the furnace and not less than that specified in the furnace manufacturer's installation instructions.

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**Exception:** The total area of the supply air ducts and outdoor and return air ducts shall not be required to be larger than the minimum size required by the furnace manufacturer's installation instructions.

### **The location of the return air for environmental air shall comply with the following requirements**

#### **918.6 Prohibited sources.**

Outdoor or return air for forced-air heating and cooling systems shall not be taken from the following locations:

1. Less than 10 feet (3048 mm) from an *appliance* vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outdoor air inlet.
2. Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
3. A hazardous or insanitary location or a refrigeration *machinery room* as defined in this code.
4. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Sections 918.2 and 918.3, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

**Exception:** The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

5. A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

#### **Exceptions:**

- 5.1. Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances, and serve the kitchen area only, taking return air from a kitchen shall not be prohibited.
- 5.2. Dedicated forced-air systems serving only a garage shall not be prohibited from obtaining return air from the garage.
6. An unconditioned crawl space by means of direct connection to the return side of a forced air system. Transfer openings in the crawl space enclosure shall not be prohibited.
7. A room or space containing a fuel-burning *appliance* where such room or space serves as the sole source of return air.

#### **Exceptions:**

- 7.1. This shall not apply where the fuel-burning *appliance* is a direct-vent *appliance*.
- 7.2. This shall not apply where the room or space complies with the following requirements:

7.2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuel-burning appliances therein.

7.2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.

7.2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of any *appliance* firebox or draft hood in the same room or space.

7.3. This shall not apply to rooms or spaces containing solid-fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of the appliances.

**918.7 Outside opening protection.**

Outdoor air intake openings shall be protected in accordance with Section [401.5](#).

**918.8 Return-air limitation.**

Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

## Chimneys and Vents

Venting for all fuel burning appliances other than gas-fired, use IMC Chapter 8.

Venting for all gas-fired appliances, use IFGC Chapter 5.

**IMC Section 801.1 Scope.** This chapter shall govern the installation, maintenance, repair and approval of factory-built chimneys, chimney liners, vents and connectors. This chapter shall also govern the utilization of masonry chimneys. Gas-fired appliances shall be vented in accordance with the International Fuel Gas Code.

**IMC Section 801.2.1 Oil-fired appliances.** Oil-fired appliances shall be vented in accordance with this code and NFPA 31.

**IMC Section 801.3 Masonry chimneys.** Masonry chimneys shall be constructed in accordance with the International Building Code.

Note: For chimneys within residential, see residential code.

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## Vents

**IMC Section 802.1 General.** All vent systems shall be listed and labeled. Type L vents and pellet vents shall be tested in accordance with UL 641.

**IMC 802.3 Installation.** Vent systems shall be sized, installed and terminated in accordance with the vent and appliance manufacturer's installation instructions.

**IMC 802.4 Vent termination cap required.** Type L vents shall terminate with a listed and labeled cap in accordance with the vent manufacturer's instructions.

**IMC 802.5 Type L vent termination.** Type L vents shall terminate not less than 2 feet above the highest point of the roof penetration and not less than 2 feet higher than any portion of a building within 10 feet.

**IFGC Section 501.1 Scope.** This chapter shall govern the installation, maintenance, repair and approval of factory-built chimneys, chimney liners, vents and connectors and the utilization of masonry chimneys serving gas-fired appliances. The requirements for the installation, maintenance, repair and approval of factory-built chimneys, chimney liners, vents and connectors serving appliances burning fuels other than fuel gas shall be regulated by the *International Mechanical Code*. The construction, repair, maintenance and approval of masonry chimneys shall be regulated by the *International Building Code*.

**IFGC Section 5501 Section 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.

**IFGC Section 1346.5501 Section 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 91100 or 3003 alloy or equivalent) not less than 0.032 inches thick to 8 inches in diameter.
2. Stainless steel (304 or 430 alloy or equivalent) not less than 26 gauge to 8 inches in diameter or not less than 24 gauge 8 inches diameter and larger.
3. Listed vent system.

**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.

**IFGC Section 1346.501.8 Appliances 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 Sections 613 and 614).
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. 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 to 9 are installed so that the aggregate input rating exceeds 20 Btu/hr per cubic foot (207 watts per m<sup>3</sup>) 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<sup>3</sup>) figure. Where the room or space in which the *equipment* or *appliance* 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.

**IFGC Section 502.1 General.**

All vents, except as provided in Section 503.7, shall be *listed* and *labeled*. Type B and BW vents shall be tested in accordance with UL 441. Type L vents shall be tested in accordance with UL 641. Vents for Category II and III appliances shall be tested in accordance with UL 1738. Plastic

vents for Category IV appliances shall not be required to be *listed* and *labeled* where such vents are as specified by the *appliance* manufacturer and are installed in accordance with the *appliance* manufacturer's installation instructions.

**IFGC Section 502.2 Connectors required.**

Connectors shall be used to connect appliances to the vertical chimney or vent, except where the chimney or vent is attached directly to the *appliance*. Vent connector size, material, construction and installation shall be in accordance with Section 503.

**502.3 Vent application.**

The application of vents shall be in accordance with Table 503.4.

**503.4 Type of venting system to be used.**

The type of venting system to be used shall be in accordance with Table 503.4.

**TABLE 503.4  
TYPE OF VENTING SYSTEM TO BE USED**

<b>APPLIANCES</b>	<b>TYPE OF VENTING SYSTEM</b>
Listed Category I appliances Listed appliances equipped with draft hood Appliances listed for use with Type B gas vent	Type B gas vent (Section 503.6) Chimney (Section 503.5) Single-wall metal pipe (Section 503.7) Listed chimney lining system for gas venting (Section 503.5.3) Special gas vent listed for these appliances (Section 503.4.2)
Listed vented wall furnaces	Type B-W gas vent (Sections 503.6, 608)
Category II appliances	As specified or furnished by manufacturers of listed appliances (Sections 503.4.1, 503.4.2)
Category III appliances	As specified or furnished by manufacturers of listed appliances (Sections 503.4.1, 503.4.2)
Category IV appliances	As specified or furnished by manufacturers of listed appliances (Sections 503.4.1, 503.4.2)
<a href="#">Incinerators</a>	<a href="#">In accordance with NFPA 82</a>
<a href="#">Deleted</a>	
Appliances that can be converted for use with solid fuel	Chimney (Section 503.5)
Unlisted combination gas and oil-burning appliances	Chimney (Section 503.5)
Listed combination gas and oil-burning appliances	Type L vent (Section 503.6) or chimney (Section 503.5)
Combination gas and solid fuel-burning appliances	Chimney (Section 503.5)
Appliances listed for use with chimneys only	Chimney (Section 503.5)
Unlisted appliances	Chimney (Section 503.5)
Decorative appliances in vented fireplaces	Chimney
Gas-fired toilets	Single-wall metal pipe (Section 626)
Direct-vent appliances	See Section 503.2.3
Appliances with integral vent	See Section 503.2.4

**IFGC Section 502.4 Insulation shield.**

Where vents pass through insulated assemblies, an insulation shield constructed of steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage) shall be installed to provide

*clearance* between the vent and the insulation material. The *clearance* shall not be less than the *clearance* to combustibles specified by the vent manufacturer's installation instructions. Where vents pass through attic space, the shield shall terminate not less than 2 inches (51 mm) above the insulation materials and shall be secured in place to prevent displacement. Insulation shields provided as part of a *listed* vent system shall be installed in accordance with the manufacturer's installation instructions.

**IFGC Section 502.5 Installation.** Vent systems shall be sized, installed and terminated in accordance with the vent and appliance manufacturer's installation instructions and Section 503.

**IFGC Section 503.5.4 Chimney termination.**

Chimneys for residential-type or low-heat appliances shall extend at least 3 feet (914 mm) above the highest point where they pass through a roof of a building and at least 2 feet (610 mm) higher than any portion of a building within a horizontal distance of 10 feet (3048 mm).

Chimneys for medium-heat appliances shall extend at least 10 feet (3048 mm) higher than any portion of any building within 25 feet (7620 mm). Chimneys shall extend at least 5 feet (1524 mm) above the highest connected *appliance* draft hood outlet or flue collar. Decorative shrouds shall not be installed at the termination of factory-built chimneys except where such shrouds are *listed* and *labeled* for use with the specific factory-built chimney system and are installed in accordance with the manufacturer's installation instructions.

**IFGC Section 1346.503.5.5 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 *appliance*, 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.

**503.5.6 Inspection of chimneys.**

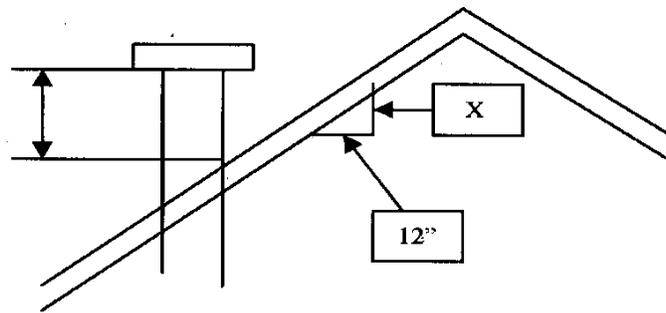
Before replacing an existing *appliance* or connecting a vent connector to a chimney, the chimney passageway shall be examined to ascertain that it is clear and free of obstructions and it shall be cleaned if previously used for venting solid or liquid fuel-burning *appliances* or fireplaces.

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

**IFGC Section 503.6.4 Gas vent terminations.**

A gas vent shall terminate in accordance with one of the following:

1. Gas vents that are 12 inches (305 mm) or less in size and located not less than 8 feet (2438 mm) from a vertical wall or similar obstruction shall terminate above the roof in accordance with Figure 503.6.4.
2. Gas vents that are over 12 inches (305 mm) in size or are located less than 8 feet (2438 mm) from a vertical wall or similar obstruction shall terminate not less than 2 feet (610 mm) above the highest point where they pass through the roof and not less than 2 feet (610 mm) above any portion of a building within 10 feet (3048 mm) horizontally.
3. As provided for industrial appliances in Section 503.2.2.
4. As provided for direct-vent systems in Section 503.2.3.
5. As provided for appliances with integral vents in Section 503.2.4.
6. As provided for mechanical draft systems in Section 503.3.3.
7. As provided for ventilating hoods and exhaust systems in Section 503.3.4.



Roof Pitch	Minimum Height in Feet
Flat to 6/12	1.0
6/12 to 7/12	1.25
7/12 to 8/12	1.5
8/12 to 9/12	2.0
9/12 to 10/12	2.5
10/12 to 11/12	3.25
11/12 to 12/12	4.0

### **IFGC Section 503.6.9 Size of gas vents.**

Venting systems shall be sized and constructed in accordance with Section 504 or other *approved* engineering methods and the gas vent and *appliance* manufacturer's installation instructions.

#### **IFGC Section 1346.503.6.9.1 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 one of the following methods:

1. The provisions of Section 504.
2. 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.
3. 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 area of the smaller draft hood outlet, nor greater than four times the smaller draft hood outlet area.
4. *Approved* engineering practices.

### **503.7.6 Installation.**

Single-wall metal pipe shall not originate in any unoccupied attic or concealed space and shall not pass through any attic, inside wall, concealed space or floor. The installation of a single-wall metal pipe through an exterior combustible wall shall comply with Section 503.7.7.

#### **IFGC 1346.503.7.9 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 *appliance* 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.

### **503.8 Venting system termination location.**

The location of venting system terminations shall comply with the following (see Appendix C):

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

#### **Exceptions:**

1. This provision shall not apply to the *combustion air* intake of a direct-vent *appliance*.
2. 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, excluding *direct-vent appliances*, shall terminate at least 4 feet (1219 mm) below, 4 feet (1219 mm) horizontally from, or 1 foot (305 mm) above any

door, operable window or gravity air inlet into any building. The bottom of the vent terminal shall be located at least 12 inches (305 mm) above finished ground level.

3. The vent terminal of a direct-vent *appliance* with an input of 10,000 Btu per hour (3 kW) or less shall be located at least 6 inches (152 mm) from any air opening into a building, and such an *appliance* with an input over 10,000 Btu per hour (3 kW) but not over 50,000 Btu per hour (14.7 kW) shall be installed with a 9-inch (230 mm) vent termination *clearance*, and an *appliance* with an input over 50,000 Btu/h (14.7 kW) shall have at least a 12-inch (305 mm) vent termination *clearance*. The bottom of the vent terminal and the air intake shall be located at least 12 inches (305 mm) above finished ground level.

4. Through-the-wall vents for Category II and 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 III appliances, this provision shall also apply. Drains for condensate shall be installed in accordance with the appliance and vent manufacturers' instructions.

**IFGC Section 503.10.5 Clearance.**

Minimum clearances from vent connectors to *combustible material* shall be in accordance with Table 503.10.5.

**Exception:** The *clearance* between a vent connector and *combustible material* shall be permitted to be reduced where the *combustible material* is protected as specified for vent connectors in Table 308.2.

▪ **TABLE 503.10.5a  
CLEARANCES FOR CONNECTORS**

APPLIANCE	MINIMUM DISTANCE FROM COMBUSTIBLE MATERIAL			
	Listed Type B gas vent material	Listed Type L vent material	Single-wall metal pipe	Factory-built chimney sections
Listed appliances with draft hoods and appliances listed for use with Type B gas vents	As listed	As listed	6 inches	As listed
Residential boilers and furnaces with listed gas conversion burner and with draft hood	6 inches	6 inches	9 inches	As listed
Residential appliances listed for use with Type L vents	Not permitted	As listed	9 inches	As listed
Listed gas-fired toilets	Not permitted	As listed	As listed	As listed
Unlisted residential appliances with draft hood	Not permitted	6 inches	9 inches	As listed
Residential and low-heat appliances other than above	Not permitted	9 inches	18 inches	As listed
Medium-heat appliances	Not permitted	Not permitted	36 inches	As listed

For SI: 1 inch = 25.4 mm.

a. These clearances shall apply unless the manufacturer's installation instructions for a listed appliance or connector specify different clearances, in which case the listed clearances shall apply.

**IFGC Section 503.10.8 Length of vent connector.**

The maximum horizontal length of a single-wall connector shall be 75 percent of the height of the chimney or vent except for engineered systems. The maximum horizontal length of a Type B double-wall connector shall be 100 percent of the height of the chimney or vent except for engineered systems.

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## Fuel Piping

### IFGC Section 401.1 Scope.

This chapter shall govern the design, installation, modification and maintenance of *piping* systems. The applicability of this code to *piping* systems extends from the *point of delivery* to the connections with the *appliances* and includes the design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance of such *piping* systems.

### IFGC Section 1301.1 Scope.

This chapter shall govern the design, installation, construction and repair of fuel-oil storage and piping systems. The storage of fuel oil and flammable and combustible liquids shall be in accordance with Chapters 6 and 57 of the *International Fire Code*.

The gas pressures that are supplied by the gas utility company, along with the equipment loads, piping material and developed length will dictate what tables within the fuel gas code to be administered for proper supply and installation of gas to the structure. You will have to verify this information before approving any gas installations.

### EXAMPLE:

GAS Pressure: Less than 2 PSI

Equipment Load: 150,000 BTU/HR

Developed Length: 30 feet

Note: Read footnotes.

Pressure and lengths are highlighted in yellow, pipe size for installation highlighted in blue.

▪ **TABLE 402.4(9)**  
**SEMIRIGID COPPER TUBING**

<b>Gas</b>	Natural
<b>Inlet Pressure</b>	Less than 2 psi
<b>Pressure Drop</b>	0.5 in. w.c.
<b>Specific Gravity</b>	0.60

**TABLE 402.4(9)**  
**SEMIRIGID COPPER TUBING**

		TUBE SIZE (inch)								
Nominal	K & L	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
	ACR	3/8	1/2	5/8	3/4	7/8	1 1/8	1 3/8	—	—
<b>Outside</b>		0.375	0.500	0.625	0.750	0.875	1.125	1.375	1.625	2.125
<b>Inside</b>		0.305	0.402	0.527	0.652	0.745	0.995	1.245	1.481	1.959
<b>Length (ft)</b>		<b>Capacity in Cubic Feet of Gas Per Hour</b>								
10		27	55	111	195	276	590	1,060	1,680	3,490
20		18	38	77	134	190	406	730	1,150	2,400
30		15	30	61	107	152	326	586	925	1,930
40		13	26	53	92	131	279	502	791	1,650

50	11	23	47	82	116	247	445	701	1,460
60	10	21	42	74	105	224	403	635	1,320
70	NA	19	39	68	96	206	371	585	1,220
80	NA	18	36	63	90	192	345	544	1,130
90	NA	17	34	59	84	180	324	510	1,060
100	NA	16	32	56	79	170	306	482	1,000
125	NA	14	28	50	70	151	271	427	890
150	NA	13	26	45	64	136	245	387	806
175	NA	12	24	41	59	125	226	356	742
200	NA	11	22	39	55	117	210	331	690
250	NA	NA	20	34	48	103	186	294	612
300	NA	NA	18	31	44	94	169	266	554
350	NA	NA	16	28	40	86	155	245	510
400	NA	NA	15	26	38	80	144	228	474
450	NA	NA	14	25	35	75	135	214	445
500	NA	NA	13	23	33	71	128	202	420
550	NA	NA	13	22	32	68	122	192	399
600	NA	NA	12	21	30	64	116	183	381
650	NA	NA	12	20	29	62	111	175	365
700	NA	NA	11	20	28	59	107	168	350
750	NA	NA	11	19	27	57	103	162	338
800	NA	NA	10	18	26	55	99	156	326
850	NA	NA	10	18	25	53	96	151	315
900	NA	NA	NA	17	24	52	93	147	306
950	NA	NA	NA	17	24	50	90	143	297
1,000	NA	NA	NA	16	23	49	88	139	289
1,100	NA	NA	NA	15	22	46	84	132	274
1,200	NA	NA	NA	15	21	44	80	126	262
1,300	NA	NA	NA	14	20	42	76	120	251
1,400	NA	NA	NA	13	19	41	73	116	241
1,500	NA	NA	NA	13	18	39	71	111	232
1,600	NA	NA	NA	13	18	38	68	108	224
1,700	NA	NA	NA	12	17	37	66	104	217
1,800	NA	NA	NA	12	17	36	64	101	210
1,900	NA	NA	NA	11	16	35	62	98	204
2,000	NA	NA	NA	11	16	34	60	95	199

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1-inch water column = 0.2488 kPa,

1 British thermal unit per hour = 0.2931 W, 1 cubic foot per hour = 0.0283 m<sup>3</sup>/h, 1 degree = 0.01745 rad.

**Notes:**

1. Table capacities are based on Type K copper tubing inside diameter (shown), which has the smallest inside diameter of the copper tubing products.
2. NA means a flow of less than 10 cfh.
3. All table entries have been rounded to three significant digits.

### **IFGC Section 1346.403.8 Protective coating.**

Where in contact with material, or passing through concrete or other abrasive material or atmosphere exerting a corrosive action, metallic *piping* and fittings coated with a corrosion-resistant material, sleeve, or casing 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.

### **IFGC Section 403.10 Metallic piping joints and fittings.**

The type of *piping* joint used shall be suitable for the pressure-temperature conditions and shall be selected giving consideration to joint tightness and mechanical strength under the service conditions. The joint shall be able to sustain the maximum end force caused by the internal pressure and any additional forces caused by temperature expansion or contraction, vibration, fatigue or the weight of the pipe and its contents.

#### **IFGC Section 1346.403.10.1 Pipe joints.**

Pipe joints shall be threaded, flanged, brazed, welded, or made with press connect fittings complying with ANSI LC 4. Where nonferrous pipe is brazed, the brazing materials shall have a melting point in excess of 1,000°F (538°C). Brazing alloys shall not contain more than 0.05 percent phosphorus.

#### **IFGC Section 1346.403.10.2 Tubing joints.**

Tubing joints shall be either made with *approved* gas tubing fittings or brazed with a material having a melting point in excess of 1,000°F (538°C), or made by press connect fittings complying with ANSI LC 4, *Press-Connect Copper and Copper Alloy, Fittings for Use in Fuel Gas Distribution Systems*. Brazing alloys shall not contain more than 0.05 percent phosphorus.

### **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.

## **The 2015 Minnesota State Plumbing code has adopted;**

Chapters 2 to 11, 14, and 17 of the 2012 edition of the Uniform Plumbing Code (UPC) as promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO), Ontario, California, and UPC appendices A, B, and I, except for IS 12-2006, IS 13-2006, IS 26-2006, SIS 1-2003, and SIS 2-2003 of appendix I, are incorporated by reference and made part of the Minnesota Plumbing Code except as qualified by the applicable provisions in chapter 1300, and as amended in this chapter. The UPC is not subject to frequent change and a copy of the UPC, with amendments for use in Minnesota, is available in the office of the commissioner of labor and industry. Portions of this chapter reproduce text and tables from the UPC, reproduced with permission. The UPC is copyright 2012 by the IAPMO. All rights reserved.

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### **Minnesota State Plumbing Code applicable state wide**

- See Minnesota rule chapter 4714.0101 subparts 1 through 5 on page 63



Subpart 1. **Scope.** As provided in Minnesota Statutes, sections 326B.43 and 326B.52, this code applies to all new plumbing installations performed anywhere in the state, including additions, extensions, alterations, and replacements.

Subp. 2. **New buildings.** In new buildings, all plumbing materials and plumbing systems or parts thereof shall be installed to meet the minimum provisions of this code.

Subp. 3. **Existing buildings.** In existing buildings and premises in which plumbing systems, drainage systems, or other work regulated by this code are to be added, altered, renovated, or replaced, the new materials and work shall meet the provisions of this code. If the Authority Having Jurisdiction finds that the full performance of bringing the work into compliance with all requirements of this code would result in exceptional or undue hardship by reason of excessive structural or mechanical difficulty or impracticability, a deviation may be granted by the Authority Having Jurisdiction only to the extent the deviation can be granted without endangering the health and safety of the occupants and the public.

Subp. 4. **Changes in building occupancy.** A plumbing system that is a part of a building or structure undergoing a change in use or occupancy, as defined in the building code, shall be in accordance with the requirements of this code that are applicable to the new use or occupancy.

Subp. 5. **Moved buildings.** Plumbing systems that are part of buildings or structures moved into this jurisdiction shall be in accordance with this code for new installations. Parts of the plumbing systems of a building or part thereof that is moved from one foundation to another, or from one location to another, shall be completely tested as new work, except that walls or floors need not be removed during such tests where other equivalent means of inspection acceptable to the Authority Having Jurisdiction are provided.

