

***Builders Information Packet
City of Harrisonville***



300 E. Pearl Street, P.O. Box 367 • Tel: 816-380-8900 • Fax: 816-380-8906 • Harrisonville, MO 64701

January 1, 2013

Dear Residential Contractor,

The City of Harrisonville is pleased you've chosen our community to construct a new single-family dwelling. The Community Development staff has developed this comprehensive builder's packet to assist you with the licensing, permitting, construction, and inspection phases of your project.

We are ready to provide you with quality customer service in a timely and effective manner while remaining committed to preserving the safety and welfare of the community's stakeholder's. We do hope you find this packet beneficial.

On behalf of the Community Development Department staff, welcome to Harrisonville. Our office hours are Monday through Friday from 8:00 A.M. until 5:00 P.M., and we may be reached at 816-380-8958. Please let us know how we can assist you.

Sincerely,
City of Harrisonville

Kip Thomas, c.B.O.
Building Official

City of Harrisonville Builder's Information Packet

Last Updated December 2013

prepared by

Community Development Department

Phone: 816-380-8958

Fax: 816-380-8906

Construction permit applications can be obtained in the Community Development Department located at 300 East Pearl Street, Monday through Friday from 8:00 AM to 5:00 PM, or online at www.ci.harrisonville.mo.us. Our telephone number is 380-8958 if you have any questions or would like to request an inspection.

Section I: Applications

On-line Permit Center

Business License Application

Application for Contractors License

Subcontractors Checklist

Welcome to the City of Harrisonville

.....Cca a i b]hm8Yj Ycda Ybt Online Permit Center!

NEW! You can now apply for permits, upload submittals and plans, and request inspections on-line. The first time you enter the site to apply for a permit, you will need to register and create a password. Please follow the instructions and if you have any problems, don't hesitate to contact us at (816) 380-8958.

The On-Line Permit Center also provides public access to the current status of permits, permit reports, inspection requests and activity, as well as access to reference material and documentation.

To search for permit status, request an inspection, verify that an inspection has been scheduled, apply for a permit, or obtain other related information, please use the menu on the left.

Applications, home improvement guidelines, and other information can be downloaded with the Downloadable Documents link.

For other permit-related city information, please email us at codesonline@ci.harrisonville.mo.us or call (816) 380-8958.

This is a new service to make business with the City easier and more efficient for our customers. Please be patient and don't hesitate to contact us if you have any difficulties.

BUILDING PERMIT APPLICATION

Jurisdiction of City of Harrisonville
FOR INSPECTIONS CALL (816) 380-8958

Date

Permit No.

JOB ADDRESS		PARCEL NO.	
1. LEGAL DESCR.	USE ZONE	DATE TO COMMENCE	
2. OWNER	MAIL ADDRESS	ZIP	PHONE
3. CONTRACTOR	MAIL ADDRESS	PHONE	
4. ARCHITECT OR DESIGNER	MAIL ADDRESS	PHONE	LICENSE NO.
5. PLUMBER	MAIL ADDRESS	PHONE	
6. ELECTRICIAN	MAIL ADDRESS	PHONE	
7. MECHANICAL	MAIL ADDRESS	PHONE	
8. CLASS OF WORK: <input type="checkbox"/> NEW <input type="checkbox"/> ADDITION <input type="checkbox"/> ALTERATION <input type="checkbox"/> REPAIR <input type="checkbox"/> MOVE <input type="checkbox"/> REMOVE			
9. DESCRIBED WORK:			
10. USE OF BUILDING	PLAN CHECK FEE		PERMIT FEE
CHANGE OF USE TO/FROM	Type of Const.	Occupancy Group	Division
11. VALUATION OF WORK: \$	Size of Bldg. (Total) Sq. Ft.	No. of Stories	Max. Occ. Load
SPECIAL CONDITIONS		No. of Bedrooms	Fire Sprinklers Required <input type="checkbox"/> Yes <input type="checkbox"/> No
	No. of Dwelling Units	No. of Rooms	Parking Spaces
		INSPECTIONS	REQUIRED
		NOT REQUIRED	FEE
APPROVED BY:	DATE	TEMP. ELEC.	
		FOOTING	
SETBACKS	COMMENTS	UND. FL. PLUMB.	
FRONT		FRAMING	
SIDE		ROUGH PLUMB.	
SIDE		ROUGH ELEC.	
REAR		WATER	
LOT AREA		SEWER	
WATER SUPPLY		GAS	
SEWER DISPOSAL		FINAL PLUMB.	
		FINAL ELEC.	
		MECHANICAL	
		SPECIAL	
		OCCUPANCY	
SIGNATURE OF CONTRACTOR OR AUTHORIZED AGENT (DATE)		WATER SYSTEM CONNECTION FEE	\$
		WASTEWATER SYSTEM CONNECTION FEE	\$
SIGNATURE OF OWNER (IF OWNER BUILDER (DATE))		ELECTRIC CONNECTION FEE	\$
		TOTAL	\$

THIS PERMIT BECOMES NULL AND VOID IF WORK AUTHORIZED IS NOT COMMENCED WITHIN 180 DAYS, OR IF WORK IS SUSPENDED OR ABANDONED FOR A PERIOD OF 180 DAYS AT ANY TIME AFTER WORK IN COMMENCED.



BUSINESS LICENSE APPLICATION

A NEW BUSINESS MAY NOT OPERATE UNTIL A BUSINESS LICENSE IS APPROVED AND ISSUED.
Please check if you sell: Liquor or Cigarette, an additional License is required.

Heating - Cooling - Plumber- Mechanical - HVAC (must first have obtain the city Contractor's License (816)-380-8959)

LICENSE FEES ARE NOT PRO-RATED: DUE: SEPT. 1ST OF EACH YEAR EXPIRES: AUGUST 31ST OF EACH YEAR

BUSINESS NAME: _____

Business D/B/A _____

BUSINESS ADDRESS: (PHYSICAL LOCATION) _____

CITY: _____ **STATE:** _____ **ZIP:** _____

BUSINESS PHONE: _____ **FAX:** _____ **CELL:** _____

MAILING ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

DESCRIPTION OF TYPE OF BUSINESS: _____

SECTION 605:030: MULTIPLE ACTIVITIES: EXAMPLE; TREE TRIMMER - ASPHALT - 2 DIFFERENT BUSINESS REQUIRES A LICENSE FOR EA.

IF YOU ARE A CONTRACTOR LIST PROJECT & WORK SITE: _____

WORKER'S COMPENSATION COVERAGE - IF YOU ARE A CONTRACTOR IN THE CONSTRUCTION INDUSTRY, WITH ONE OR MORE EMPLOYEES OTHER THAN YOURSELF, YOU ARE REQUIRED BY STATE STATUTES RSMO 287.061 TO PROVIDE A CERTIFICATE OF INSURANCE FOR WORKER'S COMPENSATION COVERAGE OR A SIGNED MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS DIVISION OF WORKER'S COMPENSATION AFFIDAVIT OF EXEMPTION FOR WORKER'S COMPENSATION INSURANCE PURSUANT TO 287.061 RSMO

BUSINESS OWNERSHIP: Individual Partnership Corporation LLP LLC Not for Profit

BUSINESS OWNER(S) NAME: _____

BUSINESS OWNERS (S) HOME ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

HOME PHONE # _____ **CELL #** _____

IF YOUR BUSINESS INVOLVES DIRECT SALES OF MERCHANDISE TO THE PUBLIC YOU MUST HAVE A MO. SALES TAX I.D. #

STATE OF MISSOURI SALES TAX I.D. NUMBER: _____ **A NO TAX DUE LETTER IS REQUIRED AND SHALL NOT BE MORE THAN NINETY DAYS BEFORE THE DATE OF SUBMISSION OF APPLICATION OR RENEWAL OF LOCAL LICENSE: PLEASE ATTACH THE NO TAX DUE LETTER.**

SIGNATURE OF APPLICANT: _____ **DATE:** _____

PRINT YOUR NAME: _____

DO YOU WANT TO BE PLACED ON THE BUSINESS LICENSE RENEWAL LIST? Yes OR No

BUSINESS LICENSE AMOUNT DUE: \$ _____ **: CASH: CHECK: CREDIT CARD \$4.00 FEE**

**CITY OF HARRISONVILLE, BUSINESS LICENSE DEPARTMENT,
300 E PEARL ST, PO Box 367
HARRISONVILLE, MO 64701
(816)-380-8908 FAX (816)-380-8910**



City of

Harrisonville ^{est. 1836}

300 E. Pearl Street, P.O. Box 367 • Tel: 816-380-8900 • Fax: 816-380-8906 • Harrisonville, MO 64701

Application For Contractor's License

TYPE OF LICENSE APPLIED FOR: Electrician Plumber Mechanical

BUSINESS NAME: _____

OWNER: _____

MASTER ELECTRICIAN/PLUMBER/MECHANICAL: _____

LOCATION OF BUSINESS: _____

Street Address

City

State

Zip

MAILING ADDRESS (IF DIFFERENT): _____

City

State

Zip

BUS. PHONE NUMBER: _____ **FAX NUMBER:** _____

I AM ENCLOSING THE FOLLOWING INFORMATION (unless otherwise noted):

- A check for each license made out to the City of Harrisonville in the amount of \$50.00 each.
- Proof of General Liability Insurance in an amount of not less than \$500,000
- Proof of Workers' Compensation, as required by the laws of the State of Missouri.
- Proof of Master License from City of Kansas City, Missouri; Independence, Missouri; or a Thomson Prometric (formerly Experior Test Certificate) with a minimum score of 75.

I HEREBY CERTIFY THAT THE FOLLOWING EMPLOYEES WILL BE WORKING FOR THIS BUSINESS UNDER THIS LICENSE, AND THAT I WILL BE RESPONSIBLE FOR SUPERVISING THEIR WORK, AND THE BUSINESS WILL BE RESPONSIBLE FOR THE QUALITY OF ALL WORK PERFORMED UNDER THIS LICENSE.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

The following statement is acknowledged by your signing and dating this document: **I do not and will not knowingly employ a person who is an unauthorized alien in connection with the business for which the permit or license has been obtained.**

Date: _____

Signature: _____

**CITY OF HARRISONVILLE
COMMUNITY DEVELOPMENT DEPARTMENT
CONTRACTORS REQUIRING BUSINESS LICENSE**

General Contractor: _____ **Date:** _____

****PLEASE NOTE:** Below is a list of subcontractors used by the listed General Contractor. A business license is required by each. It is the responsibility of the Builder that all Subs have current business licenses and permits (if applicable).

TRADE	BUSINESS	NAME	PHONE	#
General Contractor				
Brick or Stone Mason				
Cabinet Installer				
Carpet Installer				
Ceiling Tile				
Drywall Hanger				
Drywall Taper				
Electrician				
Erosion Control				
Excavator				
Fencing				
Flat Concrete Worker				
Foundation				
Framing Carpenter				
Glass Installer/Glazing				
Gutter Installer				
Hardwood Floor Installer				
Heating & Cooling				
Insulation Installer				
Irrigation Installer				
Landscaping				
Marble Top Installer				
Mirrors/Shower Doors Installer				
Overhead Door Installer				
Painter				
Paper Hanger				
Paving				
Plumber				
Pool Contractors				
Pre-Fab Fireplace Installer				
Rofer				
Security Alarm				
Sign Co. – Installer				
Sod Layer				
Steel Erectors				
Stucco Installer				
Tile Setter				
Trencher				
Trim Carpenter				
Vinyl Siding Installer				
Waterproof/Drain tile				
Miscellaneous Subcontractor				

NOTE: CERTIFICATE OF OCCUPANCY WILL NOT BE ISSUED UNTIL ALL SUB-CONTRACTORS HAVE A BUSINESS LICENSE.

Contractor Signature _____ **Date** _____

Section II: Fees & Inspections

Permit Fee Schedule

Development Fee Schedule

Required Inspections

ONE AND TWO-FAMILY RESIDENTIAL PERMIT FEE SCHEDULE

NAME OF BUILDER
ADDRESS

Lot
Plan #

Valuation	Area	Val./Sq. Ft.	=	VALUE
Living Area		0 \$ 121.11		\$0.00
Garage		0 \$ 16.66		\$0.00
UnFin. Basement		0 \$ 15.00		\$0.00
Fin. Basement		0 \$ 11.11		\$0.00
Total Valuation				\$0.00
Building Permit Fee				\$0.00

ICC Building Valuation Data - August 2013

**City of Harrisonville, Missouri
Development Fee Schedule**

Rezoning

\$50.00

Preliminary Plat

\$250.00 + \$5.00 per lot

Final Plat

\$250.00 + \$5.00 per lot

Special Use Permit

\$50.00

Board of Zoning Adjustments

\$50.00

Park Land Dedication/Fee

Land donation, cash in lieu of land donation, or a combination of both will be required for all residential developments.

Water Tap & Materials Fees

These fees are subject to market costs:

¾" tap	= \$100.00
Corp stop	= \$10.00
Saddle	= \$26.34
Connection fee	= \$172.50
Loop	= \$48.58
Ring & lid	= \$18.00

1" tap	= \$100.00
Corp stop	= \$14.50
Saddle	= \$28.75
Connection fee	= \$172.50
Loop	= \$51.50
Ring & lid	= \$35.00

Sewer Tap & Materials Fees

These fees are subject to market costs:

Tap	= \$100.00
Saddle	= \$29.17

Electric Infrastructure Reimbursement

There are certain subdivisions that require an additional electric infrastructure reimbursement fee of \$1,155.00 per lot be attached to the building permit.

Infrastructure Impact Fees

Example for a Single Family Home:

Wastewater System = \$1,387.13

Water System = \$827.09

Electric System = \$407.01

Commercial Plan Review Fee

Commercial Plan Review fee is one-half ($\frac{1}{2}$) of the permit fee and due upon permit application and plans submitted.

Development Review Fee

1% Administrative Fee

Residential Building Permits

See attached fee schedule.

Commercial Building Permits

Available upon request.

REQUIRED INSPECTIONS

December 2013

There are generally 10 or more required inspections on all residential construction projects in Harrisonville. Depending upon your specific project, there could be as many as 20-25 inspections required. All construction, or work for which a permit is required, is subject to inspection by the City's building inspector, and all such construction or work is to remain **ACCESSIBLE AND EXPOSED** for inspection purposes until approved by the building inspector. The permit holder (contractor) is responsible to make sure that the work required to be inspected remains **ACCESSIBLE AND EXPOSED** for inspection.

The responsibility of the Community Development Department is two-fold:

1. We have a responsibility to provide the contractor with timely and consistent inspection services; and
2. We have a responsibility to the eventual property owner to ensure that the structure meets the minimum standards prescribed by local ordinances. We believe that the contractor (permit holder) shares this second responsibility with us.

The Community Development Department will perform inspections according to the following guideline. Requests for inspection shall be made after the work is complete and ready to be inspected. Please call 380-8958 to request an inspection.

PRIORITY INSPECTIONS. The contractor shall notify the Community Development Department upon completion of any work requiring inspection. Priority inspections are usually made within 2 hours of notification that the work is ready to be inspected. Priority inspections are considered the following:

Footing Inspection
Foundation Wall Inspection
Sewer Inspection
Water Service Inspection
Driveway and Sidewalk Inspection

ROUTINE INSPECTIONS. The contractor shall notify the Community Development Department upon completion of any work requiring inspection. Routine inspections are usually made within 24 hours of notification that the work is ready to be inspected.

Ground Rough Plumbing Inspection

All Rough Inspection will be performed at one time consisting of:

- Framing
- Mechanical top rough
- Electrical top rough
- Plumbing top rough

Electrical Service Inspection

Gas Test Inspection

Final Occupancy Inspection

Special Note: Insulating or drywall stocking prior to rough-in approval will be subject to removal of all insulation and drywall.

Section III: General Information

Site Plan Requirements

Construction Plan Requirements

Building Planning, Concrete, Framing, Roof Coverings, Fireplaces

Mechanical

Electrical

Plumbing

One & Two Family Dwellings Site Plan Requirements

This information sheet has been written to help you with your construction project. It lists the information needed to be submitted with an application for your specific project.

Site Plan/Plot Plan/Survey-All new one and two family dwellings require a site plan, plot plan or survey drawn and sealed by a licensed surveyor or engineer registered in the State of Missouri.

Please submit the following information:

- Address and legal description of site
- Boundaries and dimensions of property, all property corners with elevations
- Show name(s) of street(s)
- Show alleys if applicable
- Show location of proposed structure
- Show drainage arrows and proposed lot line elevations and high points
- Show distance from the proposed structure to all property lines
- Show existing and proposed storm water inlets, sidewalks, manholes, water valves, hydrant assemblies, etc.
- Show proposed curb cuts and driveway locations and elevations
- Clearly indicate the site plan scale (1"=20' maximum unless pre-approved, and North arrow)
- Show dimensions and types of easements
- Show 100 year flood elevations as applicable
- Show finish grade elevations
- Show the minimum first floor elevation
- Show the lowest floor elevation for sanitary sewer service
- Fill out the building permit application.
- You will be required to call for a framing inspection, mechanical inspection, electrical inspection, and final inspection.

Construction permit applications can be obtained in the Community Development Department located at 300 East Pearl Street, Monday through Friday from 8:00 AM to 5:00 PM, or online at www.ci.harrisonville.mo.us. Our telephone number is 380-8958 if you have any questions or would like to request an inspection.

One & Two Family Dwellings Construction Plan Requirements

This information sheet has been written to help you with your construction project. It lists the information needed to be submitted with an application for your specific project.

A completed building permit application is required for all new residential construction.

Please submit the following building plans information:

- Scale: All floor plans shall be a minimum of 1/4" scale and elevations a minimum of 1/8" scale
- Foundation plan including window well locations and details, details that footing meets or exceeds a minimum frost depth of 36" inches, soil bearing capacity, foundation or footing jumps or steps, column pads, footing dimensions and required reinforcement, foundation wall height, thickness and required reinforcement, basement floor slab thickness and required reinforcement, and garage floor slab thickness and required reinforcement.
- Floor plan including a plan view of each floor of the building and basement, dimensions of each room and architectural features (hallways, stairways, etc.) total square footage of each floor and basement, identify use of each room including the basement, size and spacing of proposed floor and ceiling framing members including grade and species, other dimensions of structural elements such as steel beams, glulams, LVL's, etc., types of fasteners used, and for structural reinforced concrete floor over a usable space, submit sealed engineering drawings from a licensed design professional registered in the State of Missouri.
- Roof framing design loads, type of roof covering, size and spacing of proposed roof framing members including grade and species, other dimensions of structural elements such as steel beams, glulams, LVL's, etc., purlin, hip and valley bracing, bearing walls and point loads.
- Exterior elevations including wall openings, window locations, size and spacing of wall framing members including grade and species of lumber, method of wall bracing per Section R602.10.3.
- Illustrate details such as where safety glazing is required, size of windows to satisfy emergency egress requirements, wall framing members including grade and species, stairs rise and run, headroom clearance and width, handrails, dwelling separation from garage and living spaces, separation between dwelling units if a duplex including design numbers of fire-resistive assemblies, and minimum energy conservation (insulation) requirements per the City of Harrisonville.
- Illustrate smoke detector installations, GFCI locations, AFCI locations, water closets, lavatories, bathtubs, showers, floor drains, HVAC equipment, condensing unit location.
- Structural details identifying the transfer of roof, ceiling and floor loads through various structural elements through to the foundation, identify all load bearing walls, structural adequacy of offset bearing walls, vaulted ceilings, cantilevered beams, stairways and fireplace bays.

Construction permit applications can be obtained in the Community Development Department located at 300 East Pearl Street, Monday through Friday from 8:00 AM to 5:00 PM, or online at www.ci.harrisonville.mo.us. Our telephone number is 380-8958 if you have any questions or would like to request an inspection.

December 2013

ONE AND TWO FAMILY DWELLINGS

Building Planning, Concrete, Framing, Roof Coverings, Fireplaces

Revised December 2013

The following are general requirements pertaining to the construction of one- and two- family dwellings. This does not represent all the provisions regulating construction of these structures and is not intended to replace the adopted codes and ordinances of the City of Harrisonville, Missouri. Builders and contractors are encouraged to become knowledgeable of the provisions of the 2012 International Residential Code, and Chapter 205, Chapter 400, Chapter 500 and Chapter 700 of the City's Code of Ordinances, and the City's Land Use Regulations.

The 2006 International Residential Code (IRC) may be viewed in our offices located at City Hall, 300 East Pearl Street. You may also purchase a copy at:

International Code Council Distribution Center or ICC Website at

www.iccsafe.org

1704 E. 123rd Terrace
Olathe, Kansas 66061
913-764-6700

Bookmark
14643 W. 95th
Lenexa, Kansas 66285

Builder's Book Inc. @
www.buildersbook.com

Chapter's 205, 400, 500 and 700 of the City of Harrisonville Code of Ordinances, and the City's Land Use Regulations may be viewed at City Hall, 300 East Pearl Street, or at <http://ci.harrisonville.mo.us>.

General:

1. Fees – The amount of all building related fees is available upon request. Special Note: Construction costs are subject to review by the Director of Community Development.
2. Contractor Licenses – All contractors/builders are required to have a City of Harrisonville issued business license.
3. Master License Required - A master electrician certification, master plumbing certification, or master mechanical certification shall be a requisite for licensing an electrical, plumbing, or mechanical contractor.

4. Additionally, certified proof of a comprehensive liability policy with a minimum policy amount of five hundred thousand dollars (\$500,000.00) shall be provided along with proof of worker's compensation coverage pursuant to the laws of the State of Missouri. The certification of the master and business license must remain current throughout the period of construction. The right of a company to do work as an electrical, plumbing or mechanical contractor depends upon the retention of the person holding the master certification as an employee, member, or officer of the company. Except persons doing work on their own residence, no person, other than a licensed contractor or employee of a licensed contractor shall engage in electrical, plumbing or heating and air-conditioning business, construction, or installations.
5. Permit Submittal Documents – Construction documents and other data shall be submitted with each application for permit. A registered design professional licensed by the State of Missouri shall prepare the construction documents. Where special conditions exist, the building official is authorized to require additional documents to be prepared by a registered design professional licensed by the State of Missouri.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with the code.

Currently the majority of single-family plans are not required to be designed and sealed by a registered design professional. If plans are received for projects that are not typical platform, balloon framing, or conventional light frame construction per the provisions of the IRC, plans may be required to be designed by a registered professional and/or additional information may be required prior to the issuance of the building permit.

Construction documents shall be dimensioned and drawn upon suitable material, of sufficient clarity to indicate the location, nature and extent of the work proposed, and shown in detail that it will conform to the provisions of the IRC and other ordinances of the City of Harrisonville.

6. Permits – Permits are required for the construction of one- and two-family dwellings. Permit applications, available in the Community Development Department, must be submitted with a copy of the building plans and a plot plan sealed by a registered land surveyor in the State of Missouri. Building related fees are charged based upon the City of Harrisonville Schedule of Fees and Charges.

7. Permit Expiration – Permits for one- and two-family dwellings shall become invalid unless the work is commenced within 180 days after the date of issuance, or if the work is suspended or abandoned for a period of 180 days after the work is commenced. A permit extension may be granted upon written request received prior to the original expiration date.
8. Placement of Permit – Permits for one- and two-family dwellings shall be posted on the job site. The property address shall be clearly identified and visible from the street. Failure to clearly identify the property or post the permit may result in inspections not being performed.
9. Required Inspections – The following inspections are required for one- and two-family dwellings. To request an inspection, call (816) 380-8958.
 - Footing and Foundation Inspection – Footing and foundation inspections shall be made after the trenches are excavated completely, forms are erected, and steel reinforcement is in place.
 - Foundation Wall Inspection – Foundation walls in excess of 9' feet in height shall be inspected. This inspection will be made in order to determine the walls are constructed in accordance with the engineered design. This inspection shall be made after all forms and steel are in place but prior to the placement of concrete.
 - Concrete Slab/Under Floor Inspection – Ground rough plumbing under slab, or under slab electrical conduit piping inspections shall be made after under slab piping and other equipment is in place, but prior to being covered by either gravel or concrete.
 - Frame Inspection – Framing inspections shall be made after all roof deck, framing, fire blocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, mechanical and HVAC are in place and approved. In cases where truss systems or fabricated products are being utilized, the approved design for these systems shall be on site at the time of inspection.
 - Electrical Service Inspection – Shall be made after the service equipment is installed, including grounding and service entrance conductors.
 - Gas Test Inspection – Shall be made after, or at the same time all gas piping is installed and approved. Piping shall be tested for a minimum of 10 minutes and at not less than 10 psi. Gas service will

not be released until gas appliances have been vented and approved.

- Water Service Inspection – Shall be made after the water service piping and meter assembly has been installed, but prior to being covered.
- Sewer Service Inspection – Shall be made after the sewer service piping has been installed but prior to being covered.
- Driveway/Sidewalks Inspection – Shall be made after all forms and reinforcing steel is in place but prior to placement of concrete. As applicable, all manholes, valve boxes and other equipment shall be adjusted per APWA Standards.
- Suspended Slabs with Useable Space Below – Shall be inspected after all forms and reinforcement is in place but prior to the placement of concrete. Sealed engineering plans must be on site at the time of inspection.
- Special Inspections – In addition to the above required inspections, the Community Development Department may make or require special inspections to be made, some of which may be required to be made by a registered design professional.
- Final Inspection – The final inspection shall be made after all work required by the permit is completed, but prior to occupancy. Occupancy includes moving furniture and other items into the house that may interfere with the inspection process.

10. Reinspections – A fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete, or when corrections called for are not made, or failure to provide access on the date for which inspection is requested. This section is not to be interpreted as requiring reinspection fees the first time an inspection is rejected for failure to comply with the requirements of the code, but for controlling the practice of calling for inspections before the job is ready for inspection or reinspection. Reinspection fees shall be paid in accordance with fees established by Chapter 500 of the City's Code of Ordinances.

11. Appeals/Interpretations/Disputes – Concerns caused as a result of inspection activities should first be addressed with the building inspector. Concerns or disputes regarding permit issuance or plan approval should first be addressed with the building official. The building official is available

to address concerns regarding any facet of the Community Development Department. In order to hear and decide upon appeals or orders, decisions or determinations made by the building official, an application may be filed be heard before the Board of Building and Engineering Appeals.