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**Code** - For purposes of this chapter, "this code" or "the code" means the Minnesota Plumbing Code, Minnesota Rules, chapter 4714.

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**When utilizing the Minnesota State Plumbing Code, always reference the basic plumbing principles within the amendments of 4714; A through W give you an overview of how to utilize the code**

**4714.0100 BASIC PLUMBING PRINCIPLES.**

This code is founded upon certain basic principles of environmental sanitation and safety through properly designed, acceptably installed, and adequately maintained plumbing systems. Some of the details of plumbing construction may vary, but the basic sanitary and safety principles desirable and necessary to protect the health of the people are the same everywhere. As interpretations may be required, and as unforeseen situations arise that are not specifically covered in this code, the 23 principles in items A to W shall be used to define the intent.

A. All premises intended for human habitation, occupancy, or use shall be provided with a potable water supply that meets the requirements of the commissioner of health. The water supply shall not be connected with unsafe water sources nor shall it be subject to the hazards of backflow or back-siphonage.

B. Proper protection shall be provided to prevent contamination of food, water, sterile goods, and similar materials by backflow of sewage. When necessary, the fixtures, devices, or appliances shall be connected indirectly with the building drainage system.

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C. Each family dwelling unit shall have at least one water closet, one lavatory, one kitchen-type sink, and one bathtub or shower to meet the basic requirements of sanitation and personal hygiene. All other structures for habitation shall be equipped with sufficient sanitary facilities.

D. The building sewer in every building with installed plumbing fixtures and intended for human habitation, occupancy, or use when located on premises where the Authority Having Jurisdiction has determined that a public sewer is available shall be connected to the public sewer.

E. The building drainage system shall be designed to provide adequate circulation of air in all pipes with no danger of siphonage, aspiration, or forcing of trap seals under conditions of ordinary use.

F. The drainage system shall be designed, constructed, and maintained to conduct the waste water with velocities that prevent fouling, deposition of solids, and clogging.

G. The drainage system shall be provided with an adequate number of cleanouts so arranged that in case of stoppage the pipes may be readily cleaned.

H. Where a building drainage system may be subjected to backflow of sewage, suitable provision shall be made to prevent overflow in the building.

I. Each vent terminal shall extend to the outer air and be so installed as to minimize the possibilities of clogging and the return of foul air to the building.

J. No substance that will clog or accentuate clogging of pipes, produce explosive mixtures, destroy the pipes or their joints, or interfere unduly with the sewage disposal process shall be allowed to enter the drainage system.

K. The piping of the plumbing system shall be of durable material free from defective construction and designed and constructed to give satisfactory service for its reasonable expected life.

L. The plumbing system shall be subjected to adequate tests and to inspections in a manner that will disclose all leaks and defects in the work or the material.

M. Plumbing systems shall be maintained in a safe and serviceable condition from the standpoint of both mechanics and health.

N. Plumbing shall be installed with due regard to preservation of the strength of structural members and prevention of damage to the walls and other surfaces through fixture usage.

O. Plumbing fixtures shall be made of durable, smooth, nonabsorbent, and corrosion-resistant material and be free from concealed fouling surfaces.

P. Plumbing fixtures, devices, and appurtenances shall be supplied with water in sufficient volume and at pressures adequate to enable them to function properly and without undue noise under normal conditions of use.

Q. Plumbing fixtures shall be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleaning. Hot water shall be supplied to all plumbing fixtures which normally need or require hot water for their proper use and function.

R. All plumbing fixtures shall be installed with regard to spacing as to be accessible for their intended use and cleansing.

S. Each fixture shall be provided with a separate, accessible, self-scouring, reliable trap placed as near to the fixture as possible.

T. No water closet or similar fixture shall be located in a room or compartment that is not properly lighted and ventilated.

U. If water closets or other plumbing fixtures are installed in a building where there is no public sewer available as determined by the Authority Having Jurisdiction, suitable provisions shall be made for treatment of the building sewage by methods that meet the requirements of rules administered by the Pollution Control Agency.

V. Devices for heating and storing water shall be designed and installed to prevent all dangers from explosion and overheating.

W. Sewage or other waste shall not be discharged into surface or subsurface water unless it first has been subjected to an acceptable form of treatment approved by the Pollution Control Agency.

The following is an overview of the code for the inspection of a plumbing sanitary and potable water system installed within a single family home regulated by the code. As noted previously, this is an overview of Minnesota rule chapter 4714 and criteria specific to single family home. The following references can and will be utilized in other occupancies classified within the State Building Code and further review on your part is necessary to see if they are applicable to your specific situation.

When reviewing a single family house plan, you will notice there typically will not be a drawing of the plumbing system for you to review. The reason for this is the Plumbing systems are usually a design build system (design build system – designed and fabricated on location to meet the code, this is to include the sanitary and potable water system). Due to this, you are not seeing the design until the contractor is calling for inspections of the plumbing system. therefore; it is important that you are familiar with the terminology and the homes layout before you complete the plumbing inspections.

The following definitions will give you an understanding of what will be inspected within a single family home. Please note that some of the following definitions are not specific to a single family home and will be used when inspecting other occupancies.

- Single family dwelling MN Rule: 4714.0221  
Single-Family Dwelling – Has the meaning of dwelling, single-family in Minnesota Rules, part 1309.0202, subpart 1.

### **The sanitary system is going to consist of:**

- **The Building Sewer - 2012 UPC Chapter 2**  
That part of the horizontal piping of a drainage system that extends from the end of the building drain and that receives the discharge of the building drain and conveys it to a public sewer, private sewer, private sewage disposal system, or other point of disposal.  
**Remember** to read MN Rule 4714.0713 Sewer required: Section 713.7  
Exception: Single- family and two- family dwellings and buildings or structures accessory thereto, when connected to an approved private sewage disposal system prior to the time of connecting the premises to the public sewer need not connect to the public sewer when there is insufficient grade or slope to permit drainage to the public sewer by gravity and the following conditions are met.
  1. no hazard, nuisance, or unsanitary condition is evidenced from the private sewage disposal system;
  2. the private sewage system is maintained properly and;
  3. written permission has been obtained from the Authority having Jurisdiction.
- **Building drain - 2012 UPC Chapter 2**  
That part of the lowest piping of a drainage system that receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer beginning 2 feet outside the building wall.
- **Horizontal branch - 2012 UPC Chapter 2**

A drain pipe extending laterally from a soil or waste stack or building drain with or without vertical sections or branches, which receives the discharge from one or more fixture drains and conducts it to the soil or waste stack or to the building drain.

- **Stack - 2012 UPC Chapter 2**

The vertical main of a system of soil, waste, or vent piping extending through one or more stories.

- **Plumbing vent – 2012 UPC Chapter 2**

A pipe provided to ventilate a plumbing system, to prevent trap siphonage and backpressure, or to equalize the air pressure within the drainage system.

- **Plumbing System – MN Rule 4714.0218**

Includes all potable water, building supply, and distribution pipes; all plumbing fixtures and traps, all drainage and vent pipes; and all building drains and building sewers, including their respective joints and connections, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, potable water treating or using equipment, and non-potable water piping serving plumbing fixtures.

When inspecting the Building sewer remember that it starts at a point 2 feet outside the building and extends to the property line or other point of disposal. The following criteria needs to be addressed when inspecting the building sewer.

- **Installation:**

- MN Rule 4714.0701.1 Drainage Piping. Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.1 except that;
  - ABS and PVC DWV piping installations shall be installed in accordance with applicable standards referenced in Table 1401.1
- MN Rule 4714.0713 Sewer Required. A building in which plumbing fixtures are installed and premises having drainage piping thereon shall have a connection to a public or private sewer, except as provided in sections 713.2 and 713.4 and Minnesota Rules, part 4714.0101, subpart 6.
- The building sewer shall be sized in accordance with amended Table MN 4714.0717.

**TABLE 717.1**

**Maximum/Minimum Fixture Unit Loading on Building Sewer Piping**

**SLOPE (inches per foot)**

Size of Pipe (inches)	1/16	1/8	1/4
6 and smaller	(As specified in Table 703.2/No minimum loading)		
8	1950/1500	2800/625	3900/275
10	3400/1600	4900/675	6800/300
12	5600/1700	8000/725	11 200/325

Note: The minimum size for the sanitary sewer **does not have to be 4 inches** and can be found within the 2012 UPC Section 718.1

Slope. Building sewers shall be run in practical alignment and at a uniform slope of not less than ¼ inch per foot, such pipe or piping 4 inches through 6 inches shall be permitted to have a slope of not less than ⅛ inch per foot and such piping 8 inches and larger shall be permitted to have a slope of not less than 1/16 inch per foot.

**Note: You will also have to know the fixtures and loading within the building to verify the size of the building sewer. If you have more than 3 water closets the building sewer will always be a minimum of 4 inch.**

When inspecting the installation of the sanitary sewer make sure that it is properly separated from the building water service per amended MN Rules 4714.0721 Minimum Horizontal Distance Required from Building Sewer (Feet)

**TABLE 721.1**

**Minimum Horizontal Distance Required from Building Sewer (feet)**

Water supply wells	See M.R. Chapter 4725 <sup>1</sup>
Building supply	10 <sup>2</sup>

For SI units: 1 foot = 304.8 mm

**Notes:**

<sup>1</sup> The minimum horizontal setback distance between a building sewer and a water supply well is governed by Minnesota Rules, chapter 4725.

<sup>2</sup> Unless otherwise permitted by the Administrative Authority and when installed in accordance with Section 720.

- IPC 720 gives the installer the opportunity to run the sewer and water within the same trench provided the following is met.

## UPC 720.0 Sewer and Water pipes.

720.1 General. Building sewers or drainage piping of clay or materials that are not approved for use within a building shall not be run or laid in the same trench as the water pipes unless the following requirements are met:

1. The bottom of the water pipe, at points, shall be not less than 12 inches above the top of the sewer or drain line.
2. The water pipe shall be placed on a solid shelf excavated at one side of the common trench with a clear horizontal distance of not less than 12 inches from the sewer or drain line.
3. Water pipes crossing sewer or drainage piping constructed of clay or materials that are not approved for use within a building shall be laid not less than 12 inches above the sewer or drain pipe.

For the purpose of this section, "within a building" shall mean within the fixed limits of the building foundation.

Note: Remember that no building sewer can be located in a lot other than the lot that is the site of the building or structure.

You will need to read more within the IPC section 721 Location for more information.

### • TESTING OF THE SANITARY SYSTEM

- There are a couple different ways to test the sanitary system
- hydraulically and
- an air test on the system. See MN Rule 4714.0723 specifies the type of testing required.

#### 4714.0723 BUILDING SEWER TEST.

723.1 General. Building sewers shall be tested by plugging the end of the building sewer at its points of connection with the public sewer or private sewage disposal system and completely filling the building sewer with water from the lowest to the highest point there-of, or by approved equivalent low-pressure air test. Testing of buildings sewers shall be in accordance with Section 712, as amended. The building sewer shall be gastight or watertight.

The MN amendment of section 712.1 of the UPC allows you to utilize an air test to verify that the sewer system has no leaks.

#### 4714.0712 TESTING.

Subpart 1. **Section 712.1.** UPC section 712.1 is amended to read as follows:

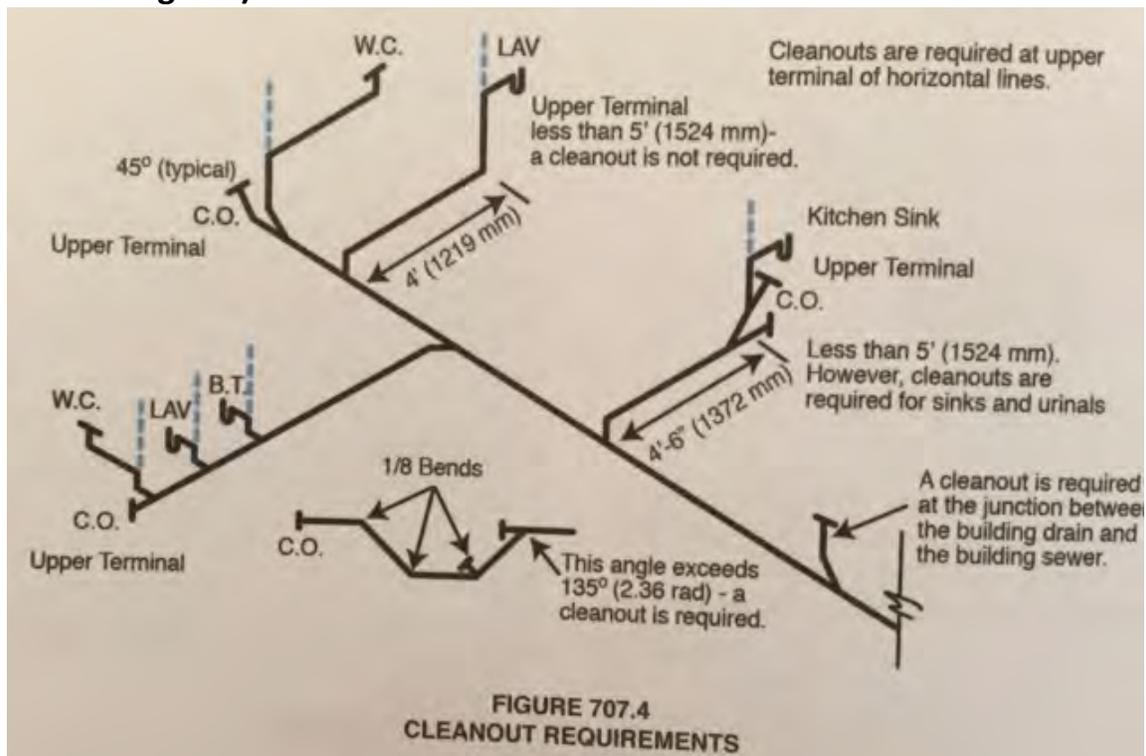
**712.1 Media.** The piping of the plumbing, drainage, and venting systems shall be tested with water or air. The Authority Having Jurisdiction shall be permitted to require the necessary points of access to ascertain whether the pressure has reached all parts of the system.

- To verify if the system is in compliance with an air test you will need to review the UPC section 712.3

UPC 712.3 Air Test. The air test shall be made by attaching an air compressor testing apparatus to a suitable opening and, after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of 5 pound-force per square inch or sufficient to balance a column of mercury 10 inches in height. The pressure shall be held without introduction of additional air for a period of not less than 15 minutes.

Lets look at the Summary of completing an inspection for the Sanitary Sewer!

- Verify that the material meets the requirements of 4714.0701
- Verify that the sanitary sewer is on the same property as the building or meets other requirements of 4714.0713
- Verify that the building sewer meets the requirements of UPC Table 717.1 for slope and size of piping for drainage fixtures.
  - Note: The building sewer for a residential shall be a minimum of 3 inches to the Municipalities stub in, and that the drainage fixture count for a residential home should never exceed design criteria found in table 717.1
- Verify the horizontal separation between the sanitary sewer and the water service, or; verify through UPC 720.1 that the materials can be installed within the same trench (materials approved for installation inside the building)
- Verify testing of the system by witnessing the air or hydraulic test
- Verify cleanouts per UPC 719.1 (every 100 feet or change in direction of 135 degrees)





- **Record your inspection for compliance or failure with corrections**

This will complete the sanitary sewer inspection portion of the project.

**The next phase of inspections of the plumbing system for a single family home will be the rough-in of the sanitary system. This will consist of:**

- the building drain,
- horizontal branches
- and venting.

When reviewing the plan for compliance and inspection purposes, you will need to verify the fixtures and get a good understanding of what size the building drain needs to be.

If you have more than three water closets, you will need to have a minimum of a 4 inch building drain to the branch for the first water closet. After that the sizing could reduce to 3 inches for the water closets and 2 inches for the rest of the building drain system.

- To verify the drainage fixture unit values (DFU) you will need to reference amended table 702.1.

**TABLE 702.1**

**Drainage Fixture Unit Values (DFU)**

Plumbing Appliances, Appurtenances, or Fixtures	Minimum Size	Private	Public	Assembly
	Trap and Trap Arm <sup>6</sup> (inches)			
Bathtub or Combination Bath/Shower	1-1/2	2.0	2.0	—
Bidet	1-1/4	1.0	—	—
Bidet	1-1/2	2.0	—	—
Clothes Washer, Domestic, Standpipe <sup>5</sup>	2	3.0	3.0	3.0
Dental Unit, Cuspidor	1-1/4	—	1.0	1.0
Dishwasher, Domestic, with Independent Drain <sup>2</sup>	1-1/2	2.0	2.0	2.0
Drinking Fountain or Water Cooler	1-1/4	0.5	0.5	1.0
Food Waste Grinder, Commercial	2	—	3.0	3.0
Floor Drain, Emergency	2	—	0.0	0.0
Floor Drain (for Additional Sizes see Section 702.0)	2	2.0	2.0	2.0



Shower, Single-Head Trap	2	2.0	2.0	2.0
Shower, Multi-Head, Each Additional	2	1.0	1.0	1.0
Lavatory, Single	1-1/4	1.0	1.0	1.0
Lavatory, in Sets of Two or Three	1-1/2	2.0	2.0	2.0
Washfountain	1-1/2	—	2.0	2.0
Washfountain	2	—	3.0	3.0
Mobile Home, Trap	3	12.0	—	—
Receptor, Indirect Waste <sup>1,3</sup>	1-1/2		See footnote <sup>1,3</sup>	
Receptor, Indirect Waste <sup>1,4</sup>	2		See footnote <sup>1,4</sup>	
Receptor, Indirect Waste <sup>1</sup>	3		See footnote <sup>1</sup>	
Sinks	—	—	—	—
Bar	1-1/2	1.0	—	—
Bar <sup>2</sup>	1-1/2	—	2.0	2.0
Clinical	3	—	6.0	6.0
Commercial With Food Waste <sup>2</sup>	1-1/2	—	3.0	3.0
Commercial Pot or Scullery	2	—	4.0	4.0
Special Purpose <sup>2</sup>	1-1/2	2.0	3.0	3.0
Special Purpose	2	3.0	4.0	4.0
Special Purpose	3	—	6.0	6.0
Kitchen, Domestic <sup>2</sup> (with or without food waste grinder, dishwasher, or both)	1-1/2	2.0	2.0	—
Laundry <sup>2</sup> (with or without discharge from a clothes washer)	1-1/2	2.0	2.0	2.0
Service or Mop Basin	2	—	3.0	3.0
Service or Mop Basin	3	—	3.0	3.0
Service, Flushing Rim	3	—	6.0	6.0
Wash, Each Set of Faucets	—	—	2.0	2.0
Urinal, Integral Trap 1.0 GPF <sup>2</sup>	2	2.0	2.0	5.0
Urinal, Integral Trap Greater Than 1.0 GPF	2	2.0	2.0	6.0

Urinal, Exposed Trap <sup>2</sup>	1-1/2	2.0	2.0	5.0
Water Closet, 1.6 GPF Gravity Tank	3	3.0	4.0	6.0
Water Closet, 1.6 GPF Flushometer Tank	3	3.0	4.0	6.0
Water Closet, 1.6 GPF Flushometer Valve	3	3.0	4.0	6.0
Water Closet, Greater Than 1.6 GPF Gravity Tank <sup>6</sup>	3	4.0	6.0	8.0
Water Closet, Greater Than 1.6 GPF Flushometer Valve	3	4.0	6.0	8.0

For SI units: 1 inch = 25 mm

**Notes:**

<sup>1</sup> Indirect waste receptors shall be sized based on the total drainage capacity of the fixtures that drain therein to, in accordance with UPC Table 702.2(b).

<sup>2</sup> Provide a 2-inch (50 mm) minimum drain.

<sup>3</sup> For refrigerators, coffee urns, water stations, and similar low demands.

<sup>4</sup> For commercial sinks, dishwashers, and similar moderate or heavy demands.

<sup>5</sup> Buildings having a clothes-washing area with clothes washers in a battery of three or more clothes washers shall be rated at 6-fixture units each for purposes of sizing common horizontal and vertical drainage piping.

<sup>6</sup> Trap sizes shall not be increased to the point where the fixture discharge is capable of being inadequate to maintain their self-scouring properties.

<sup>7</sup> Assembly [See Minnesota Rules, chapter 1305, International Building Code].

- To verify Maximum unit loading and maximum length of drainage and vent piping you will need to reference table 703.2

Table 703.2

MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING

SIZE OF PIPE (INCHES)	1-1/4	1-1/2	2	2-1/2	3	4
Max. Units Drainage Piping <sup>1</sup>						
Vertical	1	2 <sup>2</sup>	16 <sup>3</sup>	32 <sup>3</sup>	48-4	256
Horizontal	1	1	8 <sup>3</sup>	14 <sup>3</sup>	35-4	216-5
Max. Length Drainage Piping						
Vertical (feet)	45	65	85	148	212	300
Horizontal (unlimited)						
Vent Piping Horizontal and vertical – 6						
Maximum Units	1	8 <sup>3</sup>	24	48	84	256
Maximum Lengths, (feet)	45	60	120	180	212	300

- Note: this table is an example only and does not incorporate pipes larger than 4 inches. You will need to reference the actual table for larger loading.

- When reviewing the plan for inspections, document all drainage fixture unit values (DFUV) from table 702.1 for private use on pages 73, 74 and 75:
  - The sizing in this example is for the single family home on page 79

Type of fixture	Number of fixtures	Minimum size trap and trap arm size (inches)	Private use (DFUV) Single family home	Total DFUV #fixtures x DFUV = Total
Water closet 1.6 GPF	4	3	3	12
Shower	3	2	2	6
Lavatory	5	1-1/4	1	5
Floor drain	1	2	2	2
Laundry tub main floor	1	2 See footnote 2	2	2
Clothes washer, Domestic, standpipe	1	2 See footnote 5	3	3
Kitchen, domestic <sup>2</sup>	1	2 See footnote 2	2	2
			<b>Total DFUV</b>	<b>32</b>

- The building drain, horizontal branches and fixture drains will be sized from the DFUV of each fixture and total DFUV of 32
- Footnote 2 specifies the vertical drain cannot be less than two inches



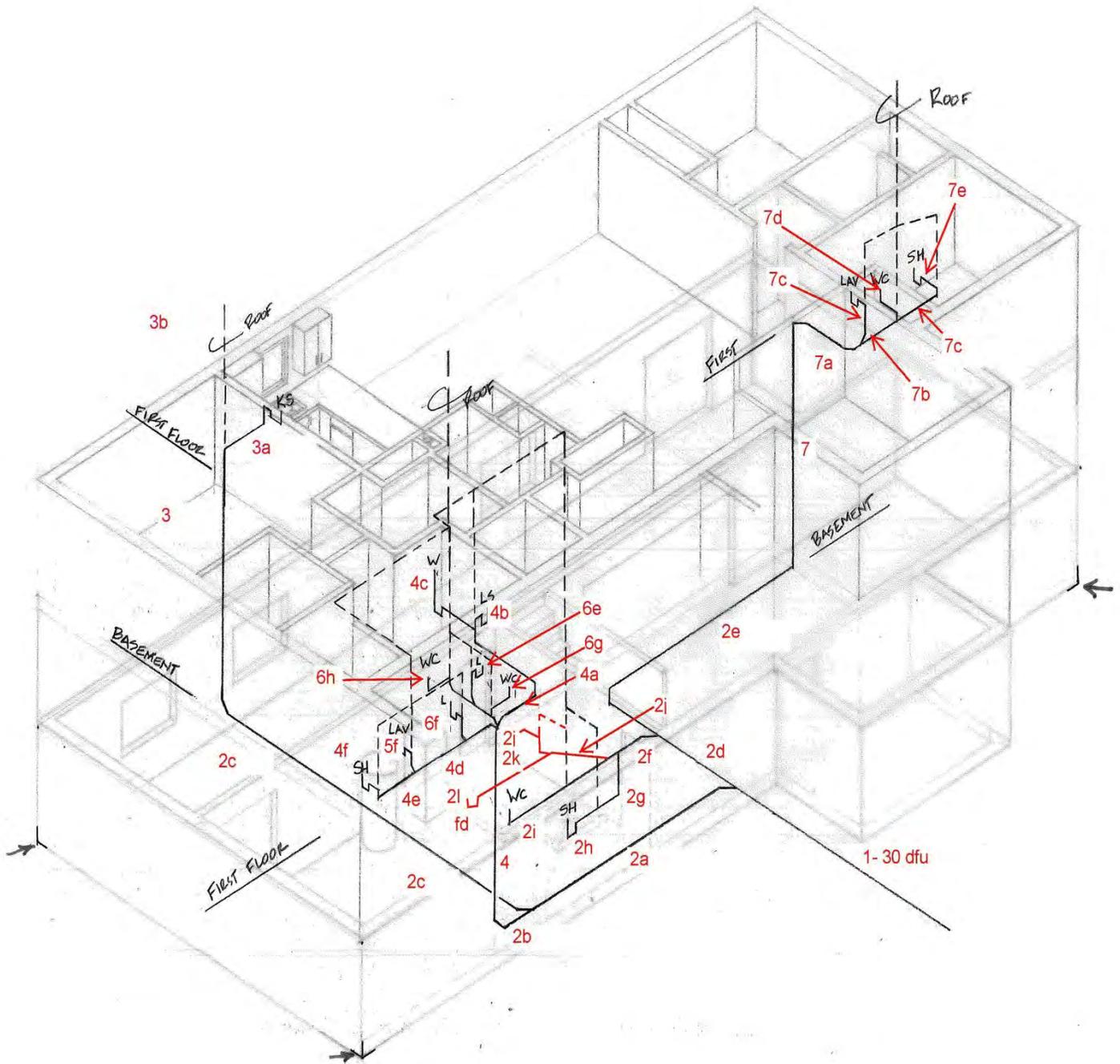
When sizing the sanitary system you will start at the connection of the building drain and sanitary sewer

- Remember the definition of the Building Drain
  - Terminates 2 feet outside the building (see definition)

- Cleanouts required
  - MN 4714.0100 Basic Plumbing Principles G.
  - UPC 707 Cleanouts See figure 707.4 on page 71
  - MN 4714.0707.4.1 Back to Back cleanouts
  - UPC 719.1 Locations – Required between the building drain and building sewer
- To determine maximum lengths of sanitary and venting you need to reference UPC table 703.2 on page 76
- There are many different ways to install the sanitary in a home and you will have to review other sections of the plumbing code to verify compliance with the code.
  - Examples;
    - Different types of wet venting see 2012 UPC sections
      - 908.1 for wet venting
      - 908.2 for horizontal wet venting
      - Note: you cannot combine both applications into one bathroom group
- To size the DFUV to the house sanitary and determine the right size for sanitary and venting see pages 73, 74 and 75 MN Rule 4714.702.1 and the example from the previous page 82

### Sanitary for Single family home with four bathrooms





Sanitary for a single family home with four bathrooms

## Sizing the sanitary system for single family home

<b>Identity</b>		Drainage fixture units table 4714.702.1		Size of sewer, building drain, horizontal drains Table 717.1	
Building sewer		35 dfu Sizing from page 82 below		Note: more than 3 water closets 4 inch required	
Type of fixture	Number of fixtures	Minimum size trap and trap arm size (inches) Table 1002.2	Private use (DFUV) Single family home	Total DFUV #fixtures x DFUV = Total	
Water closet 1.6 GPF	4	3	3	12	
Shower	3	2	2	6	
Lavatory	5	1-1/4	1	5	
Floor drain	1	2	2	2	
Laundry tub main floor	1	2 See footnote 2	2	2	
Clothes washer, Domestic, standpipe	1	2 See footnote 5	3	3	
Kitchen, domestic <sup>2</sup>	1	2 See footnote 2	2	2	
			<b>Total DFUV</b>	<b>32</b>	

## Sizing the building drain for a single family home

Identity: Building drain	Fixtures	drainage fixture units from table 4714.702.1	Total	Drainage fixture units discharging into the building drain per identity	Size of building drain based on ¼ inch per foot slope table 703.2 Note: read footnote #5	Maximum length of drainage piping and fixture loading Table 703.2
2a Receiving discharge from 2b and 2c	2 - wc 1 - sh 3 - lav 1 - lt 1 - w 1 - ks	3 2 1 2 3 2	6 2 3 2 3 2 18	18	3 inches	Vert. 212 ft. horiz. unlim. Maximum fixture loading for 3 inches is 35 dfu's Remember table 313.1 For expansion of plastic piping
2b Receiving discharge from stack #4	2 - wc 1 - sh 3 - lav 1 - lt 1 - w	3 2 1 2 3	6 2 3 2 3	16	3 inches	Horizontal unlimited Need cleanout at the base of stack
2c receiving discharge from stack #3	1 - ks	2	2	2	2 inches	Horizontal unlimited need cleanout at the base of stack
2d receiving discharge from basement bathroom and stack #7	2 - sh 2 - lav 2 - wc 1 - fd	2 1 3 2 private use	4 2 6 2	14	3 inches	Horizontal unlimited
2e receiving discharge from stack #7	1 - wc 1 - sh 1 - lav	3 2 1	3 2 1	6	3 inches	Horizontal unlimited Max dfu 35

<b>Sizing the building stacks for a single family home</b>						
Identity: Building drain	Fixtures	drainage fixture units from table 4714.702.1	Total	Drainage fixture units discharging into the building stacks	Size of stack # 3 Note: remember note #2 from table 4714.702.1 2 inch minimum drain	Maximum length of drainage piping Table 703.2
Discharge from horizontal drain 3a ks into stack # 3	1 – ks	2	2	2	2 inches	Vertical 85 ft Note: make sure to watch for total fixture loading
Discharge from horizontal drains 4a through 6h into stack # 4	1 – sh 3 – lav 2 – wc 1 – lt 1 – w	2 1 3 2 3	2 3 6 2 3	16	3 inches	Vertical 32 ft Note: Make sure to watch for total fixture loading to horizontal
Discharge from horizontal drains 7a through 7e into stack & 7	1 – lav 1 – sh 1 - wc	1 1 1	1 2 3	6	3 inches	Same as above Note: all stacks will need cleanouts at the base

**Sizing horizontal branches (drainage piping) below ground for  
basement bathroom and floor drain**

Identity: Horizontal branches (drainage piping)	Fixtures	drainage fixture units from table 4714.702.1	Total	Drainage fixture units discharging into horizontal branches (drainage piping) drain per identity	Size of horizontal branch (drainage piping) 2f Note: remember note #2 from table 4714.702.1 2 inch minimum drain	Maximum length of drainage piping and fixture loading Table 703.2
Discharge of horizontal branches (drainage piping) from 2g through 2i into 2f	1 – wc 1 – sh 1 – lav 1 - fd	3 2 1 2	3 2 1 2	8	3 inches	Horizontal 212 Max fixture loading 35 dfu
Drainage piping for shower 2g And 2h	1 – sh	2	2	2	2 inches Note: trap arm and trap table	Horizontal 8 dfu Footnote 3 – no water closets
Drainage piping for water closet 2i	1 – wc	3	3	3	3 inches	Footnote #3

Sizing horizontal branches (drainage piping) below ground for basement bathroom and floor drain continued						
Drainage piping for lavatory and shower 2j	1 – lav 1 – sh	1 2	1 2	3	2 inches	Horizontal 8 dfu Footnote #3 No water closets on 2 inch line
Drainage piping and trap arm for floor drain 2k and 2l	1 – fd	2	2	2	2 inches	Horizontal 8dfu
Drainage piping and trap arm for lav drain 2L	1 – lav	1	1	1	1 ¼ inches Read max	Vertical 1 ¼ Horizontal 1 ¼

### Sizing horizontal branches (drainage piping) above ground

Identity: Horizontal branches (drainage piping)	Fixtures	drainage fixture units from table 4714.702.1	Total	Drainage fixture units discharging into horizontal branches (drainage piping) drain per identity	Size of horizontal branch (drainage piping) Note: remember note #2 from table 4714.702.1	Maximum length of drainage piping and fixture loading Table 703.2
Discharge from 4b and 4c into 4a	1 – lt 1 – sh	2 2	2 2	4	2 inches Note: read trap arm and trap size and footnote #2	Horizontal 8 dfu Remember the wet venting that is occurring UPC 908
Discharge of lav trap arm 4b into vertical of 4a	1 – lt	2	2	2	1 ½ inches see table for trap arm and trap sizes also read footnote #2	Note the vertical due to wet venting will be 2 ½ inches because of UPC 908
Discharge of washer trap arm 4c	1 – w	3	3	3	2 inches	Note remember trap arm distances from table UPC 1002.2
Discharge of 6g wc, 6e lav and 6h into horizontal drain	2 – wc 1 – lav	3 1	6 1	8	3 inches	Note: trap arm distance from UPC table 1002.2

Discharge from 4f sh, 5f lav and 6f lav into horizontal drain 4d	1 – sh 2 – lav	2 1	2 2	4	2 inches	Horizontal 8dfu No water closets allowed
Discharge from 4f sh into 4e	1 – sh	2	2	2	2 inches	Horizontal 8dfu No water closets allowed
Trap arm 4f sh	1 – sh	2	2	2	2 inches Trap arm distance UPC 1002.2	Na
Trap arm 5f lav	1 – lav	1	1	1	1 ¼ inches Trap arm distance UPC 1002.2	Na
Trap arm 3a ks	1 – ksf	2	2	2	1 ½ inches remember footnote #2	na
Discharge from 7c lav, 7d wc and 7e into 7a horizontal branch	1 – lav 1 – wc 1 – sh	1 3 2	1 3 2	6	3 inches	Na
Discharge into 7b for 7d lav and 7e wc	1 – lav 1 – wc	1 4	1 4	5	3 inches	Na
Dis. from 7e into 7c	1 - sh	2	2	2	2 inches	Na

This completes the sanitary (drainage piping sizing for the single family home.)

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**The venting will have to be sized next. To size venting you will need to look at table 703.2 Maximum unit loading and maximum length of drainage and vent piping**

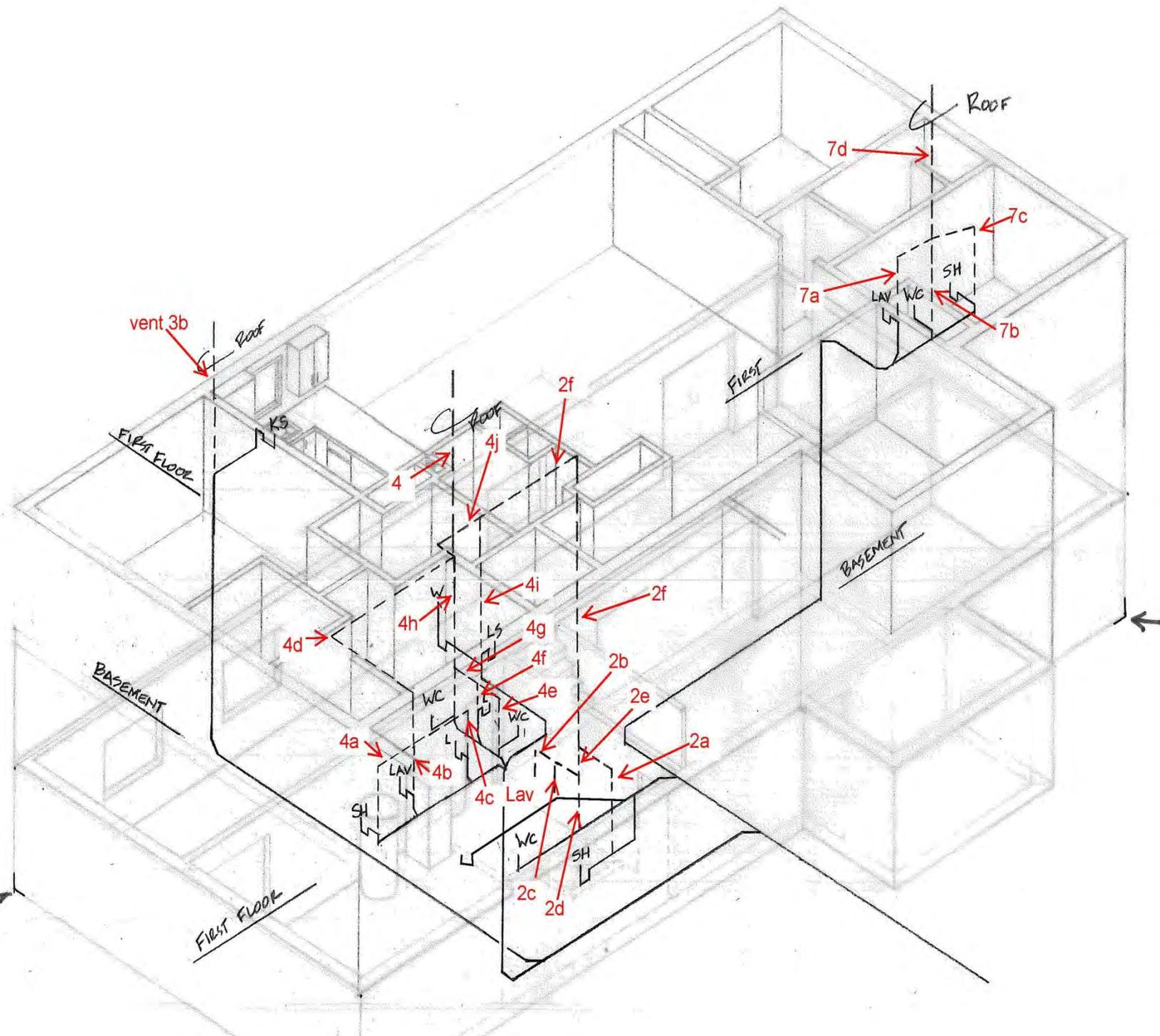
Table 703.2

**MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING**

SIZE OF PIPE (INCHES)	1-1/4	1-1/2	2	2-1/2	3	4
Max. Units Drainage Piping <sup>1</sup>						
Vertical	1	2 <sup>2</sup>	16 <sup>3</sup>	32 <sup>3</sup>	48-4	256
Horizontal	1	1	8 <sup>3</sup>	14 <sup>3</sup>	35-4	216-5
Max. Length Drainage Piping						
Vertical (feet)	45	65	85	148	212	300
Horizontal (unlimited)						
Vent Piping Horizontal and vertical – 6 Maximum Units	1	8 <sup>3</sup>	24	48	84	256
Maximum Lengths, (feet)	45	60	120	180	212	300

**Footnote #6 Where vents are increase one pipe size for their entire length, the maximum length limitations specified in this table do not apply.**

Note: this table is an example only and does not incorporate pipes larger than 4



Vent sizing per UPC table 703.2 for the above drawing

Identity: vent	Fixture	drainage fixture units from table 4714.702.1	Total dfu	Size of vent piping Horizontal Vertical table 703.2
Vent 2a basement shower	1 –sh	2	2	1 ½ inches Max units 8 dfu Max length 60'
Vent 2b basement lav	1 - lav	1	1	1 ¼ inches Max units 1 Max length 45' Increase to 1 ½ inches footnote 6
Vent 2c basement floor drain	1 – fd	2	2	1 ½ inches Max units 8 Max length 60'
Vent 2d basement water closet	1 –wc	3	3	2 inches Max units 24 Max length 120'
Vent 2e basement water closet, lavatory and floor drain	1 – wc 1 – lav 1 – fd	3 1 2	6	2 inches Max units 24 Max length 120' Footnote 3
Vent 2f basement water closet, lavatory, floor drain and shower	1 – wc 1 – lav 1 – fd 1 – sh	3 1 2 2	8	2 inches Max units 24 Max length 120'
Vent 4a first floor shower	1 – sh	2	2	1 ½ inches Max units 8 dfu Max length 60'
Vent 4b first floor lav	1 – lav	1	1	1 ¼ inches Max units 1 Max length 45' Increase to 1 ½ inches footnote 6
Vent 4c first floor lave	1 – lav	1	1	1 ¼ inches Max units 1 Max length 45'
Vent 4d first floor shower and 2 lavs	2 – lav 1 – sh	1 2	4	1 ½ inches Max units 8 dfu Max length 60'
Vent 4e water closet first floor half bath	1 – wc	3	3	2 inches Max units 24 Max length 120' Remember footnote 3
Vent 4f lavatory	1 – lav	1	1	1 ¼ inches

first floor half bath				Max units 1 Max length 45' Increase to 1 ½ inches
Vent 4g water closet and lavatory first floor half bath	1 – lav 1 – wc	1 3	4	2 inches Max units 24 Max length 120' Remember footnote 3
Vent 4h 2 water closets and 1 lavatory first floor	1 – lav 2 – wc	1 3	7	2 inches Max units 24 Max length 120' Remember footnote 3
Vent 4i laundry tub and washer first floor laundry	1 – lt 1 - w	2 3	5	1 ½ inches Max units 8 dfu Max length 60'
Vent 4j basement fixtures and first floor fixtures	1 – lav 1 – sh 1 – wc 1 – fd 1 – w 1 - lt	1 2 3 2 3 2	13	2 inches Max units 24 Max length 120' Remember footnote 3
Vent stack 4 basement, first floor and first floor master bath fixtures	3 – lav 2 – sh 3 – wc 1 – fd 1 – w 1 - lt	1 2 3 2 3 2	23	3 inches Max units 84 Max length 212
Vent 7a lav first floor master bath	1 – lav	1	1	1 ¼ inches Max units 1 Max length 45' Increase to 1 ½
Vent 7b water closet first floor master bath	1 – wc	3	3	2 inches Max units 24 Max length 120' Remember footnote 3
Vent 7c shower first floor master bath	1 – sh	2	2	1 ½ inches Max units 8 dfu Max length 60'
Vent 7d vent for first floor master bath through roof	1 – lav 1 – wc 1 – sh	1 3 2	6	2 inches Max units 24 Max length 120' Remember footnote 3
Vent 3b kitchen sink through roof	1 – ks	2	2	1 ½ Note: MN rule 4714.906.7

**MN rule 4714.906.7 Frost or snow closure**

- **Minimum size 2 inches**
- **The change in diameter of piping has to occur at least 1 foot below the roof in an insulated space**

**This will complete the sanitary drain, waste and vent for single family home**

# WATER DISTRIBUTION

The next thing to look at is the water service and distribution to make sure that the minimum volume of water is supplied to each fixture.