Applications for appeal to the Board of Building and Engineering Appeals shall be based upon a claim that the true intent of the code has been incorrectly interpreted, the provisions of the code do not fully apply, or an equally good or better form of construction is proposed. The Board of Building and Engineering Appeals may not waive the requirements of the code.

12. Temporary Certificate of Occupancy (TCO) – TCO's may be issued contingent upon the following:

- The TCO has been specifically requested.
- No outstanding life safety issues exist.
- The lot is either permanently stabilized or adequate erosion control has been installed.
- The structure is not in danger of being flooded due to improper drainage of the site.
- All outstanding fees have been paid.
- Required public sidewalks are installed or specific approval granted otherwise due to weather conditions.
- The driveway is installed or specific approval granted otherwise due to weather conditions.
- Any required structural engineering reports have been submitted and approved.
- All required inspections have been performed and approved.
- All applicable utilities have been connected and are in service.

TCO's will routinely be issued for 30-day periods unless known circumstances will prevent completion of the project within the initial 30-day time frame. Prior to expiration of the TCO, the permit applicant shall request a final reinspection or file a written request for an extension.

If the necessary work has not been completed within the established time frame or an extension has not been requested and approved, a Notice of Violation will be mailed to the permit applicant placing them on official notice that corrective actions must occur within 10 days. If the issue is not resolved within 10 days, the matter may be submitted to municipal court for resolution.

Building Planning:

1. Adopted Climatic and Geographic Design Criteria

Ground Snow Load	20 psf
Wind Speed	90 mph
Weathering	Severe
Frost Line Depth	36 inches
Seismic Category	A
Termite	Moderate to Heavy
Decay	Slight to Moderate
Winter Design Temp	6 Degrees F
Ice Barrier Underlayment	Not Applicable
Annual Air Temperature	55.5 Degrees Fahrenheit

2. Design – The construction of buildings and structures shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. (IRC R301.1)
3. Engineered Design – The requirements of the code are based upon platform and balloon framing. When buildings or building elements are constructed otherwise, these elements must be constructed in accordance with accepted engineering practice. (IRC R301.1.3)
4. Driveways – Must be hard surface constructed of asphalt or concrete. See the City of Harrisonville Zoning Regulations.
5. Drive Approaches and Public Sidewalks – Must be constructed in accordance with the APWA Standards as adopted by the City of Harrisonville.
6. Light/Ventilation - With exceptions, all habitable rooms shall be provided with an aggregate glazing area of not less than 8% percent of the floor area of the room. Natural ventilation shall be through windows, doors or other approved openings to the outside air. (For a full listing and exceptions, see IRC R303.1)
7. Bathtub and Shower Spaces – Walls surrounding showers and bathtubs installed with showerheads shall be finished with a non-absorbent surface. Such wall surface shall extend to a height of not less than 6' feet above the floor. (IRC R307.2)

Cement, fiber-cement and glass mat gypsum backers are required for wall tile in tub and shower areas and wall panels in shower areas.

Cement, fiber-cement and glass mat gypsum backers shall be in compliance with ASTM C1288, C1325 or C1178 and shall be installed in accordance with manufacturer's recommendations.

8. Safety/Tempered Glazing Requirements – Based upon the location and use of glazing, many areas within a house are required to be provided with safety or tempered glass. For a full listing of these requirements, see IRC Section R308.4.

9. Garages and Carports – (IRC R309)

- Garages shall be separated from the residence and its attic area by not less than 1/2" inch gypsum board applied to the garage side.
- Garages beneath habitable rooms shall be separate from all habitable rooms above by not less than 5/8" inch Type X gypsum board or equivalent.
- When the separation is a floor-ceiling assembly, the structure supporting (beams and columns) the separation shall be protected by not less than 1/2" inch gypsum board or equivalent.
- Doors between the living or other unprotected areas and the garage shall be solid wood doors not less than 1-3/8" inches in thickness, solid honeycomb core steel doors not less than 1-3/8" inches thick, or 20 minute fire-rated doors.
- A garage shall not open into a room used for sleeping purposes.
- Ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gage sheet steel or other approved material. Such ducts shall have no openings into the garage. Exception: Supply duct openings may be permitted; provided a 20-minute rated fire damper protects the openings.
- Automatic garage door openers, if provided, shall be listed in accordance with UL 325.

10. Emergency Escape and Rescue Openings – (IRC R310) Basements and every sleeping room shall have at least one openable emergency escape and rescue window. Such opening shall open directly into a public street, public alley, yard or court. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44" inches above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section

R310.3. The net clear opening dimension required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2.

Window wells. The minimum horizontal area of the window well shall be 9 square feet with a minimum horizontal projection and width of 36" inches. The area of the window well shall allow the emergency escape and rescue opening to be fully opened.

Exception: The ladder or steps required by Section R310.2.1 shall be permitted to encroach a maximum of 6" inches into the required dimensions of the window well.

Ladders and steps. 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. Ladders or steps required by this section shall not be required to comply with Sections R311.5 and R311.6. Ladders or rungs shall have an inside width of at least 12" inches, shall project at least 3" inches from the wall and shall be spaced not more than 18" inches on center vertically for the full height of the window well.

Minimum opening area. All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet.

Exception: grade floor openings shall have a minimum net clear opening of 5 square feet.

All emergency escape and rescue openings shall have a minimum net clear opening height of 24" inches and the minimum net clear opening width of 20" inches.

Emergency escape windows are allowed to be installed under decks and porches provided the location of the deck allows the emergency escape window to be fully opened and provides a path not less than 36" inches in height to a yard or court.

11. Exit Doors – Not less than one exit door conforming to the 2012 IRC shall be provided from every dwelling unit. The required exit door shall provide direct access to the outside without travel through the garage. Exit doors shall be side-hinged, not less than 3' feet in width, not less than 6' feet 8" inches in height and shall be openable from the inside without the use of a key or special knowledge or effort. (IRC R311).

There shall be a floor or landing on each side of each exterior door. The floor landing at the exterior door shall not be more than 1.5" inches lower than the top of the threshold. The landing shall be permitted to have a slope not to exceed 0.25 units vertical in 12 units horizontal (2% percent).

12. Hallways – The minimum width of a hallway shall not be less than 3' feet. (IRC R311.3).
13. Guards – Porches, balconies, or raised floor surfaces located more than 30" inches above the floor or grade below shall have guards not less than 36" inches in height. Open sides of stairs with a total rise of more than 30" inches above the floor or grade below shall have guards not less than 34" inches in height measured vertically from the nosing of the treads. (IRC 312.1)
14. Guard Openings – Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4" inches or more in diameter. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be such size that a sphere 6" inches in diameter cannot pass through. Openings for required guards on the sides of stair treads shall not allow a sphere 4-3/8" inches to pass through.
15. Handrails – Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers. Handrails shall have a minimum height of 34" inches and a maximum height of 38" inches measured vertically from the sloped plane adjoining the tread nosing to the top of the handrail. Handrails shall run the full length of the stair from a point directly above the top riser to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate into newel post or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1-1/2" inches between the wall and the handrails.

Exceptions:

1. Handrails shall be permitted to be interrupted by a newel post at the turn.
 2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.
16. Stairways – Stairways shall not be less than 36" inches in clear width at all points above the permitted handrail height and below the required headroom height. Required stairway width varies dependent upon the

configuration. For additional information regarding stairway widths, see IRC Section R311.

The maximum riser height shall be 7-3/4" inches and the minimum tread depth shall be 10" inches. The riser heights shall be measured vertically from the leading edge of the adjacent treads. The tread depths shall be measured horizontally between the vertical planes of the foremost projections (nosing) and at a right angle to the tread's leading edge. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8" inch.

The minimum headroom in all parts of the stairway shall not be less than 6' feet 8" inches (finished height) measured vertically from the sloped plane adjoining the tread nosing from the floor surface of the landing or platform. (IRC R311.5.2)

Enclosed accessible space under stairs shall have walls, under stair surface and any soffits protected on the enclosed side with 1/2" inch gypsum board. (IRC R311.2.2). Code compliant protection of this space does require the gypsum board to be fire taped.

17. Landings - There shall be a floor or landing at the top and bottom of each stairway except for the top of an interior flight of stairs, provided doors not swing over the stairs. (IRC R311.5.4)

The width of each landing shall not be less than the width of the stairway served and shall have a minimum dimension of 36" inches measured in the direction of travel. (IRC R311.5.4)

18. Smoke Alarms – Smoke alarms shall be installed in the following areas:

- Each sleeping room.
- Outside each separate sleeping area in the immediate vicinity of the bedroom.
- On each additional story, including basements.

The alarm devices shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Smoke alarms in new construction shall receive primary power from the building wiring and secondary power from a battery. (IRC R314.1)

When interior alterations, repairs, or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be provided with smoke

alarms located as required for new dwellings; the smoke alarms shall be interconnected and hard-wired. (IRC R314.2.1)

19. Two-Family Separation (Duplexes) – Dwelling units in two-family dwellings shall be separated from each other by wall and/or ceiling assemblies having not less than 1-hour fire-resistance rating when tested in accordance with ASTM E 119. Fire-resistance rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing. (IRC R302.3)

20. Townhouses – Each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302. (IRC R302.2)

Exception: A common 2-hour fire-resistive-rated wall is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

See IRC Sections R302.2 through R302.2.4 for additional townhouse construction requirements.

21. Premises Identification (Address) – Approved numbers or addresses shall be provided for all new buildings in such a position as to be plainly visible from the street or road fronting the property. (IRC R319.1). Numbers shall be a minimum of 4” inches in height.

22. Foundation Elevation – The top of any exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device a minimum of 12” inches plus 2% percent. Alternative elevations are permitted subject to approval of the building official, provided it can be demonstrated that required drainage to the point of discharge and away from the structure is provided at all locations on site. (IRC R403.1.7.3)

Foundation walls shall extend above the finished grade a minimum of 4” inches where masonry veneer is used and a minimum of 6” inches elsewhere. (IRC R404.1.6)

Exterior Insulation Finish Systems, EIFS, shall terminate not less than 6” inches above finished grade. (IRC R703.9)

23. Site Preparation – The area within the foundation walls shall have all vegetation, topsoil, and foreign matter removed. (IRC R506.2)

Concrete

1. Frost Line – Footings are required to extend below frost line, a minimum of 36” inches below grade.
2. Soils – Footings shall be supported upon undisturbed soils or engineered fill. Fill soils that support footings and foundations shall be designed, installed and tested in accordance with accepted engineering practice. (IRC R403.1)

A soils test may be required in areas likely to have expansive, compressive, shifting or other unknown soil characteristics. (IRC R403.1.8)

3. Footings – Footings shall be in accordance with IRC Section R403 and Table R403.1. See reinforcement tables under separate cover.

Footings for basement foundation walls shall have a minimum reinforcement consisting of not less than two No.4 bars, uniformly spaced, located a minimum of 3” inches from the bottom and edges of the footing. Additional reinforcement may be required based on the width of the footing and criteria in R403.

Column pads shall be a minimum of 24” inches by 24” inches and 8” inches deep. Reinforcement shall consist of a minimum of three No.4 bars each way, uniformly spaced within each column pad.

4. Stepped Footings – Stepped footings shall be continuous (in plan view). Cantilevering of foundation walls, unless in accordance with an engineered design, is not permitted.
5. Foundation Walls in Excess of 9’ Feet in Height – Foundation walls over 9’ feet in height shall be designed by a registered architect/engineer and shall be constructed accordingly.
6. Required Concrete Mixtures – Concrete basement walls, foundations, basement slabs, interior slabs on grade except garage slabs, and other concrete exposed to the weather shall have a minimum compressive strength of 2500 psi and shall be air entrained if subject to freezing during construction. (IRC Table R402.2)

Concrete basement walls, foundation walls and other vertical concrete exposed to the weather shall have a minimum compressive strength of 3000 psi and be air entrained. (IRC Table R402.2)

Concrete porches, carport slabs and steps exposed to the weather and garage floor slabs shall have a minimum compressive strength of 3500 psi and be air entrained. (IRC Table R402.2)

Maximum plate anchorage-bolt spacing shall remain in compliance with IRC Table R403.1.6 of the 2012 International Residential Code.

Backfill shall not be placed against the wall until the wall has sufficient strength or has been sufficiently braced to prevent damage by the backfill.

7. Drains – Drains shall be provided around all concrete or masonry foundations that retain earth and enclose habitable or useable spaces below grade. Drainage tiles, perforated pipe or other approved systems or materials shall be installed at or below the area to be protected and shall discharge by gravity or mechanical means into an approved drainage system. The top of the open joints of drain tiles shall be protected with strips of building paper, and the drainage tiles or perforated pipe shall be placed on a minimum of 2” inches of washed gravel or crushed rock at least one sieve size larger than the tile joint opening or perforation and covered with not less than 6” inches of the same material. (IRC R405.1)
8. Waterproofing/Dampproofing – Foundation walls that enclose habitable or useable spaces shall be dampproofed from the top of the footing to the finished grade. (IRC R406.1) Foundation walls located in areas where water tables or other severe water-soil conditions are known to exist shall be waterproofed with a membrane extending from the top of the footing to finished grade. (IRC R406.2)
9. Columns – Wood columns shall be not less than 4” inches by 4” inches and be protected from decay as required by IRC R319. Steel columns shall be not less than 3” inches in diameter and given a shop coat of rust-inhibitive paint. All columns shall be restrained to prevent lateral displacement at the bottom. (IRC R407)

Wood Framing

1. Span Tables – See span tables provided under separate cover.
2. Protection Against Decay – For a full listing of areas required to be protected from decay and the required materials, See IRC Section R317. The most common areas that must be protected from decay are as follows:
 - Wood joists or the bottom of a wood structural floor when closer than 18” inches or wood girders when closer than 12” inches to the

exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.

- All wood framing members that rest on concrete or masonry exterior walls when less than 8" inches from exposed ground.
 - Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from the slab by an impervious moisture barrier.
 - Wood siding, sheathing and wall framing on the exterior of the building having a clearance of less than 6" inches from the ground.
 - Wood furring strips or other wood framing attached directly to the interior of exterior masonry or concrete walls except where an approved vapor barrier has been installed.
 - Vertical and horizontal members of exterior decks and balconies.
 - Exterior posts, poles or columns.
 - All wood in direct contact with the ground.
 - The ends of wood girders entering exterior masonry or concrete walls having clearances of less than 1/2" inch on the tops, sides, and ends.
 - Decay resistant materials shall be treated in accordance with AWPA U1 standards or naturally durable wood. (IRC R317)
3. Decks – Shall be positively anchored (bolted) to the primary structure and designed for both vertical and lateral loads as applied. Such attachment shall not be made by the use of toenails or nails subject to withdraw. Where positive connection to the building can not be verified during inspection, decks shall be self-supporting. (IRC R502.2.2)

Foundation Plates or Sills

1. All sills and foundation plates shall be of decay resistant wood per IRC R317.
2. Foundation sills and exterior wall sole plates shall be anchored to the foundation with anchor bolts spaced a maximum of 6' feet on center. There shall be a minimum of two bolts per plate section with one bolt located not more than 12" inches or less than 7 bolt diameters from each end of the plate section. Anchor bolts shall be at least 1/2" inch in diameter and shall extend a minimum of 7" inches into the concrete. A nut and washer shall be tightened on each bolt to the plate. (IRC R403.1.6)

Wood Floor Framing

1. Spans – See span tables under separate cover.
2. Joists Under Parallel Bearing Walls – Joists under parallel bearing partitions shall be of adequate size to support the load. Double joists,

- sized to adequately support the load, that are separated to permit the installation of piping or vents shall be full depth solid blocked with lumber not less than 2" inches in nominal thickness spaced not more than 4' feet on center. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth unless joists are sized to carry the additional load. (IRC R502.4)
3. Joist Bearing – The ends of each joist, beam or girder shall have not less than 1-1/2" inches of bearing on wood or metal and not less than 3" inches on masonry or concrete unless supported by a 1" inch by 4" inch ribbon strip and nailed to the adjacent stud or supported by approved joist hangers. (IRC R502.6)
 4. Joist Framing – Joists framing into the side of a wood girder shall be supported by approved framing anchors or on ledger strips not less than nominal 2" inches by 2" inches. (IRC R502.6.2)
 5. Floor Systems – Joists framing from opposite sides over a bearing support shall lap a minimum of 3" inches and shall be nailed with a minimum of 3 10d face nails. A wood or metal strip splice with strength equal to or greater than that provided by the nailed lap is permitted. (IRC R502.6.1)
 6. Joist Lateral Restraint – Joists shall be supported laterally at the ends by full depth solid blocking not less than 2" inches nominal in thickness or by attachment to a full-depth header, band or rim joist, or to an adjoining stud. (IRC R502.7)
 7. Joist Drilling and Notching – Solid Lumber (IRC R502.8.1)
 - Notches shall not exceed 1/6 the depth of the joist, shall not be longer than 1/3 the depth of the joist and shall not be located in the middle 1/3 of the span. Notches at the ends of the joists shall not exceed 1/4 the depth of the joist.
 - The diameter of holes shall not exceed 1/3 the depth of the joist, shall not be closer than 2" inches to the top or bottom of the joist or within 2" inches of any other hole in the joist. When the joist is also notched, holes may not be located closer than 2" inches from the notch.
 8. Engineered Wood Products – Cuts, notches, and holes bored in trusses, laminated lumber or I-joists are not permitted unless the effects are specifically considered in the design of the member. Engineering calculations or data sheets provided by the manufacturer or registered design professional for the proposed cut, notch or hole shall be provided to the Community Development Department (IRC R502.8.2)

9. Floor Framing Around Openings – Openings in the floor framing shall be framed with a header and trimmer joists. When the header joist span does not exceed 4' feet, the header joist may be a single member the same size as the floor joist. Single trimmer joists may be used to carry a single header joist that is located within 3' feet of the trimmer joist bearing. When the header joist span exceeds 4' feet, the header and trimmer joists shall be doubled and of sufficient cross section to support the floor joists framing into the header. Approved hangers shall be used for the header joist to trimmer joist connections when the header joist span exceeds 6' feet. Tail joists over 12' feet long shall be supported at the header by framing anchors or on ledger strips not less than 2" inches by 2" inches. (IRC R502.10)
10. Manufactured Wood Joists – When using manufactured wood joists, framing details and lay-out plans provided by the supplier shall be available on site at the time of the framing inspection.

Walls

1. Stud Grade – Studs walls shall be a minimum No. 3 standard or stud grade lumber. Bearing studs not supporting floors and nonbearing studs may be utility grade lumber. (IRC R602.2)
2. Exterior and Load Bearing Wall Top Plates – Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset 24" inches. (IRC R602.3.2) However, single top plates may be used if installed in accordance with the exception listed in IRC R602.3.2
3. Interior Non-Bearing Wall Top Plates – May be constructed with a single top plate. (IRC R602.5)
4. Bottom (Sole) Plate – Studs shall have full bearing on a nominal 2-by or larger plate or sill having a width equal to the width of the studs. (IRC R602.3.4)
5. Drilling/Notching Studs – Any stud in an exterior wall or bearing partition may be cut or notched to a depth not exceeding 25% percent of its width. Studs in nonbearing partitions may be notched not to exceed 40% percent of a single stud width. Any stud may be bored or drilled provided the hole does not exceed 60% percent of the width of the stud, the edge of the hole is no more than 5/8" inch to the edge of the stud, and the hole is not located in the same section as a cut or notch. Studs located in exterior walls or bearing partitions drilled over 40% percent and up to 60% percent shall also be doubled with no more than two successive doubled studs bored. (IRC R602.6)

Exception: Use of approved stud shoes is permitted when they are installed in accordance with the manufacturer's recommendations.

6. Drilling and Notching Top Plates – When top plates are notched more than 50% percent of its width, a galvanized metal tie not less than .054 thick (16 gage) and 1-1/2” inches wide shall be fastened across and to the plate at each side of the opening with not less than eight 16d nails at each side or equivalent. (IRC R602.6.1)
7. Fireblocking – Fireblocking shall be provided to cut off all concealed draft openings in accordance with IRC R302.11.
8. Cripple Walls – Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4’ feet in height, such walls shall be framed of studs having the size required for an additional story. Cripple walls with a stud height less than 14” inches shall be sheathed on at least one side with wood structural panel that is fastened to both the top and bottom plates in accordance with IRC Table R602.3 (1), or cripple walls shall be constructed of solid blocking. Cripple walls shall be supported on continuous foundations. (IRC R602.9)
9. Braced Wall Lines – Braced wall lines shall consist of wall panel construction in accordance with IRC Sec. R602.10.3. The amount and location of bracing shall be in accordance with IRC Table R602.10.1.
10. Headers – Headers located in bearing walls shall consist of 2, 3, or 4 members and be supported by 1 or 2 trimmers on each end per IRC Tables R502.5 (1) and R502.5(2).
11. Stud Size, Height and Spacing – The size, height and spacing of studs shall be in accordance with IRC Table R602.3 (5).

Exceptions:

1. Utility grade studs shall not be spaced more than 16” inches on center, shall not support more than a roof and ceiling, and shall not exceed 8’ feet in height for exterior walls and load-bearing walls or 10’ feet for interior nonload-bearing walls.
 2. Studs more than 10’ feet in height which are in accordance with IRC Table R602.3.1.
12. Windows – Windows shall be installed and flashed in accordance with the manufacturer's written installation instructions. Written installation instructions shall be provided by the manufacturer for each window. (IRC

R613.1). **The requirements for window sills in IRC Section R313.2 have been deleted from the code.**

Vehicular access doors shall be tested in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the acceptance criteria of ANSI/DASMA 108.

13. Panel Siding – Vertical joints in panel siding shall occur over framing members, unless wood or wood structural panel sheathing is used, and shall be shiplapped or covered with a batten. Horizontal joints shall be lapped a minimum of 1” inch, or be shiplapped or shall be flashed with Z-flashing and occur over solid blocking, wood or wood structural panel sheathing. (IRC R703.3.1)
14. Horizontal Siding – Horizontal lap siding shall be lapped a minimum 1” inch, or 1/2” inch if rabbeted, and shall have the ends caulked, covered with a batten or sealed and installed over a strip of flashing. (IRC R703.3.2)
15. EIFS – All EIFS systems shall be installed in accordance with the manufacturer’s installation instructions. Decorative trim shall not be face nailed through the EIFS. The EIFS shall terminate not less than 6” inches above the finished ground level. (IRC R703.9.) All EIFS shall have a water-resistive barrier applied between the underlying water-sensitive components and the exterior insulation, and a means of draining water to the exterior of the veneer. A water-resistive barrier shall be compliant with ASTM D 226 Type 1 asphalt saturated felt or equivalent, shall be applied horizontally with the upper layer lapped over the lower layer not less than 2” inches, and shall have all vertical joints lapped not less than 6” inches. (IRC R703.9.1)
16. Flashing – Approved corrosion-resistant flashing shall be applied shingle-fashion in such a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. The flashing shall extend to the surface of the exterior wall finish, and be installed at all of the following locations in accordance with IRC Sec. R703.8;
 - Exterior window and door openings.
 - At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
 - Under and at ends of masonry, wood or metal copings and sills.
 - Continuously above all projecting wood trim.
 - Where exterior porches, decks or stairs attach to a wall or floor assembly of wood frame construction.

- At wall and roof assemblies, and built-in gutters.
17. Water-Resistant Barrier – One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D 226 for Type 1 felt or other approved water-resistive barrier shall be applied over studs or sheathing of all exterior walls. IRC Sec. R703.2.
 18. Weepholes – Shall be provided in the outside wythe of masonry walls at a maximum spacing of 33” inches on center. Weepholes shall not be less than 3/16” inch in diameter and shall be located immediately above the flashing. (IRC R703.7.6)

Ceiling and Roofs

The framing details required in Section R802.2 apply to roofs having a minimum slope of 3 units vertical in 12 units horizontal (25% percent slope) or greater.

1. Span Tables – Span tables are available under separate cover.
2. Rafters – Rafters shall be framed to ridge board or to each other with a gusset plate as a tie. The ridge board shall be at least 1” inch nominal thickness and not less in depth than the cut end of the rafter. At all valleys and hips there shall be a valley or hip rafter not less than 2” inch nominal thickness and not less in depth than the cut end of the rafter. Hip and valley rafters shall be supported at the ridge by a brace to a bearing partition or be designed to carry and distribute the specified load at that point. Where the roof pitch is less than 3 units vertical in 12 units horizontal, structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams. (IRC R802.3)
3. Ceiling Joist and Rafter Connection – Ceiling joists and rafters shall be nailed to each other in accordance with IRC Table R802.5.1(9), and the rafter shall be nailed to the top plate in accordance with Table R602.3(1). Ceiling joists shall be continuous or securely joined in accordance with Table R802.5.1(9) where they meet over interior partitions and are nailed to adjacent rafters to provide a continuous tie across the building when such joists are parallel to the rafters. Where ceiling joists are not connected to the rafters at the top plate, joists connected higher in the attic shall be installed as rafter ties, or rafter ties shall be installed to provide a continuous tie. Where ceiling joists are not parallel to rafters, rafter ties shall be installed. Rafter ties shall be a minimum of 2” inch by 4” inch nominal, installed in accordance with the connection requirements of in Table R802.5.1(9). Where ceiling joists or rafter ties are not provided, the ridge formed by these rafters shall be supported by a wall or girder designed in accordance with accepted engineering practice. Collar ties

- shall be a minimum of 1" inch by 4" inch nominal, spaced not more than 4' feet on center. (IRC R802.3.1)
4. Cutting and Notching – Cuts, notches and holes in solid lumber joists, rafters and beams shall comply with R502.8.1. Ceiling joist taper cuts shall not exceed 1/4 the depth of the member measured at the inside face of the support. (IRC R802.7.1.2)
 5. Purlins – Purlins shall be sized no less than the size of the rafter that they support. Purlins shall be continuous and shall be supported by 2" inch by 4" inch braces installed to bearing walls at a slope not less than 45 degrees from the horizontal. The braces shall be spaced not more than 4' feet on center and the unbraced length of braces shall not exceed 8' feet. (IRC R802.5.1)
 6. Lateral Support – Rafters and ceiling joists having a depth-to-thickness ratio exceeding 5 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent lateral rotation. (IRC R802.8)
 7. Bridging – Bridging shall be provided every 8' feet when rafters or ceiling joists exceed a depth-to-thickness ratio of 6 to 1. (IRC R802.8.1)
 8. Openings – Openings in roofs and ceilings shall be framed with header and trimmer joists. When the header joist span does not exceed 4' feet, the header joist may be a single member the same size as the ceiling joist or rafter. When the header joist span exceeds 4' feet, the trimmer joists and the header shall be doubled and of sufficient cross section to support the ceiling joists or rafter framing into the header. Approved hangers shall be used for the header joist to trimmer joist connection when the header joist span exceeds 6' feet. Tail joists over 12' feet long shall be supported at the header with approved framing hangers or on ledger strips not less than 2" inches by 2" inches. (IRC R802.9)
 9. Wood Trusses – Truss design drawings, in accordance with IRC R802.10.1 shall be submitted and approved prior to installation. A copy of these drawings must be on site at the time of the framing inspection.
 10. Alterations to Trusses – Truss members shall not be cut, notched, bored, drilled, spliced, or otherwise altered in any way without the approval of a registered design professional.
 11. Ventilation – Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of the roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. (IRC R806.1)

12. Vent Clearance – Insulation shall not block the free flow of air from soffit vents. A minimum of 1” inch shall be provided between the insulation and the roof sheathing and at the location of the vent. (IRC R806.3)
13. Attic Access – Buildings with combustible ceiling or roof construction shall have an attic access opening to attic areas that exceed 30 square feet and have a vertical height of 30” inches or more. The rough-framed opening shall not be less than 22” inches x 30” inches and shall be located in a hallway or other readily accessible location. 30” inch minimum unobstructed headroom in the attic space shall be provided at some point above the access opening. (IRC R807.1) Attics containing appliances shall be provided with openings large enough to allow removal of the largest appliance.