## **Note: 15 psi**

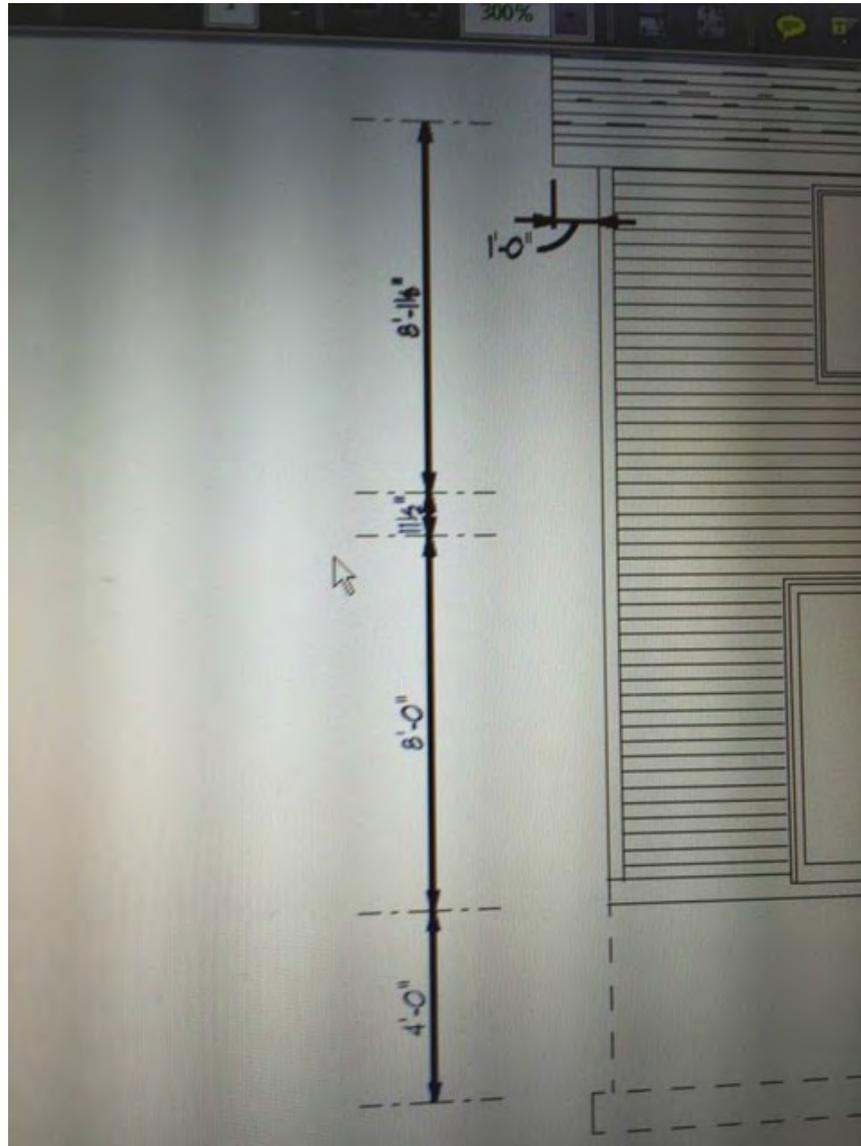
MN Rule 4714.0610 is the table needed to size the water service and distribution system. To do this there are certain criteria that you will need to know before you can properly review/inspect the system, these are;

- Total number of Appliances, Appurtenances, or Fixtures
- Total pressure losses through appliances
  - Water filter
  - Water softener
  - Tankless water heater
  - Backflow prevention device
  - Other appliances that create pressure losses
- Total pressure at main or meter
  
- The Difference in elevation is from source of known pressure to the highest fixture
  - The Pressure drop can be calculated by multiplying difference in elevation by .433 psi.
  - The known source of pressure will either be at the street main or the water meter inside the building
  - The difference in elevation can be calculated by scaling the plan or reading the elevations that are given on the plan
    - In this case we will be assuming a water service at 8 feet below grade and the highest shower head to be 7 feet above the finished floor
    - Remember every fixture has to maintain a minimum pressure of 15 pounds per square inch gauge (psig)
      - Reference 2015 MSPC, section 608.1 of the 2012 UPC
      - Inadequate water pressure.
      - Residual water pressure shall maintain a minimum of 15 psi
      - Needs to be during maximum demand periods
      - If other fixtures require more the system shall be designed for the demand above 15 psig

## **Based on the elevations given, we can apply the following:**

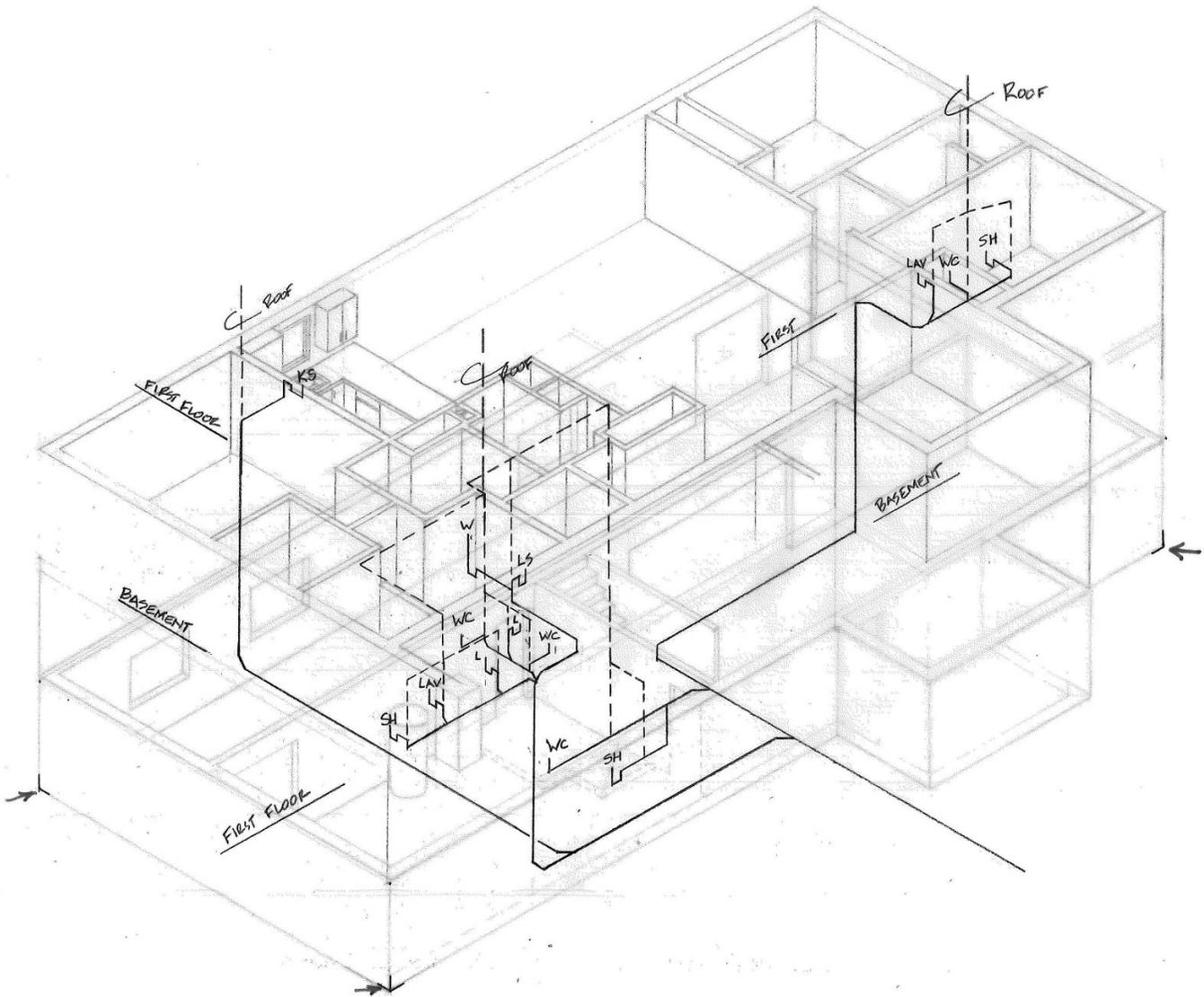
- 8 feet from water main to basement slab
- 9.5 feet to first floor
- 7 feet to shower head
- Total difference in elevation 24.5 feet

- Pressure loss due to difference in elevation
- $24.5 \times .433 \text{ psi} = 10.6 \text{ psig}$



**The developed length from known pressure at the meter to the furthest fixture outlet (total distance of piping)**

- We will assume that the pressure at the main is 70 psig
- The total developed link to the furthest fixture is the shower in the master bath
- The developed length used for this application is 113 feet from the main to the highest fixture



- 4714.0610 Size of potable water piping Table 610.3 Water Supply Fixture Units (WSFU) and Minimum Fixture Branch Pipe Sizes<sup>3</sup>
    - Table 610.3 represents WSFU for combined cold and hot water demand for each listed fixture
    - See table 4714.610.03 on page 22 and 23
    - Make sure and read the footnotes
- 

## **4714.0610 SIZE OF POTABLE WATER PIPING.**

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UPC section 610, Table 610.3, is amended to read as follows:



TABLE 610.3

Water Supply Fixture Units (WSFU) and Minimum Fixture Branch Pipe Sizes

Appliances, Appurtenances, or Fixtures <sup>2</sup>	Minimum Fixture Branch Pipe Size <sup>1,4</sup> (inches)	Private	Public	Assembl
Bathtub or Combination Bath/Shower (fill)	1/2	4.0	4.0	—
3/4-inch Bathtub Fill Valve	3/4	10.0	10.0	—
Bidet	1/2	1.0	—	—
Clothes Washer	1/2	4.0	4.0	—
Dental Unit, cuspidor	1/2	—	1.0	—
Dishwasher, domestic	1/2	1.5	1.5	—
Drinking Fountain or Water Cooler	1/2	0.5	0.5	0.75
Hose Bibb	1/2	2.5	2.5	—
Hose Bibb, each additional <sup>8</sup>	1/2	1.0	1.0	—
Lavatory (each basin), or hand sink	1/2	1.0	1.0	1.0
Lawn sprinkler, each head <sup>5</sup>	—	1.0	1.0	—
Mobile Home, each (minimum)	—	12.0	—	—
Sinks	—	—	—	—
Bar	1/2	1.0	2.0	—
Clinic Faucet	1/2	—	3.0	—
Clinic Flushometer Valve with or without faucet	1	—	8.0	—
Kitchen, domestic with or without dishwasher	1/2	1.5	1.5	—
Laundry	1/2	1.5	1.5	—
Service or Mop Basin	1/2	1.5	3.0	—
Washup, each set of faucets	1/2	—	2.0	—
Shower, per head	1/2	2.0	2.0	—
Urinal, 1.0 GPF Flushometer Valve	3/4	See Footnote <sup>7</sup>	—	—

Urinal, greater than 1.0 GPF Flushometer Valve	3/4	See Footnote <sup>7</sup>	–	–
Urinal, flush tank	1/2	2.0	2.0	3.0
Wash Fountain, circular spray	3/4	–	4.0	–
Water Closet, 1.6 GPF Gravity Tank	1/2	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Tank	1/2	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Valve	1	See Footnote <sup>7</sup>	–	–
Water Closet, greater than 1.6 GPF Gravity Tank	1/2	3.0	5.5	7.0
Water Closet, greater than 1.6 GPF Flushometer Valve	1	See Footnote <sup>7</sup>	–	–

For SI units: 1 inch = 25 mm

**Notes:**

<sup>1</sup> Size of the cold branch pipe, or both the hot and cold branch pipes.

<sup>2</sup> Appliances, appurtenances, or fixtures not referenced in this table shall be permitted to be sized by reference to fixtures having a similar flow rate and frequency of use.

<sup>3</sup> The listed fixture unit values represent their load on the cold water building supply. The separate cold water and hot water fixture unit value for fixtures having both hot and cold water connections shall be permitted to be each taken as three-quarters of the listed total value of the fixture.

<sup>4</sup> The listed minimum supply branch pipe sizes for individual fixtures are the nominal (I.D.) pipe size.

<sup>5</sup> For fixtures or supply connections likely to impose continuous flow demands, determine the required flow in gallons per minute (gpm) (L/s), and add it separately to the demand in gpm (L/s) for the distribution system or portions thereof.

<sup>6</sup> Assembly [Public Use]. See Minnesota Rules, chapter 1305, International Building Code.

<sup>7</sup> Where sizing flushometer systems, see Section 610.10.

Based on the following criteria we can now size the water service and distribution system for the single family home

Water service and water distribution sizing criteria	
Total water supply fixture load on house	31
Total difference in elevation	24.5 ft x .433 psig = 10.6 psig
Total developed length	113 feet
Total pressure at the main	70 psig

- the water service (building service)
- water meter size
- building supply
- building branches

---

**How to properly size the water piping for a single family home**  
**First: Fixture obtain fixture unit values from Table 610.3**

Type of fixture	Number of fixtures	Supply fixture unit values: Private use	Total supply fixture unit values: Private	Minimum fixture branch pipe size (inches)
Water closet, 1.6 GPF gravity tank	4	2.5	10	½
Shower	3	2	6	½
Lavatory	4	1	4	½
Laundry tub	1	1.5	1.5	½
Washer	1	4	4	½
Kitchen sink	1	1.5	1.5	½
Outside hose bibb	3	2.5 Each additional 1 Footnote: 8	2.5 + 2 = 4.5 Footnote 8	½
		<b>Total WSFU:</b>	<b>31.5</b>	

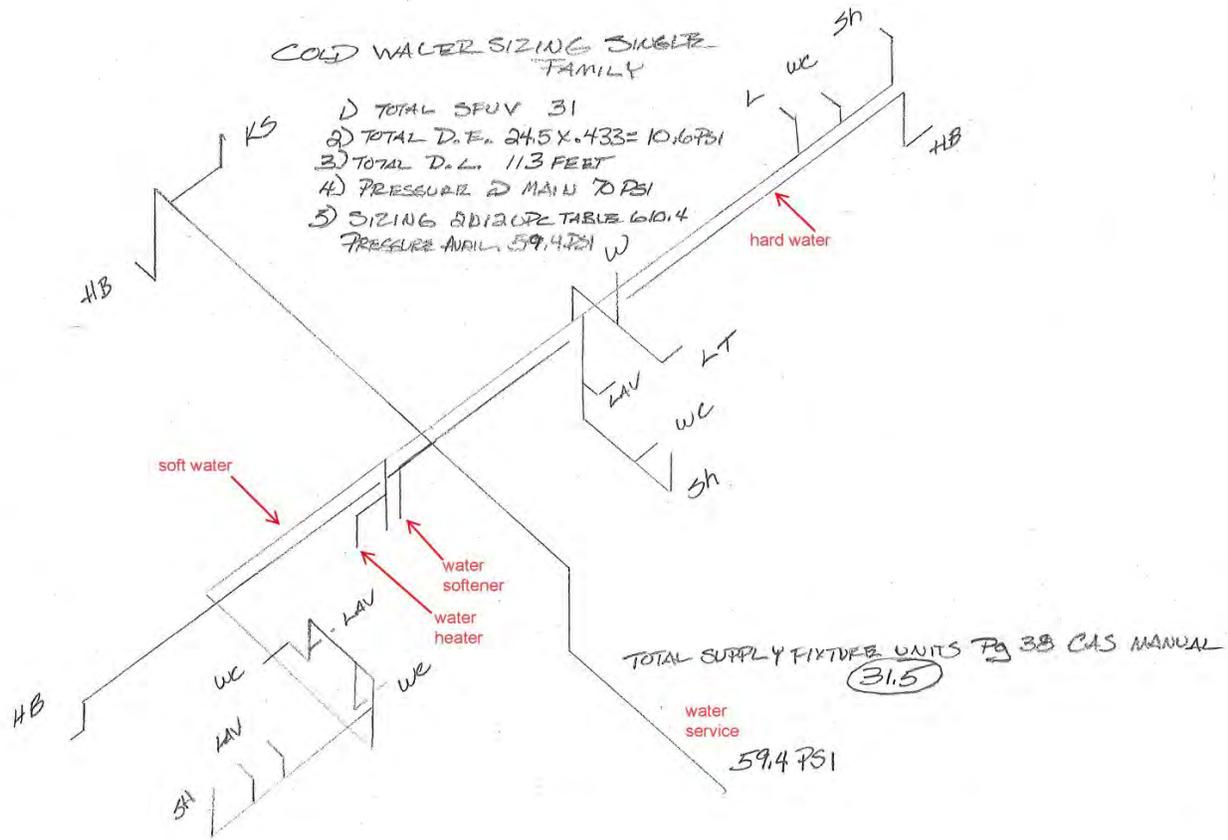
**Remember always read the footnotes:**

**Footnote #8:**

Reduced fixture unit loading for additional hose bibs is to be used where sizing total building demand and for pipe sizing where more than one hose bib is supplied by a segment of water distribution pipe. The fixture branch to each hose bib shall be sized on the basis of 2.5 fixture units.

COLD WATER SIZING SINGLE FAMILY

- 1) TOTAL SFUV 31
- 2) TOTAL D.E.  $24.5 \times .433 = 10.6 \text{ PSI}$
- 3) TOTAL D.L. 11.3 FEET
- 4) PRESSURE @ MAIN 70 PSI
- 5) SIZING SIDISUP TABLE 610.4  
PRESSURE AVAILABLE 59.4 PSI



**TABLE 610.3  
WATER SUPPLY FIXTURE UNITS (WSFU) AND MINIMUM FIXTURE BRANCH PIPE SIZES<sup>3</sup>**

APPLIANCES, APPURTENANCES OR FIXTURES <sup>2</sup>	MINIMUM FIXTURE BRANCH PIPE SIZE <sup>1,4</sup> (inches)	PRIVATE	PUBLIC	ASSEMBLY <sup>6</sup>
Bathtub or Combination Bath/Shower (fill)	½	4.0	4.0	—
¼ inch Bathtub Fill Valve	¾	10.0	10.0	—
Bidet	½	1.0	—	—
Clothes Washer	½	4.0	4.0	—
Dental Unit, cuspidor	½	—	1.0	—
Dishwasher, domestic	½	1.5	1.5	—
Drinking Fountain or Water Cooler	½	0.5	0.5	0.75
Hose Bibb	½	2.5	2.5	—
Hose Bibb, each additional <sup>8</sup>	½	1.0	1.0	—
Lavatory	½	1.0	1.0	1.0
Lawn Sprinkler, each head <sup>5</sup>	—	1.0	1.0	—
Mobile Home, each (minimum)	—	12.0	—	—
Sinks	—	—	—	—
Bar	½	1.0	2.0	—
Clinic Faucet	½	—	3.0	—
Clinic Flushometer Valve with or without faucet	1	—	8.0	—
Kitchen, domestic with or without dishwasher	½	1.5	1.5	—
Laundry	½	1.5	1.5	—
Service or Mop Basin	½	1.5	3.0	—
Washup, each set of faucets	½	—	2.0	—
Shower, per head	½	2.0	2.0	—
Urinal, 1.0 GPF Flushometer Valve	¾	See Footnote <sup>7</sup>		—
Urinal, greater than 1.0 GPF Flushometer Valve	¾	See Footnote <sup>7</sup>		—
Urinal, flush tank	½	2.0	2.0	3.0
Wash Fountain, circular spray	¾	—	4.0	—
Water Closet, 1.6 GPF Gravity Tank	½	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Tank	½	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Valve	1	See Footnote <sup>7</sup>		—
Water Closet, greater than 1.6 GPF Gravity Tank	½	3.0	5.5	7.0
Water Closet, greater than 1.6 GPF Flushometer Valve	1	See Footnote <sup>7</sup>		—

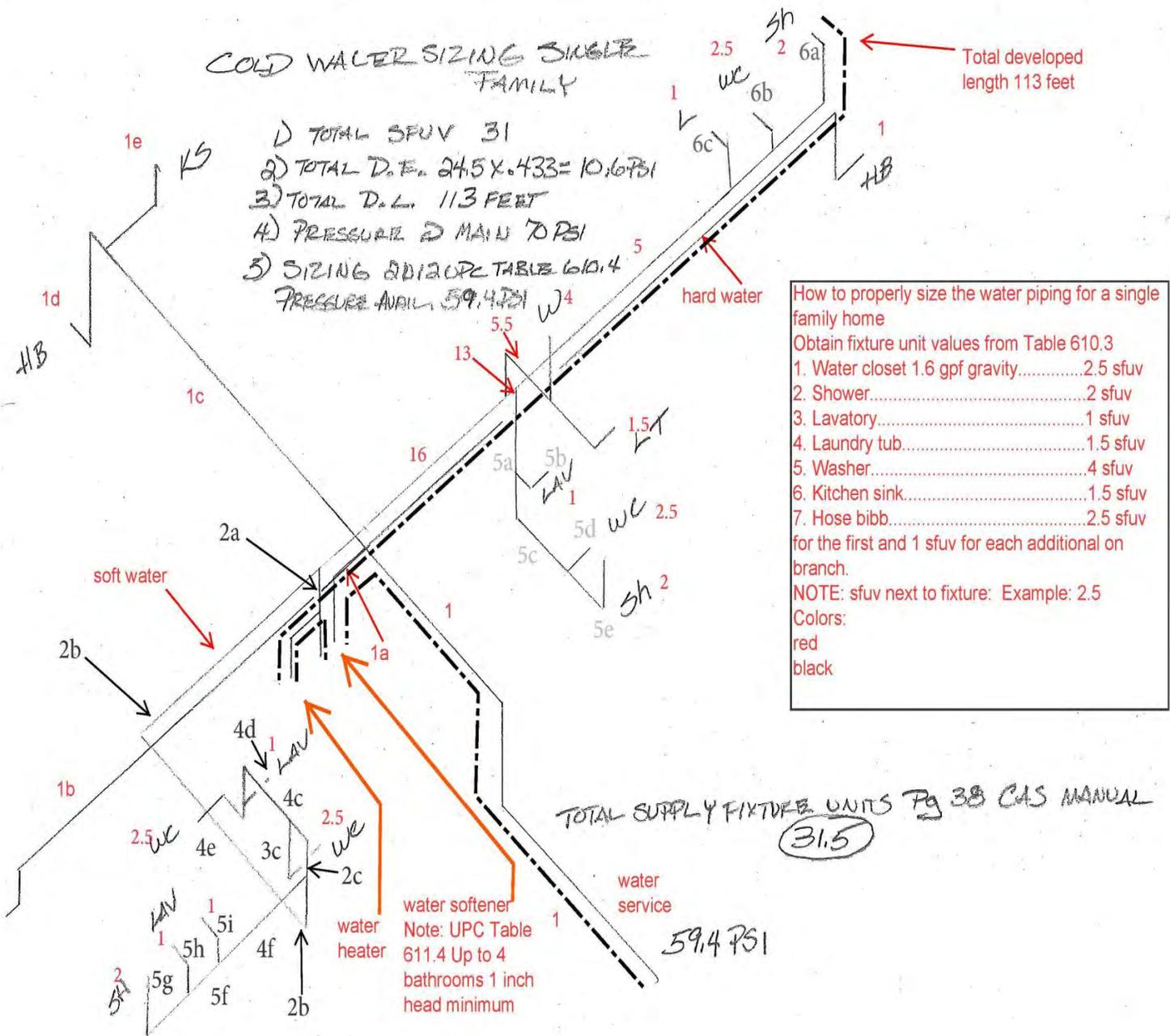
For SI units: 1 inch = 25 mm

**Notes:**

- <sup>1</sup> Size of the cold branch pipe, or both the hot and cold branch pipes.
- <sup>2</sup> Appliances, appurtenances, or fixtures not referenced in this table shall be permitted to be sized by reference to fixtures having a similar flow rate and frequency of use.
- <sup>3</sup> The listed fixture unit values represent their load on the cold water building supply. The separate cold water and hot water fixture unit value for fixtures having both hot and cold water connections shall be permitted to be each taken as three-quarter of the listed total value of the fixture.
- <sup>4</sup> The listed minimum supply branch pipe sizes for individual fixtures are the nominal (I.D.) pipe size.
- <sup>5</sup> For fixtures or supply connections likely to impose continuous flow demands, determine the required flow in gallons per minute (gpm) (L/s), and add it separately to the demand in gpm (L/s) for the distribution system or portions thereof.
- <sup>6</sup> Assembly [Public Use (See Table 422.1)].
- <sup>7</sup> Where sizing flushometer systems, see Section 610.10.
- <sup>8</sup> Reduced fixture unit loading for additional hose bibbs is to be used where sizing total building demand and for pipe sizing where more than one hose bibb is supplied by a segment of water distribution pipe. The fixture branch to each hose bibb shall be sized on the basis of 2.5 fixture units.