Residential Energy Efficiency

Residential energy efficiency compliance shall be demonstrated by meeting the following requirements of IRC table N1102.1 for Climate Zone 4.

1. Wall assemblies forming portions of a building envelope shall meet or exceed an R factor rating of 13. This requirement does not apply to doors, windows, or other openings or approved penetrations, nor does it apply to basement concrete walls when the basement is not finished as a habitable space.
2. Floor assemblies forming portions of a building envelope shall meet or exceed an R factor rating of 19. Garage ceilings with living area above shall comply with this requirement. Exception: Concrete floors in contact with the earth need not be insulated.
3. Roof assemblies forming portions of a building envelope shall meet or exceed an R factor rating of 30. This requirement does not apply to skylights or other approved penetrations.
4. Ceilings forming portions of a building envelope shall meet or exceed an R factor rating of 49 at the time of installation.

Air Leakage

The building thermal envelope must be durably sealed to limit infiltration and the following items must be caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.

6. Knee walls.
7. Walls and ceilings separating the garage from conditioned spaces.
8. Behind the tub and showers on exterior walls.
9. Common walls between dwelling units.
10. Other sources of infiltration.

Roof Coverings

1. General – Roof decks shall be covered with approved roof coverings secured to the building in accordance with the code. Roof assemblies shall be designed in accordance with the approved manufacturer's installation instructions. (IRC 903.1)
2. Product Information – Roof coverings shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels when required. (IRC 904.4)
3. Asphalt Shingles – Asphalt shingles shall be fastened to solidly sheathed decks, shall only be used on roofs with slopes greater than 2:12, shall comply with ASTM D 225 or D 3462, shall be fastened with 12 gage nails with a minimum of 3/8" inch diameter head and of a length to penetrate through the roofing material 3/4" inch into the roof sheathing, shall have a minimum number of fasteners as required by the manufacturer and in normal applications shall be fastened with not less than 4 nails per strip shingle, and shall be provided with underlayment felt, in accordance with IRC 905.2.7.
4. Cricket and Saddles – Shall be provided on the ridge side of any chimney greater than 30" inches wide. (IRC 903.2.2) See Figure R1001.17 for sizing.
5. Sidewall Flashing – Flashing against a vertical sidewall shall be the step flashing method. (IRC 905.2.8.3)
6. Clay and Concrete Tiles – Shall be tested and approved in accordance with IRC 905.3 and 905.3.5.

Factory-Built Fireplaces

1. General – Shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Factory-built fireplaces shall be tested in accordance with UL 127. (IRC R1004.1)
2. Hearth Extensions – Shall be readily distinguishable from surrounding floor area and installed in accordance with the listing of the fireplace. (IRC R1004.2)

3. Unvented Gas Log Heaters – An unvented gas log heater shall not be installed in a factory-built fireplace unless the system has been specifically tested, listed and labeled for such use in accordance with UL 127. (IRC R1004.4)

4. Exterior Air Supply – Factory-built fireplaces shall be equipped with an exterior air supply unless the room is ventilated and controlled so that the indoor pressure is neutral or positive. (IRC R1006.1) Exterior air intakes shall not be located in the garage or basement of the dwelling nor shall the intake be located at an elevation higher than the firebox. (IRC R1006.2) Unlisted combustion air ducts shall be installed with a minimum 1" inch clearance to combustibles for all parts of the duct within 5' feet of the duct outlet. (IRC R1006.3)

ONE- AND TWO- FAMILY DWELLINGS

MECHANICAL

Revised December 2013

The following are general requirements pertaining to the heating, ventilation, and air conditioning (HVAC) requirements for one- and two- family dwellings. This does not represent all the provisions regulating HVAC installations in one- and two- family dwellings and is not intended to replace the adopted codes and ordinances of the City of Harrisonville, Missouri. For all requirements pertaining to HVAC in one- and two- family dwellings, refer to the 2012 International Residential Code and Chapter 500 of the City of Harrisonville Code of Ordinances.

General

1. Fees – The amount of all mechanical permit fees are available upon request. Special Note: Construction costs are subject to review by the Director of Community Development
2. Contractor Licenses – All contractors/builders are required to have a City of Harrisonville issued business license.
3. Master License Required – A master mechanical certification shall be requisite for licensing a mechanical contractor. Additionally, certified proof of a comprehensive liability policy with a minimum policy amount of five hundred thousand (\$500,000.00) shall be provided along with proof of worker's compensation coverage pursuant to the laws of the State of Missouri. The certification of the master mechanical contractor must remain current throughout the period of construction. The right of a company to do work as a mechanical contractor depends upon the retention of the person holding the master certification as an employee, member, or officer of the company. Except persons doing work on their own residences, no person, other than a licensed contractor or employee of a licensed contractor shall engage in the mechanical contracting business, construction, or installations.
4. Permits – With exceptions, permits are required for mechanical installations in one- and two- family dwellings. Exceptions would include recharging or minor part change-outs. Contact the Community Development Department at 380-8958 for more information.
5. Permit Expiration – Permits shall become invalid unless the work is commenced within 180 days after the date of issuance, or if the work is suspended or abandoned for a period of 180 days after the work is commenced.

6. Placement of Permit – Permits shall be posted on site and be visible from the street or the property address clearly identified and visible from the street. Failure to clearly identify the property or post the permit may result in inspections not being performed.
7. Required Inspections – The following mechanical inspections are required:
 - Concrete Slab/Under Floor Inspection – Ductwork placed under the floor or concrete slab shall be inspected after all ductwork has been installed, but prior to being covered.
 - Top Rough Mechanical Inspection – Shall be inspected after all ducting and other components to be concealed are complete, including the installation of the furnace, but prior to being covered up by insulation or sheetrock. This inspection is typically performed in conjunction with the framing inspection.
 - Mechanical Final Inspection – Shall be made after all HVAC equipment and components are complete and operational. This inspection is typically made at the same time the building final inspection is made.
8. Appeals/Interpretations/Disputes – Concerns caused as a result of inspection activities should first be addressed with the inspector. Concerns or disputes regarding permit issuance or plan approval should first be addressed with the building official. The building official is available to address concerns regarding any facet of the Community Development Department. In order to hear and decide upon appeals or orders, decisions or determinations made by the building official, an application may be filed to be heard before the Board of Building and Engineering Appeals.

Applications for appeal to the Board of Building and Engineering Appeals shall be based upon a claim that the true intent of the code has been incorrectly interpreted, the provisions of the code do not fully apply, or an equally good or better form of construction is proposed. The Board of Building and Engineering Appeals may not waive the requirements of the code.

General Code Requirements

1. Listed and Labeled - Appliances regulated by this code shall be listed and labeled for the application in which they are installed and used, unless otherwise approved in accordance with Section R104.11. (IRC M1302.1) A permanent factory applied nameplate(s) shall be affixed to appliances on which shall appear, in legible lettering, the manufacturer's name or

trademark, the model number, a serial number and the seal or mark of the testing agency, and shall include the required information in Section IRC M1303.1. (IRC M1303.1)

2. Appliance Access For Inspection Service, repair and Replacement - Appliances shall be accessible for inspection, service, repair and replacement without removing permanent construction, other appliances, or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30" inches deep and 30" inches wide shall be provided in front of the control side to service an appliance. (IRC M1305.1)
3. Appliance Clearance - Appliances shall be installed with the clearances from unprotected combustible materials as indicated on the appliance label and in the manufacturer's installation instructions. (IRC M1306.1) Clearance reductions shall be in accordance with the appliance manufacturer's instructions and Table M1306.2. Forms of protection with ventilated air space shall conform to the requirements in IRC M1306.2.
4. Elevation of Ignition Sources - Appliances having an ignition source shall be elevated such that the source of ignition is not less than 18" inches above the floor in garages. (IRC M1307.3) Appliances located in a garage or carport shall be protected from impact by automobiles. (IRC M1307.3.1)

Heating and Cooling Equipment

1. Installation – Heating and cooling equipment and appliances shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. (IRC M1401.1)
2. Central Furnaces Combustion Air - Combustion air shall be supplied in accordance with Chapter 17. Combustion air openings shall be unobstructed for a distance of not less than 6" inches in front of the openings. (IRC M1402.3)
3. Heat Pumps – The minimum unobstructed total area of the outside and return air ducts or openings to a heat pump shall be not less than 6 square inches per 1,000 Btu/h output rating or as indicated by the conditions of the listing of the heat pump. Electric heat pumps shall conform to UL 1995. (IRC M1403.1)
4. Refrigeration Cooling Equipment – Shall comply with IRC M1404.1. In addition to main condensate disposal, a secondary drain or auxiliary drain pan shall be required for each evaporator coil where damage to any

building components will occur as a result of overflow or stoppage in the condensate drain piping. (IRC M1411.3.1)

Exhaust Systems

1. Clothes Dryer Exhaust - Dryer exhaust systems shall be independent of all other systems, and shall convey the moisture to the outdoors. (IRC M1502.1) Exhaust ducts shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. Exhaust ducts shall terminate not less than 3' feet in any direction from openings into buildings. Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination. (IRC M1502.2) The diameter of the exhaust duct shall be as required by the clothes dryer's listing and the manufacturer's installation instructions. (IRC M1502.3) Transition ducts shall not be concealed within construction. Flexible transition ducts used to connect the dryer to the exhaust duct system shall be limited to single lengths, not to exceed 8' feet and shall be listed and labeled in accordance with UL 2158A. (IRC M1502.4) Exhaust ducts shall be constructed of minimum 0.016" inch thick rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Exhaust ducts shall not be connected with sheet metal screws or fastening means which extend into the duct. (IRC M1502.5) The maximum length of a clothes dryer exhaust duct shall not exceed 35' feet from the dryer location to the outlet terminal. The maximum length of the duct shall be reduced in accordance with Table M1502.4.4.1 where fittings are used.. The maximum length of the exhaust duct does not include the transition duct. Exception: Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for the dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions. (IRC M1502.4.4.1)
2. Range Hoods - Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be airtight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building. Exception: Where installed in accordance with the manufacturer's installation instructions and where mechanical or natural ventilation is otherwise provided, listed and labeled ductless range hoods shall not be required to discharge to the outdoors. (IRC M1503.1)

Duct Systems

1. Duct Design – Duct systems serving heating, cooling and ventilation equipment shall be fabricated in accordance with the provisions of Chapter 16 of the IRC and Manual D-95, Residential Duct Systems as authored by the Air Conditioning Contractors of America (ACCA). (IRC M1601.1). Supply and return ducts within the building but outside of conditioned space must be insulated to an installed R-5 and insulated to an installed R-8 when located outside of the building. (IRC N1103.2)
2. Installation Joints and Seams - Joints of duct systems shall be made substantially airtight by means of tapes, mastics, gasketing or other approved closures systems. (IRC M1601.4.1)
3. Return Air - Return air shall be taken from inside the dwelling. Dilution of return air with outdoor air shall be prohibited. (IRC M1602.1)
4. Prohibited Sources – Outdoor and return air for a forced-air heating or cooling system shall not be taken from the following locations:
 - Closer than 10' feet to an appliance vent outlet, plumbing vent, or discharge outlet of exhaust fan unless the outlet is 3' feet above the outside are inlet.
 - Where flammable vapors are present; or where located less than 10' feet above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
 - A room or space, the volume of which is less than 25% percent of the entire volume served by such system.
 - A closet, bathroom, toilet room, kitchen, garage, mechanical room, furnace room or other dwelling unit. (IRC M1602.2)

Combustion Air

1. General Prohibited Sources - Combustion air ducts and openings shall not connect appliance enclosures with space in which the operation of a fan may adversely affect the flow of combustion air. Combustion air shall not be obtained from an area in which flammable vapors present a hazard. Fuel-fired appliances shall not obtain combustion air from sleeping rooms, bathrooms, and toilet rooms. (IRC M1701.4)

Vents

1. Installation – Vent and chimney connectors shall be installed in accordance with the manufacturer's installation instructions and within the space where the appliance is located. Appliances shall be located as close as practical to the vent or chimney. Connectors shall be as short and

straight as possible and installed with a slope of not less than 1/4" inch rise per foot of run. Connectors shall be securely supported and joints shall be fastened with sheet metal screws or rivets. Devices that obstruct the flow of flue gases shall not be installed in a connector unless listed and labeled or approved for such installation. (IRCM1803.3). A chimney or vent connector shall not pass through any floor or ceiling. (IRC M1803.3.1) Connectors that pass through walls shall be listed and labeled for wall pass-through. (IRC M1803.3.1)

2. Direct Vent Termination – Vent terminals for direct-vent appliances shall be installed in accordance with the manufacturer's installation instructions. (IRC M1804.2.5)
3. Masonry and Factory Built Chimneys – Masonry and factory-built chimneys shall be built and installed in accordance with IRC Sections R1001 and R1002 respectively. Flue lining for masonry chimneys shall comply with IRC Section R1001.8. (IRC M1805.1)

ONE- AND TWO- FAMILY DWELLINGS

ELECTRICAL
December 2013

The following are general requirements pertaining to the electrical requirements for one- and two- family dwellings. This does not represent all the provisions regulating electrical installations in one- and two- family dwellings and is not intended to replace the adopted codes and ordinances of the City of Harrisonville, Missouri. For all requirements pertaining to electrical in one- and two- family dwellings, refer to the 2012 International Residential Code and Chapter 500 of the City of Harrisonville Code of Ordinances.

General

1. Fees – The amount of all electrical permit fees are available upon request. Special Note: Construction costs are subject to review by the Director of Community Development.
2. Contractor Licenses – All contractors/builders are required to have a City of Harrisonville issued business license.
3. Master License Required – A master electrician certification shall be requisite for licensing an electrical contractor. Additionally, certified proof of a comprehensive liability policy with a minimum policy amount of five hundred thousand dollars (\$500,000.00) shall be provided along proof of worker's compensation coverage pursuant to the laws of the State of Missouri. The certification of the master electrician must remain current throughout the period of construction. The right of a company to do work as an electrical contractor depends upon the retention of the person holding the master certification as an employee, member, or officer of the company. Except persons doing work on their own residence, no person, other than a licensed contractor or employee of a licensed contractor shall engage in the electrical business, construction, or installations.
4. Permits – With exceptions, permits are required for electrical installations in one- and two- family dwellings. Exceptions would include changing of lighting fixtures where the existing wiring is not altered. Contact the Community Development Department at 380-8958 for more information.
5. Permit Expiration – Permits shall become invalid unless the work is commenced within 180 days after the date of issuance, or if the work is suspended or abandoned for a period of 180 days after the work is commenced.

6. Placement of Permit – Permits shall be posted on site and be visible from the street or the property address clearly identified and visible from the street. Failure to clearly identify the property or post the permit may result in inspections not being performed.
7. Required Inspections – The following electrical inspections are required:
 - Electrical Rough Inspection – Shall be made after all wiring boxes and cabinets have been installed but prior to insulation or sheetrock. This inspection is typically made at the same time as the framing inspection.
 - Electrical Service Inspection – Shall be made after the service equipment is installed, including grounding and service entrance conductors. The City of Harrisonville Electric Department will be notified of all approved electrical services no later than the following day after the electrical service is approved.
8. Appeals/Interpretations/Disputes – Concerns caused as a result of inspection activities should first be addressed with the inspector. Concerns or disputes regarding permit issuance or plan approval should first be addressed with the building official. The building official is available to address concerns regarding any facet of the Community Development department. In order to hear and decide upon appeals or orders, decisions or determinations made by the building official, an application may be filed to be heard before the Board of Building and Engineering Appeals.

Applications for appeal to the Board of Building and Engineering Appeals shall be based upon a claim that the true intent of the code has been incorrectly interpreted, the provisions of the code do not fully apply, or an equally good or better form of construction is proposed. The Building and Engineering Board of Appeals may not waive the requirements of the code.

9. Listing and Labeling – Electrical materials, components, devices, fixtures and equipment shall be listed for the application, shall bear the label of an approved agency and shall be installed, and used, or both, in accordance with the manufacturer’s installation instructions. (IRC E3403.3)
10. Protection of Equipment – Equipment identified only as “dry locations”, “Type 1” or “indoor use only” shall be protected against permanent damage from the weather during building construction. (IRC E3404.4)
11. Integrity of Electrical Equipment – Internal parts of electrical equipment, including busbars, wiring terminals, insulators and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners or abrasives, and corrosive residues. There shall not be any

damaged parts that might adversely affect safe operation or mechanical strength of the equipment such as parts that are broken, bent, cut, deteriorated by corrosion, chemical action, or overheating. Foreign debris shall be removed from equipment. (IRC E3404.7)

12. Mounting – Electrical equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into masonry, concrete, plaster, or similar materials shall not be used. (IRC E3404.8)

Electrical Conductors and Connections

1. Minimum Size of Conductors – The minimum size of conductors for feeders and branch circuits shall be 14 AWG copper and 12 AWG aluminum. (IRC E3406.3)
2. Length of Conductor for Splice or Termination – Where conductors are to be spliced, terminated or connected to fixtures or devices, a minimum length of 6” inches of free conductor shall be provided at each outlet, junction or switch point. (IRC E3406.11.3)
3. Aluminum and Copper Connections – Terminals and splicing connectors shall be identified for the material of the conductors joined. Conductors of dissimilar metals shall not be joined in a terminal or splicing connector where physical contact occurs between dissimilar conductors such as copper and aluminum, copper and copper clad aluminum, or aluminum and copper-clad aluminum, except where the device is listed for the purpose and application. Materials such as inhibitors and compounds shall be suitable for the application and shall be of a type that will not adversely affect the conductors, equipment or installation. (IRC E3406.8)
4. Splices – Conductors shall be spliced or joined with splicing devices listed for the purpose. Wire connectors or splicing means installed on conductors for direct burial shall be listed for such use. (IRC 3306.10)
5. Device Connection – The continuity of a grounded conductor in multiwire branch circuits shall not be dependent upon connection to devices such as receptacles and lampholders. The continuity of equipment grounding conductors shall not be dependent upon such connections in any type of branch circuit. (IRC E3406.11.2)

Services

1. Number of Services – One- and two-family dwellings shall be supplied by only one service. (IRC E3501.2)

2. Service Disconnect Required – Means shall be provided to disconnect all conductors in a building or other structure from the service entrance conductors. (IRC E3601.6)
3. Marking of Service Equipment and Disconnects – Service disconnects shall be permanently marked as a service disconnect. Service equipment shall be listed for the purpose. Individual meter socket enclosures shall not be considered service equipment. (IRC E3601.6.1)
4. Service Disconnect Locations – The service disconnecting means shall be installed at a readily accessible location either outside of the building or structure or inside nearest the point of entrance of the service conductors. Service disconnecting means shall not be installed in bathrooms. Each occupant shall have access to the disconnect serving the dwelling unit in which they reside. (IRC E3601.6.2)
5. Maximum Number of Disconnects – The service disconnecting means shall consist of not more than 6 switches or 6 circuit breakers mounted in a single enclosure or in a group of separate enclosures. (IRC E3601.7)
6. Rating of Service Disconnect – The combined rating of all individual service disconnects serving a single dwelling unit shall not be less than the load determined from IRC Table E3602.2 and shall not be less than as specified in Section E3502.1. (IRC E3602.3)
7. Service and Grounding Electrode Conductor Size – The grounding electrode conductors shall be sized based on the size of the service entrance conductors as required in IRC Table E3603.1.
8. Grounding Electrode System – Where available on the premises at each building served, electrodes and any made electrodes shall be bonded together to form the grounding electrode system. (IRC E3608.1)
9. Metal Underground Water Pipe – A metal underground water pipe in direct contact with the earth for 10 feet or more and electrically continuous to the points of connection of the grounding electrode conductor and the bonding conductors shall be considered as a grounding electrode. Interior metal water piping located more than 5' feet from the entrance to the building shall not be used as part of the grounding electrode system or as a conductor to interconnect electrodes that are part of the grounding electrode system. An additional electrode of a specified type in Sections E3608.1.2 through E3608.1.5 shall supplement a metal underground water pipe. The supplemental electrode shall be bonded to the grounding electrode conductor, the grounded service entrance conductor and the grounded service enclosure. (IRC E3608.1.1 and IRC E3608.1.1.1)

10. Rod and Pipe Electrodes – Rod and pipe electrodes shall not be less than 8' feet in length and shall consist of one of the materials listed in IRC E3508.1.4. Copper ground rods shall not be less than ½" inch in diameter. Electrodes shall be installed so that at least 8' feet of length is in contact with the soil. It shall be driven to a depth of at least 8' feet, except that where rock bottom is encountered, the electrode shall be driven at an angle not to exceed 45 degrees from the vertical or shall be buried in a trench at least 2.5' feet deep. The upper end of the electrode shall be flush or below grade level unless protected from physical damage. (IRC E3608.1.4.1)
11. Grounding Conductor Connection to Electrodes – Grounding conductors shall be connected to electrodes by exothermic welding, listed lugs, listed pressure connectors, listed clamps or other listed means. (IRC E3611.1)
12. Working Clearances for Energized Equipment and Panelboards – A workspace not less than 36" inches deep and 30" inches wide shall be provided in front of all panel boards. The workspace shall allow at least a 90 degree opening of the panel door. (IRC E3405.2) A minimum of 6.5' feet of headroom clearance and lighting shall be provided for all work spaces for service equipment and panel boards located indoors. (IRC E3405.3)

Branch Circuits

1. 15 and 20 Amp Branch Circuits – A 15 or 20 amp branch circuit shall be permitted to supply lighting units, utilization equipment or a combination of both. The rating of any one cord and plug connected utilization equipment not fastened in place shall not exceed 80% percent of the branch circuit rating. The total rating of utilization equipment fastened in place, other than lighting fixtures, shall not exceed 50% percent of the branch circuit ampere rating where lighting units, cord and plug utilization equipment not fastened in place, or both, are supplied. (IRC E3702.3)
2. 30 Amp Circuits – A 30 amp branch circuit shall be permitted to supply fixed utilization equipment. A rating of any one cord and plug connected utilization equipment shall not exceed 80% percent of the branch circuit ampere rating. (IRC E3702.4)
3. Branch Circuits Serving Multiple Loads – The rating of a fastened in place appliance or equipment, where used in combination on the same branch circuit with light fixtures, receptacles, and/or other appliances or equipment not fastened in place, shall not exceed 50% percent of the branch circuit rating. Multi-outlet branch circuits serving lighting or receptacles shall be limited to a maximum branch circuit rating of 20 amps. (IRC E3702.3)

4. Other Loads – To compute the branch circuit loads for motors, ranges, ovens, air conditioners, heating loads and others, see IRC E3702.
5. Branch Circuits for Heating – Central heating equipment other than fixed electric space heating shall be supplied by an individual branch circuit. Permanently connected air-conditioning equipment, and auxiliary equipment directly associated with the central heating equipment such as pumps, motorized valves, humidifiers and electrostatic air cleaners, shall not be prohibited from connecting to the same branch circuit as the central heating equipment. (IRC E3703.1)
6. Kitchen and Dining Area Receptacles – A minimum of two 20-amp branch circuits shall be provided to serve all wall and floor receptacle outlets located in the kitchen, pantry, breakfast area, dining area or similar area of a dwelling. The kitchen countertop receptacles shall be served by a minimum of two 20-amp rated branch circuits, either or both of which may also supply other receptacle outlets in the kitchen, pantry, breakfast and dining area including receptacle outlets for refrigeration appliances. (IRC E3703.2)
7. Laundry Circuit – A minimum of one 20-amp branch circuit shall be provided for receptacles located in the laundry area and shall serve only receptacles located in the laundry. (IRC E3703.3)
8. Bathroom Branch Circuits – A minimum of one 20-amp rated circuit shall be provided to supply bathroom outlet(s). Such circuits shall serve no other outlets. Exception: Where the 20-amp circuit supplies a single bathroom, outlets for equipment within the same bathroom may also be supplied in accordance with IRC Section E3702. (IRC E3703.4)
9. Minimum Number of Branch Circuits – The minimum number of branch circuits shall be determined from the total calculated load and the size or rating of the circuits used. The number of circuits shall be sufficient to supply the load served. In no case shall the load on any one circuit exceed the maximum specified by IRC Section E3702. (IRC E3703.5)
10. Overcurrent Protection Required – All ungrounded branch circuit and feeder conductors shall be protected against overcurrent by an overcurrent device installed at the point where the conductors receive their supply. (IRC E3705.5)
11. Overcurrent Devices of the Next Higher Rating – The next higher standard overcurrent device rating, above the ampacity rating of the conductors being protected, shall be permitted to be used, provided that all the conditions of IRC E3705.5.2 are met. (IRC E3705.5.2)

Wiring Methods

1. Wiring in Attics Across Structural Members – Where run across the top of the floor joists, or run within 7' feet of floor or floor joists across the face of rafters or studding, in attics and roof spaces that are provided with access, the cable shall be protected by substantial guard strips that are at least as high as the cable. Where such spaces are not provided with access by permanent stairs or ladders, protection shall only be required within 6' feet of the nearest edge of the attic entrance. (IRC E3802.2.1)
2. Unfinished Basements – Where type SE or NM cable is run at angles with joists in unfinished basements, cable assemblies containing two or more conductors of sizes 6 AWG and larger and assemblies containing three or more conductors of sizes 8 AWG and larger shall not require additional protection where attached directly to the bottom of the joists. Smaller cables shall be run either through bored holes in joists or on running boards. NM cable used on a wall of an unfinished basement shall be permitted to be installed in a listed conduit or tubing. Such conduit or tubing shall be provided with a nonmetallic bushing or adapter at the point where the cable enters the raceway. (IRC E3802.4)
3. Protection From Physical Damage – Where subject to physical damage, cables shall be protected by rigid metal conduit, intermediate metal conduit, electrical metallic tubing, Schedule 80 PVC rigid nonmetallic conduit, or other approved means. Where passing through a floor, the cable shall be enclosed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, Schedule 80 PVC rigid nonmetallic conduit or other approved means extending not less than 6" inches above the floor. (IRC E3802.3.2)
4. Bends – Bends shall be made so as not to damage the wiring method or reduce the internal diameter of the raceways. For NM and SE cable, the radius of the curve of the inner edge of any bend shall not be less than 5 times the diameter of the cable. (IRC E3802.5)
5. Allowable Applications of Wiring Methods – Allowable applications for wiring methods are found in IRC Table E3801.4.
6. General Installation and Support Requirements for Wiring Methods – General installation and support requirements for wiring methods are found in Table E3802.1.