# COLD WATER SIZING SINGLE FAMILY

- 1) TOTAL SFUV 31
- 2) TOTAL D.E.  $24.5 \times 4.33 = 10.6 \text{ PSI}$
- 3) TOTAL D.L. 113 FEET
- 4) PRESSURE @ MAIN 70 PSI
- 5) SIZING @ 120 PSI TABLE 610.4
- 6) PRESSURE AVAILABLE 59.4 PSI



How to properly size the water piping for a single family home  
 Obtain fixture unit values from Table 610.3  
 1. Water closet 1.6 gpf gravity.....2.5 sfuv  
 2. Shower.....2 sfuv  
 3. Lavatory.....1 sfuv  
 4. Laundry tub.....1.5 sfuv  
 5. Washer.....4 sfuv  
 6. Kitchen sink.....1.5 sfuv  
 7. Hose bibb.....2.5 sfuv  
 for the first and 1 sfuv for each additional on branch.  
 NOTE: sfuv next to fixture: Example: 2.5  
 Colors:  
 red  
 black

TOTAL SUPPLY FIXTURE UNITS Pg 38 CAS MANUAL  
 (31.5)

water softener  
 Note: UPC Table 611.4 Up to 4 bathrooms 1 inch head minimum

59.4 PSI

Fixture unit table for determining water pipe and meter sizes  
Table 610.4

METER AND STREET SERVICE (Inches)	BUILDING SUPPLY AND BRANCHES (Inches)	MAXIMUM ALLOWABLE LENGTH (feet)														
		40	60	80	100	150	200	250	300	400	500	600	700	800	900	1000
PRESSURE RANGE - 46 to 60 psi <sup>1</sup>																
¼	½ <sup>2</sup>	7	7	6	5	4	3	2	2	1	1	1	0	0	0	0
¼	¾	20	20	19	17	14	11	9	8	6	5	4	4	3	3	3
¼	1	39	39	36	33	28	23	21	19	17	14	12	10	9	8	8
1	1	39	39	39	36	30	25	23	20	18	15	12	10	9	8	8
¼	1¼	39	39	39	39	39	39	34	32	27	25	22	19	19	17	16
1	1¼	78	78	76	67	52	44	39	36	30	27	24	20	19	17	16
1½	1¼	78	78	78	78	66	52	44	39	33	29	24	20	19	17	16
1	1½	85	85	85	85	85	85	80	67	55	49	41	37	34	32	30
1½	1½	151	151	151	151	128	105	90	78	62	52	42	38	35	32	30
2	1½	151	151	151	151	150	117	98	84	67	55	42	38	35	32	30
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	83	80
1½	2	370	370	340	318	272	240	220	198	170	150	135	123	110	102	94
2	2	370	370	370	370	368	318	280	250	205	165	142	123	110	102	94
2	2½	654	640	610	580	535	500	470	440	400	365	335	315	285	267	250

Sizing the water service:

- Pressure at the main 59.4 psi
- Total supply fixture units 31.5
- Total developed length 113

¾ inch water service

Fixture unit table for determining water pipe and meter sizes  
Table 610.4

METER AND STREET SERVICE (inches)	BUILDING SUPPLY AND BRANCHES (inches)	MAXIMUM ALLOWABLE LENGTH (feet)														
		40	60	80	100	150	200	250	300	400	500	600	700	800	900	1000
PRESSURE RANGE – 46 to 60 psi <sup>1</sup>																
3/4	1/2	7	7	6	5	4	3	2	2	1	1	1	0	0	0	0
3/4	3/4	20	20	19	17	14	11	9	8	6	5	4	4	3	3	3
3/4	1	39	39	36	33	28	23	21	19	17	14	12	10	9	8	8
1	1	39	39	39	36	30	25	23	20	18	15	12	10	9	8	8
1	1 1/4	39	39	39	39	39	39	34	32	27	25	22	19	19	17	16
1	1 1/2	78	78	76	67	52	44	39	36	30	27	24	20	19	17	16
1 1/2	1 1/4	78	78	78	78	66	52	44	39	33	29	24	20	19	17	16
1	1 1/2	85	85	85	85	85	85	80	67	55	49	41	37	34	32	30
1 1/2	1 1/2	151	151	151	151	128	105	90	78	62	52	42	38	35	32	30
2	1 1/2	151	151	151	151	150	117	98	84	67	55	42	38	35	32	30
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	83	80
1 1/2	2	370	370	340	318	272	240	220	198	170	150	135	123	110	102	94
2	2	370	370	370	370	368	318	280	250	205	165	142	123	110	102	94
2	2 1/2	654	640	610	580	535	500	470	440	400	365	335	315	285	267	250

**SIZING BUILDING SUPPLY AND BRANCHES**

BUILDING SUPPLY (B.S.) OR BRANCH NUMBER (B.N.)	TOTAL SFUV	SIZE OF PIPING	OTHER REQUIREMENTS
B.S. – 1	31.5 SFUV	1 1/4 INCHES	1346.1417 section 609.11 water meter inches above the floor UPC 606.2 Fullway valve before and on the discharge side of the meter?
B.S. – 1a	29 SFUV Note: footnote 8 subtract 3.5 sfuv for hose bibbs	1 INCH	Table 610.3 footnote #8 reduction For sfuv loading of multiple hose bibbs
Water softener	29 sfuv	1 inch inlet 1 inch outlet	Table 611.4 sizing of residential water Softeners Note: footnotes 1 through 4
Water heater	19 sfuv	1 inch inlet 1 inch outlet	UPC 606.5 control valve on the inlet Of water heater UPC 608.3 expansion tank requires T/P valve and drain

Fixture unit table for determining water pipe and meter sizes  
Table 610.4

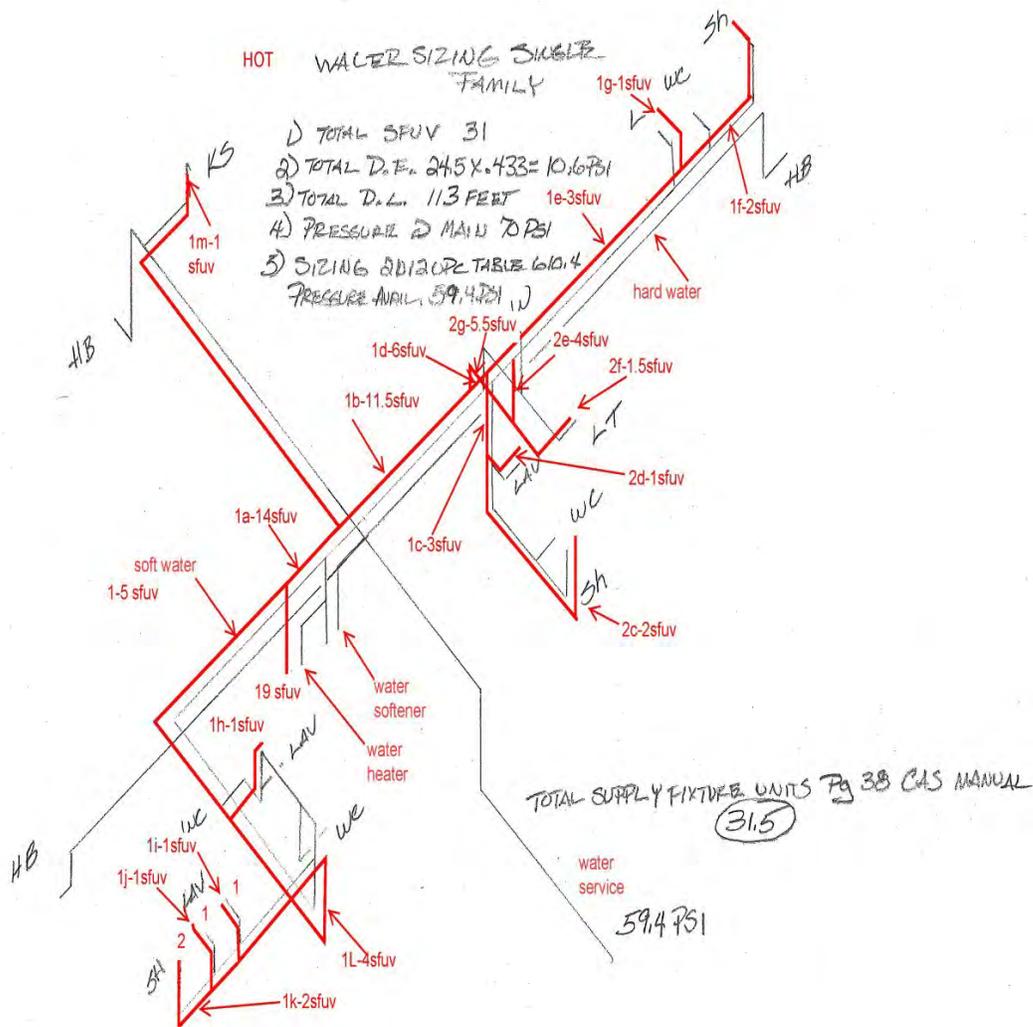
B.S. – 2b	10 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715. 1430 Horizontal: every 6 feet Vertical: each story
B.N. – 2c	5.5 sfuv	¾ inch	UPC 609.10 water hammer arrestor Where quick acting valves are used
B.N. – 3c	2.5 sfuv	½ inch	UPC 605.5 control valve required does Not have to be fullway UPC table 603.3.1 minimum air gaps Read the footnotes
B.N. – 4c	3.5 sfuv	½ inch	
B.N. – 4d	1 sfuv	½ inch	UPC 605.5 shut off valve
B.N. – 4e	2.5 sfuv	½ inch	UPC 605.5 shut off valve UPC 401.1 Quality of fixtures UPC chapter 14 referenced standards Approval of fixtures
B.N. – 1b	2.5 sfuv	½ inch	UPC 605.5 shut off valve UPC 603.3.3 hose connection backflow UPC table 603.2 backflow prevention Read footnotes
B.N. – 1c - hard water	2.5 sfuv	½ inch	Supplies kitchen sink and hose bibb May recommend insulation due to Hose bibb
B.N. – 1d	1 sfuv - MN table 610.3 footnote #8	½ inch	May want to insulate
B.N. – 1e	1.5 sfuv	½ inch	UPC 605.5 shut off valve UPC 603.3.3 hose connection backflow UPC table 603.2 backflow prevention Read footnotes
B.N. – 1 hose bibb by Master bath	1 sfuv MN table 610.3 footnote #	½ inch	May want to insulate UPC 605.5 shut off valve
B.S. – 7	16 sfuv	1 inch	Design not to exceed 10 feet per Second creates oxygen in lines Creating turbulence (failure of piping)
B.S. – 7a	13 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715. 1430 Horizontal: every 6 feet 1 ¼ or less Vertical: each story
B.N. – 7b	5 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715. 1430 Horizontal: every 6 feet Vertical: each story
B.N.- 5a	5.5 sfuv	¾ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1"

**Fixture unit table for determining water pipe and meter sizes**  
**Table 610.4**

B.N. 5b	1 sfuv	½ inch	UPC 605.5 shut off valve UPC 603.3.3 hose connection backflow UPC table 603.2 backflow prevention Read footnotes
B.N. 5c	4.5 sfuv	¾ inch	UPC 609.10 water hammer arrestor Where quick acting valves are used
B.N. 5d	2.5 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 5e	2 sfuv	½ inch	UPC 408.3 control valves Pressure balance type Or combination pressure balance / Thermostatic mixing valve ASSE 1016 or ASME A112.18.1 UPC 408.7.1 tests for shower receptor Fill base with water to threshold UPC 408.6 shower compartments Minimum 30 circle
B.N. 5f	5.5 sfuv	¾ inch	UPC 609.10 water hammer arrestor Where quick acting valves are used
B.N. 5g	4 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 5h	1.5 sfuv	½ inch	UPC 605.5 shut off valve UPC 603.3.3 hose connection backflow UPC table 603.2 backflow prevention Read footnotes
B.N. 7c	4.5 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715. 1430 Horizontal: every 6 feet 1 ¼ or less Vertical: each story
B.N. 6a	2 sfuv	½ inch	ASSE 1016 or ASME A112.18.1 UPC 408.7.1 tests for shower receptor Fill base with water to threshold UPC 408.6 shower compartments Minimum 30 circle
B.N. 6b	2.5 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 6c	1 sfuv	½ inch	UPC 605.5 shut off valve

After sizing the cold water distribution system, we can now look at the hot water distribution system.

We will continue to utilize UPC table 610.4 and based on the cold water sizing information we know that the water heater will have a 19 supply fixture unit value to calculate from.



Fixture unit table for determining water pipe and meter sizes  
Table 610.4

METER AND STREET SERVICE (inches)	BUILDING SUPPLY AND BRANCHES (inches)	MAXIMUM ALLOWABLE LENGTH (feet)														
		40	60	80	100	150	200	250	300	400	500	600	700	800	900	1000
PRESSURE RANGE – 46 to 60 psi <sup>1</sup>																
¼	½ <sup>2</sup>	7	7	6	5	4	3	2	2	1	1	1	0	0	0	0
¼	¾	20	20	19	17	14	11	9	8	6	5	4	4	3	3	3
¼	1	39	39	36	33	28	23	21	19	17	14	12	10	9	8	8
1	1	39	39	39	36	30	25	23	20	18	15	12	10	9	8	8
¼	1¼	39	39	39	39	39	39	34	32	27	25	22	19	19	17	16
1	1¼	78	78	76	67	52	44	39	36	30	27	24	20	19	17	16
1½	1¼	78	78	78	78	66	52	44	39	33	29	24	20	19	17	16
1	1½	85	85	85	85	85	85	80	67	55	49	41	37	34	32	30
1½	1½	151	151	151	151	128	105	90	78	62	52	42	38	35	32	30
2	1½	151	151	151	151	150	117	98	84	67	55	42	38	35	32	30
1	2	85	85	85	85	85	85	85	85	85	85	85	85	85	83	80
1½	2	370	370	340	318	272	240	220	198	170	150	135	123	110	102	94
2	2	370	370	370	370	368	318	280	250	205	165	142	123	110	102	94
2	2½	654	640	610	580	535	500	470	440	400	365	335	315	285	267	250

**HOT WATER SIZING FOR BUILDING SUPPLY AND BRANCHES**

BUILDING SUPPLY (B.S.) OR BRANCH NUMBER (B.N.)	TOTAL SFUV	SIZE OF PIPING	OTHER REQUIREMENTS
Water heater discharge	19 sfuv	1 inch	MN 1322 residential code R403.4.2 Hot water piping insulation required
B.N. 1	5 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715.1430 Horizontal: ever 6 feet 1 ¼ or less Vertical: every story
B.N. 1L	4 sfuv		MN Rule 4714.0610 Table 610.3 Footnote # 3 sizing reduction to 75% for fixtures having both h and c
B.N. 1i	1 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 1j	1 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 1k	2sfuv	½ inch	UPC 408.3 control valves Pressure balance type Or combination pressure balance / Thermostatic mixing valve ASSE 1016 or ASME A112.18.1

Fixture unit table for determining water pipe and meter sizes  
 Table 610.4

			ASME A112.18.1 UPC 408.7.1 tests for shower receptor Fill base with water to threshold UPC 408.6 shower compartments Minimum 30 circle
B.N. 1m	1.5 sfuv	½ inch	UPC 605.5 shut off valve
B.S. 1b	11.5 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715.1430 Horizontal: ever 6 feet 1 ¼ or less Vertical: every story
B.S. 1d	6 sfuv	¾ inch	MN 1322 residential code R403.4.2 Hot water piping insulation required
B.N. 1c	3 sfuv	½ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1"
B.N. 2c	2 sfuv	½ inch	UPC 408.3 control valves Pressure balance type Or combination pressure balance / Thermostatic mixing valve ASSE 1016 or ASME A112.18.
B.N. 2d	1 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 2e	4 sfuv	½ inch	UPC 609.10 water hammer arrestor Where quick acting valves are used
B.N. 2f	1.5 sfuv	½ inch	UPC 605.5 shut off valve UPC 603.3.3 hose connection backflow UPC table 603.2 backflow prevention Read footnotes
B.N. 2g	5.5 sfuv	¾ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1"
B.N. 1e	3 sfuv	½ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1" Table 313.3 hangers and supports MN 4715.1430 Horizontal: ever 6 feet 1 ¼ or less Vertical: every story
B.N. 1f	2 sfuv	½ inch	UPC 408.3 control valves Pressure balance type Or combination pressure balance / Thermostatic mixing valve ASSE 1016 or ASME A112.18.
B.N. 1g	1	½ inch	UPC 605.5 shut off valve

Fixture unit table for determining water pipe and meter sizes  
Table 610.4

			ASME A112.18.1 UPC 408.7.1 tests for shower receptor Fill base with water to threshold UPC 408.6 shower compartments Minimum 30 circle
B.N. 1m	1.5 sfuv	½ inch	UPC 605.5 shut off valve
B.S. 1b	11.5 sfuv	¾ inch	Table 313.3 hangers and supports MN 4715.1430 Horizontal: ever 6 feet 1 ¼ or less Vertical: every story
B.S. 1d	6 sfuv	¾ inch	MN 1322 residential code R403.4.2 Hot water piping insulation required
B.N. 1c	3 sfuv	½ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1"
B.N. 2c	2 sfuv	½ inch	UPC 408.3 control valves Pressure balance type Or combination pressure balance / Thermostatic mixing valve ASSE 1016 or ASME A112.18.
B.N. 2d	1 sfuv	½ inch	UPC 605.5 shut off valve
B.N. 2e	4 sfuv	½ inch	UPC 609.10 water hammer arrestor Where quick acting valves are used
B.N. 2f	1.5 sfuv	½ inch	UPC 605.5 shut off valve UPC 603.3.3 hose connection backflow UPC table 603.2 backflow prevention Read footnotes
B.N. 2g	5.5 sfuv	¾ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1"
B.N. 1e	3 sfuv	½ inch	UPC 312.9 steel nail plates 18 gauge when piping closer than 1" Table 313.3 hangers and supports MN 4715.1430 Horizontal: ever 6 feet 1 ¼ or less Vertical: every story
B.N. 1f	2 sfuv	½ inch	UPC 408.3 control valves Pressure balance type Or combination pressure balance / Thermostatic mixing valve ASSE 1016 or ASME A112.18.
B.N. 1g	1	½ inch	UPC 605.5 shut off valve

You have now sized the sanitary, drain, waste, vent, water service and distribution piping for a single family home. Remember this is only an overview of all the requirements that apply to the installation of the system and you will have to review the rest of the code to make sure the building is in compliance.

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# Retention Schedule

## Building Inspections and Permits/Licenses

[http://www.mcfoa.org/vertical/sites/%7B067FFB58-E3CD-42BA-9FB1-11EFC7933168%7D/uploads/General Records Retention Schedule for MN Cities - July 2013.pdf](http://www.mcfoa.org/vertical/sites/%7B067FFB58-E3CD-42BA-9FB1-11EFC7933168%7D/uploads/General%20Records%20Retention%20Schedule%20for%20MN%20Cities%20-%20July%202013.pdf)

### GENERAL RECORDS RETENTION SCHEDULE FOR MINNESOTA CITIES

SECTION	CODE	TITLE & DESCRIPTION	RETENTION PERIOD	CLASSIFICATION	STATUTE
BUILDING INSPECTIONS	BUI 00100	BUILDING INSPECTION RECORD Includes grading, demolition, signs.	1	Public	
BUILDING INSPECTIONS	BUI 00200	BUILDING PLANS: COMMERCIAL, INDUSTRIAL Includes architectural, design specifications, structural & utility plans.	15, or until superseded with complete set.	Public/Private/Non-public	MS 13.37, Subd. 1b, MS 541.051.
BUILDING INSPECTIONS	BUI 00300	BUILDING PLANS: RESIDENTIAL Includes architectural, design specifications, structural & utility plans.	1 after completion of project.	Public/Private/Non-public	MS 13.37, Subd. 1b.
BUILDING INSPECTIONS	BUI 00400	CERTIFICATE OF OCCUPANCY	Permanent	Public	
BUILDING INSPECTIONS	BUI 00410	CERTIFICATE OF SURVEY Survey of property.	Permanent	Public	
BUILDING INSPECTIONS	BUI 00500	CODE COMPLIANCE INSPECTION Point of conveyance.	Until new ownership	Public	
BUILDING INSPECTIONS	BUI 00600	ELECTRICAL INSPECTION RECORD	Permanent	Public	
BUILDING INSPECTIONS	BUI 00700	FIRE INSPECTION RECORD-ANNUAL Multiple dwelling/commercial.	5 (Per MN State Fire Code 104.6)	Public	
BUILDING INSPECTIONS	BUI 00800	HEATING/ VENTILATION INSPECTION RECORD Includes heating, a/c, ventilating, fireplace.	Permanent	Public	
BUILDING INSPECTIONS	BUI 00900	HOUSING INSPECTION RECORD Change of ownership, point of sale.	6	Public	
BUILDING INSPECTIONS	BUI 01000	INSPECTION NOTICES TO HOMEOWNER, VIOLATOR, ETC. Includes inspection request correction notice, violation notice, referral form, grading site access, special inspections by third party, zoning complaints.	1 after correction unless unusual circumstances occur (i.e. environment)	Public	
BUILDING INSPECTIONS	BUI 01100	INSPECTOR REPORTS Daily, monthly, quarterly.	2	Public	

**GENERAL RECORDS RETENTION SCHEDULE FOR MINNESOTA CITIES**

<i>SECTION</i>	<i>CODE</i>	<i>TITLE &amp; DESCRIPTION</i>	<i>RETENTION PERIOD</i>	<i>CLASSIFICATION</i>	<i>STATUTE</i>
BUILDING INSPECTIONS	BUI 01200	PLUMBING INSPECTION RECORD	Permanent	Public	
BUILDING INSPECTIONS	BUI 01210	RENTAL INSPECTION RECORDS	Until superseded	Public	
BUILDING INSPECTIONS	BUI 01220	SEWER AVAILABILITY REPORT And supplemental documentation submitted to Met Council.	2	Public	
BUILDING INSPECTIONS	BUI 01300	SIGN INSPECTION RECORD	Permanent	Public	
BUILDING INSPECTIONS	BUI 01310	SURCHARGE REPORT Supporting documents - submitted to State.	6	Public	

**GENERAL RECORDS RETENTION SCHEDULE FOR MINNESOTA CITIES**

<i>SECTION</i>	<i>CODE</i>	<i>TITLE &amp; DESCRIPTION</i>	<i>RETENTION PERIOD</i>	<i>CLASSIFICATION</i>	<i>STATUTE</i>
PERMITS/ LICENSES	PER 01300	DOCK LICENSES To use public parks, streams, etc.	2 after expiration	Public	
PERMITS/ LICENSES	PER 01410	ELECTRICAL PERMIT	2 after expiration	Public	
PERMITS/ LICENSES	PER 01600	EXCAVATION/RIGHT-OF-WAY PERMITS Includes land alteration permits.	2 after expiration	Public	
PERMITS/ LICENSES	PER 01700	FIRE EXTINGUISHER SERVICE LICENSE	2 after expiration	Public	
PERMITS/ LICENSES	PER 01800	FIREWORKS PERMIT & LICENSE	2 after expiration	Public	
PERMITS/ LICENSES	PER 01850	FOOD ESTABLISHMENT LICENSE	6 after expiration	Public	
PERMITS/ LICENSES	PER 01900	GAMBLING LICENSES & REPORTS	4 after expiration	Public	MS 349.19, Subd 6.
PERMITS/ LICENSES	PER 01920	GAS FITTERS LICENSE	6 after expiration	Public	
PERMITS/ LICENSES	PER 01930	HEATING, VENTILATION, AIR CONDITIONING PERMIT Mechanical.	2 after expiration	Public	
PERMITS/ LICENSES	PER 02000	HOTEL & MOTEL LICENSES	6 after expiration	Public	
PERMITS/ LICENSES	PER 02020	HUNTING/SHOOTING PERMIT	6 after expiration	Public/Private	MS 13.37
PERMITS/ LICENSES	PER 02050	INSPECTION RECORDS OF LICENSED FACILITIES Restaurants, public pools, etc.	2 after expiration	Public	
PERMITS/ LICENSES	PER 02100	LIQUOR LICENSE Club, wine, beer, Sunday and setup, certificate of insurance, background investigation report, etc.	6 after expiration	Public	MN Rules 7515.0440, Subd. 5.