Receptacle Outlets/Receptacles

1. Convenience Receptacle Distribution – In every kitchen, family room, dining room, living room, parlor, library, den, sun room, bedroom,

recreation room or similar room or area of dwelling units, receptacle outlets shall be installed in accordance with the general provisions specified in IRC Sections E3901.2.1 through E3901.2.3. (IRC E3901.2)

2. Spacing – Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 6’ feet from a receptacle. Receptacles shall, insofar as practicable, be spaced equal distances apart. (IRC E3901.2.1)
3. Wall Space – Wall space shall include the following:
 - Any space that is 2’ feet or more in width, including space measured around corners, and that is unbroken along the floor line by doorways, fireplaces and similar openings.
 - The space occupied by fixed panels in exterior walls, excluding sliding panels.
 - The space created by room dividers such as railings and freestanding bar-type counters. (IRC E3901.2.2)
4. Countertop Wall Space – A receptacle outlet shall be installed at each wall counter space 12” inches or wider. Receptacle outlets shall be installed so that no point along the wall line is more than 24” inches measured horizontally from a receptacle outlet in that space. (IRC E3901.4.1)
5. Receptacle Outlet Location – Receptacle outlets shall be located not more than 20” inches above the countertop and shall not be installed in a face-up position in the countertop. (IRC E3901.4.5)
6. Appliance Outlets – Appliance receptacles outlets installed for specific appliances, such as laundry equipment, shall be installed within 6’ feet of the intended location of the appliance. (IRC E3901.5)
7. Bathroom Outlets – At least one wall receptacle outlet shall be installed in bathrooms and such outlet shall be located within 36” inches of the outside edge of each lavatory basin. The receptacle outlet shall be located on a wall that is adjacent to the lavatory location. (IRC E3901.6)
8. Outdoor Outlets – At least one receptacle outlet accessible at grade level and not more than 6’ feet 6” inches above grade, shall be installed outdoors at the front and back of each dwelling unit having direct access to grade. (IRC E3901.7)
9. Basements and Garages – At least one receptacle outlet, in addition to any provided for laundry equipment, shall be installed in each basement, attached garage and detached garages provided with power. (IRC E3901.9)

10. Hallways – Hallways of 10' feet or more in length shall have at least one receptacle outlet. The hall length shall be considered the length measured along the centerline of the hall without passing through a doorway. (IRC E9801.10)
11. Foyers – Foyers that are not part of a hallway and have an area greater than 60 square feet shall have a receptacle(s) located in each wall space that is 3' feet or more in width and unbroken by doorways and similar openings. (IRC E3901.11)
12. HVAC Outlet – A 125-volt, single phase, 15 or 20- amp rated receptacle outlet shall be installed at an accessible location for the servicing of heating, air-conditioning and refrigeration equipment. The receptacle outlet shall be located on the same level and within 25' feet of the heating, air-conditioning and refrigeration equipment. The receptacle outlet shall not be connected to the load side of the HVAC equipment disconnecting means. (IRC E3901.11)
13. Receptacle Rating – A single receptacle installed on an individual branch circuit shall have an ampere rating not less than that of the branch circuit. When two or more receptacles are connected to a branch circuit, the receptacles shall be rated in accordance with IRC Table E4002.1.2.
14. Grounding Type – Receptacles installed on 15- and 20- amp branch circuits shall be of the grounding type. (IRC E4002.2)
15. Position of Receptacle Faces – After installation, receptacle faces shall be flush with or project from face plates of insulating material and shall project a minimum of 0.015" inch from metal face plates. Face plates shall be installed so as to completely cover the opening and seat against the mounting surface. (IRC E4002.5)
16. Receptacles Mounted in Boxes – Receptacles mounted in boxes that are set back from the finished wall surface as permitted by Section 3906.5 shall be installed so the mounting yoke or strap of the receptacle is held rigidly at the finished surface of the wall. Receptacles mounted in boxes that are flush with the wall surface or project from the wall surface shall be installed so that the mounting yoke or strap is seated against the box or raised cover. (IRC E4002.6)
17. Damp Locations – Receptacles installed outdoors in a location protected from the weather or in other damp locations shall have an enclosure for the receptacle that is weatherproof when the cover is closed and an attachment plug is not inserted. (IRC E4002.8)

18. Bathtub and Shower Spaces – Receptacles shall not be installed within or directly over a bathtub or shower stall. (IRC E4002.11)

Ground Fault and Arc Fault Circuit Interrupter Protection

1. Bathrooms – All 125- volt, single phase, 15- and- 20 amp receptacles installed in bathrooms shall have ground-fault circuit-interrupter protection for personnel. (IRC E3902.1)
2. Garages – All 125 volt, single phase, 15- and 20- amp receptacles installed in garages and grade level portions of unfinished accessory buildings used for storage or work areas shall have ground-fault circuit-interrupter protection for personnel. Exception: Receptacles that are not readily accessible, a single or duplex outlet for appliances located within a dedicated space that are not easily moved from one place to another, and that is cord- and- plug connected. (IRC E3902.2)
3. Outdoor – All 125 volt, single phase, 15 and 20 amp outlets installed outdoors shall have ground-fault circuit-interrupter protection for personnel. (IRC E3902.3). Exception: outdoor outlets installed for snow melting equipment and in accordance with IRC Section E4101.7 may be installed without ground-fault protection.
4. Crawl Spaces – All 125 volt, single phase, 15 and 20 amp outlets installed in crawl spaces shall have ground-fault circuit-interrupter protection for personnel. (IRC E3902.4)
5. Unfinished Basements – All 125 volt, single phase, 15 and 20 amp outlets installed in unfinished basements shall have ground-fault circuit-interrupter protection for personnel. For purposes of this section, unfinished basements are defined as areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and the like. (IRC E3902.5)
6. Kitchen Receptacles – All 125 volt, single phase 15 and 20-ampere receptacles that serve countertop surfaces shall have ground-fault circuit-interrupter protection for personnel. (IRC E3902.6)
7. Sink Receptacles – All 125 volt, single phase, 15 and 20 amp receptacles that are located within 6' feet of the outside edge of a laundry, utility or wet bar sink shall have ground-fault circuit-interrupter protection for personnel. Receptacle outlets shall not be installed in a face-up position in the work surfaces or countertops. (IRC E3802.7)
8. All ground-fault circuit-interrupters shall be installed in a readily accessible location. (IRC E3902.11)

9. Arc-Fault Protection– All branch circuits that supply 120-volt, single-phase, 15- and 20- amp outlets installed in family rooms, dining rooms, living rooms, parlors, libraries, bedrooms, sunrooms, closets, hallways, and similar rooms or areas shall be protected by a combination type or branch circuit type arc-fault circuit interrupter installed to provide protection of the entire branch circuit. (IRC Section E3902.12)

Exception: Where an outlet branch-circuit type AFCI is installed at the first outlet to provide protection for the remaining portion of the branch–circuit, the portion of the branch-circuit between the branch-circuit overcurrent device and the first outlet shall be installed with metal outlet and junction boxes and RMC, IMC, EMT, type MC, or steel armored cables. (IRC E3902.12)

Lighting Outlets

1. Habitable Rooms – At least one wall switch-controlled lighting outlet shall be installed in every habitable room and bathroom. Exception: In other than kitchens and bathrooms, outlets controlled by a wall switch are considered equivalent to the required lighting. Lighting outlets shall be permitted to be controlled by occupancy sensors that are in addition to wall switches, or that are located at a customary wall switch location and equipped with a manual override that will allow the sensor to function as a wall switch. (IRC E3903.2)
2. Additional Locations – At least one wall-switch-controlled lighting outlet shall be installed in hallways, stairways, attached garages with electric power. At least one wall-switch-controlled lighting outlet shall be installed to provide illumination on the exterior side of each outdoor egress door having grade level access, including outdoor egress doors for attached garages and detached garages with electric power. A vehicle door in a garage shall not be considered as an outdoor egress door. Where one or more lighting outlets are installed for interior stairways, there shall be a wall switch at each level and landing level that includes an entryway to control the lighting outlets where the stairway between floor levels has six or more risers. Exception: In hallways, stairways, and outdoor egress doors, remote, central, or automatic control of lighting shall be permitted. (IRC E3903.3)
3. Storage or Equipment Spaces – In attics, under-floor spaces, utility rooms and basements, at least one lighting outlet shall be installed where these spaces are used for storage or contain equipment requiring servicing. Such lighting outlet shall be controlled by a wall switch or shall have an integral switch. At least one point of control shall be at the usual point of entry to these spaces. The lighting outlet shall be provided at or near the equipment requiring servicing. (IRC E3903.4)

4. Switches – General-use and motor-circuit switches and circuit breakers shall clearly indicate whether they are in the open OFF or closed ON position. Where installed vertically the up position of the handle shall be the ON position. (IRC E4001.3)
5. Rating and Application of Snap Switches – General-use snap switches shall be used within their ratings and shall control only the following loads:
 1. Resistive and inductive loads, including electric-discharge lamps, not exceeding the ampere rating of the switch at the voltage involved.
 2. Tungsten-filament lamp loads not exceeding the ampere rating of the switch at 120 volts.
 3. Motor loads not exceeding 80% percent of the ampere rating of the switch at its rated voltage. (IRC E4001.1)
6. Recessed Incandescent Fixtures – Except as specified in this section, recessed incandescent fixtures shall have thermal protection and shall be listed as thermally protected. (IRC E4003.5)
7. Recessed Luminaire Clearance – A recessed luminaire that is not identified for contact with insulation shall have all recessed parts at least 1/2" inch from combustible materials. (IRC E4004.8)
8. Recessed Luminaire Installation – Thermal insulation shall not be installed above or within 3" inches of a recessed luminaire's enclosure, wiring compartment, or ballast except where such luminaire is identified for contact with insulation, Type IC. (IRC E4004.9)
9. Bathtub and Shower Areas – Cord-connected luminaires, chain-, cable-, or cord-suspended (paddle) fans shall not have any parts located within a zone measured 3' feet horizontally and 8' feet vertically from the top of the tub rim or shower stall threshold. This zone is all encompassing and includes the zone directly over the tub or shower. Luminaires located in this zone shall be listed for damp locations and where subject to shower spray, shall be listed for wet locations. (IRC E4003.10)
10. Fixtures in Closets – See IRC E4003.11.
11. Support – Luminaires and lampholders shall be securely supported. A luminaire that weighs more than 6 pounds or exceeds 16" inches in any dimension shall not be supported by the screw shell of a lampholder. (IRC E4004.4)

General Installation Requirements

1. Electrical Continuity of Metal Raceways and Enclosures – Metal raceways, cable armor and other metal enclosures for conductors shall be mechanically joined together into a continuous electric conductor and shall be connected to all boxes, fittings and cabinets so as to provide effective electrical continuity. Raceways and cable assemblies shall be mechanically secured to boxes, fittings, cabinets and other enclosures. Exceptions: Short sections of raceway used to provide cable assemblies with support or protection against physical damage. (IRC E3904.1)
2. Conduit and Tubing Fill – The maximum number of conductors installed in conduit shall be in accordance with IRC Table E3904.6 (1) through E3904.6 (10). (IRC E3804.6)
3. Air Handling-Stud Cavity/Joist Spaces – Where wiring having a nonmetallic covering passes through stud cavities or joist spaces used for air handling, such wiring shall pass through such spaces perpendicular to the long dimension of the spaces. (IRC E3904.7)
4. Metal Boxes – All metal boxes shall be grounded. (IRC E3905.2)
5. Nonmetallic Boxes – Shall be used with only nonmetallic-sheathed cable, cabled wiring methods, flexible cords and nonmetallic raceways. See exceptions. (IRC E3905.3)
6. NM Cable and NM Boxes – Where nonmetallic sheathed cable is used, the cable assembly, including the sheath, shall extend into the box not less than 1/4” inch through a nonmetallic-sheathed cable knockout opening. (IRC E3905.3.1)
7. Securing to Box – All permitted wiring methods shall be secured to the boxes. Exception: Where NM cable is used with boxes not larger than a nominal size of 2-1/4” inch by 4” inches mounted in walls or ceilings, and where the cable is fastened within 8” inches of the box measured along the sheath, and where the sheath extends through a cable knockout not less than 1/4” inch, securing the cable to the box shall not be required. (IRC E3905.3.2)
8. Boxes at Luminaire Outlets – Boxes for luminaire outlets shall be designed for the purpose and shall be installed to allow a luminaire to be attached. (IRC E3905.6)
9. Boxes at Fan Outlets – Outlet boxes and outlet box systems used as the sole support of ceiling-suspended fans (paddle) shall be marked by their manufacturer as suitable for this purpose and shall not support ceiling-

suspended fans (paddle) that weigh more than 70 lbs. For outlet boxes and outlet box systems designed to support ceiling-suspended fans (paddle) that weigh more than 35 lbs, the required marking shall include the maximum weight to be supported. (IRC E3905.9)

10. Conduit Bodies and Junction, Pull and Outlet Boxes to be Accessible – Conduit bodies and junction, pull and outlet boxes shall be installed so that the wiring therein can be accessed without removing any part of the building or, in underground circuits, without excavating sidewalks, paving, earth or substance used to establish the finished grade. (IRC E3905.10)
11. Number of Conductors In Outlet, Device, and Junction Boxes, and Conduit Bodies – Boxes and conduit bodies shall be of sufficient size to provide free space for all enclosed conductors. In no case shall the volume of the box, as calculated in Section E3905.12.1, be less than the box fill calculation as calculated in Section E3905.12.2. The minimum volume for conduit bodies shall be calculated in Section E3905.12.3. (IRC E3905.12)
12. Box Volume Calculations – The volume of a wiring enclosure (box) shall be the total volume of the assembled sections, and, where used, the space provided by plaster rings, domed covers, extension rings, etc., that are marked with their volume in cubic inches or are made from boxes the dimensions of which are listed in IRC Table E3905.12.1. (IRC 3905.12.1)

Installation of Boxes, Conduit Bodies and Fittings

1. Conductors Entering Boxes, Conduit Bodies or Fittings – Conductors entering boxes, conduit bodies or fittings shall be protected from abrasion. (IRC E3906.1)
2. Unused Openings – Unused cable or raceway openings shall be effectively closed to afford protection substantially equivalent to that of the wall of the box or conduit body. (IRC E3906.4)
3. Boxes in Walls or Ceilings – Boxes in walls or ceilings of concrete, tile or other noncombustible material employing a flush-type cover or faceplate shall be installed so that the front edge of the box will not be set back from the finished surface more than 1/4" inch. In walls constructed of wood or other combustible material, boxes shall be flush with the finished surface or project therefrom. (IRC E3906.5)
4. Exposed Surface Extensions – Surface extensions from a flush-mounted box shall be made by mounting and mechanically securing a box or extension ring over the flush box. (IRC E3906.7)

5. Covers and Canopies – Outlet boxes shall be effectively closed with a cover, faceplate or fixture canopy. (IRC E3906.9)
6. Metal Covers and Plates – Metal covers and plates shall be grounded. (IRC E3906.10)

Cabinets and Panel Boards

1. Position in Wall – In walls of concrete, tile or other noncombustible material, cabinets and panelboards shall be installed so that the front edge of the cabinet will not set back more than 1/4" inch. In walls constructed of wood or other noncombustible material, cabinets shall be flush with the finished surface or shall project therefrom. (IRC E3907.3)
2. Unused Openings – Shall be effectively closed. (IRC E3907.5)
3. Openings To Be Closed – Openings through which conductors enter cabinets, panel boards and meter sockets shall be adequately closed. (IRC E3807.7)
4. Cables – Where cables are used, each cable shall be secured to the cabinet, panel board, cutout box, or meter socket enclosure. Exceptions to this requirement are listed in IRC E3907.8. (IRC E9807.8)
5. Conductors Entering Cabinets – Conductors entering cabinets and panelboards shall be protected from abrasion and shall comply with Section E3906.1.1. (IRC E3907.6)

Grounding

1. Metal Enclosures – Metal enclosures of conductors, devices and equipment shall be grounded.

Exception: A short section metal enclosure used to support or protect cables, a metal elbow installed in underground nonmetallic conduit with a minimum cover of 18" inches. (IRC E3908.1)

2. Equipment Grounding – Shall be in accordance with IRC Section E3908.
3. Continuity and Attachment of Equipment Grounding Conductors to Boxes – Where circuit conductors are spliced within a box or terminated on equipment within or supported by a box, any equipment grounding conductors associated with the circuit conductors shall be spliced or joined within the box or to the box with devices suitable for the use. Connections depending solely on solder shall not be used. Splices shall be made in accordance with Section E3406.11 except that insulation shall not be

required. The arrangement of grounding connections shall be such that the disconnection or removal of a receptacle, luminaire or other device fed from the box will not interfere with or interrupt the grounding continuity. (IRC E3908.13)

4. Connecting Receptacle Grounding Terminal to Box – An equipment bonding jumper shall be used to connect the grounding terminal of a grounding-type receptacle to a grounded box except when installed in accordance with one of the exceptions listed in E3908.14. (IRC E3908.14)
5. Metal Boxes – A connection shall be made between the one or more equipment grounding conductors and a metal box by means of a grounding screw that shall be used for no other purpose, or by means of a listed grounding device. Sheet-metal screws shall not be used to connect grounding conductors or connection devices to boxes. (IRC E3908.15)
6. Nonmetallic Boxes – One or more equipment grounding conductors brought into a nonmetallic outlet box shall be arranged to allow connection to fittings or devices installed in that box. (IRC E3908.16)

Panelboards

1. Panelboard Circuit Identification – All circuits and circuit modifications shall be legibly identified as to their clear, evident, and specific purpose or use. The identification shall include sufficient detail to allow each circuit to be distinguished from all others. The identification shall be included in a circuit directory located on the face of the panelboard enclosure or inside the panel door. (IRC E3706.2)

ONE- AND TWO- FAMILY DWELLINGS

PLUMBING

Revised December 2013

The following are general requirements pertaining to plumbing and fuel gas in one- and two- family dwellings. This does not represent all the provisions regulating plumbing and fuel gas of one- and two- family dwellings and is not intended to replace the adopted codes and ordinances of the City of Harrisonville, Missouri. For all requirements pertaining to plumbing and fuel gas in one- and two- family dwellings, refer to the 2012 International Residential Code and Chapter 500 of the City of Harrisonville Code of Ordinances.

General

1. Permit Fees – The amount of all plumbing related fees are available upon request. Special Note: Construction costs are subject to review by the Director of Community Development.
2. Contractor Licenses – All contractor/builders are required to have a City of Harrisonville issued business license.
3. Master License Required – A master plumbing certification shall be requisite for licensing a plumbing contractor. Additionally, certified proof of a comprehensive liability policy with a minimum policy amount of five hundred thousand dollars (\$500,000.00) shall be provided along with proof of worker's compensation coverage pursuant to the laws of the State of Missouri. The certification of the master plumber must remain current throughout the period of construction. The right of a company to do work as a plumbing contractor depends upon the retention of the person holding the master certification as an employee, member, or officer of the company. Except persons doing work on their own residence, no person, other than a licensed contractor or employee of a licensed contractor shall engage in the plumbing business, construction, or installations.
4. Permits – With exceptions, permits are required for plumbing installations in one and two family dwellings. Exceptions would include changing of plumbing fixtures where the supply, drain, or waste and vent system is not altered. Contact the Community Development Department at 380-8958 for more information.
5. Permit Expiration – Permits shall become invalid unless the work is commenced within 180 days after the date of issuance, or if the work is suspended or abandoned for a period of 180 days after the work is commenced.

6. Placement of Permit – Permits shall be posted on site and be visible from the street or the property address clearly identified and visible from the street. Failure to clearly identify the property or post the permit may result in inspections not being performed.
7. Required Inspections – The following plumbing inspections are required:
 - Concrete Slab/Under Floor Inspection – Under floor piping shall be inspected after all water and wastewater piping has been installed and supported but prior to being covered.
 - Top-Rough Plumbing Inspection – Shall be inspected after all water and wastewater piping and vents have been installed but prior to being covered by insulation or sheetrock. This inspection is typically performed in conjunction with the framing inspection.
 - Gas Test Inspection – Shall be made after all gas piping is installed and approved but not covered. Piping shall be tested for a minimum of 10 minutes and at not less than 10 psi or 6” inches of mercury. Gas Service will not be released until gas appliances and equipment have been vented and approved.
 - Water Service Inspection – Shall be made after the water service piping has been installed but prior to being covered.
 - Plumbing Final Inspection – Shall be made after all plumbing piping, fittings, fixtures and connections are complete and operational. This inspection is typically made at the same time the building final inspection is made.
8. Appeals/Interpretations/Disputes – Concerns caused as a result of inspection activities should first be addressed with the inspector. Concerns or disputes regarding permit issuance or plan approval should first be addressed with the building official. The building official is available to address concerns regarding any facet of the Community Development Department. In order to hear and decide upon appeals or orders, decisions or determinations made by the building official, an application may be filed to be heard before the Board of Building and Engineering Appeals.

Applications for appeal to the Board of Building and Engineering Appeals shall be based upon a claim that the true intent of the code has been incorrectly interpreted, the provisions of the code do not fully apply, or an equally good or better form of construction is proposed. The Building and Engineering Board of Appeals may not waive the requirements of the code.

General Code Requirements

1. Protection from Physical Damage – In concealed locations, where piping, other than cast-iron or galvanized steel is installed through holes or notches in studs, joists, rafters or other members less than 1-1/2” inches from the nearest edge of the member, the pipe shall be protected by shield plates. (IRC P2603.2.1)
2. Pipes Through Footings or Foundations – Any pipe that passes under a footing or through a foundation wall shall be provided with a relieving arch; or there shall be built into the masonry wall a pipe sleeve two pipe sizes greater than the pipe passing through. (IRC P2603.5)
3. Sleeves – Annular spaces between sleeves and pipes shall be filled or tightly caulked as approved by the building official. Annular spaces between sleeves and pipes in fire-rated assemblies shall be filled or tightly caulked in accordance with the building portion of the code. (IRC P2606.1)
4. Freezing – Water, soil, or waste pipe shall not be installed in exterior walls, attics, crawl spaces, outside of a building, in exterior walls, in attics or crawl spaces, or in any other place subjected to freezing temperatures unless adequate provision is made to protect it from freezing by insulation, heat, or both. Water service pipe shall be installed a minimum of 42” inches below grade. (IRC P2603.6)
5. Breakage and Corrosion – Pipes passing through or under walls shall be protected from breakage. Pipes passing through concrete or cinder walls and floors, cold-formed steel framing or other corrosive material shall be protected against external corrosion by a protective sheathing or wrapping or other means that will withstand any reaction from lime and acid of concrete, cinder or other corrosive material. Sheathing or wrapping shall allow for expansion and contraction of piping to prevent any rubbing action. Minimum wall thickness of material shall be 0.025” inch. (IRC P2603.3)
6. Trenching and Bedding – Where trenches are excavated such that the bottom of the trench forms the bed for the pipe, solid and continuous load-bearing support shall be provided between joints. Where over-excavated, the trench shall be backfilled to the proper grade with compacted earth, sand, fine gravel or similar granular material. Piping shall not be supported on rocks or blocks at any point. Rocky or unstable soil shall be over-excavated by two or more pipe diameters and brought to the proper grade with suitable compacted granular material. (IRC P2604.1)
7. Backfilling – Backfill shall be free from discarded construction material and debris. Backfill shall be free from rocks and frozen chunks until the pipe is

covered by at least 12" inches of tamped earth. Backfill shall be placed evenly on both sides of the pipe and tamped to retain proper alignment. Loose earth shall be carefully placed in the trench in 6" inch layers and tamped into place. (IRC P2604.3)

8. Waterproofing of Openings – Roof and exterior wall penetrations shall be made watertight. Joints at the roof, around vent pipes, shall be made water tight by the use of lead, copper or galvanized iron flashings or an approved elastomeric material. Counterflashing shall not restrict the required internal cross-sectional area of any vent. (IRC P2607.1)
9. Workmanship – Valves, pipes and fittings shall be installed in correct relationship to the direction of flow. Burred ends shall be reamed to the full bore of the pipe. (IRC P2608.1)
10. Installation of Materials – All materials used shall be installed in strict accordance with the standards under which the materials are accepted and approved. In the absence of such installation procedures, the manufacturer's installation instructions shall be followed. Where the requirements of referenced standards or manufacturer's installation instructions do not conform to the minimum provisions of the code, the provisions of the code shall apply. (IRC P2609.2) Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer. (IRC P2609.1)
11. Water Supply System – Water service pipe material shall be Type K copper from the water main to the water meter. The material between the water meter and point 15' feet from the structure may be of any materials allowed by Code. The material from point 15' feet from the structure to a minimum of 12" inches inside the structure shall be Type K copper. Water service pipe material inside the structure may be any material permitted by the code which has been evaluated and listed as conforming to the requirements of NFS 61. (IRC P2608.5, CC 700.710)
12. Access to Connections – Slip joints shall be made with an approved elastomeric gasket and shall be installed only on the trap outlet, trap inlet and within the trap seal. Fixtures with concealed slip-joint connections shall be provided with an access panel or utility space at least 12" inches in its smallest dimension or other approved arrangement so as to provide access to the slip connections for inspection and repair. (IRC P2704.1)
13. Pipe Support – Piping shall be supported in accordance with IRC Section P2605.1 and Table P2605.1.
14. Fixture Installation – The contact area of where fixtures come into contact with walls and floors shall be watertight. The centerline of water closets or

bidets shall not be less than 15” inches from adjacent walls or partitions or not less than 15” inches from centerline of a bidet to the outermost rim of an adjacent water closet. There shall be at least 21” inches clearance in front of the water closets, bidets, or lavatories to any wall, fixture or door. The location of piping, fixtures or equipment shall not interfere with the operation of windows or doors. Floor-outlet or floor-mounted fixtures shall be secured to the drainage connection and to the floor, where so designed, by screws, bolts, washers, nuts and similar fasteners of copper, brass or other corrosion-resistant material. (IRC P2705.1)

15. Laundry Tray Connection – A laundry tray waste line is permitted to connect into a standpipe for the automatic clothes washer drain. The standpipes shall not be less than 30” inches as measured from the crown weir. The outlet of the laundry tray shall be a maximum horizontal distance of 30” inches from the standpipe trap. (IRC P2706.2.1)

16. Hot Water – Fixture fittings and faucets that are supplied with both hot and cold water shall be installed and adjusted so that the left-hand side of the water temperature control represents the flow of hot water when facing the outlet. Shower and tub/shower mixing valves conforming are exempt. (IRC P2722.2)

Showers

1. General – Showers shall have at least 900 square inches of interior cross-sectional area and be 30” inches minimum dimension measured from the interior dimension of the shower compartment. (IRC P2708.1)
2. Bathtub and Shower Spaces – Bathtub and shower floors and walls above bathtubs with installed shower heads and in shower compartments shall be finished with a non-absorbent surface. Such wall surface shall extend to a height of not less than 6’ feet above the floor. (IRC R307.2)
3. Shower Control Valves – Individual shower and tub/shower combination valves shall be equipped with control valves of the pressure-balance, thermostatic-mixing or combination pressure-balance/thermostatic-mixing valve types with high a limit stop in accordance with ASSE 1016 or A112.18.1/CSA B125. The high limit stop shall be set to limit water temperature to a maximum of 120 degrees F. In-line thermostatic valves shall not be used for compliance with this section. (IRC P2708.3)
4. Water Supply Riser – The supply riser from the shower valve to the shower head outlet shall be secured to the permanent structure. (IRC P2708.2)

Food Waste Grinders

1. Food Waste Grinder Waste Outlet – Food waste grinders shall be connected to a drain of not less than 1-1/2” inches in diameter. (IRC P2716.1)
2. Directional Fitting Required – Approved directional-type branch fittings shall be installed in fixture tailpieces receiving the discharge from food waste disposal units or dishwashers. (IRC P2707.1)

Dishwashing Machines

1. Protection of Water Supply – The water supply shall be protected by an air gap or integral backflow preventor. (IRC P2717.1)
2. Sink, Dishwasher and Food Grinder – The combined discharge from a sink, dishwasher and food grinder is permitted to discharge through a single 1-1/2” inch trap. The discharge pipe from the dishwasher shall be increased to a minimum 3/4” inch in diameter and shall connect with a wye fitting to the sink tailpiece. The dishwasher waste line shall rise and be securely fastened to the underside of the counter before connecting to the sink tailpiece. (IRC P2717.3)

Whirlpool Bathtubs

1. Access To Pump – Access shall be provided to circulation pumps in accordance with the fixture manufacturer’s installation instructions. Where the manufacturer’s instructions do not specify the location and minimum size of field fabricated access openings, a 12” inch by 12” inch minimum size opening shall be installed to provide access to the circulation pump. Where pumps are located more than 2’ feet from the access opening, and 18” inch by 18” inch minimum size opening shall be installed. A door or panel shall be permitted to close the opening. In all cases, the access opening shall be unobstructed and be of the size necessary to permit the removal and replacement of the circulation pump. (IRC P2720.1)
2. Piping Drainage – The circulation pump shall be accessibly located above the crown weir of the trap. The pump drain line shall be properly graded to ensure minimum water retention in the volute after fixture use. The circulation piping shall be installed to be self-draining. (IRC P2720.2)
3. Manufacturer’s Instructions – The product shall be installed in accordance with the manufacturer’s instructions. (IRC P2720.4)

Water Heaters

1. Required Pan – Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a galvanized steel pan having a minimum thickness of 24 gage or other pans for such use. Listed pans shall comply with CSA LC3. (IRC P2801.5) The pan shall be not less than 1-1/2” inches deep and shall be of sufficient size and shape to receive all dripping or condensate from the tank or water heater. The pan shall be drained by an indirect waste pipe having a minimum diameter of 3/4” inch. (IRC P2801.5)
2. Water Heaters Installed in Garages – Water heaters having an ignition source shall be elevated such that the source of ignition is not less than 18” inches above the garage floor. (IRC P2801.6)
3. Relief Valves Required – Appliances and equipment used for heating water or storing hot water shall be protected by a separate pressure-relief valve and a separate temperature-relief valve, or a combination pressure-and temperature-relief valve. (IRC P2803.1) Pressure-relief valves shall have a relief rating adequate to meet the pressure conditions for the appliances or equipment protected. In tanks, they shall be installed directly into a tank tapping or in a water line close to the tank. They shall be set to open at least 25 psi above the system pressure but not over 150 psi. The relief-valve setting shall not exceed the tanks rated working pressure. (IRC P2803.3) Temperature-relief valves shall have a relief rating compatible with the temperature conditions of the appliances or equipment protected. The valves shall be installed such that the temperature-sensing element monitors the water within the top 6” inches of the tank. The valve shall be set to open at a maximum temperature of 210 degrees F. (IRC P2803.4)

Water

1. Backflow Protection – A means of protection against backflow shall be provided in accordance with IRC Sections P2902.3.1 through P2902.3.6, and the State of Missouri Department of Natural Resources.
2. Water Supply System Design Criteria – The water service and water distribution systems shall be designed and pipe sizes shall be selected such that under conditions of peak demand, the capacities at the point of outlet discharge shall not be less than shown in IRC Table P2903.1. The maximum water consumption flow rates and quantities for all plumbing fixtures and fixture fittings shall be in accordance with IRC Table P2903.2.
3. Maximum Pressure – Maximum static pressure shall be 80 psi. When main pressure exceeds 80 psi, an approved pressure-reducing valve

conforming to ASSE 1003 shall be installed on the domestic water branch main or riser at the connection to the water service pipe. (IRC P2903.3.1)

4. Pipe Sizing – Shall be in accordance with IRC P2903.7.
5. Service Valve – Each dwelling unit shall be provided with an accessible main shutoff valve near the entrance of the water service. The valve shall be of a full-open type having nominal restrictions to flow, with provision for drainage such as a bleed orifice or installation of a separate drain valve. Additionally, the water service shall be valved at the curb or property line in accordance with City of Harrisonville requirements. (IRC P2903.9.1)
6. Hose Bibb – Hose bibbs subject to freezing, including the “frost-proof” type, shall be equipped with an accessible stop-and-waste type valve inside the building so that they can be controlled and/or drained during cold periods. Exception: Frost-proof hose bibbs installed such that the stem extends through the building insulation into an open heated or semi-conditioned space need not be separately valved. (IRC P2903.10)
7. Water Service Pipe – Water service pipe material shall be Type K copper from the water main to the water meter. The material between the water meter and point 15’ feet from the structure may be of any materials allowed by Code. The material from point 15’ feet from the structure to a minimum of 12” inches inside the structure shall be Type K copper. Water service pipe material inside the structure may be any material permitted by the code which has been evaluated and listed as conforming to the requirements of NFS 61. (IRC P2608.5, CC 700.710)

Sanitary Drainage

1. Protection from Freezing – No portion of the above grade DWV system other than vent terminals shall be located outside of a building, in attics or crawl spaces, concealed in outside walls, or in any other place subjected to freezing temperatures unless adequate provision is made to protect them from freezing by insulation or heat or both. (IRC P3001.2)
2. Fittings – Fittings shall be approved and compatible with the type of piping being used and shall be a sanitary or DWV design for drainage and venting as shown in IRC Table P3002.3. Water pipe fittings shall be permitted in engineer-designed systems where the design indicates compliance with Section P3101.2.1 (IRC P3002.3)
3. Tightness – Joints and connections in the DWV system shall be gas tight and water tight for the intended use or pressure required by test. (IRC P3003.1)

4. Provisions for Future Fixtures – Where drainage has been roughed-in for future fixtures, the drainage unit values of the future fixtures shall be considered in determining the required drain sizes. Such future installations shall be terminated with an accessible permanent plug or cap fitting. (IRC P3005.1.6)
5. Drainage Pipe Cleanouts – Drainage pipe cleanouts shall comply with IRC Sections P3005.2.1 through P3005.2.11. (IRC P3005.2)
6. Horizontal Drainage Piping Slope – Horizontal drainage piping shall be installed in uniform alignment at uniform slopes not less than 1/4 unit vertical in 12 units horizontal (2% percent slope) for 2-1/2” inch diameter and less, and not less than 1/8 unit vertical in 12 units horizontal (1% percent slope) for diameters of 3” inches or more. (IRC P3005.3)
7. Drain Pipe Sizing – Drain pipes shall be sized according to drainage fixture unit (d.f.u.) loads. The size of the drainage piping shall not be reduced in size in the direction of flow. (IRC P3005.4).
8. Building Drain and Sewer Size and Slope – Pipe size and slope shall be determined from IRC Table P3005.4.2 on the basis of drainage fixture units (d.f.u.) computed from IRC Table P3004.1. (IRC P3005.4.2) The minimum size of a building sewer serving a dwelling unit shall be 4” inches. (City of Harrisonville Ordinance #3046.)

Vents

1. Venting Required – Every trap and trapped fixture shall be vented in accordance with one of the venting methods specified in IRC Chapter 31. (IRC P3101.2.1)
2. Vent Stacks and Stack Vents – The vent system serving each building drain shall have at least one vent pipe that extends to the outdoors. (IRC P3102.1) The required vent shall be a dry vent that connects to the building drain or an extension of a drain that connects to the building drain. Such vent shall not be an island fixture vent as permitted by IRC section P3112. (IRC P3102.2) The required vent shall be sized in accordance with IRC Section P3113.1 based on the required size of the building drain. (IRC P3102.3)
3. Roof Extension – Open vent pipes that extend through a roof shall be terminated at least 6” inches above the roof or 6” inches above the anticipated snow accumulation, whichever is greater, except that where a roof is to be used for any purpose other than weather protection, the vent extension shall run at least 7’ feet above the roof. (IRC P3103.1)

4. Location of Vent Terminal – An open vent terminal from a drainage system shall not be located less than 4' feet directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building, nor shall any such vent terminal be within 10' feet horizontally of such opening unless it is at least 2' feet above the top of such opening. (IRC P3103.5)
5. Grade – Vent and branch vent pipes shall be graded connected and supported to allow moisture and condensate to drain back to the soil or waste pipe by gravity. (IRC P3104.2)
6. Vent for Future Fixtures – Where the drainage piping has been roughed-in for future fixtures, a rough-in connection for a vent shall be installed a minimum of one-half the diameter of the drain. The vent rough-in shall connect to the vent system or shall be vented by other means as provided in IRC Chapter 31. The connection shall be identified to indicate that the connection is a vent. (IRC P3104.6)
7. Distance of Trap from Vent – Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture drain from the trap weir to the vent fitting are within the requirements set forth in Table P3105.1. (IRC P3105.1)
8. Island Fixture Venting – Island fixture venting shall not be permitted for fixtures other than sinks and lavatories. Kitchen sinks with a dishwasher waste connection, a food waste grinder, or both, in combination with the kitchen sink waste, shall be permitted to be vented in accordance with IRC P3112.

Traps

1. Trap Setting and Protection – Traps shall be set level with respect to their water seals and shall be protected from freezing. Trap seals shall be protected from siphonage, aspiration or back pressure by an approved system of venting (See Section P3101). (IRC P3201.3)
2. Size of Fixture Traps – Fixture trap size shall be sufficient to drain the fixture rapidly and not less than the size indicated in Table P3201.7. A trap shall not be larger than the drainage pipe into which the trap discharges.

Fuel Gas

1. Structural Safety – The building shall not be weakened by the installation of any gas piping. In the process of installing or repairing any gas piping, the finished floors, walls, ceilings, tile work or any other part of the building or premises which are required to be changed or replaced shall be left in a

safe structural condition in accordance with the requirements of the 2012 IRC.

2. Prohibited Locations – Appliances shall not be located in sleeping rooms, bathrooms, toilet rooms or storage closets. (IRC G2406.2 (303.3))
3. Appliance Location – Appliances shall be located so as not to interfere with proper circulation of combustion, ventilation and dilution air. (IRC G2407.2 (304.3))
4. Combustion Air Ducts – Shall comply with the provisions of IRC Section G2407.11. (IRC G2407.11 (304.11))
5. Installation – Equipment and appliances shall be installed as required by the terms of their approval, in accordance with the conditions of listing, the manufacturer's instructions and the IRC. Manufacturer's installation instructions shall be available on the job site at the time of inspection. Where a code provision is less restrictive than the condition of the listing of the equipment or appliance or the manufacturer's installation instructions, the conditions of the listing and the manufacturer's installation instructions shall apply. (IRC G2408.1 (305.1))
6. Private Garages – Appliances located in private garages shall be installed with a minimum clearance of 6' feet above the floor. Exception: The requirements of this section shall not apply where the appliances are protected from motor vehicle impact and installed in accordance with IRC Section G2408.2. (IRC G2408.3 (305.5))
7. Clearances to Combustible Construction – Heat-producing equipment and appliances shall be installed to maintain the required clearances to combustible construction as specified in the listing and manufacturer's instructions. Such clearances shall be reduced only in accordance with IRC Section G2409. Clearances to combustibles shall include such considerations as door swing, drawer pull, overhead projections or shelving and window swing. Devices, such as door stops or limits and closers, shall not be used to provide the required clearances. (IRC G2408.5 (305.8))

Pipe Sizing

1. General Considerations – Piping systems shall be of such size and so installed as to provide a supply of gas sufficient to meet the maximum demand without undue loss of pressure between the point of delivery and the appliance. (IRC G2413.1 (402.1))

2. Sizing – Gas piping shall be sized in accordance with one of the following: Pipe sizing tables or sizing equations in accordance with IRC Section G2413.4. The sizing tables included in a listed piping system’s manufacturer’s installation instructions. Other approved engineering methods. (IRC G2413.3 (402.3))

Piping Materials

1. General – Materials used for piping systems shall comply with the requirements of IRC Chapter 24 or shall be approved. The use of copper tubing and fittings for gas-fired appliances shall not be permitted. Copper and brass tubing shall not be used for the distribution of fuel gas. Aluminum or aluminum alloy tubing shall not be used for the distribution of fuel gas. (IRC G2414.1 (403.1) & City of Harrisonville Ordinance #3046.
2. Used Materials – Pipe, fittings, valves or other materials shall not be used again unless they are free of foreign materials and have been ascertained to be adequate for the service intended. (IRC G2414.2 (403.2))

Inspection, Testing and Purging

1. General – Prior to acceptance and initial operation, all piping installations shall be inspected and pressure tested to determine that the materials, design, fabrication, and installation practices comply with the requirements of Chapter 24 of the IRC. (IRC G2417.1 (406.1))
2. Test Pressure Measurement – The test pressure to be used shall not be less than one and one-half times the proposed maximum working pressure, but not less than 10 psig (68.9 kPa) irrespective of design pressure. For welded piping and for piping carrying gas pressures in excess of fourteen (14”) inches water column pressure, the test pressure shall not be less than 60 psig. Where the test pressure exceeds 125 psig, the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50% percent of the specified minimum yield strength of the pipe. (IRC G2417.4.1 (406.4.1) & City of Harrisonville Ordinance #3046
3. Test Duration – The test duration shall not be less than 10 minutes. (IRC G2417.5 (406.5))
4. Corrections – Where leakage or other defects are located, the affected portion of the piping system shall be repaired or replaced and retested.

Piping Support

1. General – Piping shall be provided with support in accordance with IRC Section G2418.2 and at intervals not exceeding the spacing specified in IRC Table G2424.1. (IRC G2418.1 (407.1) & IRC G2424.1 (415.1))

Section IV: Resource Materials

Governing Codes

Ordinance 3236: Adoption of Building Codes

Ordinance 2913: Licensure of Contractors

Ordinance 2914: Tracking Mud on Streets and Sidewalks

Span Tables

Fastener Schedules for Structural Members

Overhead Service Drop Conductors

Missouri One Call System

ALL BUILDERS, CONTRACTORS AND SUBCONTRACTORS

The City of Harrisonville Board of Alderman approved the adoption of the following codes at their regularly scheduled Board meeting on August 05, 2013. Ordinance numbers 3235, 3236, 3237, and 3240.

2012 International Building Code (IBC), including Appendix Chapters B, C, E, F, G, I, J, and K, including amendments.

2012 International Residential Code (IRC), including Appendix Chapters E, H, J and M, including amendments.

2012 International Fire Code (IFC), including Appendix Chapters B, C, D, E, F, G, H, and I, including amendments.

2012 International Mechanical Code (IMC), including Appendix Chapter A, including amendments.

2011 National Electrical Code (NEC), including Annex Chapters A, B, C, D and H, including amendments.

2012 International Plumbing Code (IPC), including Appendix Chapters B, E and F, including amendments.

2012 International Fuel Gas Code (IFGC), including Appendix Chapters A, B, C and D, including amendments.

2012 International Existing Building Code (IEBC) including amendments.

Ordinances may be viewed online at <http://sullivanpublications.com> or by request at the City Clerk's office

These Codes will go into effect officially November 4th, 2013

Council Bill 042

Ordinance 3236

An Ordinance Repealing Chapter 500 Building and Property Maintenance Codes of the City of Harrisonville, Missouri Code of Ordinances and Enacting in Lieu Thereof a New Chapter 500 Building and Property Maintenance Codes.

WHEREAS, the International Building Code regulates and governs the conditions and maintenance of property, buildings and structures; by providing the standards for supplied utilities and facilities and other physical things and conditions essential to ensure that structures are safe, sanitary and fit for human occupation and use; and

WHEREAS, the International Residential Code regulates and governs the construction, alteration, movement, enlargement, replacement, repair, equipment, location, removal and demolition of detached one- and two-family dwellings and multiple single family dwellings (townhouses) not more than three (3) stories in height with separate means of egress; and

WHEREAS, the International Mechanical Code regulates and governs the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of mechanical systems; and

WHEREAS, the International Plumbing Code regulates and governs the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of plumbing systems; and

WHEREAS, the International Fuel Gas Code regulates and governs fuel gas systems and gas-fired appliances; and

WHEREAS, the purpose of the National Electric Code is to regulate and safeguard persons and property from the hazards arising from the use of electricity; and

WHEREAS, the International Existing Building Code regulates and governs the repair, alteration, change of occupancy, addition, and relocation of existing buildings, including historic buildings; and

WHEREAS, the Board of Aldermen of the City of Harrisonville, Missouri, held a public hearing on August 5, 2013.

NOW THEREFORE, BE IT ORDAINED BY THE MAYOR AND THE BOARD OF ALDERMEN OF THE CITY OF HARRISONVILLE, MISSOURI, AS FOLLOWS:

Section 1: That Chapter 500 of the Code of Ordinances of the City of Harrisonville,

Missouri is hereby repealed and a new Chapter 500 is enacted in lieu thereof:

ARTICLE I. INTERNATIONAL BUILDING CODE.

SECTION 500.010: ADOPTION OF THE INTERNATIONAL BUILDING CODE (IBC)

- A. The City hereby adopts the International Building Code, 2012 Edition, as published by the International Code Council, including Appendix Chapters B, C, E, F, G, I, J, and K as the official Building Code of the City of Harrisonville, Missouri.
- B. The City is hereby directed to maintain a copy of the International Building Code, 2012 Edition, at all times in the offices of the City.

SECTION 500.020: AMENDMENTS

The building code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IBC Section 101.1. Insert: "City of Harrisonville".

IBC Section 101.4.6. Energy Code. Delete in its entirety.

IBC Section 103. Department of Building Safety. Shall be amended as follows: Delete "Department of Building Safety" and insert: "Department of Community Development".

IBC Section 103.1. Creation of enforcement agency. Shall be amended as follows: Delete the entire paragraph and insert: "The Department of Community Development is hereby created and the official in charge thereof, or designee, for purposes of administration of this code shall be known as the Building Official, Code Official, or Director of Community Development."

IBC Section 103.3. Deputies. Delete the last sentence.

IBC Section 111.1 shall be amended as follows: Insert: "Exception: Group U Occupancies".

The following new subsections (Section 111.4.1 through Section 111.4.5) shall be added as follows:

111.4.1. Temporary Certificate of Occupancy (TCO). A request for a TCO shall

be made in writing to the Building Official. Such request shall include the address and permit number of the building and a list of the deficiencies for which additional time is needed to complete. The request shall be signed and dated by the permit holder. The Building Official shall act upon a request for a TCO by either approving or denying said request in writing.

111.4.2. Assurance of Completion. A letter from a lending institution stating that a monetary sum in the amount necessary to complete deficiencies is being held in escrow shall be submitted to the Building Official. Said letter shall include a list of deficiencies for which monies have been escrowed, In lieu of a letter from a lending institution, a cash amount as determined by the Building Official may be deposited with the City. The amount of required deposits shall be determined by the Building Official on an annual basis. Separate deposit amounts shall be determined for lineal feet of sidewalks, square footage of driveways and parking lots, landscaping and a lump sum amount for miscellaneous items. The required deposit amounts shall be posted in the Community Development Department office. Deposits shall be refunded when all deficiencies have been satisfied. The City, at its discretion, may upon expiration of a temporary certificate of occupancy use deposited monies to complete any deficiencies.

111.4.3. Length of Temporary Certificate of Occupancy (TCO) Validity. TCO's shall be valid for thirty (30) days. TCO's may be extended for up to an additional ninety (90) days for sidewalks, driveways, parking lots and landscaping (including seeding or sodding) when it is determined by the Building Official that weather conditions are such that additional time is warranted. Requests for additional time shall be made in writing to the Building Official prior to the expiration of the thirty-day TCO.

111.4.4. Violation. Failure to complete deficiencies or request and receive an extension due to weather conditions before the expiration of a TCO shall be considered a violation of this section.

111.4.5. Penalty. Any person who violates any provision of this section, upon conviction, shall be punished by a fine of not less than five dollars (\$5.00) nor more than five-hundred (\$500.00); each day's violation thereof shall be considered a separate offense for the purpose hereof.

IBC Section 901.5. Acceptance Tests. Amend as follows by adding the last sentence to read: "The Building Code Official and Fire Code Official shall be notified 48 hours before any required acceptance testing is performed. It shall be unlawful to occupy portions of a structure until the required fire protection systems within that portion of the structure have been tested and approved."

IBC Section 903.2.1.2. Group A-2. Amend item number 2 by adding an exception as follows: "Exception: Where approved by the building official, tenant spaces of less than 5,000 square feet in existing multi-tenant buildings may increase occupant load to 300."

IBC Section 901.8. NFPA 13 sprinkler systems. Add a subsection 7 as follows: "Automatic sprinkler systems required by this code shall be installed in sprinkler system rooms with access provided to the room from an exterior 3'-0"x6'-8" door for emergency personnel. The door shall be labeled in 3 inch (76 mm) letters, "FIRE SPRINKLER ROOM"."

Exception: The fire area is 5,000 square feet or less, except for Group H occupancies and woodworking operations in excess of 2,500 square feet.

IBC Section 903.2.1.2. Group A-2. Add an exception under item two (2) as follows: "Exception: The occupant load may be increased to 300 if the use is a restaurant that is well lit, does not have excessive noise, and would not be considered a nightclub, tavern, bar or casino."

IBC Section 903.4.2. Alarms. Amend by adding the following: "Alarm devices provided on the exterior of the building shall be a combination horn and strobe device."

IBC Section 905.3.4.1. Hose and cabinet. Delete in its entirety.

IBC Section 905.5.3. Class II system 1-inch (25 mm) hose. Delete in its entirety.

IBC Section 905.7. Cabinets. Delete the words "fire hose".

IBC Section 912.2. Fire Department Connection. Amend by adding the following section: "The location of fire department connections shall be approved by the fire code official. Connections shall be 4 inch Storz quick coupling connector type fitting and located within 100 feet of a fire hydrant, or as approved by the fire code official."

IBC Chapter 13. Energy Efficiency. Delete in its entirety.

IBC Table 1505.1. Minimum Roof Coverings: Delete footnotes a, b, and c from the table.