**GENERAL RECORDS RETENTION SCHEDULE FOR MINNESOTA CITIES**

<i>SECTION</i>	<i>CODE</i>	<i>TITLE &amp; DESCRIPTION</i>	<i>RETENTION PERIOD</i>	<i>CLASSIFICATION</i>	<i>STATUTE</i>
PERMITS/ LICENSES	PER 00100	ANIMAL & PET LICENSES OR PERMITS Rabies, vaccinations, etc.	2 after expiration	Public/private	
PERMITS/ LICENSES	PER 00200	APPLICATIONS - PERMIT DENIED	1	Public/private/non-public	See individual permit/license
PERMITS/ LICENSES	PER 00300	BICYCLE LICENSE OR PERMIT City copy.	2 after expiration	Public/private	
PERMITS/ LICENSES	PER 00400	BILLIARD (POOL HALL) LICENSE	6 after expiration	Public	
PERMITS/ LICENSES	PER 00500	BOWLING ALLEY LICENSE	6 after expiration	Public	
PERMITS/ LICENSES	PER 00600	BUILDING PERMITS - COMMERCIAL Applications, summary data etc.	Permanent	Public/non-public	MS 13.37
PERMITS/ LICENSES	PER 00700	BUILDING PERMITS - RESIDENTIAL Applications, summary data etc.	5 after expiration	Public/non-public	MS 13.37
PERMITS/ LICENSES	PER 00800	BURNING PERMITS - RESIDENTIAL	1 after expiration	Public	
PERMITS/ LICENSES	PER 00900	CARNIVAL LICENSE APPLICATIONS	6 after expiration	Public	
PERMITS/ LICENSES	PER 01000	CIGARETTE/TOBACCO/ETC. LICENSES & APPLICATIONS	6 after expiration	Public	
PERMITS/ LICENSES	PER 01100	CONTRACTOR'S LICENSE For construction trades - includes applications, certificate of insurance, certificate of trade, etc.	6 after expiration	Public	
PERMITS/ LICENSES	PER 01200	DANCE/PARADE/PUBLIC GATHERING PERMITS	2 after expiration	Public	

*Sample*

**SINGLE FAMILY DWELLING PERMIT REQUIREMENTS**

The following information must be submitted to the Building Department before a building permit can be processed and approved.

1. **Building Permit Application Form.**
2. **Survey or Site Plan [two copies].**
3. **Building Plans [two sets].**
4. **Energy Code Compliance Forms.**
5. **Mechanical Code Compliance Forms**
6. **Miscellaneous as required.**

A more detailed description of items 1-6 is listed below. After a preliminary review additional information may be required. Allow \_\_\_\_\_ working days for processing.

**1. Building Permit Application:** Complete and sign a Building Permit Application form. Forms are available at the Department of Building Safety.

**2. Survey or Site Plan:** Provide a site plan of the property showing all property lines, road right of ways, easements, existing buildings [with dimensions] and project address or PIN number. Diagram the proposed building location, dimensions and proposed setbacks from property lines, existing buildings and all topographical features, elevations and drainage. A registered survey may be required when deemed necessary by the department.

**3. Building Plans:**

- **Elevation Drawings** [exterior views], of front, rear and sides of the finished building.
- **Floor Plans** of the basement and each floor showing the dimensions of the house, interior rooms and use of each room [bedroom, bathroom etc.], window and door locations [safety glazing if required], interior walls, header sizes, stairs and plumbing and mechanical equipment.
- **Section Drawings** [side cutaway view] showing the details of the footing, foundation construction with a drainage system, radon system, waterproofing or dampproofing and insulation, floor, wall and roof construction. Provide copies of the floor and roof truss specifications prepared and stamped by a MN licensed engineer [some cities may allow or require them to be provided later at the framing inspection].
- Include plans for decks and garage if applicable.

**3. Energy Code Compliance Form:** Complete an Energy Code Compliance Form to verify compliance with the MN Energy Code, [both the building envelope and mechanical pressurization form are required].

**4. Mechanical Code Compliance Forms:** Provide calculations for combustion air, make-up air and ventilation air.

**5. Miscellaneous:**

**Fireplace:** Masonry fireplaces must be installed and inspected to code, prefabricated fireplaces install per the manufactures installation instructions, provide installation instructions on-site for a rough-in and final inspection.

**General Zoning** requirements must be met, contact a municipal planner for specific requirements, phone: xxx-xxxx. A zoning permit application is required if a variance, conditional use permit or special evaluation is required. Building permits will not be issued until all zoning requirements are approved.

**Permit fees** will be determined after the application and plans have been reviewed. Fees must be paid in full before a permit can be issued or work can begin.

**Electrical wiring** must be inspected and approved by an Electrical Inspector. To obtain a permit call xxx-xxx-xxxx, to request an inspection or to answer electrical questions call: Name: at xxx-xxx-xxxx, call between 7 a.m. and 8:30 a.m., Monday through Friday.

### General Information

**A Certificate of Occupancy** is required before the house can be used or occupied. All the required inspections must be completed and approved including final approval from the State Electrical Inspector.

**Required Inspection: Footings**, after forms and re-enforcing are in place but prior to placement of concrete. **Foundations**, block and wood foundations prior to backfill, cast in place concrete, after the forms and re-enforcing are in place prior to placement of concrete then again prior to backfill. Dampproofing and waterproofing and a perimeter drainage system must be in place for inspection. **Plumbing Rough-in**, after all water piping and waste and vent piping is installed, a 5# air test for 15 minutes is required on the waste and vent piping, **Mechanical Rough-in**, when all ducting, furnace and mechanical equipment is installed [prior to covering]. **Gas Piping**, a 25# air test shall be 1/2 hour, when testing a system in a single family dwelling the test is permitted to be reduced to 10 minutes with prior approval from the building official all piping must be visible. **Fireplaces, Masonry Chimneys and Woodstoves**, for pre-fabricated fireplaces call for inspection when framing is complete, masonry chimneys and fireplaces when setting the throat, woodstoves when set, provide the manufacturers installation instructions on site.

**Framing**, when all the framing is complete and all plumbing , mechanical, and is installed.

**Energy**, when the insulation, vapor retarder and attic ventilation is complete before covering.

**Plumbing manometer** test of the waste and vent piping. **Final** when the house is complete, final electrical inspection is completed and all other inspections have been approved.

**To schedule** an inspection call \_\_\_ **hours** in advance at **xxx-xxx-xxxx**, 8 a.m. to 4:30 p.m., Monday through Friday.

**Excavations**, prior to excavating call Gopher State One, 48 hours in advance at 651-454-0002 or for Greater Minnesota 1-800-252-1166, to verify the location of underground utilities etc.

**Gas and Electric Utilities**, contact your local utility for specific requirements.

If you have any questions, please contact the Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at **xxx-xxx-xxxx**, or write to: **Address , City, State, Zip Code**

*Sample*  
**BUILDING PERMIT REQUIREMENTS  
FOR RESIDENTIAL ADDITIONS AND PORCHES**

The following information must be submitted to the Building Department before a building permit can be processed and approved.

1. **Building Permit Application form.**
2. **Survey or Site Plan [two copies].**
3. **Building Plans [two copies].**
4. **Miscellaneous as required.**

A more detailed description of items 1-4 is listed below. After a preliminary review additional information may be required. Allow \_\_\_\_\_ working days for processing.

**1. Building Permit Application:** Complete a Building Permit Application form. Application forms are available in the Building Department.

**2. Survey or Site Plan:** Provide an updated plan of the property showing the direction north, property lines, road right of ways, easements, existing buildings [with dimensions] and project address or PIN number. Diagram the proposed addition location, dimensions and proposed setbacks from property lines, existing buildings and all topographical features. A registered survey may be required.

**3. Building Plans:**

A. **Elevation Drawings** [exterior views] of front, rear and sides of finished addition. Indicate the height from finished grade to the top of the sidewalls and peak.

B. **Section drawing** [side, cutaway drawing] showing the details of the footings, foundation, floor, wall and roof construction, provide an engineers signed roof truss specifications at the framing inspection.

C. **Floor Plans** of the basement and each floor showing the length and width of the addition, room dimensions and use [bedroom, bathroom etc.], finished and unfinished areas, window and door locations, header sizes, interior walls, stairs and plumbing/heating fixtures.

**Permit Fees:** Building and Zoning fees will be determined after the application and required plans have been approved. Fees must be paid in full before a permit can be issued or work can begin.

### General Information

**\*Required Inspections:**

1. Footings [before concrete is placed].
2. Foundations [before backfill]
3. Plumbing 5# air test.
4. Framing.
5. Fireplace rough-in.
6. Insulation
7. Mechanical rough-in.
8. Plumbing Manometer.
9. Gas Piping [25 # pressure for a minimum 10 minutes ].
10. Final, after the electrical inspector has done a final and all work and inspections are complete.

\*Additional inspections as required

**Inspection Requests:** For all inspections call **xxx-xxx-xxxx** \_\_\_\_\_ hours in advance.

**Gas and Electric Utilities:** Contact your local supplier for specific requirements.

**Electrical:** Must be inspected and approved by an Electrical Inspector. To obtain a permit or request an inspection call: **xxx-xxx-xxxx**. Call between 7 a.m. and 8:30 a.m., Monday through Friday.

**Excavations:** Before excavating call Gopher State One 48 hours in advance at 1-800-252-1166 or 651-454-0002 to verify the location of underground utilities, etc..

If you have any questions, please contact the Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at: **xxx-xxx-xxxx**.

**City Name**  
**Address**  
**City, State, Zip**  
**Phone**

*Sample*  
**DECK PERMIT REQUIREMENTS**

The following information must be submitted to the Building Department before a building permit can be processed and approved. A more detailed description of items 1-4 is listed below.

1. **Building Permit Application form.**
2. **Survey or Site Plan [two copies].**
3. **Building Plans [two copies].**
4. **Miscellaneous as required.**

After a preliminary review additional information may be required. Allow \_\_\_\_\_ working days for processing.

1. **Building Permit Application:** Complete and sign a building permit application form. Forms are available at the Building Department.
2. **Survey or Site Plan:** Provide an updated plan of the property showing all property lines, existing buildings [with dimensions] and project address or PIN number. Diagram the proposed building location, dimensions and proposed setbacks from property lines, existing buildings and all topographical features. a registered survey may be required.
3. **Building Plans [two sets]:**
  - A. **Section drawing** [side, cutaway drawing] showing the footing width and thickness, post size, joist size, beam size, decking, height above grade, guard, cantilevers [overhang], anchoring, flashing, connectors, lateral load connections and hanger types, include grade and species of lumber.
  - B. **Floor Plans** of the deck showing the length and width of the deck, beam location, post spacing, joist spacing, stair location and type of lumber [pressure treated, redwood, cedar etc.].

**4. Miscellaneous:**

**Permit Fees:** Building and Zoning fees will be determined after the application and required plans have been approved. Fees must be paid in full before a permit can be issued or work can begin.

**General Information**

**Required Inspections:**

1. Footing inspection [before concrete is poured].
2. Framing/Final

For all inspections call xxx-xxx-xxxx \_\_\_\_\_ hours in advance.

**Footings/Posts:** Footings must be a minimum \_\_\_\_\_ below final grade. The base of the footing must be wide enough to transfer the weight of the deck to the soil determine minimum footings]. Posts must be pressure treated, redwood, cedar, concrete or other approved material.

**Framing:** The joists and beams must be sized to support a 40# per sq. ft. live load

**Guard:** Residential decks 30" or more above adjacent grade must be protected by a guard with a minimum height of 36". Open guardrails shall have intermediate rails or ornamental pattern such that a 4"[four inch] sphere cannot pass through.

**Stairs/Residential:** The minimum width of a stairway is 36" inches in width. The maximum rise on stairs is 7 3/4". The minimum run of the treads is 10." A handrail is required on all stairs with four or more risers. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch-diameter sphere.

**Handrails:** A handrail is required on one side of a stairs with four or more risers. The handrail must be 34" to 38" high, be continuous and uninterrupted the full length of the stairs. All required handrails shall be one of the following types. **(TYPE 1)** handrail with a circular cross section shall have an outside diameter not be less than 1 1/4 inches or more than 2 inches. If the handrail is not circular it shall have a perimeter dimension of at least 4 inches and not greater than 6 1/4 inches with a maximum cross sectional dimension of 2 1/4 inches.

**(TYPE 2)** Handrails with a perimeter of greater than 6 1/4 inches shall provide a graspable finger recess area on both sides of the profiles. The finger recess shall begin within a distance of 3/4 inch measured vertically from the tallest portion of the profile and the achieved depth of at least 5/16 inch within 7/8 inch below the widest portion of the profile. This required depth shall continue for at least 3/8 to a level that is not less than 1 1/4 inches below the tallest portion of the profile. The maximum width of the handrail above the recess shall be 1 1/4 to a maximum of 2 3/4 inches. Edges shall have a maximum radius of 0.01 inch.

**Special Design Note:** Some designs may not be appropriate if a future porch, addition or hot tub is intended to be installed on the deck. Footings, beams and joists should be sized for all future loads.

**Excavations:** Before excavating call Gopher State One 48 hours in advance at 651-454-0002 or Greater Minnesota; 1-800-252-1166 to verify the location of underground utilities, etc..

If you have any questions, please contact the Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at:

**City Name**  
**Address**  
**City, State, Zip**  
**Phone Number.**

*Sample*  
**BASEMENT OR INTERIOR REMODELING  
PERMIT REQUIREMENTS**

The following information must be submitted to the Building Department before a building permit can be processed and approved. A more detailed description of items 1-3 is listed below.

1. **Permit Application Form.**
2. **Building Plans [two copies].**
3. **Description of work.**

After a preliminary review additional information may be required, allow xxxxxx days for processing.

1. **Permit Application:** Complete a Building Permit Application Form. Application forms are available at the Building Department.
2. **Building Plans [two copies]:** Floor Plan showing length and width of each floor and room dimensions, finished and unfinished areas, interior walls, beams, existing walls. Walls being removed, plumbing and mechanical fixtures and indicate on the floor plan how each area will be used, [bedroom, recreation room etc.].
3. **Description of use:** Provide a detailed written description of the work being done.

**General Information**

**Inspections Required:** Framing, mechanical, plumbing 5# air test and manometer, gas piping air test, insulation, and final [rough-in and final electrical inspection must be completed prior to scheduling a project final].

For all inspections call **xxx-xxx-xxxx**, 24 hours in advance.

**Electrical wiring** must be inspected and approved by a State Electrical Inspector [rough-in and final inspection]. To request an inspection or to answer electrical questions call: Name: Phone:, call between 7AM and 8:30 AM, Monday through Friday.

If you have any questions, please contact the Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at:

**City Name**  
**Address**  
**City, State, Zip**  
**Phone**

*Sample*  
**GARAGE PERMIT REQUIREMENTS**

The following information must be submitted to the building department before a permit can be processed and approved.

A more detailed description of items 1-4 is listed below.

1. **Building Permit Application form.**
2. **Survey or Site Plan [two copies].**
3. **Building Plans [two copies].**
4. **Miscellaneous as required.**

After a preliminary review additional information may be required. Allow \_\_\_\_\_ working days for processing.

1. **Building Permit Application:** Complete a building permit application form. Forms are available at the Department of Building Safety.
2. **Survey or Site Plan:** Provide an updated plan of the property showing all property lines, road right of ways, easements, existing buildings [with dimensions] and project address or PIN number. Diagram the proposed building location, dimensions and proposed setbacks from property lines. A registered survey may be required when deemed necessary.
3. **Building Plans:**
  - A. **Elevation Drawings** [exterior views] of front, rear and sides of finished building. Indicate the height from finished grade to the top of the sidewalls and peak.
  - B. **Section drawing** [side, cutaway drawing] showing the details of the footings, foundation, beam sizes, wall and roof construction.
  - C. **Floor Plans** of the garage floor showing the length and width of the garage, interior walls, plumbing and heating equipment, use of garage [car storage etc.], window/door locations and header sizes.

**4. Miscellaneous:**

**Zoning:** A zoning application may be required if a variance, conditional use permit or special evaluation is required. If the garage is for a use other than accessory storage to a dwelling contact the Building Official for additional requirements.

**Permit Fees:** Building and zoning fees will be determined after the application and required plans have been approved. Fees must be paid in full before a permit can be issued or work can begin.

## General Information

### Inspections Required:

1. Footing inspection [before concrete is poured].
2. Framing.
3. Electrical wiring rough-in and final.
4. Final.
5. Additional inspections may be required if plumbing or mechanical systems are installed.

For all inspections call xxx-xxx-xxxx \_\_\_\_\_ hours in advance.

**Footings:** Detached garages may be placed on an approved floating slab.

**Firewall:** Garages attached to dwellings require a fire separation on the garage side of the common wall. The separation is required from the floor to the roof sheathing and common soffits. The separation material is typically one layer of ½" gypsum board [or equivalent]. If the firewall terminates at the ceiling, the ceiling shall have gypsum board installed and the walls supporting the ceiling shall have gypsum board applied. The doors or openings in the wall must be 1 3/8" solid wood or have a 20-minute fire label.

**Electrical Wiring** must be inspected and approved by an Electrical Inspector. To obtain a permit call xxx-xxx-xxxx, to request an inspection call xxx-xxxx between 7 a.m. and 8:30 a.m., Monday through Friday.

**Excavations:** Before excavating call Gopher State One 48 hours in advance at 651-454-0002, Greater Minnesota call 1-800-252-1166 to verify the location of underground utilities, etc.

If you have any questions, please contact the Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at: Address/Phone

*Sample*  
**POLE BUILDING REQUIREMENTS**

The following information must be submitted to the building department before a building permit can be processed and approved. If the building is for **agricultural use**, by definition, a building permit is not required but a zoning permit may be required. A more detailed description of items 1-5 is listed below.

1. **Permit Application form.**
2. **Survey or Site Plan [two copies].**
3. **Building Plans [two copies].**
4. **Roof Truss Specifications [two copies].**  
**\*Miscellaneous as required.**

After a preliminary review additional information may be required. Allow \_\_\_\_\_ days for processing.

1. **Permit Application:** Complete and sign a building permit application. Forms are available at the building department.
2. **Survey or Site Plan:** Provide an updated plan of the property showing the direction north, all property lines, road right of ways, easements, existing buildings [with dimensions], and proposed building location, dimensions and proposed setbacks.
3. **Building Plans:**

**Section drawing** [side, cutaway drawing] showing the footing width, thickness, and depth below grade, anti-wind lift for the pole, pole dimensions, wall construction, wind bracing, roof framing, purlin and girt spacing and grade of lumber, truss bracing and connection, and roof covering material.

**Floor Plan** showing length/width of building, post spacing, window/door locations, header sizes, interior. Include on the floor plan a written description of the use of all areas of the building.

**Elevation Drawings** of front, rear and sides of finished building. Include sidewall height and height to peak from grade.

4. **Roof truss specifications:** Provide two copies of the manufacturers roof truss design [signed by a licensed engineer] showing the truss span, spacing, design snow load, dead loads, required bracing and spacing and grade of lumber for roof purlins. Check with the local building official before ordering trusses to determine the required snow load for the proposed use of the building.

## General Information

### \*Required Inspections:

1. Footings [before concrete is placed]
  2. Framing inspection.
  3. Final inspection
- \*Additional inspections as needed.

For all inspections call **xxx-xxx-xxxx** ,\_\_\_\_hours in advance.

**Electrical:** Must be inspected and approved by an Electrical Inspector. To obtain a permit or request an inspection call: Name\_\_\_\_\_Phone\_\_\_\_\_call between 7 a.m. and 8:30 a.m., Monday through Friday.

**Excavations:** Before excavating, call Gopher State One at 1-800-252-1166 or 651-454-0002 to verify the location of underground utilities, etc..

**Permitted Use:** Typically pole buildings are permitted for residential accessory buildings. *If the pole building is for a business, commercial, agricultural or mixed use, contact the building department for additional requirements. If the buildings use changes in the future, the Building Official and the planning department must approve the use ; additionally it must comply with all applicable ordinances and building codes.*

If you have any questions, please contact the Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at **xxx-xxx-xxxx** or write to

**City Name**  
**Address**  
**City, State, Zip**  
**Phone**

*Sample*  
**BUSINESS/COMMERCIAL/INDUSTRIAL  
BUILDING PERMIT HANDOUT**

The following information must be submitted to the building department before a building permit can be processed and approved.

1. **Building Permit Application Form.**
2. **Survey or Site Plan [two copies].**
3. **Building Plans [two copies].**
4. **Miscellaneous as required.**

A more detailed description of items 1-4 is listed below. After a preliminary review additional information may be required, allow \_\_\_\_\_ working days for processing.

1. **Building Permit Application:** Complete and sign a building permit application form. Forms are available at the department of building safety.
2. **Survey or Site Plan:** Provide an accurate, detailed site plan of the property showing all property lines, road rights of ways, easements, existing buildings [include dimensions] and the address of the property or PIN number. Diagram the proposed building location, dimensions and proposed setbacks from property lines, existing buildings and all topographical features. A registered land survey may be required.
3. **Building Plans:** Some business/commercial/industrial use structures may be required by the building official and/or state statute to be prepared by and signed by a MN Licensed Architect, Structural Engineer and Mechanical Engineer. Contact the Building Official to determine if your building requires these design professionals.
  - A. **Elevation Drawings** [exterior views], of front, rear and sides of the finished building.
  - B. **Floor Plans** of the basement and each floor showing the dimensions of the building, interior rooms and use of each room, window and door locations, interior walls, header sizes, stairs and plumbing and mechanical equipment.
  - C. **Section Drawings** [side cutaway view] showing the details of the footing, foundation construction with dampproofing and insulation, floor, wall and roof construction.
  - D. **Plumbing Plans** must be submitted to and approved by the MN Department of Health, Plumbing Division. Provide the Health Departments letter of approval and two sets of plumbing plans to the city.
  - E. **Mechanical Plans**, specifications and energy code calculations.
  - F. **Project specifications**, copy of the project specifications.