IBC section 1505.5. Non-classified roofing: Amend as follows: "Non-classified roofing shall not be installed unless utilized for the repair of ten percent or less of the total roof covering in any three-year period."

IBC Chapter 34. Existing Structures. Delete in its entirety.

SECTION 500.030: FEES

Fees shall be as follows:

TOTAL VALUATION *	FEE
\$0 to \$500	\$20
\$500.01 to \$1,000	\$25
\$1,000.01 to \$2,000	\$30
\$2,000.01 to \$14,000	\$30 for the first \$2,000 valuation plus \$2.00 for each additional \$1,000 valuation up to and including \$14,000.
\$4,000.01 and greater	\$54.00 for the first \$14,000 plus \$3 for each additional \$1,000 of valuation.

**Based on the latest edition of Building Valuation Data Square Foot Constructions Costs published by the International Code Council (ICC).*

Other fees:

The commercial plan review fee is 50% of permit fee. This fee is due upon submittal of application.

Inspections outside of normal business hours \$30.00/hr.

Reinspection fee \$20.00

Additional plan review \$30.00/hr.

Outside consultants for plan checking and Actual costs of review inspections, or both.

SECTION 500.040: CONFLICTS

In the event of any conflict between the provisions of the code adopted by this Article and the applicable provisions of this Code of Ordinances, State law or City ordinances, rules or regulations, the provisions of this Code of Ordinances, State law or City ordinances, rules or regulations shall prevail and be controlling.

SECTION 500.050: PERMIT TERM

For any residential building permit issued under the provisions of this Chapter or any ordinances of the City, all outside construction of the structure shall be completely, permanently, and finally enclosed within six (6) months from the date of issuance of the permit. For any commercial building permit issued under the provisions of this Chapter or any ordinances of the City, when the square footage of said structure is less than fifty thousand (50,000) square feet, all outside construction of the structure shall be completely, permanently, and finally enclosed within six (6) months from the date of

issuance of the permit. When the square footage is in excess of fifty thousand (50,000) square feet, all outside construction shall be completed within twelve (12) months from the date of issuance of the permit

Exception: The permit holder may be granted a six (6) month permit extension upon written request to the Community Development Department prior to the expiration of the original permit. In no case shall a permit be extended more than one (1) time.

SECTION 500.060: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or ordinance shall be punished by a fine of not exceeding five hundred dollars (\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.
- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE II. INTERNATIONAL RESIDENTIAL CODE (IRC) FOR ONE- AND TWO-FAMILY DWELLINGS

SECTION 500.070: ADOPTION OF THE INTERNATIONAL RESIDENTIAL CODE FOR ONE- AND TWO-FAMILY DWELLINGS (IRC)

- A. The City hereby adopts the International Residential Code for One- And Two-Family Dwellings, 2012 Edition, as published by the International Code Council, including Appendix Chapters E, H, J, and M, as the official Building Code for One- and

Two-Family Dwellings of the City of Harrisonville, Missouri.

- B. The City is hereby directed to maintain a copy of the International Residential Code, 2012 Edition, at all times in the offices of the City.

SECTION 500.080: AMENDMENTS

The residential code for one- and two-family dwellings adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IRC Section R101.1. Insert: "City of Harrisonville".

IRC Section R103. Department of Building Safety. Shall be amended as follows: delete Department of Building Safety and insert: "Community Development Department."

IRC Section R103.1. Creation of enforcement agency. Shall be amended as follows: Delete the entire paragraph and insert: "The Community Development Department is hereby created and the official in charge thereof for purposes of administration of this code shall be known as the Building Official, Code Official or Director of Community Development."

IRC Section R105.2. Work Exempt from Permit. Amend item one (1) by changing 200 square feet to 120 square feet.

IRC Section 105.2. Work Exempt from Permit. Delete item two (2) in its entirety.

IRC Section 105.2. Work Exempt from Permit. Item five (5) shall be amended as follows: "Sidewalks and Driveways located on private property." _

IRC Section R108. Fees: Delete in its entirety.

The following new subsections (Section 110.4.1 through Section 110.4.5) shall be added as follows:

R110.4.1. Temporary Certificate of Occupancy (TCO). A request for a TCO shall be made in writing to the Building Official. Such request shall include the address and permit number of the building and a list of the deficiencies for which additional time is needed to complete. The request shall be signed by the permit holder. The Building Official shall act upon a request for a TCO by either approving or denying said request in writing.

R110.4.2. Assurance of Completion. A letter from a lending institution stating that

a monetary sum in the amount necessary to complete deficiencies is being held in escrow shall be submitted to the Building Official. Said letter shall include a list of deficiencies for which monies have been escrowed. In lieu of a letter from a lending institution, a cash amount as determined by the Building Official may be deposited with the City. The amount of required deposits shall be determined by the Building Official on an annual basis. Separate deposit amounts shall be determined for the lineal feet of sidewalks, square footage of driveways and parking lots, landscaping and a lump sum amount for miscellaneous items. The required deposit amounts shall be posted in the Community Development Department's office. Deposits shall be refunded when all deficiencies have been satisfied. The City, at its discretion, may upon expiration of a temporary certificate of occupancy use deposited monies to complete any deficiencies.

R110.4.3. Length of Temporary Certificate of Occupancy (TCO) Validity. TCO's shall be valid for thirty (30) days. TCO's may be extended for up to an additional ninety (90) days for sidewalks, driveways, parking lots and landscaping (including seeding or sodding) when it is determined by the Building Official that weather conditions are such that additional time is warranted. Requests for additional time shall be made in writing to the Building Official before the expiration of the thirty-day temporary certificate of occupancy.

R110.4.4. Violation. Failure to complete deficiencies or request and receive an extension due to weather conditions before the expiration of a temporary certificate of occupancy shall be considered a violation of this section.

R110.4.5. Penalty. Any person who violates any provision of this section, upon conviction, shall be punished by a fine of not less than five dollars (\$5.00) nor more than five-hundred dollars (\$500.00); each day's violation thereof shall be considered a separate offense for the purpose hereof.

IRC Section R112. Board of Appeals: Delete in its entirety.

Table R301.2 (1). Climatic and Geographic Design Criteria. Insert:

Ground Snow Load	20 pounds per square foot
Wind Speed	90 miles per hour
Seismic Design Category	A
Weathering	Severe

Frost Line Depth	36 inches
Termite	Moderate to heavy
Winter Design Temp	6 Degrees Fahrenheit
Ice Barrier Underlayment	N/A
Flood Hazards	January 2, 2013, FIRM
Air Freezing Index	927
Annual Air Temperature	55.5 Degrees Fahrenheit

IRC Section R302.3. Exception 1. Two Family Dwellings: Amend exception number 1 by adding D after 13.

IRC Section R312.2. Window sills: Delete in its entirety.

IRC Section 313. Residential Sprinkler Systems: Delete in its entirety.

IRC Section R317.1.1. Field treatment: Delete in its entirety.

IRC Section R318.1.2. Field treatment: Delete in its entirety.

IRC Section R403.1.1.1. Footing reinforcement: Establish a new subsection as follows: "Footings for basement foundation walls shall have a minimum reinforcement consisting of not less than two No. 4 bars, uniformly spaced, located a minimum of 3 inches (76 mm) from the bottom and edges of the footing."

IRC Section R403.1.1.2. Column pads: Establish a new subsection as follows: "Column pads shall be a minimum of 24 inches (610 mm) by 24 inches (610 mm) and 8 inches (203 mm) deep (24" x 24" x 8"). Reinforcement shall consist of a minimum of three No. 4 bars each way, uniformly spaced within each column pad."

IRC Section R404.1.3. Design required. Amend by adding the following:

"3. Foundation walls over 9 feet (2745 mm) in height measured from the top of the footing to the top of the wall."

IRC Tables R404.1.1 (1), R404.1.1 (2), R404.1.1 (3), and R404.1.1 (4). Delete in its entirety.

IRC Tables R404.1.2 (1), R404.1.2 (2), R404.1.2 (3), R404.1.2 (4), R404.1.2 (5), R404.1.2 (6), R404.1.2 (7), R404.1.2 (8). Delete in its entirety.

IRC Table 404.1.2 (3). Minimum Vertical Reinforcement for 8-inch Nominal Flat Concrete Basement Walls. Delete in its entirety and insert 2000 IRC Table 401.1 (1).

IRC Section R502.8.2. Engineered wood products. Amend as follows: Add last sentence to read: "Engineering calculations or data sheets provided by the manufacturer or registered design professional for the proposed cut, notch or hole shall be provided to the Community Development Department."

IRC Section R801.3. Roof drainage. Amend as follows: "All dwellings shall have a controlled method of water disposal from roofs that will collect and discharge all roof drainage to the ground surface at least 3 feet (915 mm) from the foundation walls or to an approved drainage system."

IRC Section N1102.1. Compliance: Amend as follows: "Residential energy efficiency compliance shall be demonstrated by meeting the following requirements of Table N1102.1 for Climate Zone 4. Exception: Portions of the building thermal envelope that do not enclose conditioned space."

- (a) Wall assemblies forming portions of a building envelope shall meet or exceed an R factor rating of 13. This requirement does not apply to doors, windows, or other openings or approved penetrations nor does it apply to basement concrete walls when the basement is not finished as a habitable space.
- (b) Floor assemblies forming portions of a building envelope shall meet or exceed an R factor rating of 19. Garage ceilings with living area above shall comply with this requirement. Exception: Concrete floors in contact with the earth need not be insulated.
- (c) Roof assemblies forming portions of a building envelope shall meet or exceed an R factor rating of 30. This requirement does not apply to skylights or other approved penetrations.
- (d) Ceilings forming portions of a building envelope shall meet or exceed an R factor rating of 30 at the time of installation.

IRC Section N1102.4. Air leakage. The building thermal envelope must be durably sealed to limit infiltration and the following items must be caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film or solid material;

- (a) All joints, seams and penetrations.
- (b) Site-built windows, doors and skylights.
- (c) Openings between window and door assemblies and their respective jambs and framing.
- (d) Utility penetrations.
- (e) Dropped ceilings or chases adjacent to the thermal envelope.
- (f) Knee walls.
- (g) Walls and ceilings separating the garage from conditioned spaces.
- (h) Behind the tub and showers on exterior walls.
- (i) Common walls between dwelling units.
- (j) Other sources of infiltration.

IRC Section 1103.2. Ducts. Delete in its entirety and amend as follows: "All portions of the air distribution system shall be installed in accordance with IRC Section M1601. Supply and return ducts located within the building but outside of conditioned space must be insulated to an installed R-5, and insulated to an installed R-8 when located outside of the building."

IRC Section G2414.1 (403.1). Piping Materials: Insert a second paragraph to read as follows: "The use of copper tubing and fittings for gas-fired appliances shall not be permitted."

IRC Section P2603.5. Freezing: amend as follows: "Water, soil or waste pipe shall not be installed outside a building, in exterior walls, in attics or crawl spaces, or in any other place subjected to freezing temperatures unless adequate provision is made to protect it from freezing by insulation or heat or both. Water service pipe shall be installed not less than 42 inches (1068 mm) in depth below grade."

IRC Section P2603.5.1. Sewer depth: Amend as follows: "Building sewers shall be a minimum of 12 inches (305 mm) below grade."

IRC Section P2902.5.3. Lawn irrigation systems: Amend as follows: "The potable water supply to lawn irrigation systems shall be protected against backflow by a device approved by the Missouri Department of Natural Resources. Backflow

devices installed within structures shall be a minimum of 6 inches (152 mm) away from a wall or vertical obstruction. The backflow device shall be installed between 12 inches (305 mm) and 48 inches (1220 mm) above the floor and shall be accessible.”

IRC Section P3005.4.2. Building drain and sewer size and slope: Amend by adding a last sentence as follows: “The minimum size of a building sewer serving a dwelling unit shall be 4 inches (102 mm).”

SECTION 500.090: CERTAIN UTILITIES NOT SUPPLIED PRIOR TO SUCCESSFUL INSPECTIONS

No water service or electrical service shall be supplied to any building prior to successful completion of all building, electrical, plumbing and mechanical inspections.

SECTION 500.100: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or ordinance shall be punished by a fine not exceeding five hundred dollars (\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.
- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE III. INTERNATIONAL MECHANICAL CODE (IMC)

SECTION 500.110: ADOPTION OF THE INTERNATIONAL MECHANICAL CODE (IMC)

- B. The City hereby adopts the International Mechanical Code, 2012 Edition, as published by the International Code Council, including Appendix Chapter A as the official Mechanical Code of the City of Harrisonville, Missouri.
- B. The City is hereby directed to maintain one copy of the International Mechanical Code, 2012 Edition, at all times in the offices of the City.

SECTION 500.120: AMENDMENTS

The International Mechanical Code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IMC Section 101.1. Insert: "City of Harrisonville"

IMC Section 103. Department of Mechanical Inspection. Shall be amended as follows: Delete "Department of Mechanical Inspection" and insert: "Community Development Department".

IMC Section 103.1. General. Shall be amended as follows: Delete the entire paragraph and insert: "The Community Development Department is hereby created and the official in charge thereof for purposes of administration of this code shall be known as the Building Official, Code Official or Director of Community Development."

IMC Section 106.5.2. Fee Schedule: Delete in its entirety.

IMC Section 109. Means of Appeal: Delete in its entirety.

SECTION 500.130: FEES

Fees shall follow Section 500.030.

SECTION 500.140: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or

ordinance shall be punished by a fine not exceeding five hundred dollars (\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.

- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE IV. INTERNATIONAL PLUMBING CODE (IPC)

SECTION 500.150: ADOPTION OF THE INTERNATIONAL PLUMBING CODE (IPC)

- B. The City hereby adopts the International Plumbing Code, 2012 Edition, as published by the International Code Council, including Appendix Chapters B, E, and F as the official Plumbing Code of the City of Harrisonville, Missouri.
- B. The City is hereby directed to maintain one copy of the International Plumbing Code, 2012 Edition, at all times in the offices of the City.

SECTION 500.160: AMENDMENTS

The plumbing code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IPC Section 101.1. Insert: City of Harrisonville.

IPC Section 103. Department of Plumbing Inspection. Shall be amended as follows: Delete "Department of Plumbing Inspection" and insert: "Community Development Department".

IPC Section 103.1. General. Shall be amended as follows: Delete the entire paragraph and insert: "The Community Development Department is hereby

created and the official in charge thereof for purposes of administration of this code shall be known as the Building Official, Code Official or Director of Community Development.”

IPC Section 109. Means of Appeal: Delete in its entirety.

IPC Section 305.4.1. Sewer depth. Amend as follows: “Building sewers shall be a minimum of 12 inches (305 mm) below grade.”

IPC Section 312.10. Inspection and testing of backflow prevention assemblies. Amend as follows: “Inspection and testing of backflow prevention assemblies shall be in accordance with the policies prescribed by the Public Works Department of the City of Harrisonville, Missouri.”

IPC Section 903.1. Roof extension. Insert “6 inches (152 mm)”.

IPC Section 1101.3. Prohibited drainage: Shall be amended as follows: “Storm water shall not be drained into sewers intended for sewage only. Sanitary sewer systems shall be designed, built and maintained in such a manner to prevent all storm or ground water from draining, discharging or entering into the sanitary sewer system. Connection of sump pumps, foundation drains, yard drains, gutter downspouts and any other storm water drainage receptacle(s) or system(s) are specifically prohibited from being connected to the sanitary sewer system.”

SECTION 500.170: PLASTIC PIPE

The building sewer shall be a minimum four (4) inch diameter PVC or ABS Schedule 40 plastic pipe or better.

SECTION 500.180: FEES

Fees shall follow Section 500.030.

SECTION 500.190: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or ordinance shall be punished by a fine not exceeding five hundred dollars

(\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.

- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE V. INTERNATIONAL FUEL GAS CODE.

SECTION 500.200: ADOPTION OF THE FUEL GAS CODE (IFGC)

- C. The City hereby adopts the International Fuel Gas Code, 2012 Edition, as published by the International Code Council, including Appendix Chapters A, B, C, and D, as the official Fuel Gas Code of the City of Harrisonville, Missouri.
- B. The City is hereby directed to maintain one copy of the International Fuel Gas Code, 2012 Edition, at all times in the offices of the City.

SECTION 500.210: AMENDMENTS

The fuel gas code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IFGC Section 101.1. Insert: "City of Harrisonville".

IFGC Section 103. Department of Inspection. Shall be amended as follows: Delete "Department of Inspection" and insert: "Community Development Department".

IFGC Section 103.1. General. Shall be amended as follows: Delete the entire paragraph and insert: "The Community Development Department is hereby created and the official in charge thereof for purposes of administration of this code shall be known as the Building Official, Code Official or Director of

Community Development”.

IFGC Section 109. Means of Appeal. Delete in its entirety.

IFGC Section 403.4.3. Copper and Brass. Amend as follows: “Copper and brass tubing shall not be used for the distribution of fuel gas.”

IFGC Section 403.4.4. Aluminum. Amend as follows: “Aluminum or aluminum alloy tubing shall not be used for the distribution of fuel gas.”

IFGC Section 406.4.1. Test pressure. Amend as follows: “The test pressure to be used shall be not less than one and one-half times the proposed maximum working pressure, but not less than 10 psig (68.9 kPa) irrespective of design pressure. For welded piping, and for piping carrying gas at pressures in excess of fourteen (14) inches (356 mm) water column pressure, the test pressure shall not be less than 60 psig. Where the test pressure exceeds 125 psig (862 kPa), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.”

SECTION 500.220: FEES

Fees shall follow Section 500.030.

SECTION 500.230: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or ordinance shall be punished by a fine not exceeding five hundred dollars (\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.
- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or

permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE VI. NATIONAL ELECTRIC CODE

SECTION 500.240: ADOPTION OF THE NATIONAL ELECTRIC CODE (NEC)

- C. The City hereby adopts the National Electrical Code, NFPA 70, 2011 Edition, as published by the National Fire Protection Association, including Annex Chapters A, B, C, D and H as the official Electrical Code of the City of Harrisonville, Missouri.
- B. The City is hereby directed to maintain one copy of the National Electric Code, 2011 Edition, at all times in the offices of the City.

SECTION 500.250: AMENDMENTS

The electric code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

NEC Annex Chapter H. Administration and Enforcement: Amend as follows:
Delete Section 80.15. Electrical Board, paragraph A through H in its entirety.

NEC Annex Chapter H. Administration and Enforcement: Amend as follows:
Delete Section 80.19. Permits and Approvals, paragraph D and E in its entirety.

NEC Annex Chapter H. Administration and Enforcement: Amend as follows:
Delete Section 80.23. Notice of Violations, Penalties, paragraph B in its entirety.

NEC Annex Chapter H. Administration and Enforcement: Amend as follows:
Delete Section 80.27. Inspector's Qualifications, paragraph A through D in its entirety.

SECTION 500.260: FEES

Fees shall follow Section 500.030.

SECTION 500.270: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or ordinance shall be punished by a fine not exceeding five hundred dollars (\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.
- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE VII. INTERNATIONAL EXISTING BUILDING CODE.

SECTION 500.280: ADOPTION OF EXISTING BUILDING CODE (IEBC).

- A. The City hereby adopts the International Existing Building Code, 2012 Edition, as published by the International Code Council as the official Existing Building Code of the City of Harrisonville, Missouri.

B. The City is hereby directed to maintain one copy of the International Existing Building Code, 2012 Edition, at all times in the offices of the City.

SECTION 500.290: AMENDMENTS.

The Existing Building code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IEBC Section 101.1. Insert: "the City of Harrisonville".

IEBC Section 103. Department of Building Safety. Shall be amended as follows: Delete "Department of Building Safety" and insert: "Community Development Department".

IEBC Section 103.1. Creation of enforcement agency. Shall be amended as follows: Delete the entire paragraph and insert: "The Community Development Department is hereby created and the official in charge thereof for purposes of administration of this code shall be known as the Building Official, Code Official or Director of Community Development".

IEBC Section 108. Fees. Delete in its entirety.

IEBC Section 112. Means of Appeal. Delete in its entirety.

IEBC Section 406. Glass Replacement: Delete and replace as follows. "The installation of replacement of glass shall be as required for new installation, unless the structure is of historic or architectural significance as determined by the City."

IEBC Section 707. Energy Conservation. Delete in its entirety.

IEBC Section 811. Energy Conservation. Delete in its entirety.

IEBC Section 908. Energy Conservation. Delete in its entirety.

IEBC Section 1106. Energy Conservation. Delete in its entirety.

SECTION 500.300: FEES

Fees shall follow Section 500.030.

SECTION 500.310: GENERAL PENALTY -- CONTINUING VIOLATIONS

- A. Whenever in the Code adopted in this Article or in any ordinance of the City amending said Code any act is prohibited or is made or declared to be unlawful or an offense, or whenever in this Code or ordinance the doing of any act is required or the failure to do any act is declared to be unlawful, where no specific penalty is provided therefor, the violation of any such provision of this Code or ordinance shall be punished by a fine not exceeding five hundred dollars (\$500.00) or by imprisonment not exceeding ninety (90) days, or by both such fine and imprisonment; provided however, that in any case wherein the penalty for an offense is fixed by any State law or Statute, the same penalty so fixed by State law or Statute shall be imposed for the punishment of such offense and no other, except that imprisonments, when made under this Section, may be in the City Jail instead of the County Jail.
- B. Each day any violation of any provision of this Code or of any such ordinance shall continue shall constitute a separate offense.
- C. In addition to the penalty set out in Subsection (A), any condition caused or permitted to exist in violation of any of the provisions of this Code or any such ordinance shall be deemed a public nuisance and may be, by the City, abated as provided by law and each day that such condition continues shall be regarded as a new and separate offense.

ARTICLE VIII. PROPERTY MAINTENANCE

SECTION 500.320: STRUCTURE

Every foundation, roof, exterior wall, door, sky light and window shall be reasonably

weather tight and water tight, and shall be kept in sound condition and good repair. Existing screen doors and windows shall be maintained in sound condition and good repair. Floors, interior walls and ceilings shall be in good condition and good repair. All exterior wood surfaces, other than decay-resistant woods, shall be protected from the elements and decay by paint which is not lead based paint or by other protective coverings or treatment. Walls shall be capable of affording privacy for occupants.

SECTION 500.330: EXTERIOR APPURTENANCES

Exterior appurtenances, including but not limited to screens, awnings, trellises, television antennas, chimneys, storm windows, gutters, eaves, storm doors, fences, and retaining walls shall be installed pursuant to the requirements of all other portions of the City's code in a safe and secure manner and shall be maintained in good repair.

SECTION 500.340: HANDRAILS

Every stairway outside of the building or dwelling shall be kept in safe condition and sound repair. Every flight of stairs shall be free of deterioration. Every stairwell and flight of stairs which is three (3) or more risers high shall have handrails or railings on at least one (1) side. Every rail and balustrade shall be firmly fastened and maintained in good condition. No flight of stairs shall have settled or have pulled away from the supporting or adjacent structure so as to create a safety hazard. No flight of stairs shall have rotting, loose, or deteriorating supports. The treads and risers of every flight of stairs shall be uniform in width and height.

SECTION 500.350: GUARDRAILS

Every porch, balcony or raised floor surface located more than thirty (30) inches above the floor or grade below shall have guards not less than thirty-six (36) inches in height. The intermediate rails or ornamental closures shall not have an opening greater than what a sphere four (4) inches in diameter will pass through. Ornamental patterns on the intermediate rails shall not create a ladder effect.

ARTICLE IX. ABANDONED RESIDENTIAL PROPERTY REGISTRATION

SECTION 500.360: DEFINITIONS

For the purposes of this Chapter, certain words and phrases used in this Article are defined as follows:

ABANDONED: A property that is vacant and under a current Notice of Default or Notice of Sale, or properties that have been the subject of a foreclosure sale where the title was retained by the beneficiary of a deed of trust involved in the foreclosure and any properties transferred under a deed in lieu of foreclosure or sale.

ACCESSIBLE PROPERTY: A property that is accessible through a compromised, breached or broken gate, fence or other entry point.

ACCESSIBLE STRUCTURE: A structure that is unsecured or breached in such a way as to allow access to the interior space by unauthorized persons.

BENEFICIARY: A lender under a note secured by a deed of trust.

DAYS: Consecutive calendar days.

DEED IN LIEU OF FORECLOSURE OR SALE: A recorded document that transfers ownership of a property from the trustor to the holder of a deed of trust upon consent of the beneficiary of the deed of trust.

DEED OF TRUST: An instrument by which title to real estate is transferred to a third party trustee as security for a real estate loan. This definition includes any subsequent deeds of trust.

DEFAULT: The failure to fulfill a contractual obligation, monetary or conditional.

EVIDENCE OF VACANCY: Any condition that on its own, or combined with other conditions present, would lead a reasonable person to believe that the property is vacant. Such conditions include, but are not limited to, overgrown or dead vegetation, accumulation of newspapers, circulars, flyers or mail, past due utility notices or disconnected utilities, accumulation of trash, junk or debris, the absence of window coverings such as curtains, blinds or shutters, the absence of furnishings or personal items consistent with residential habitation, statements by neighbors, passersby, delivery agents, government employees that the property is vacant.

FORECLOSURE: The process by which a property, placed as security for a real estate loan, is sold at auction to satisfy the debt if the trustor (borrower) under a deed of trust defaults.

LOCAL: Within forty (40) road/driving miles distance of the subject property.

NOTICE OF DEFAULT: A notice, issued pursuant to the applicable real estate security document or Section 408.554, RSMo., which a default has occurred under a deed of trust.

OUT OF AREA: In excess of forty (40) road/driving miles distance of the subject

property.

OWNER: Any person, co-partnership, association, corporation, or fiduciary having a legal or equitable title or any interest in any real property.

OWNER OF RECORD: The person having recorded title to the property at the point in time the record is provided by the Cass County Recorder's office.

PROPERTY: Any unimproved or improved real property or portion thereof, situated in the City and includes the buildings or structures located on the property regardless of condition.

REGISTERED REPRESENTATIVE: The person designated by a beneficiary as the beneficiary's representative for purposes of accepting notice, service and summons on behalf of the beneficiary and for otherwise ensuring compliance with the requirements of this Article.

RESIDENTIAL BUILDING: Any improved real property or portion thereof, situated in the City, designed or permitted to be used for dwelling purposes, and shall include the buildings and structures located on such improved real property. This includes any real property being offered for sale, trade, transfer, or exchange as "residential" whether or not it is legally permitted or zoned for such use.

SECURING: Such measures as may be directed by the Director of Community Development or his designee that assist in rendering the property inaccessible to unauthorized persons, including, but not limited to, the repairing of fences and walls, chaining/pad locking of gates, the repair or boarding of door, window or other openings.

TRUSTEE: The person, firm or corporation holding a deed of trust on a property.

TRUSTOR: A borrower under a deed of trust, who deeds property to a trustee as security for the payment of a debt.

VACANT: A building/structure that is not legally occupied.

SECTION 500.370: REGISTRATION

- A. Any beneficiary under a deed of trust covering a property located within the City of Harrisonville shall cause an inspection to be performed of the property that is the security for the deed of trust within fifteen (15) days of issuing a notice of default to the trustor. The beneficiary shall, within ten (10) days of the inspection, register the property with the Director of Community Development or his designee on forms provided by the City.
- B. The registration shall contain the full legal name of the beneficiary and the registered representative, the direct street/office mailing address of the beneficiary and the registered representative (no P. O. Boxes), a direct contact name and phone number for the beneficiary and registered representative, and, if

applicable, the local property management company responsible for the security, maintenance and marketing of the property.

- C. The registration shall be valid as long as the subject property remains vacant and shall be amended as needed.
- D. This Section shall also apply to properties that have been the subject of a foreclosure sale where title to the property was transferred to the beneficiary of a deed of trust involved in the foreclosure and any properties transferred under a deed in lieu of foreclosure or sale.
- E. Properties subject to this Article shall remain under the security and maintenance standards of this Section as long as they remain vacant.
- F. Any person, firm or corporation that has registered a property under this Article must report any change of information contained in the registration within ten (10) days of the change.

SECTION 500.380: MAINTENANCE REQUIREMENTS

Properties subject to this Article shall be in compliance with the City of Harrisonville Property Maintenance Code. Adherence to this Section does not relieve the beneficiary or property owner of any obligations set forth in any covenants, conditions and restrictions or homeowner's association rules and regulations which may apply to the property.

SECTION 500.390: SECURITY REQUIREMENTS

- A. Properties subject to this Section shall be maintained in a secure manner so as not to be accessible to unauthorized persons. This includes, without limitation, the closure and locking of windows, doors (walk-through, sliding and garage), gates and any other opening of such size that it may allow a child to access the interior of the property and/or structure(s). In the case of broken windows, "*securing*" means the reglazing or boarding of the window.
- B. If the beneficiary is an out of area beneficiary, a local property management company shall be contracted to perform weekly inspections to verify that the requirements of this Section, and any other applicable laws, are being met.
- C. The beneficiary shall cause the property to be inspected on a weekly basis to determine if the property is in compliance with the requirements of this Article.

SECTION 500.400: COMPLIANCE WITH OTHER AUTHORITY

The requirements of this Article are in addition to any other maintenance and security measures required by the Code of Ordinances. The requirements of this Article shall not serve to lessen or abrogate any other applicable provisions of the Code of Ordinances.

SECTION 500.410: VIOLATIONS

Any beneficiary, registered representative, or local property management company that violates any provision of this Article shall be in violation of this Article, and a General Ordinance Summons (GOS) may be issued against the beneficiary's representative for such violation. In addition to any other penalties which may be assessed for a violation of this Article, any person or entity who violates a provision of this Article shall be assessed a fine of five hundred dollars (\$500.00) per violation, or imprisonment not exceeding ninety (90) days, or both such fine and imprisonment.

Section 3. If any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Section 4. That this order shall become effective ninety (90) days after its passage and approval.

Vote taken as follows:

Ayes: Aldermen Meyer, Dahlman, Coburn, Dickerson, Reece, Stull, Mollenhour

Nays: None

Abstain: None

Absent: Alderman Milner

READ ONE TIME BY TITLE ONLY ON AUGUST 5, 2013. READ FOR A SECOND TIME BY TITLE ONLY ON AUGUST 5TH, 2013 AND WAS DULY APPROVED BY THE BOARD OF ALDERMEN THIS 5TH DAY OF AUGUST 2013.



Kevin W. Wood, Mayor and Ex-Officio
Chairman of the Board of Aldermen

ATTEST:



Kim Hubbard, City Clerk

APPROVED by the Mayor this 5th day of August 2013.

- C. The provisions of this Chapter shall not apply to helicopter rescue units, emergency medical service or the personnel which are:
1. Owned and operated by an agency of the United States Government;
 2. Rendering assistance at the request of the EMS department in cases of disasters or major emergency too great for the Harrisonville Emergency Services resources.

ARTICLE III. EMERGENCY MANAGEMENT

SECTION 205.090: ORGANIZATION

This agency shall consist of an Emergency Services Director and other members appointed by the Emergency Services Director to conform to the State organization and procedures for the conduct of emergency operations as outlined in the Missouri Emergency Operations Plan.

SECTION 205.100: OATH

No person shall be employed or associated in any capacity in any organization established under this act who advocates or has advocated a change by force or violence in the constitutional form of the government of the United States or in this State or the overthrow of any government in the United States by force or violence or has been convicted of or is under indictment or information charging any subversive act against the United States. Each person who is appointed to serve in an organization shall, before entering upon his/her duties, take an oath, in writing, before a person authorized to administer oaths in this State, which oath shall be substantially as follows:

"I, _____, do solemnly swear/affirm that I will support and defend the Constitution of the United States and the Constitution of the State of Missouri against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will faithfully discharge the duties upon which I am about to enter. And I do further swear/affirm that I do not advocate, nor am I a member of any political party or organization that advocates the overthrow of the government of the United States or of this State by force or violence; and that during such a time as I am a member of the Harrisonville Emergency Management Agency, I will not advocate nor become a member of any political party or organization that advocates the overthrow of the government of the United States or of this State by force or violence."

ARTICLE IV. FIRE CODE

SECTION 205.110: ADOPTION OF INTERNATIONAL FIRE CODE (IFC)

- A. The City hereby adopts the International Fire Code, 2012 Edition, as published by the International Code Council, including Appendix Chapters B, C, D, E, F, G, H, and I as the official Fire Code of the City of Harrisonville, Missouri.
- B. The City is hereby directed to maintain one copy of the International Fire Code, 2012 Edition, at all times in the offices of the City.

SECTION 205.120: AMENDMENTS

The fire code adopted by the provisions of this article is hereby amended and/or modified in the following respects:

IFC Section 101.1. Insert: “the City of Harrisonville”.

IFC Section 105.1.2. Types of permits. Delete paragraph number 2 in its entirety.

IFC Section 105.7. Required construction permits. Delete in its entirety.

IFC Section 108. Board of Appeals. Delete in its entirety.

IFC Section 113. Fees. Delete in its entirety.

IFC Section 307. Open Burning, Recreational Fires and Portable Outdoor Fire Places. Delete in its entirety and enact as follows:

“307.1. *General.* A person shall not kindle or maintain or authorize to be kindled or maintained any open burning unless conducted in accordance with this Section and Sections 205.040-205.060.”

“307.1.2. During any period when the Fire Code Official has declared a burn ban under the provisions of the Code of Ordinances of the City of Harrisonville.”

“307.2. *Extinguishment of Burn.* When open burning becomes offensive or objectionable due to smoke or odor emissions or when atmospheric conditions or local circumstances make such fires hazardous, the Fire Code Official or his/her designee is authorized to order the extinguishment of the open burning.”

“307.3. *Location.* The location for open burning shall not be less than 50 feet (15240 mm) from any structure and provisions shall be made to prevent the fire from spreading to within 50 (15240 mm) feet of any structure. Burning is not permitted in or on public parks, sidewalks, streets, curbs or drainage areas or in parking areas which are generally open to the public.”

“Exceptions:

1. Fires in approved containers that are less than 15 (4572 mm) feet from a structure.
2. The minimum required distance from a structure shall be 25 feet (7620 mm) where the pile size is 3 feet (915 mm) or less in diameter and 2 feet (610 mm) or less in height.”

307.3.1 “*Bonfires.* A bonfire shall not be conducted within 25 feet (7620 mm) of a structure or combustible material unless the bonfire is contained in a barbeque pit.

Conditions which could cause a fire to spread within 25 feet (7620 mm) of a structure shall be eliminated prior to ignition.”

307.3.2 *“Recreational Fires.* Recreational fires shall not be conducted within 25 feet (7620 mm) of a structure or combustible material unless the fire is contained in a barbecue pit. Conditions which could cause a fire to spread within 25 feet (7620 mm) of a structure shall be eliminated prior to ignition.”

307.4. *“Attendance.* Open burning; bonfires or recreational fires shall be constantly attended until the fire is extinguished. A minimum of one portable fire extinguisher complying with IFC Section 906 with a minimum 4-A rating or other approved on-site fire extinguishing equipment such as dirt, sand, water barrel, garden hose or water truck shall be available for immediate utilization.”

307.5. *“Open-flame cooking devices.* Charcoal burners and other open-flame cooking devices shall not be operated on combustible balconies or within 10 feet (3048 mm) of combustible construction.”

“Exceptions:

1. One-and two-family dwellings.
2. Where buildings, balconies or decks are protected by an automatic sprinkler system.

307.5.1. Liquefied-petroleum-gas-fueled cooking devices. LP-gas burners having a LP-gas container with a water capacity greater than 25 pounds (1.14 kg) LP-gas capacity shall not be located on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exception: One-and two-family dwellings.”

IFC Section 503.4.1. Traffic Calming Devices. Delete in its entirety.

IFC Section 510.1. Emergency Responder Radio Coverage. Delete exception 3 in its entirety.

IFC Section 510.2 through Section 510.6.3. Delete in its entirety.

IFC Section 901.4.6. Pump and riser room size. Amending by adding as follows: “Automatic sprinkler systems required by this code shall be installed in sprinkler system rooms with access provided to the room from an exterior 3’-0”x6’-8” door for emergency personnel. The door shall be labeled in 3 inch letters, “FIRE SPRINKLER ROOM”.”

Exception: The fire area is 5,000 square feet or less, except for Group H occupancies and woodworking operations in excess of 2,500 square feet.

IFC Section 901.5. Installation acceptance testing. Amend as follows: “Fire detection and alarm systems, fire extinguishing systems, fire hydrant systems, fire standpipe systems, fire pumps, private fire mains and all other protection systems and appurtenances thereto shall be subject to acceptance test(s) as contained in the installation standards and as approved by the Building Code Official and Fire Code Official. The Building Code Official and Fire Code Official shall be notified 48 hours before any required acceptance testing is performed. It shall be unlawful to occupy portions of a structure until the required fire protection systems within that portion of the structure have been tested and approved.”

IFC Section 903.2.1.2. Group A-2. Amend item number 2 by adding an exception as follows: “Exception: Where approved by the building official, tenant spaces of less than 5,000 square feet in existing multi-tenant buildings may increase occupant load to 300” as allowed in IBC Section 903.2.1.2 (Group A-2) and the exception as stated in the adopting ordinance Section 500.020.

IFC Section 903.2.8. Group R. Amend as follows: Add Exception: “One-and two-family dwellings.”

IFC Section 903.3.1.1. NFPA 13 sprinkler systems.

IFC Section 903.3.7. Fire department connections. Amend by adding the following: “The location of the fire department connections shall be approved by the fire code official. Connections shall be a 4 inch Storz quick coupling connector type fitting and located within 100 feet of a fire hydrant, or as approved by the fire code official.”

IFC Section 903.4.2. Alarms. Amend by adding the following: “Alarm devices provided on the exterior of the building shall be a combination horn and strobe device.”

IFC Section 905.3.4.1. Hose and cabinet. Delete in its entirety.

IFC Section 905.5.3. Class II system 1-inch hose. Delete in its entirety.

IFC Section 905.7. Cabinets. Delete the words “fire hose”.

IFC Section 5704.2.9.5. Above-ground tanks inside of buildings. . Insert: “Prohibited in R-1, R-1M, R-2, R-3, R-4, CBD-1 and CBD-2. By permit only in C-O, C-1 and C-2.”

IFC Section 5704.2.9.6. Above-ground tanks outside of buildings. Insert: “Prohibited in R-1, R-1M, R-2, R-3, R-4, CBD-1 and CBD-2. By permit only in C-O, C-1 and C-2.”

IFC Section 5704.2.4.4. Limits in which the storage of Class I and Class II liquids in above-ground tanks is prohibited: Insert: “Prohibited in R-1, R-1M, R-2, R-3, R-4, CBD-1 and CBD-2. By permit only in C-O, C-1 and C-2.”

IFC Section 6104.2. Limits in which the storage of liquefied petroleum gas (LPG) is restricted for the protection of heavily populated or congested areas: Insert: “Prohibited in R-1, R-1M, R-2, R-3, R-4, CBD-1 and CBD-2, except that LPG containers of not more than 120 gallons may be used in these districts for fireplace fuel only. By permit only in C-O, C-1 and C-2.”

IFC Section D105.1. Where required. Amend by adding the following last sentence: "Aerial apparatus access roads as defined in IFC Appendix D shall be provided completely around the perimeter of every building classified as a Group R-1, R-2, or R-4 occupancy."

ARTICLE V. FIREWORKS

SECTION 205.130: DEFINITION

For the provisions of this Article, the term "*fireworks*" shall mean any composition or device for the purpose of producing a visible or an audible effect for entertainment purposes by combustion, deflagration, or detonation that meets the definition of 1.4G fireworks or 1.3G fireworks as set forth herein.

FIREWORKS, 1.4g (Formerly known as Class C, Common Fireworks): Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by composition. Such 1.4G fireworks which comply with the construction, and labeling regulations of the DOTn for Fireworks, UN0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507, are not explosive material for the purpose of the Code. "*Fireworks*" shall mean and include, but are not limited to the following: blank cartridges, toy pistols, toy cannons, toy canes or toy guns in which explosives are used, the type of balloons which require fire underneath to propel the same, fire crackers, torpedoes, skyrockets, roman candles, sparklers, or other fireworks of like construction or other device or any explosive substance. "*Fireworks*" shall not include toy guns, toy pistols, toy canes, and other devices where twenty-five hundredths (0.25) grains or less of an explosive compound are used.

FIREWORKS, 1.3G (Formerly Class B, Special Fireworks): Large fireworks devices, which are explosive materials, intended for use in fireworks displays and designed to produce audible or visible effects by combustion, deflagration, or detonation. Such 1.3G fireworks include, but are not limited to firecrackers containing more than one hundred thirty (130) milligrams (2 grains) of explosive composition, aerial shells containing more than forty (40) grams of pyrotechnic composition, and other display pieces which exceed the limits for classification as 1.4G fireworks. Such 1.3G fireworks are also described as fireworks, UN0335 by the DOTn. Examples are devices typically displayed at commercial or professional displays.

SECTION 205.140: EXCEPTION

Nothing in this Article shall be construed as applying to the manufacture, storage, sale or use of signals necessary for the safe operation of railroads or other classes of public or private transportation, nor applying to the military or naval forces of the United States or of this State or to Peace Officers, nor as prohibiting the sale or use of blank cartridges for ceremonial or theatrical or athletic events or agricultural purposes.

SECTION 205.150: SALE, ETC., RESTRICTED

No retailer, dealer or any other person shall sell, offer for sale, store, display or have in his/her possession any fireworks that have not been approved and labeled as 1.4G fireworks as defined above. No fireworks shall be sold except during the fireworks season as herein defined. "*Fireworks season*" shall be the period beginning on the twentieth (20th) day of June and continuing through the fifth (5th) day of July of the same year.

Council Bill 046

Ordinance 3240

An Ordinance Amending Chapter 700, Utilities, Section 700.210, of the City of Harrisonville, Missouri Code of Ordinances.

NOW THEREFORE, BE IT ORDAINED BY THE MAYOR AND THE BOARD OF ALDERMEN OF THE CITY OF HARRISONVILLE, MISSOURI, AS FOLLOWS:

Section 1: That Section 700.210 Subsection C of the Code of Ordinances of the City of Harrisonville, Missouri is hereby repealed and replaced as follows:

“For new water service connections, the material shall be type K Copper between the main and the meter. The material between the meter and a point 15 feet from the structure can be any material allowed by the Code. The material from a point 15 feet from the structure into the structure shall be type K Copper.”

Section 2. If any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Section 3. That this order shall become effective ninety (90) days after its passage and approval.

Vote taken as follows:

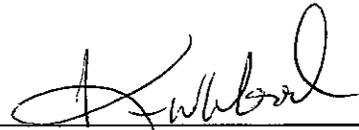
Ayes: Aldermen Meyer, Dahlman, Coburn, Dickerson, Reece, Stull, Mollenhour

Nays: None

Abstain: None

Absent: Alderman Milner

READ ONE TIME BY TITLE ONLY ON AUGUST 5, 2013. READ FOR A SECOND TIME BY TITLE ONLY ON AUGUST 5TH, 2013 AND WAS DULY APPROVED BY THE BOARD OF ALDERMEN THIS 5TH DAY OF AUGUST 2013.



Kevin W. Wood, Mayor and Ex-Officio
Chairman of the Board of Aldermen

Council Bill 043

Ordinance 3237

An Ordinance Amending Chapter 505, Building Regulations, of the City of Harrisonville, Missouri Code of Ordinances.

NOW THEREFORE, BE IT ORDAINED BY THE MAYOR AND THE BOARD OF ALDERMEN OF THE CITY OF HARRISONVILLE, MISSOURI, AS FOLLOWS:

Section 1: That Chapter 505, Section 505.010 B of the Code of Ordinances of the City of Harrisonville, Missouri is hereby amended as follows: "Section 500.025" shall be changed to "Section 500.030."

Section 2: That Chapter 505, Section 505.020 of the Code of Ordinances of the City of Harrisonville, Missouri is hereby repealed and a new Section 505.020 is enacted in lieu thereof:

SECTION 505.020: ENCLOSURE OF SWIMMING POOL

- A. *Required.* All outdoor swimming pools capable of holding more than 24 inches of water, according to the manufacturer's specification, are required to have a building permit. Additionally, the pool, and surrounding area shall comply with all other applicable laws or codes adopted by the City.
- B. *Permanent Pools.* Permanent above ground or in-ground pools shall be completely surrounded by a fence or wall, not less than four (4) feet in height that is not easily climbable by small children and shall be constructed as to have no openings, holes or gaps that would allow the passage of a four inch sphere. A dwelling or accessory building may be used as part of the enclosure. All gates or doorways into the enclosed pool area shall be self-closing and self-latching, with the exception of the dwelling unit door if equipped with alarm to indicate unauthorized opening.
- C. *Seasonable Pools.* All seasonal pools designed to be storable, may be set up from May 1 until October 1 each calendar year. Such pools may be installed in a fenced yard or enclosure not less than 42 inches in height, that is not easily climbable by small children, and shall not have openings, holes or gaps, that would allow for the passage of a four inch sphere. All gates or doorways into the enclosed pool area shall be self-closing and self-latching or secured against unauthorized opening during the time that the pool is erected.
- D. *Modifications Authorized.* Modification to the pool enclosure may be made provided that there is no decrease in the level of safety required by these ordinances. Such modification shall only be made upon approval of the Director of Community Development or Building Official, upon examination of the requested modification.

Section 3: That Chapter 505, Section 505.030 D2 of the Code of Ordinances of the City of Harrisonville, Missouri is hereby repealed and a new Section 505.030 D2 is enacted in lieu thereof:

2. To review the decision of the Building Official, Director of Community Development, Director of Emergency Services, or other City official in the interpretation of the International Building Code, International Residential Code, International Plumbing Code, International Mechanical Code, International Fire Code, International Fuel Gas Code, National Electric Code, or the International Existing Buildings Code, or other related City ordinance specified in the appeal ordinance.

Section 4: That Chapter 505, Section 505.030 D4 of the Code of Ordinances of the City of Harrisonville, Missouri is hereby repealed and a new Section 505.030 D4 is enacted in lieu thereof:

4. The Board shall have no authority to waive requirements of the International Building Code, International Residential Code, International Plumbing Code, International Mechanical Code, International Fire Code, International Fuel Gas Code, National Electric Code or the International Existing Buildings Code.

Section 5: That Chapter 505, Section 505.050 through Section 505.080 of the Code of Ordinances of the City of Harrisonville, Missouri is hereby repealed and replaced as follows:

SECTION 505.050: METHOD OF NUMBERING

All buildings fronting on public streets and avenues of the City shall be numbered in conformity with the numbering map of the City on file with the Director of Community Development.

SECTION 505.060: EXPENSE

The expense incurred in compliance with this article shall be borne by the party placing the number.

Section 6. If any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Section 7. That this order shall become effective ninety (90) days after its passage and approval.

Vote taken as follows:

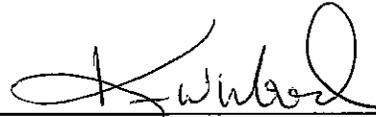
Ayes: Aldermen Meyer, Dahlman, Coburn, Dickerson, Reece, Stull, Mollenhour

Nays: None

Abstain: None

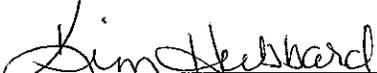
Absent: Alderman Milner

READ ONE TIME BY TITLE ONLY ON AUGUST 5, 2013. READ FOR A SECOND TIME BY TITLE ONLY ON AUGUST 5TH, 2013 AND WAS DULY APPROVED BY THE BOARD OF ALDERMEN THIS 5TH DAY OF AUGUST 2013.



Kevin W. Wood, Mayor and Ex-Officio
Chairman of the Board of Aldermen

ATTEST:



Kim Hubbard, City Clerk

APPROVED by the Mayor this 5th day of August 2013.

COUNCIL BILL NO. 042

ORDINANCE NO. -2913 (25-05)

AN ORDINANCE TO REPEAL CHAPTER 11, ARTICLE I, SECTION(S) 11-1 THROUGH 11-3, ARTICLE III, DIVISION 2, LICENSE, SECTION(S) 11-51 THROUGH 11-60 INCLUSIVE, CHAPTER 27, ARTICLE I, SECTION(S) 27-1 THROUGH 27-3, ARTICLE III, DIVISION 1, GENERALLY, SECTION(S) 27-36 THROUGH 27-52 INCLUSIVE OF THE CODE OF ORDINANCES OF THE CITY OF HARRISONVILLE, MISSOURI; AND ENACTING A NEW SECTION 8-20, LICENSING OF CERTAIN CONSTRUCTION TRADES REQUIRED WITHIN THE CITY OF HARRISONVILLE, MISSOURI.

WHEREAS the City of Harrisonville Board of Alderman are concerned with the health, safety and general welfare of its citizens.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF ALDERMAN OF THE CITY OF HARRISONVILLE, MISSOURI, AS FOLLOWS:

Section 1: That Section 8-20 of Article II of Chapter 8 of the Code of Ordinances of the City of Harrisonville, Missouri shall be enacted to read as follows:

Sec. 8-20. Licensing of certain construction trades required.

(1) The provisions of Section 8-20, Article II of Chapter 8 shall take precedent over any portions of international codes adopted by the City of Harrisonville in Sections 11-1 through 11-3, Sections 11-51 through Sections 11-60, Sections 27-1 through 27-3, and 27-36 through 27-52 that are contrary to its provisions.

Definitions:

Electrical contractor. Any person, business, organization, partnership, corporation, or sole proprietorship that engages in the business of contracting for installation, alteration, repair, assembly, maintenance, or service of electrical systems and equipment within the City of Harrisonville, Missouri.

Mechanical contractor. Any person, business, organization, partnership, corporation, or sole proprietorship that engages in the business of contracting for installation, alteration, repair assembly, maintenance, or service of heating, ventilating, and air conditioning (HVAC) systems within the City of Harrisonville, Missouri.

Plumbing contractor. Any person, business, organization, partnership, corporation, or sole proprietorship that engages in the business of contracting for the installation, alteration, repair, assembly, maintenance, or service of plumbing systems and fixtures within the City of Harrisonville, Missouri.

No electrical, mechanical, or plumbing contractor, as defined herein, or other person, business, organization, partnership or corporation, shall contract to perform, sublet any work to a person not licensed for such work under the provisions of this section, or perform electrical, mechanical, or plumbing work, unless at least one (1) person who is licensed, as set forth in subsection (4), is an employee of the business, organization, partnership, or corporation, to do or doing the electrical, mechanical, or plumbing work, or is the person to do or doing the work.

To be properly licensed, a person must hold at the time of contracting and at the time of the performance of the work, a valid Master Electrical, Master Residential Electrical, Master Plumbing, Master Residential Plumbing, Master Mechanical, or a Residential Air Conditioning Trade License, from the City of Kansas City, Missouri; Independence, Missouri; or a Thomson Prometric (formerly Exporior) Test Certificate with a minimum score of 75.

No permit shall be issued for the performance of electrical, mechanical, or plumbing work as defined in this section unless said work will be performed in compliance with subsection (3) and a valid license or test certificate as required in subsection (4) is provided for inspection at the time the permit is applied for or received.

Exceptions. The following persons shall not be required to comply with the above licensing requirements:

a) Craftsman employed by a licensed contractor.

Manufacturer's representatives working under the direct supervision of a licensed individual and/or sales representatives installing low amperage fixtures that they have sold to the location where it is to be installed.

Any person currently occupying and doing work regulated by this section in an existing single-family dwelling used exclusively for living purposes, including the usual detached accessory building(s), providing such person certifies that he or she is occupying the existing dwelling and is the bona fide owner of such dwelling and accessory building(s), and that said owner shall personally purchase all material and perform all labor in connection therewith, providing however, that all such work herein shall be subject to permit, inspection, and approval in accordance with the terms of this article.