#### 4. **Miscellaneous:**

**Pre-Construction Meeting:** A meeting with the city staff should be scheduled to determine if the proposed use is permitted by the zoning, building and municipal ordinances.

**\*Special Inspections:** IBC Chapter 17 requires the owner, architect or engineer of record to indicate what special inspections are required [if any] and who will be performing the special inspections, subject to the approval of the building official.

**General Zoning:** Check with the jurisdiction to determine if a variance, conditional use permit or special evaluation is required.

**Permit fees** will be determined after the application and plans have been reviewed. Fees must be paid in full before a permit can be issued or construction can begin.

**Electrical wiring** must be inspected and approved by an electrical inspector. To request an inspection or to answer electrical questions call: Name: \_\_\_\_\_ Phone: \_\_\_\_\_, call between 7 a.m. and 8:30 a.m., Monday through Friday.

### **General Information**

**A Certificate of Occupancy** is required before the structure can be occupied. All the required building inspections must be completed and approved, the septic system installed and inspected and final approval received from the State Electrical Inspector.

#### **\*\*Required Inspections:**

1. **Footings**, after forms are in place but prior to placement of concrete, gravel or sand.
2. **Foundations**, prior to backfilling and as deemed necessary by the Building Official and design professionals.
3. **Plumbing 5# Air Test** of all waste and vent piping prior to covering, contact the MN Department of Health and then the local building Official with inspection requests.
4. **Fireplaces and Masonry Chimneys Rough-In**, for pre-fabricated when framing is complete, for masonry fireplaces when the throat is set, masonry chimneys when starting.
5. **Mechanical Rough-in** when complete, prior to covering.
6. **Gas Piping** must hold 25# of air for 1/2 hour, all piping and fittings must be exposed for inspection
7. **Framing/Structural** when all the framing is complete.
8. **Insulation** when the insulation, vapor barrier, firestopping and draftstopping is in place.
9. **Plumbing Manometer Test** of all the waste and vent piping after all fixtures are set, contact the State Health Department for inspection requests then the local Building Official.
10. **Special Inspections** of soils, concrete, welding, bolting, fire resistive construction and similar components. The Building Official, Architect and Engineer of record shall indicate what special inspections are required. An inspector approved by the Building Official must perform the special inspections and file copies of all reports with the Building Official.

\*\* Depending on the project inspection of exterior and interior wall finish, fire suppression systems, alarms, elevators, firestopping etc.

5. **Final** when the structure is complete and the required inspections have been approved..

**To schedule** an inspection call \_\_\_\_\_ **hours** in advance at **xxx-xxx-xxxx**, 8 a.m. to 4:30 p.m., Monday through Friday.

**Excavations:** Prior to excavating call Gopher State One, 48 hours in advance at 651-454-0002 or 1-800-252-1166 to verify the location of underground utilities etc.

**Gas and Electric Utilities:** Contact your local utility for specific requirements.

If you have any questions, please contact the City Building Department, Monday through Friday, 8 a.m. to 4:30 p.m. at **xxx-xxx-xxxx**.

**City Name**  
**Address**  
**City, State, Zip**  
**Phone**



The following is a portion of the statutes that regulate excavations in Minnesota. Municipalities should contact Gopher State One Call to obtain copies of the display and informational handouts that are required to be displayed. Metro area call: 651.454.0002, Greater Minnesota: 1.800.252.1166 or visit their web site at: [www.gopherstateonecall.org](http://www.gopherstateonecall.org)

**216D.02 Notice to excavator or operator.**

Subdivision 1. Display and distribution. Local governmental units that issue permits for an activity involving excavation must continuously display an excavator's and operator's notice at the location where permits are applied for and obtained. An excavator and operator's notice and a copy of sections 216D.03 to 216D.07 must be furnished to each person obtaining a permit for excavation.

Subd. 2. Form. The notification center shall prescribe an excavator and operator's notice. The notice must inform excavators and operators of their obligations to comply with sections 216D.03 to 216D.07. The center shall furnish to local governmental units:

- (1) a copy of the notice and sections 216D.03 to 216D.07 in a form suitable for photocopying;
- (2) a copy of the display and distribution requirements under subdivision 1; and
- (3) the telephone number and mailing address of the notification center.

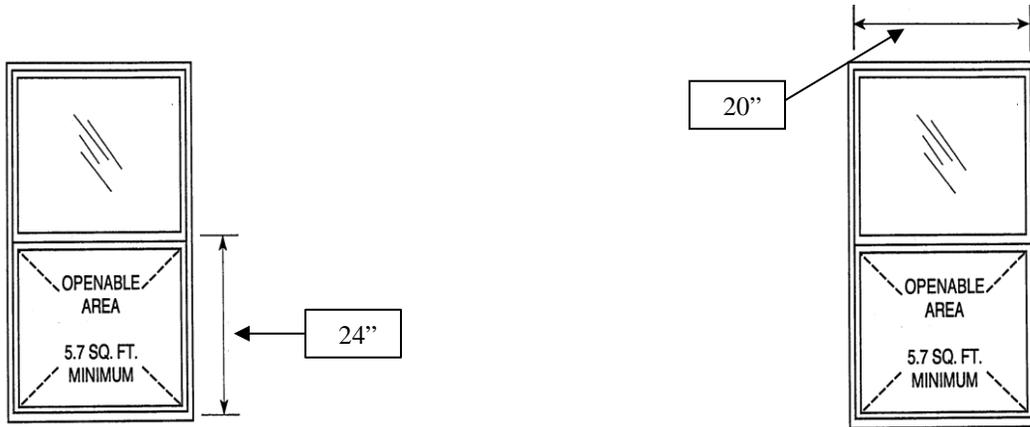
HIST: 1987 c 353 s 8

Copyright 2001 by the Office of Revisor of Statutes, State of Minnesota.

### Emergency Escape and Rescue Openings

All emergency escape and rescue openings shall have a:

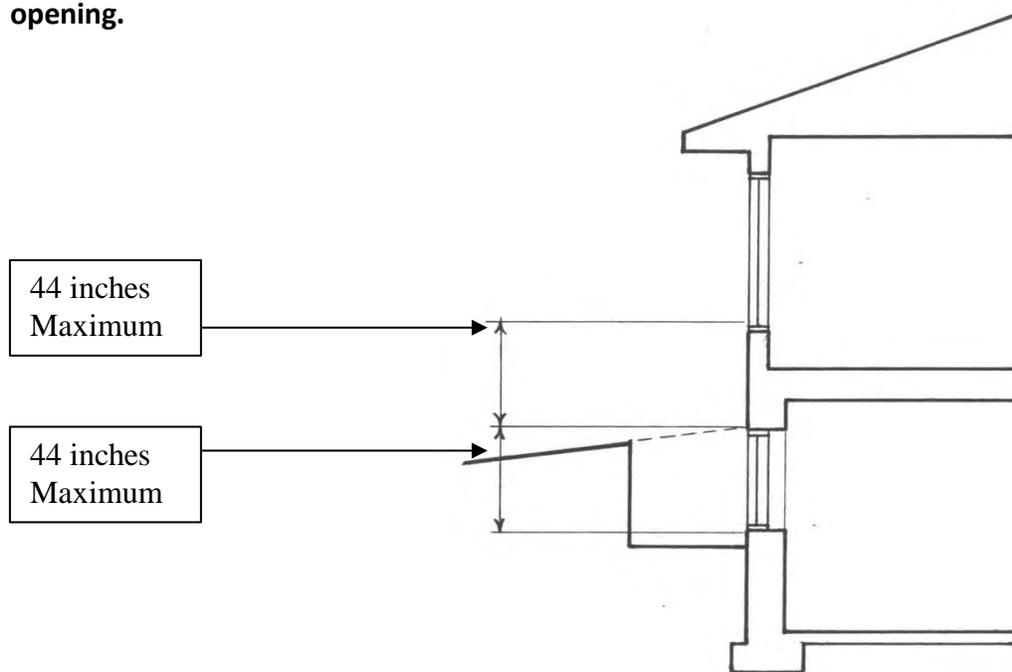
- minimum net clear opening of **5.7 square feet**.
- minimum net clear opening height shall be **24 inches**
- minimum net clear opening width shall be **20 inches**.



(Installations after March 31, 2003)

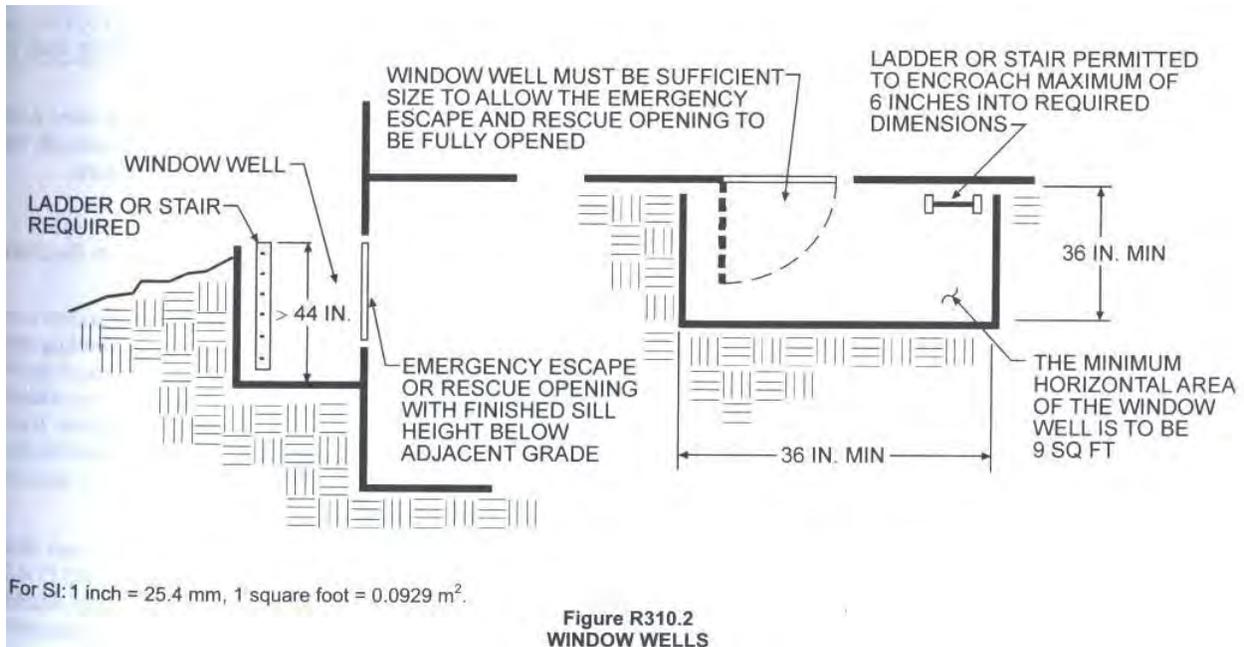
Exception: Grade floor openings shall have a minimum net clear opening of 5 square feet.

Grade floor opening is a window or other opening located such that the sill height of the opening is not more than 44 inch adjacent to the opening.

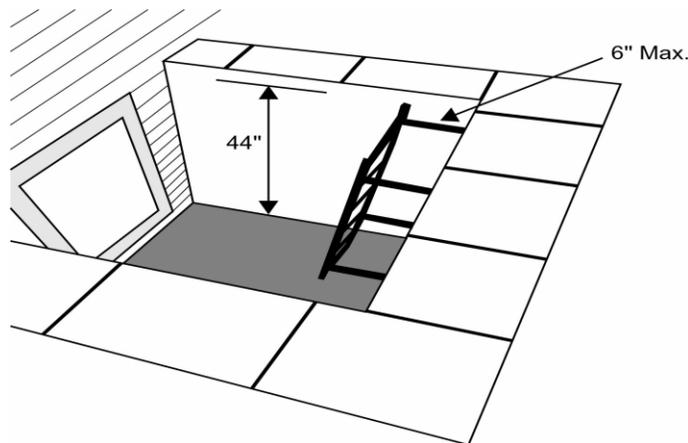


## Emergency Escape and Rescue Openings Window Wells

Window wells required for emergency escape and rescue shall have horizontal dimensions that allow the door or window of the emergency escape and rescue opening to be fully opened. The horizontal dimensions of the window well shall provide a minimum net clear area of 9 square feet with a minimum horizontal projection and width of 36 inches.



Window wells with a vertical depth greater than 44 inches shall be equipped with a **permanently affixed ladder or steps** usable with the window in the fully open position. The ladder or stairs...shall be permitted to encroach a maximum of 6 inches.



## **Elevator Installations and Alterations**

A person, firm, or corporation that seeks to install or alter an elevator shall first obtain a permit from the department, or with a municipality that is authorized by law to issue a permit, before beginning installation, or alteration. An application for a permit must be submitted on forms from the department or an authorized municipality. Plans and specifications describing the permitted work must be submitted with the application for a permit. A permit will be issued to the applicant when the plans and specifications have been approved and the appropriate permit fees have been paid. A permit issued by the department becomes invalid if the work has not started within 180 days after issuance or if the work is suspended or abandoned for more than 180 days after the work has commenced.

The department's fees for a permit to install or alter an elevator are:

- A. A permit fee to install or alter an elevator is \$100, and \$500 if work that requires a permit is begun without a permit.
- B. Inspection fees for installation and alteration of permitted elevator work are 1-1/2 percent of the total cost of the project permitted work for labor and materials including related electrical and mechanical equipment. The cost of special decorative fixtures in the permitted work may be deducted from the cost of the permitted elevator work up to a maximum of five percent of the total cost of the permitted work upon approval of the commissioner.
- C. An elevator that passes department inspection will be issued an operating permit by the department. Renewal of the operating permit is required on an annual basis except in private residential applications.
- D. Vertical reciprocating conveyors, (American Society of Mechanical Engineers/American National Standards Institute Standard B20.1) are subject to filing and inspection fees for new and altered installations but are exempt from routine inspection by an elevator inspector.

## **Elevator Complaints Procedure**

1. Any person may make a complaint.
2. Complaints received in person or by telephone must be documented on a complaint form provided by this department.
3. All complaints will be investigated. Investigation may be by on-site inspection, correspondence or by telephone. Assignment of investigations of complaints will be made by the supervisor of the elevator safety section.
4. The purpose of the investigation of a complaint is to resolve safety issues before someone gets hurt. Investigations will be limited to safety issues.
5. Whenever feasible the property owner or manager will be notified in advance that an investigation regarding a safety complaint has been initiated and, where an on-site inspection is required, the owner or manager will be invited to accompany the inspector on the investigation. Where notification is not immediately possible, the owner/manager will be notified within one working day of the investigation of the action taken by the department and the basis for the action. Notification will include specific details.
6. The owner or manager will be provided with the opportunity to discuss any aspect of a complaint, or the resultant investigation with the state elevator inspector.
7. Questions or concerns regarding complaints should be referred to the state elevator inspector.
8. Pursuant to the Data Practices Act (Minnesota Statutes Chapter 13) investigation reports are private until the investigation is complete and the file is closed. Only the state elevator inspector, the state building inspector or the commissioner may close a file.
9. "Private" means that the person or firm who is the subject of the complaint may see the file, but others may not. Complaints are confidential and may not be given to the subject of the complaint.
10. Those filing complaints do not have to agree to reveal to others their identity, but they should be notified that if the matter goes to court, their name may become known to all others.

## Wheelchair Lift Information

- 1. What is an Inclined or Vertical Wheelchair Platform Lift?** These are devices that are designed for providing those in wheelchairs, or persons with other mobility impairments, with a way of getting from one level in a building to another. These are not traditional elevators with enclosed cabs operating in an enclosed hoistway (shaft). Travel is limited to open areas such as atriums.
- 2. How Are They Different From a Traditional Elevator?** An inclined wheelchair platform lift goes up on an angle, usually from one floor to the next. A vertical wheelchair platform lift runs vertically from one level to another to a maximum vertical travel of 14 feet. Both types of units are limited to a maximum capacity of 750 pounds and no more than 18 square feet of net floor space. Equipment that exceeds these limits are required to meet more stringent safety standards.
- 3. Why the Limitations?** These units are not designed with the same safety systems that are required for a traditional elevator. They are not designed to handle freight, furniture, office supplies or other non-pedestrian uses.
- 4. Do They Meet All National and State Codes?** This type of equipment requires a permit for installation and will be reviewed and inspected to assure all code requirements are met.
- 5. Do Inclined and Vertical Wheelchair Platform Lifts Meet Accessibility Requirements?** Inclined and vertical wheelchair platform lifts are usually not allowed in new construction where an accessible route is required. However, accessibility is not always required. The local building official can help you determine whether accessibility is required. An inclined or vertical wheelchair platform lift is allowed in limited cases and where access is not required in new construction. Inclined and vertical wheelchair platform lifts are allowed in alterations to existing buildings.
- 6. Do Inclined Stairway Chairlifts Meet Code Requirements in Minnesota?** Inclined stairway chairlifts provide a more limited means of access than wheelchair platform lifts. Inclined stairway chairlifts are allowed for private residence use only, or within individual dwelling units.
- 7. Can a Vertical Wheelchair Lift Have Both Hoistway Doors on the Same Side?** The most efficient and effective traffic pattern is in one end and out the other. When a wheelchair must back in or back out, options and add-ons are available for the standard wheelchair platform lift that may address the issue. Contact the enforcing authority for additional information.
- 8. Could We Install a Small Elevator?** Limited use, limited application elevators (LULA's) are typically installed in existing buildings. These elevators are limited by capacity, speed, and rise.

- 9. Are Restricted or Limited-Use Elevators Less Expensive Than Conventional Elevators?**  
Usually. Because of smaller platform size and limited travel, restricted/limited-use elevators are normally less expensive both for the elevator and construction cost. However, add-ons and options should be considered carefully.
- 10. Who Can Help Us Decide What Equipment Will Fit Our Needs and Answer Questions to Assure Our Needs Will Be Met?** State elevator inspection personnel, city elevator inspection personnel (St. Paul and Minneapolis), equipment vendors, and accessibility advocates. City building inspectors and local fire marshals can provide guidance on accessibility and safe entry and exit requirements, as well as building construction issues.
- 11. What Permits and Inspections Will We Need to Install This Equipment?** Most likely you will need building, electrical and elevator installation permits. Each of these will require a separate permit and inspection fee, inspection by the relevant agency, and review of plans and drawings.
- 12. Who Inspects This Equipment?** The cities of St. Paul and Minneapolis inspect elevators in their jurisdiction. The State of Minnesota, through the Building Codes and Standards Division, Elevator Safety Section, inspects elevators and related equipment in all other areas of the state.
- 13. Are Churches and Private Organizations Exempt From This Inspection?** No. Contact the enforcing authority for additional information.
- 14. Who Can I Call if I Have a Problem, Need to Get a Referral to the Proper Organization, or if I Get Conflicting Information?**

**Enforcing Authority:**

Minneapolis - Minneapolis Elevator Inspections. The number is (612) 673-5839

St. Paul - Building Inspections of St. Paul. The number is (651) 266-9010

All other areas - Elevator Safety Section, Building Codes and Standards Division.  
The number is (651) 284-5071

# Statutes

## RESIDENTIAL CONTRACTORS AND REMODELERS

Effective December 1, 2007

### MINNESOTA RESIDENTIAL BUILDING CONTRACTOR AND RESIDENTIAL REMODELER LICENSING REQUIREMENTS

### MINNESOTA RESIDENTIAL BUILDING CONTRACTOR AND RESIDENTIAL REMODELER LICENSING REQUIREMENTS

### RESIDENTIAL ROOFER LICENSING REQUIREMENTS

**Where are the laws that govern residential building contractors?**

Below are the links to the licensing statutes.

[Licensing laws](#) (PDF)

[Enforcement](#) (PDF)

[Statutory warranty](#)

[Contractor registration](#)

[Worker classification](#)

[Prohibition against rebating insurance deductibles](#)

[Rules](#)

## MINNESOTA DEPARTMENT OF LABOR AND INDUSTRY

### BUILDING CONTRACTOR COMPLAINT FILING PROCESS

#### Who can I contact with questions about a contractor, remodeler, or roofer?

To get information on the complaint filing process, check a contractor's enforcement record, or ask general questions regarding the licensing program:

Construction Codes and Licensing Division

Tel: (651) 284-5065

Web site: [www.doli.state.mn.us](http://www.doli.state.mn.us)

E-mail: [DLI.contractor@state.mn.us](mailto:DLI.contractor@state.mn.us)

#### Who can file a complaint?

- Consumers
- Building Officials/Inspectors
- Licensees
- Industry Representatives
- Attorneys
- Law Enforcement Agencies
- Any person who has a complaint against someone regulated by the Department

#### How do I file a complaint?

- Complaints must be filed in writing.
- A downloadable complaint form can be found on our Web site at: [www.doli.state.mn.us](http://www.doli.state.mn.us)
- Complaint must clearly identify the problem.
- Complaining party must attach copies of contracts, canceled checks or any pertinent documents or evidence to support the complaint.

#### Where do I file the written complaint?

Minnesota Department of Labor and Industry  
Residential Building Contractors  
443 Lafayette Road N.  
St. Paul, Minnesota 55155-4344

#### What happens once a complaint is filed?

- Investigative file is opened and assigned to an investigator.
- Complaint is logged into computer system and maintained indefinitely.
- Investigator receives and reviews file.

- **Licensee is sent copy of complaint** and licensee must provide written response to investigator (usually within 15 days).
- Response from licensee is reviewed and investigator determines if additional information is necessary. Response of licensee may be sent to complaining party for comment and review.
- Once all available facts are gathered, investigator makes a determination if there is sufficient evidence of a violation of the law.
- If insufficient evidence is available to prove a violation, the file is closed. The complaining party and licensee are notified in writing of the conclusion of the investigation.
- If a violation of law has occurred, the investigator prepares an investigative memorandum detailing the investigation and recommends the appropriate administrative disciplinary action.
- If action is taken, the investigator notifies the complaining party, in writing, of the action taken.

### **What type of authority does the Department have to obtain information during an investigation?**

The Department is authorized under Minn. Stat. § 45.027 to obtain information through several methods:

- Conduct investigations within and outside of Minnesota.
- Request written statements, sworn or unsworn.
- Examine records: the Department has free access to all types of records and files of licensed or unlicensed persons and entities.
- Issue Orders to Appear or Orders for Report of Sales or transactions.
- Compel production of evidence by issuing subpoenas or requiring sworn statements.

### **What type of action can the Department take against a licensee?**

- Deny a license applicant
- Issue Cease and Desist Orders (for unlicensed activity)
- Censure a licensee
- Suspend a license
- Revoke a license
- Issue a Statement of Charges
- Impose fines or penalties (up to \$10,000 per violation)
- Refer cases for criminal prosecution (i.e., unlicensed activity is a misdemeanor, or gross misdemeanor if the unlicensed activity is in violation of an Order of the Commissioner)

### **How can a licensee resolve a disciplinary action recommended by the Department?**

If the Department recommends a disciplinary action, the licensee can:

- A. Enter into a Consent Order: A written agreement voluntarily entered into by the licensee and the Department, in which the licensee agrees to the terms of the action; or

- B. Request a Hearing: If a hearing is requested, the file is forwarded to the Attorney General's Office and a Statement of Charges is issued and a hearing is scheduled. At the Hearing the licensee has the right to be represented by legal counsel and the Department and the licensee present their case to an Administrative Law Judge (ALJ).

After the Hearing, (usually within 30 days) the ALJ issues a report indicating whether or not the Department met its burden of proof.

The licensee is notified of the ALJ's report and has 10 days to file exceptions.

The Commissioner has the final decision making authority regarding appropriate sanctions.

Licensee has right to appeal final decision to the Court of Appeals.

**What violations result in administrative disciplinary action against a licensee or unlicensed person?**

The Department is authorized to take a disciplinary action if the licensee or license applicant has:

- filed an application for a license which is false or misleading.
- engaged in fraudulent, deceptive or dishonest practice.
- is permanently or temporarily enjoined by the Court from engaging in or continuing in any aspect of their business.
- failed to reasonably supervise employees, agents, subcontractors, or salespersons, or performed negligently or in breach of contract.
- failed to comply with any provision of the licensing law.
- been shown to be incompetent, untrustworthy or financially irresponsible.
- been convicted of a violation of the state building code, or, if the work was performed in a non-code area, refused to correct a violation of the state building code as certified by a structural engineer licensed by the State of Minnesota.
- misused or converted client funds or failed to use the proceeds of any payment for the payment of labor, skill, material, and machinery contributed to the construction or improvement.
- forged lien waivers or has failed to furnish valid lien waivers to the person making payment.
- engaged in conduct which was the basis for a recovery fund payment and the payment has not been reimbursed.
- engaged in bad faith, unreasonable delays, or frivolous claims in defense of a civil lawsuit.
- has had a judgment entered against them for failure to make payments to employees or subcontractors, and all appeals of the judgment have been exhausted or the period for appeal has expired.
- if unlicensed, obtaining a building permit by the fraudulent use of a fictitious license number or the license number of another, or, if licensed, has knowingly allowed an unlicensed person to use the licensee's license number for the purpose of fraudulently obtaining a building permit.

# Minnesota State Contractor License Law

## Notice to Homeowners: Be Sure Your Contractor is Licensed

### Know Your Rights

The State of Minnesota recently adopted a statewide “*Contractor and Remodeler License Law*.” This law is designed to protect the consumer by requiring that contractors be licensed with the State. Contractors must apply to the State, post a bond, and show proof of insurance and competency. The law gives homeowners reasonable assurance that they are dealing with a reputable, professional contractor, and a place they can call to get general contractor information.

### Getting Information on a Contractor

Contractors, with a few exceptions, who contract with a homeowner to perform home construction, remodeling, or repair, must be licensed with the Minnesota Department of Labor and Industry. Homeowners can call the Department Licensing Division at 1-800-DIAL-DLI, 651-284-5069 or visit the web site @ <http://www.dli.mn.gov> to obtain information on a specific contractor. Contractors must display their license number on their advertising and they must make it available to consumers. Building permits cannot be granted to contractors who are not properly licensed by the state.

### Exceptions to Being Licensed

State law exempts contractors who have gross annual receipts from the construction business of less than \$15,000.00. Also exempt are specialty contractors who perform only one specialty skill.

### Homeowner Rights if a Contractor is Not Licensed

If your contractor is required to be licensed by the State of Minnesota and you find that he/she is not, you may still have recourse under the law. Generally, the law provides that a contractor who is working in violation of the Minnesota State License Law has no lien rights and may not be able to enforce a contract signed with a homeowner. If you find yourself in this situation, you should consult with an attorney to get sound legal advice. You should never knowingly hire someone who is deliberately violating the State License Law.

### Working on Your Own Home

You can obtain permits to do work on your own home. The License Law was written to insure a reasonable degree of protection for you as the consumer of construction services, not to discourage homeowners from doing work on their own property. For your safety, building permits are required for most construction projects.

For more information on State Licensing, contact the  
Minnesota Department of Labor and Industry at 800/DIAL-DLI or 651/284-5069

**NOTE:** The use of this form is optional. *Its use is not required by MN Law or Rule.*

Permit Number: \_\_\_\_\_

Parcel Number: \_\_\_\_\_

## **Property Owner Waiver**

### **Minnesota State Contractor Licensing Requirements**

*The purpose of this form is to have property owners acknowledge their responsibilities to the Minnesota State Building Code, to Zoning Ordinances, and to other applicable rules and regulations when they are acting as general contractor in building projects.*

I understand that the State of Minnesota requires that all Residential Building Contractors, Remodelers, and Roofers, obtain a State License unless they qualify for a specific exemption from the licensing requirements. By signing this waiver, I attest to the fact that I am building or improving my property by myself. I claim to be exempt from the State License requirements because I am not in the business of building on speculation or for resale and this is the first residential structure that I have built or improved in the past 24 months.

I acknowledge that because I do not have a State License, I forfeit any mechanic's lien rights to which I may otherwise have been entitled under Minnesota State Statute 514.01.

I acknowledge that I may be hiring independent contractors to perform certain aspects of the construction or improvement of this property. Some of these contractors may be required to be licensed by the State of Minnesota. I understand that unlicensed residential contracting, remodeling, and/or roofing activity is a misdemeanor under Minnesota State Statute 326.92, subdivision 1, and that I forfeit my rights to reimbursement from the Contractor's Recovery Fund in the event that any contractors that I hire are unlicensed.

I also acknowledge that as the contractor on this project, I am solely and personally responsible for any violations of the State Building Code and/or jurisdictional Ordinance in connection with the work performed on this property.

\_\_\_\_\_  
Signature or Property Owner

\_\_\_\_\_  
Project Address

\_\_\_\_\_  
Date

**Please return this signed waiver with the Building Permit Application.**

To determine whether a particular contractor is required to be licensed, or to check on the licensing status of an individual contractor, call the Minnesota Department of Labor and Industry, Licensing Division at 651/284-5065, or toll-free at 1-800/ DIAL-DLI (342-5354).

## Licensing, Bond and Insurance

### Minnesota Statutes 326B.41 to 326B.59

#### Licensing, Bond and Insurance

**Subdivision 1: Plumbers must be licensed in certain cities; master and journeyman plumbers; plumbing on one's own premises; rules for examination.** In any city now or hereafter having 5,000 or more population, according to the last federal census, and having a system of waterworks or sewerage, no person, firm, or corporation shall engage in or work at the business of a master plumber or journeyman plumber unless licensed to do so by the state commissioner of health. Anyone not so licensed may do plumbing work which complies with the provisions of the minimum standard prescribed by the state commissioner of health on premises or that part of premises owned and actually occupied by the work as a residence, unless otherwise forbidden to do so by a local ordinance.

The department of health shall prescribe rules, not inconsistent herewith, for the examination and licensing of plumbers.

**Subdivision 2: Bond; insurance.** Any person contracting to do plumbing work must give bond to the state in the amount of \$25,000 for all work entered into within the state. The bond shall be for the benefit of persons injured or suffering financial loss by reason of failure to comply with the requirements of the Plumbing Code.

#### Water Conditioning

**MPC 4715.5000 Scope and Applicability:** Parts 4715.5000 to 4715.6000 prescribe minimum standards and procedures for all water conditioning installations and servicing in single-family dwellings. Any person who installs or services water conditioning equipment, whether or not such person is licensed pursuant to Minnesota Statutes 1978, Sections 328.57 to 328.66, must comply with the applicable provisions of the current version of the Minnesota Plumbing Code, Parts 4715.500 to 4715.6000.

#### Minnesota Statutes , Chapters 326:

**326.58 Local regulations:** Any city or town with a population of 5000 or more persons may, by ordinance, adopt local regulations providing for water conditioning permits, bonds, approval of plans, and inspections of water conditioning installations and servicing, which regulations shall not be in conflict with the water conditioning standards on the same subject prescribed by the state commissioner of health.

**326.60 Licensing in certain cities:** In any city or town now or hereafter having a population of 5,000 or more according to the last federal census, no person, firm, or corporation shall engage in or work at the business of water conditioning installation or servicing after January 1, 1970, unless (a) at all times a person licensed as a water conditioning contractor by the state commissioner of health shall be responsible for the proper water conditioning installation and servicing work of such person, firm, or corporation, and (b) all installations, other than

exchange of portable equipment, are actually made by a licensed water conditioning contractor or licensed water conditioning installer.

**326.65 State license:** The provisions of Section 326.57 to 326.65 which require the obtaining of licenses to engage in the work or business of water conditioning installation, and the provisions which provide for the examination of applicants for such licenses, shall only apply to cities and towns having a population of 5,000 or more and shall not apply to master plumbers and journeyman plumbers licensed under the provisions of Sections 326.37 to 326.45.

## **Plumbing Plan Review and Inspection Unit Effects of 2007 Legislation – Plumbing**

The 2007 Minnesota Legislature passed legislation that has significant impact on the plumbing industry in Minnesota. In part, this legislation has the following effects.

### **Plumber license required statewide**

Beginning December 1, 2007, all people – statewide – working at the business of plumbing must be licensed plumbers or registered apprentices. The one exception is those people who install sewer or water service pipes outside buildings who are certified with pipe laying training and have a \$25,000 plumbing code compliance bond filed with the Department of Labor and Industry.

**New “restricted” license** established for cities with less than 5,000 population and rural areas. People with restricted licenses may perform plumbing everywhere in the state except in cities with a population of more than 5,000.

Unlicensed people with two or more years experience have until December 31, 2007, to obtain a “restricted” license if they qualify and apply as described below.

### **Application requirements for restricted licenses**

Two years of experience is required for restricted journeyman plumber license.

Four years of experience is required for restricted master plumber license.

Applicants who are plumbing contractors must have been in compliance with plumbing code compliance bond requirements for contractor experience to count.

Applicants who are or have been registered plumber apprentices also can apply.

An application form must be submitted by December 31, 2007 with:

- a \$30 application fee;
- evidence of workers’ compensation insurance (if applicant has any employees); and
- proof of liability insurance (if applicant will be a plumbing contractor).

Annual license fees are the same as for master and journeyman (\$120 and \$55, respectively).

Visit [www.doli.state.mn.us/pdf/pe\\_restricted\\_plumbing\\_licenses.pdf](http://www.doli.state.mn.us/pdf/pe_restricted_plumbing_licenses.pdf) for more information.

### **Plumbing work and Plan Review – legislative changes**

Owners of public, commercial and licensed facilities will no longer be able to do plumbing in their facilities in areas of less than 5,000 population unless licensed to perform plumbing. Plans for installation of plumbing in these facilities must be prepared by a licensed engineer, or the licensed plumber who will do the installation. This is the same as currently required in cities of 5,000 or more. See above for description of new restricted licenses. All submitted plans must include the signature and license number of the designer.

## **Plumbing Board**

A state Plumbing Board was established consisting of:

- industry and licensed individuals;
- one public member; and
- commissioners of the Department of Labor and Industry (voting) and the Department of Health (nonvoting) or their designee.

The Plumbing Board has authority to adopt:

- plumbing code;
- licensing and apprentice registration criteria; and
- license reciprocity agreements.

A two-thirds majority of members is needed for approval of code amendments.

The commissioner of the Department of Labor and Industry retains authority for licensing activities, enforcement of rules and laws, and inspections.

The Plumbing Board has final interpretive authority of rules about written requests to the board.

## **Bonds**

Registering a bond with the state is the only option for complying with plumbing code compliance bond and insurance requirements (the option to post bond with local government was removed).

Effective date: Dec, 1, 2007.

## **Apprentices**

The changes require unlicensed individuals to be registered with the department as apprentices. Apprentices are required to be directly supervised.

Effective date: July t , 2007.

## **Water conditioning**

Registering a bond with the state is the only option for complying with plumbing code compliance bond and insurance requirements (the option to post bond with local government was removed).

## **Various changes effective Dec. 1, 2007**

The legislation establishes reciprocity language.

It voids any sales contract provision for plumbing equipment or supplies that would waive a provision of this act or if the provision stipulates the contract is subject to the laws of another state.

The legislation establishes in law Plumbing Plan Review Agreements with Municipalities that wish to perform plan review services.

It prohibits air admittance valves and water-free urinals.

**Other changes**

Starting in 2008, license numbers for master and journeyman will change under the new license program.

For more information, visit [www.doli.state.mn.us/plumbing.html](http://www.doli.state.mn.us/plumbing.html) or call the Plumbing Plan Review and Inspection unit's general phone line at (651) 284-5067.

Visitors may view and sign up for the *CCLD Review* newsletter at [www.doli.state.mn.us/review.html](http://www.doli.state.mn.us/review.html).

## **Plumbing License Required Statewide**

<https://www.revisor.mn.gov/statutes/?id=326B.46>

Among changes to Minnesota's plumbing laws made by the 2007 Legislature was the requirement, effective Dec. 1, 2007, that throughout the state all persons (with few exceptions) working at the business of interior plumbing must be licensed plumbers or registered apprentices. Persons having certification as pipelayers may perform some plumbing installation outside of buildings, if properly bonded.

### **Must unlicensed rural and small town plumbers get licensed?**

Yes. Beginning Dec. 1, 2007, all plumbers statewide must be licensed or registered as an apprentice. A special class of licenses was created, including the restricted journeyman plumber license and the restricted master plumber license - which limit the holders to working in cities with a population of 5,000 or less. Prior to this, no license was required to work in those areas.

### **What is a restricted plumber's license?**

Individuals are licensed as restricted journeyman and restricted master plumbers similar to existing journeyman and master plumbers. The restricted licenses allow the holder to "engage in the plumbing trade in all areas of the state except in cities and towns with a population of more than 5,000 according to the federal census.

### **Who qualifies for a restricted license?**

A Restricted Master Plumbing License will be granted to an applicant who can document at least four years of practical plumbing experience and, if this experience includes any years when the applicant contracted for plumbing work, who complied with the requirement to have a \$25,000 Plumbing Code Compliance Bond on file with the department during those years.

A Restricted Journeyman Plumbing License will be granted to an applicant who can document at least two years of practical plumbing experience and, if this experience includes any years when the applicant contracted for plumbing work, who complied with the requirement to have a \$25,000 Plumbing Code Compliance Bond on file with the department during those years.

### **How can I get a restricted license?**

If you qualify for a restricted license, you must apply for either the Restricted Journeyman Plumber or Restricted Master Plumber license by submitting the following items to the department by Dec. 31, 2007:

1. A completed application form, using the form provided by the department;
2. A fee of \$30;
3. If you have any employees, proof of workers' compensation insurance or that you are exempt from the workers' compensation insurance requirement; and
4. If you are not a plumbing contractor, a statement that you will not be contracting to perform plumbing work. If you are a plumbing contractor, evidence of public liability insurance, including products liability insurance with limits of at least \$50,000 per person and \$100,000 per occurrence and property damage insurance with limits of at least \$10,000. This insurance must go into effect no later than Dec. 1, 2007.

*If the department does not receive the completed application, including all of the above items, by Dec. 31, 2007, the department must deny your application.*

### **Can I wait until Dec. 1, 2007, to submit my application for a restricted license?**

Not if you want to work at the business of interior plumbing during the month of December. If you are neither licensed nor registered by Dec. 1, 2007, then you cannot work at the business of interior plumbing. If you work without being licensed or registered, then you will be subject to enforcement proceedings, such as a penalty up to \$10,000 per violation for working without a required license or registration. The department therefore recommends that you apply for a restricted license well in advance of Dec. 1, 2007, to allow sufficient time for your application to be processed.

### **Does a restricted plumber's license expire?**

Yes. Beginning in 2008, restricted plumber licenses expire on Dec. 31 every year like Journeyman and Master Plumber licenses. The restricted licenses may also be renewed every year at \$120 for the Restricted Master Plumber's license and \$55 for the Restricted Journeyman Plumber's license. Failure to renew a license within 12 months after the expiration date will result in permanent forfeiture of the restricted license.

### **Is a Plumbing Code Compliance Bond still required?**

Yes. All plumbers including licensed restricted plumbers must comply with the bond and liability insurance requirements in Minnesota Statutes, Section 326.40. Liability insurance coverage is mandatory starting Dec. 1, 2007.

### **How does a restricted plumber get an unrestricted plumber's license?**

A licensed restricted plumber may qualify to take the Master Plumber (unrestricted) license exam once the applicant has a total of 5 years experience as a plumbing contractor with a \$25,000 Plumbing Code Compliance Bond on file with the department.

In order to take the Journeyman Plumber (unrestricted) license exam, a licensed restricted plumber must meet the same requirements as anyone else. The licensed restricted plumber would still need to be a registered plumber's apprentice for at least two years and meet the requirements concerning four years of practical plumbing experience.

### **If I currently am a registered plumber's apprentice and I want to obtain a restricted license, is there any reason for me to maintain my apprentice registration?**

Only if you want to have the option of taking the journeyman plumber license exam. As described above, everyone (including licensed restricted plumbers) must have four years practical plumbing experience as a registered apprentice before taking the journeyman plumber license exam (see Minnesota Rule 4715.3140).

### **Is there a license available for anyone who has had less than two years of practical plumbing experience?**

No, although pipelaying outside a building can be done without a license, as described below.

### **What options are available for those individuals who don't qualify for a restricted plumber's license?**

Individuals possessing a "pipelayer's card" that demonstrates they have had training, and have filed and maintain a \$25,000 Plumbing Code Compliance Bond with the department can install water service, sanitary sewer and storm sewer systems outside a building. This does not allow installation of plumbing inside a building, however.

Individuals can become registered apprentices and work for a plumbing firm.

An individual can hire a licensed plumber to be responsible for the work of the individual's business and to supervise the work of registered apprentices. The business must also hold and register a \$25,000 Plumbing Code Compliance Bond.

### **Can a homeowner still perform plumbing in a home they occupy?**

Yes.

**Can a business owner perform plumbing on the premises of a business they own without being a licensed plumber?**

No. Just as is currently required in cities of 5,000 population or more, all plumbing statewide must be performed by a licensed plumber or licensed restricted plumber after Dec. 1, 2007, except that someone who owns and occupies a single family home may perform plumbing in that home.

**What about handymen, hardware store owners and business owners who only performed plumbing occasionally, but never had a Plumbing Code Compliance Bond? Can they obtain a restricted license?**

No, they will not be eligible since they were by law required to have the Plumbing Code Compliance Bond. Because any plumbing experience they obtained was in violation of this law, that experience cannot count toward the minimum practical plumbing experience requirement for a restricted license. Minnesota Statutes, section 326.40, requires a person contracting for plumbing work to have a Plumbing Code Compliance Bond. Since 1999, any person contracting to perform plumbing work must give bond to the state in the amount of \$25,000 for all work entered into within the state. The bond is for the benefit of persons injured or suffering financial loss by reason of failure to comply with the requirements of the Plumbing Code.

**If an individual or business had a \$25,000 Plumbing Code Compliance Bond for at least two years, but never registered it with the state, can they obtain a restricted license?**

No.

**Where can I find more information about these restricted licenses?**

Please call the Minnesota Department of Labor and Industry at (651) 284-5067 for more information. <https://www.revisor.mn.gov/statutes/?id=326B.33>  
<https://www.revisor.mn.gov/statutes/?id=326B.33>

Electrical

<https://www.revisor.mn.gov/statutes/?id=326B.33>

## MEMORANDUM

**DATE:** June 27, 2003

**TO:** All Municipalities, Building Officials, and Mechanical Contractors

**FROM:** State Building Official

**SUBJECT:** **Statewide Surety Bond and Filing Fee Requirements for mechanical work per MS 326.992 in Minnesota. Law effective: July 1, 2003**

The State Legislature passed a law effective July 1, 2003 requiring anyone who installs gas piping, heating, ventilation, cooling, air conditioning, fuel burning or refrigeration (G/HVACR) equipment to post a \$25,000 bond and file with the Department of Labor and Industry, Construction Codes and Licensing Division.

This bond is for the benefit of persons suffering financial loss by reason of the contractor's failure to comply with the requirements of the State Mechanical Code. Furthermore, a statewide surety bond will eliminate duplication of multiple bonds required of mechanical contractors who work in more than one jurisdiction.

The bond in the amount of \$25,000 and a \$15 filing fee must be filed with the Minnesota Department of Labor & Industry, Construction Codes and Licensing Division prior to commencing with work covered by the bond.

**Minnesota Statute 326.992** [Bond requirement: gas, heating, ventilation, air conditioning, refrigeration (G/HVACR) contractors.]

(a) A person contracting to do gas, heating, ventilation, cooling, air conditioning, fuel burning, or refrigeration work must give bond to the state in the amount of \$25,000 for all work entered into within the state. The bond must be for the benefit of persons suffering financial loss by reason of the contractor's failure to comply with the requirements of the State Mechanical Code. A bond given to the state must be filed with the commissioner of Labor and Industry and is in lieu of all other bonds to any political subdivision required for work covered by this section. The bond must be written by a corporate surety licensed to do business in the state.

(b) The commissioner of Labor and Industry may charge each person giving bond under this section an annual bond filing fee of \$15. The money must be deposited in a special revenue fund and is appropriated to the commissioner to cover the cost of administering the bond program. **Mail the bond form and the \$15 fee to:** Department of Labor and Industry, Financial Services, 443 Lafayette Road N., St. Paul, MN 55155.

**The Mechanical Surety Bond and Fee form may be found on the Web site**

**at:** <http://www.doli.state.mn.us/ccld/HVAC.asp>, Construction Codes and Licensing Division, right column under Quick Links or by calling the Department of Labor and Industry, Construction Codes and Licensing Division, (651) 284-5068.