As a condition precedent to the issuance of a business license involving electrical, mechanical, or plumbing work, the applicant shall furnish to the City a Certificate of Insurance evidencing that the applicant has a comprehensive general liability coverage policy with the minimum limits of Five Hundred Thousand and 00/100 (\$500,000.00) Dollars for personal injuries and property damage; proof of worker's compensation coverage pursuant to the laws of the State of Missouri; and an executed good and sufficient bond in the sum of Two Thousand Five Hundred and 00/100 (\$2,500.00) Dollars which is conditioned as follows: "That said contractor shall indemnify and protect the city against all costs and expenses which may in any way accrue against the

city consequential to the operations covered by any electrical, mechanical, or plumbing license in the city to include damage to city property or right-of-way which includes excavation made in, or any obstructions placed upon any street or sidewalk in the city or any claims or causes of action for personal injuries or property damage brought against the city due to damage placed upon city property or right-of-way by said licensee while engaged in and about the performance of such work.”

Any person, corporation, or partnership violating the requirements of this section shall be punished as set forth in Section 1-10 of the Code of Ordinances of the City of Harrisonville.

Section 2: That this order shall become effective one hundred twenty (120) days after its passage and approval.

Read one time by title on April 18, 2005, and the second time by title only on April 18, 2005, and passed and approved by the Board of Alderman this 18th day of April 2005.

Kevin W. Wood, Mayor & Ex-Officio
Chairman of the Board of Alderman

ATTEST:

Debbie Grant, City Clerk

APPROVED by the Mayor this 18th day of April 2005.

COUNCIL BILL NO. 043

ORDINANCE NO. 2914 (26-05)

AN ORDINANCE TO AMEND CHAPTER 16, ARTICLE II, SECTION 16-18 OF THE CODE OF ORDINANCES OF THE CITY OF HARRISONVILLE, MISSOURI; ENACTING NEW SUBPARAGRAPH (I), TRACKING OR DEPOSITING MUD, DEBRIS, ETC.: AN ORDINANCE PROHIBITING THE TRACKING OR DEPOSITING OF MUD, DEBRIS, ETC. ON ANY STREET OR SIDEWALK WITHIN THE CITY OF HARRISONVILLE, MISSOURI.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF ALDERMAN OF THE CITY OF HARRISONVILLE, MISSOURI, AS FOLLOWS:

Section 1: That subparagraph (i) of Section 16-18 of Article II of Chapter 16 of the Code of Ordinances of the City of Harrisonville, Missouri shall be enacted as follows:

(i) Any contractor, builder, developer, or owner and/or his/her employees and/or subcontractors who deposit, spill, drop or track any dirt, earth, mud, rock, sand, shale, concrete, debris, rubbish or other material on any street or sidewalk shall immediately remove the material from the street or sidewalk. Erosion of soil which flows onto any street, sidewalk, right of way, gutter, storm sewer, waterway or drainage way from property before or during construction shall be considered as depositing dirt, earth, mud, rock, sand, shale, concrete, debris or other construction debris. If the contractor, builder, developer, or owner and/or his/her employees and/or subcontractors fail to immediately remove the dirt, earth, mud, rock, sand, shale, concrete, debris, rubbish or other material from the street or sidewalk, the Director of Codes Administration or their designee may take any or all of the following actions: Issue a Stop Work Order; Discontinue all inspections for any site contributing to the violation; Withhold certificate(s) of occupancy, including temporary certificates of occupancy(s), or Issue a citation for any site contributing to the violation.

Additionally, failure to immediately remove said material from the street or sidewalk is a violation of Section 16-18 (i) of the City of Harrisonville Code of Ordinances and is punishable under Section 1-10 of the City of Harrisonville Code of Ordinances as set forth in the following punishment schedule.

First conviction: a fine of not less than \$1.00 and not more than \$500.00; imprisonment for not more than 90 days may also be adjudged.

Second conviction: a fine of not less than \$100.00 and not more than \$500.00; imprisonment for not more than 90 days may also be adjudged.

Third conviction: a fine of \$500.00; imprisonment for not more than 90 days may also be adjudged.

All subsequent convictions after the third shall be a fine of \$500.00 and imprisonment for not less than ten days and not more than 90 days.

At the Director of Codes Administration's discretion, a report of a violation of this section shall be forwarded to the City's prosecuting attorney for legal remedy. Each day's violation shall be considered a separate offense.

Section 2: That this order shall become effective upon its passage and approval.

Read one time by title only on April 18, 2005, and the second time by title only on April 18, 2005, and passed and approved by the Board of Alderman this 18th day of April 2005.

Kevin W. Wood, Mayor & Ex-Officio
Chairman of the Board of Alderman

ATTEST:

Debbie Grant, City Clerk

APPROVED by the Mayor this 18th day of April 2005.

Community Development Department Concrete Reinforcement Tables

December 2013

The attached span tables are based on the 2000 International Residential Code and are reproduced with the permission from the International Code Council.

2. Walls supporting more than 48 inches (1219 mm) of unbalanced backfill that do not have permanent lateral support at the top and bottom.

R404.1.4 Seismic Design Categories D₁ and D₂. In addition to the requirements of Table R404.1.1(1), plain concrete and plain masonry foundation walls located in Seismic Design Categories D₁ and D₂, as established in Table R301.2(1), shall comply with the following:

1. Minimum reinforcement shall consist of one No. 4 (No. 13) horizontal bar located in the upper 12 inches (305 mm) of the wall,
2. Wall height shall not exceed 8 feet (2438 mm),
3. Height of unbalanced backfill shall not exceed 4 feet (1219 mm), and
4. A minimum thickness of 7.5 inches (191 mm) is required for plain concrete foundation walls except that a minimum thickness of 6 inches (152 mm) shall be per-

mitted for plain concrete foundation walls with a maximum height of 4 feet, 6 inches (1372 mm).

5. Plain masonry foundation walls shall be a minimum of 8 inches (203 mm) thick.

Vertical reinforcement for masonry stem walls shall be tied to the horizontal reinforcement in the footings. Masonry stem walls located in Seismic Design Categories D₁ and D₂ shall have a minimum vertical reinforcement of one No. 3 bar located a maximum of 4 feet (1220 mm) on center in grouted cells.

Foundation walls located in Seismic Design Categories D₁ and D₂, as established in Table R301.2(1), supporting more than 4 feet (1219 mm) of unbalanced backfill or exceeding 8 feet (2438 mm) in height shall be constructed in accordance with Table R404.1.1(2), R404.1.1(3) or R404.1.1(4) and shall have two No. 4 (No. 13) horizontal bars located in the upper 12 inches (305 mm) of the wall.

**TABLE R404.1.1(1)
PLAIN CONCRETE AND PLAIN MASONRY FOUNDATION WALLS**

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^c (feet)	PLAIN CONCRETE MINIMUM NOMINAL WALL THICKNESS (inches)			PLAIN MASONRY ^a MINIMUM NOMINAL WALL THICKNESS (inches)		
		GW, GP, SW and SP	GM, GC, SM, SM-SC and ML	SC, MH, ML-CL and inorganic CL	Soil classes ^b		
					GW, GP, SW and SP	GM, GC, SM, SM-SC and ML	SC, MH, ML-CL and inorganic CL
5	4	6	6	6	6 solid ^d or 8	6 solid ^d or 8	6 solid ^d or 8
	5	6	6	6	6 solid ^d or 8	8	10
6	4	6	6	6	6 solid ^d or 8	6 solid ^d or 8	6 solid ^d or 8
	5	6	6	6	6 solid ^d or 8	8	10
	6	6	8 ^g	8 ^g	8	10	12
7	4	6	6	6	6 solid ^d or 8	8	8
	5	6	6	8 ^g	6 solid ^d or 8	10	10
	6	6	8	8	10	12	10 solid ^d
	7	8	8	10	12	10 solid ^d	12 solid ^d
8	4	6	6	6	6 solid ^d or 8	6 solid ^d or 8	8
	5	6	6	8	6 solid ^d or 8	10	12
	6	8 ^h	8	10	10	12	12 solid ^d
	7	8	10	10	12	12 solid ^d	Footnote e
9	4	6	6	6	6 solid ^d or 8	6 solid ^d or 8	8
	5	6	8 ^g	8	8	10	12
	6	8	8	10	10	12	12 solid ^d
	7	8	10	10	12	12 solid ^d	Footnote e
	8	10	10	12	12 solid ^d	Footnote e	Footnote e
	9	10	12	Footnote f	Footnote e	Footnote e	Footnote e

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 Pa.

- a. Mortar shall be Type M or S and masonry shall be laid in running bond. UngROUTED hollow masonry units are permitted except where otherwise indicated.
- b. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.
- c. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.
- d. Solid grouted hollow units or solid masonry units.
- e. Wall construction shall be in accordance with Table R404.1.1(2) or a design shall be provided.
- f. A design is required.
- g. Thickness may be 6 inches, provided minimum specified compressive strength of concrete, f_c , is 4,000 psi.

**TABLE R404.1.1(2)
REINFORCED CONCRETE AND MASONRY^a FOUNDATION WALLS**

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^b (feet)	MINIMUM VERTICAL REINFORCEMENT SIZE AND SPACING ^{b, c} FOR 8-INCH NOMINAL WALL THICKNESS		
		Soil classes ^d		
		GW, GP, SW and SP soils	GM, GC, SM, SM-SC and ML soils	SC, MH, ML-CL and Inorganic CL soils
6	5	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	6	#4 at 48" o.c.	#4 at 40" o.c.	#5 at 48" o.c.
7	4	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 40" o.c.
	6	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 40" o.c.
	7	#4 at 40" o.c.	#5 at 40" o.c.	#6 at 48" o.c.
8	5	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 40" o.c.
	6	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 40" o.c.
	7	#5 at 48" o.c.	#6 at 48" o.c.	#6 at 40" o.c.
	8	#5 at 40" o.c.	#6 at 40" o.c.	#6 at 24" o.c.
9	5	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7	#5 at 48" o.c.	#6 at 48" o.c.	#6 at 32" o.c.
	8	#5 at 40" o.c.	#6 at 32" o.c.	#6 at 24" o.c.
	9	#6 at 40" o.c.	#6 at 24" o.c.	#6 at 16" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Mortar shall be Type M or S and masonry shall be laid in running bond.
- b. Alternative reinforcing bar sizes and spacings having an equivalent cross-sectional area of reinforcement per lineal foot of wall shall be permitted provided the spacing of the reinforcement does not exceed 72 inches.
- c. Vertical reinforcement shall be Grade 60 minimum. The distance from the face of the soil side of the wall to the center of vertical reinforcement shall be at least 5 inches.
- d. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.
- e. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.

**TABLE R404.1.1(3)
REINFORCED CONCRETE AND MASONRY^a FOUNDATION WALLS**

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^b (feet)	VERTICAL REINFORCEMENT SIZE AND SPACING ^{b, c} FOR 12-INCH NOMINAL WALL THICKNESS		
		Soil classes ^d		
		GW, GP, SW and SP soils	GM, GC, SM, SM-SC and ML soils	SC, MH, ML-CL and Inorganic CL soils
7	4	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6	#4 at 72" o.c.	#4 at 64" o.c.	#4 at 48" o.c.
	7	#4 at 72" o.c.	#4 at 48" o.c.	#5 at 56" o.c.
8	5	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6	#4 at 72" o.c.	#4 at 56" o.c.	#5 at 72" o.c.
	7	#4 at 64" o.c.	#5 at 64" o.c.	#4 at 32" o.c.
	8	#4 at 48" o.c.	#4 at 32" o.c.	#5 at 40" o.c.
9	5	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6	#4 at 72" o.c.	#4 at 56" o.c.	#5 at 64" o.c.
	7	#4 at 56" o.c.	#4 at 40" o.c.	#6 at 64" o.c.
	8	#4 at 64" o.c.	#6 at 64" o.c.	#6 at 48" o.c.
	9	#5 at 56" o.c.	#7 at 72" o.c.	#6 at 40" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Mortar shall be Type M or S and masonry shall be laid in running bond.
- b. Alternative reinforcing bar sizes and spacing having an equivalent cross-sectional area of reinforcement per lineal foot of wall shall be permitted provided the spacing of the reinforcement does not exceed 72 inches.
- c. Vertical reinforcement shall be Grade 60 minimum. The distance from the face of the soil side of the wall to the center of vertical reinforcement shall be at least 8.75 inches.
- d. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.
- e. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.

TABLE R404.1.1(4)
REINFORCED CONCRETE AND MASONRY^a FOUNDATION WALLS

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^b (feet)	MINIMUM VERTICAL REINFORCEMENT SIZE AND SPACING ^{b,c} FOR 10-INCH NOMINAL WALL THICKNESS		
		Soil Classes ^d		
		GW, GP, SW and SP soils	GM, GC, SM, SM-SC and ML soils	SC, MH, ML-CL and inorganic CL soils
7	4	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6	#4 at 56" o.c.	#4 at 48" o.c.	#4 at 40" o.c.
	7	#4 at 56" o.c.	#5 at 56" o.c.	#5 at 40" o.c.
8	5	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 48" o.c.
	6	#4 at 56" o.c.	#4 at 48" o.c.	#5 at 56" o.c.
	7	#4 at 48" o.c.	#4 at 32" o.c.	#6 at 56" o.c.
	8	#5 at 56" o.c.	#5 at 40" o.c.	#7 at 56" o.c.
9	5	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 48" o.c.
	6	#4 at 56" o.c.	#4 at 40" o.c.	#4 at 32" o.c.
	7	#4 at 56" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	8	#4 at 32" o.c.	#6 at 48" o.c.	#4 at 16" o.c.
	9	#5 at 40" o.c.	#6 at 40" o.c.	#7 at 40" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Mortar shall be Type M or S and masonry shall be laid in running bond.
- b. Alternative reinforcing bar sizes and spacings having an equivalent cross-sectional area of reinforcement per lineal foot of wall shall be permitted provided the spacing of the reinforcement does not exceed 72 inches.
- c. Vertical reinforcement shall be Grade 60 minimum. The distance from the face of the soil side of the wall to the center of vertical reinforcement shall be at least 6.75 inches.
- d. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.
- e. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.

R404.1.5 Foundation wall thickness based on walls supported. The thickness of concrete and masonry foundation walls shall not be less than the thickness of the wall supported, except that foundation walls of at least 8-inch (203 mm) nominal thickness shall be permitted under brick-veneered frame walls and under 10-inch-wide (254 mm) cavity walls where the total height of the wall supported, including gables, is not more than 20 feet (6096 mm), provided the requirements of Sections R404.1.1 and R404.1.2 are met.

R404.1.5.1 Pier and curtain wall foundations. Except in Seismic Design Categories D and E, pier and curtain wall foundations shall be permitted to be used to support light-frame construction not more than two stories in height, provided the following requirements are met:

1. All load-bearing walls shall be placed on continuous concrete footings placed integrally with the exterior wall footings.
2. The minimum actual thickness of a load-bearing masonry wall shall be not less than 4 inches (102 mm) nominal or 3³/₈ inches (92 mm) actual thickness, and shall be bonded integrally with piers spaced in accordance with R606.8.
3. Piers shall be constructed in accordance with Section R606.5 and Section R606.5.1, and shall be bonded into the load-bearing masonry wall in accordance with Section R608.1.1 or Section R608.1.1.2.
4. The maximum height of a 4-inch (102 mm) load-bearing masonry foundation wall supporting wood

framed walls and floors shall not be more than 4 feet (1219 mm) in height.

5. Anchorage shall be in accordance with Section R403.1.6 or as specified by engineered design accepted by the building official.
6. The unbalanced fill for 4-inch (102 mm) foundation walls shall not exceed 24 inches (610 mm) for solid masonry or 12 inches (305 mm) for hollow masonry.

R404.1.6 Height above finished grade. Concrete and masonry foundation walls shall extend above the finished grade adjacent to the foundation at all points a minimum of 4 inches (102 mm) where masonry veneer is used and a minimum of 6 inches (152 mm) elsewhere.

R404.1.7 Backfill placement. Backfill shall not be placed against the wall until the wall has sufficient strength and has been anchored to the floor above, or has been sufficiently braced to prevent damage by the backfill.

Exception: Such bracing is not required for walls supporting less than 4 feet (1219 mm) of unbalanced backfill.

R404.1.8 Rubble stone masonry. Rubble stone masonry foundation walls shall have a minimum thickness of 16 inches (406 mm), shall not support an unbalanced backfill exceeding 8 feet (2438 mm) in height, shall not support a soil pressure greater than 30 psf (481 kg/m²), and shall not be constructed in Seismic Design Categories D₁ or D₂ as established in Figure R301.2(2).

Community Development Department

Span Tables

December 2013

The attached span tables are based on the 2012 International Residential Code and are reproduced with the permission from the International Code Council.

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

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 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	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)

FLOORS

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

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 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 D₀, D₁ and D₂ shall be determined in accordance with Section R301.2.2.1.

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

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 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)

FLOORS

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

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 x 6	2 x 8	2 x 10	2 x 12	2 x 6	2 x 8	2 x 10	2 x 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 ^a
	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 D₀, D₁, and D₂ shall be determined in accordance with Section R301.2.2.2.1.

TABLE R502.3.3(1)
CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING LIGHT-FRAME EXTERIOR BEARING WALL AND ROOF ONLY^{a, b, c, f, g, h}
 (Floor Live Load ≤ 40 psf, Roof Live Load ≤ 20 psf)

Member & Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in Lbs.) ^{a, e}											
	Ground Snow Load											
	≤ 20 psf			30 psf			50 psf			70 psf		
	Roof Width			Roof Width			Roof Width			Roof Width		
	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft
2 × 8 @ 12"	20" (177)	15" (227)	—	18" (209)	—	—	—	—	—	—	—	—
2 × 10 @ 16"	29" (228)	21" (297)	16" (364)	26" (271)	18" (354)	—	20" (375)	—	—	—	—	—
2 × 10 @ 12"	36" (166)	26" (219)	20" (270)	34" (198)	22" (263)	16" (324)	26" (277)	—	—	19" (356)	—	—
2 × 12 @ 16"	—	32" (287)	25" (356)	36" (263)	29" (345)	21" (428)	29" (367)	20" (484)	—	23" (471)	—	—
2 × 12 @ 12"	—	42" (209)	31" (263)	—	37" (253)	27" (317)	36" (271)	27" (358)	17" (447)	31" (348)	19" (462)	—
2 × 12 @ 8"	—	48" (136)	45" (169)	—	48" (164)	38" (206)	—	40" (233)	26" (294)	36" (230)	29" (304)	18" (379)

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

- a. Tabulated values are for clear-span roof supported solely by exterior bearing walls.
- b. Spans are based on No. 2 Grade lumber of Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir for repetitive (three or more) members.
- c. Ratio of backspan to cantilever span shall be at least 3:1.
- d. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.
- e. Uplift force is for a backspan to cantilever span ratio of 3:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 3 divided by the actual backspan ratio provided (3/backspan ratio).
- f. See Section R301.2.2.2.5, Item 1, for additional limitations on cantilevered floor joists for detached one- and two-family dwellings in Seismic Design Category D₀, D₁, or D₂ and townhouses in Seismic Design Category C, D₀, D₁, or D₂.
- g. A full-depth rim joist shall be provided at the unsupported end of the cantilever joists. Solid blocking shall be provided at the supported end.
- h. Linear interpolation shall be permitted for building widths and ground snow loads other than shown.

TABLE R502.3.3(2)
CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING EXTERIOR BALCONY^{a, b, e, f}

Member Size	Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in lb) ^{c, d}		
		Ground Snow Load		
		≤ 30 psf	50 psf	70 psf
2 × 8	12"	42" (139)	39" (156)	34" (165)
2 × 8	16"	36" (151)	34" (171)	29" (180)
2 × 10	12"	61" (164)	57" (189)	49" (201)
2 × 10	16"	53" (180)	49" (208)	42" (220)
2 × 10	24"	43" (212)	40" (241)	34" (255)
2 × 12	16"	72" (228)	67" (260)	57" (268)
2 × 12	24"	58" (279)	54" (319)	47" (330)

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

- a. Spans are based on No. 2 Grade lumber of Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir for repetitive (three or more) members.
- b. Ratio of backspan to cantilever span shall be at least 2:1.
- c. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.
- d. Uplift force is for a backspan to cantilever span ratio of 2:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 2 divided by the actual backspan ratio provided (2/backspan ratio).
- e. A full-depth rim joist shall be provided at the unsupported end of the cantilever joists. Solid blocking shall be provided at the supported end.
- f. Linear interpolation shall be permitted for ground snow loads other than shown.

TABLE R502.5(1)
GIRDER SPANS^a AND HEADER SPANS^a FOR EXTERIOR BEARING WALLS
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) ^c																	
		30						50						70					
		Building width ^e (feet)																	
		20		28		36		20		28		36		20		28		36	
Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d		
Roof and ceiling	2-2 x 4	3-6	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1	2-10	1	2-6	1	2-3	1
	2-2 x 6	5-5	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2	4-2	1	3-8	2	3-3	2
	2-2 x 8	6-10	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2	5-4	2	4-7	2	4-1	2
	2-2 x 10	8-5	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2	6-6	2	5-7	2	5-0	2
	2-2 x 12	9-9	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2	7-6	2	6-6	2	5-10	3
	3-2 x 8	8-4	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2	6-8	1	5-9	2	5-2	2
	3-2 x 10	10-6	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2	8-2	2	7-0	2	6-4	2
	3-2 x 12	12-2	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2	9-5	2	8-2	2	7-4	2
	4-2 x 8	9-2	1	8-4	1	7-8	1	8-4	1	7-5	1	6-8	1	7-8	1	6-8	1	5-11	2
	4-2 x 10	11-8	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2	9-5	2	8-2	2	7-3	2
4-2 x 12	14-1	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2	10-11	2	9-5	2	8-5	2	
Roof, ceiling and one center-bearing floor	2-2 x 4	3-1	1	2-9	1	2-5	1	2-9	1	2-5	1	2-2	1	2-7	1	2-3	1	2-0	1
	2-2 x 6	4-6	1	4-0	1	3-7	2	4-1	1	3-7	2	3-3	2	3-9	2	3-3	2	2-11	2
	2-2 x 8	5-9	2	5-0	2	4-6	2	5-2	2	4-6	2	4-1	2	4-9	2	4-2	2	3-9	2
	2-2 x 10	7-0	2	6-2	2	5-6	2	6-4	2	5-6	2	5-0	2	5-9	2	5-1	2	4-7	3
	2-2 x 12	8-1	2	7-1	2	6-5	2	7-4	2	6-5	2	5-9	3	6-8	2	5-10	3	5-3	3
	3-2 x 8	7-2	1	6-3	2	5-8	2	6-5	2	5-8	2	5-1	2	5-11	2	5-2	2	4-8	2
	3-2 x 10	8-9	2	7-8	2	6-11	2	7-11	2	6-11	2	6-3	2	7-3	2	6-4	2	5-8	2
	3-2 x 12	10-2	2	8-11	2	8-0	2	9-2	2	8-0	2	7-3	2	8-5	2	7-4	2	6-7	2
	4-2 x 8	8-1	1	7-3	1	6-7	1	7-5	1	6-6	1	5-11	2	6-10	1	6-0	2	5-5	2
	4-2 x 10	10-1	1	8-10	2	8-0	2	9-1	2	8-0	2	7-2	2	8-4	2	7-4	2	6-7	2
4-2 x 12	11-9	2	10-3	2	9-3	2	10-7	2	9-3	2	8-4	2	9-8	2	8-6	2	7-7	2	
Roof, ceiling and one clear span floor	2-2 x 4	2-8	1	2-4	1	2-1	1	2-7	1	2-3	1	2-0	1	2-5	1	2-1	1	1-10	1
	2-2 x 6	3-11	1	3-5	2	3-0	2	3-10	2	3-4	2	3-0	2	3-6	2	3-1	2	2-9	2
	2-2 x 8	5-0	2	4-4	2	3-10	2	4-10	2	4-2	2	3-9	2	4-6	2	3-11	2	3-6	2
	2-2 x 10	6-1	2	5-3	2	4-8	2	5-11	2	5-1	2	4-7	3	5-6	2	4-9	2	4-3	3
	2-2 x 12	7-1	2	6-1	3	5-5	3	6-10	2	5-11	3	5-4	3	6-4	2	5-6	3	5-0	3
	3-2 x 8	6-3	2	5-5	2	4-10	2	6-1	2	5-3	2	4-8	2	5-7	2	4-11	2	4-5	2
	3-2 x 10	7-7	2	6-7	2	5-11	2	7-5	2	6-5	2	5-9	2	6-10	2	6-0	2	5-4	2
	3-2 x 12	8-10	2	7-8	2	6-10	2	8-7	2	7-5	2	6-8	2	7-11	2	6-11	2	6-3	2
	4-2 x 8	7-2	1	6-3	2	5-7	2	7-0	1	6-1	2	5-5	2	6-6	1	5-8	2	5-1	2
	4-2 x 10	8-9	2	7-7	2	6-10	2	8-7	2	7-5	2	6-7	2	7-11	2	6-11	2	6-2	2
4-2 x 12	10-2	2	8-10	2	7-11	2	9-11	2	8-7	2	7-8	2	9-2	2	8-0	2	7-2	2	
Roof, ceiling and two center-bearing floors	2-2 x 4	2-7	1	2-3	1	2-0	1	2-6	1	2-2	1	1-11	1	2-4	1	2-0	1	1-9	1
	2-2 x 6	3-9	2	3-3	2	2-11	2	3-8	2	3-2	2	2-10	2	3-5	2	3-0	2	2-8	2
	2-2 x 8	4-9	2	4-2	2	3-9	2	4-7	2	4-0	2	3-8	2	4-4	2	3-9	2	3-5	2
	2-2 x 10	5-9	2	5-1	2	4-7	3	5-8	2	4-11	2	4-5	3	5-3	2	4-7	3	4-2	3
	2-2 x 12	6-8	2	5-10	3	5-3	3	6-6	2	5-9	3	5-2	3	6-1	3	5-4	3	4-10	3
	3-2 x 8	5-11	2	5-2	2	4-8	2	5-9	2	5-1	2	4-7	2	5-5	2	4-9	2	4-3	2
	3-2 x 10	7-3	2	6-4	2	5-8	2	7-1	2	6-2	2	5-7	2	6-7	2	5-9	2	5-3	2
	3-2 x 12	8-5	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	3	7-8	2	6-9	2	6-1	3
	4-2 x 8	6-10	1	6-0	2	5-5	2	6-8	1	5-10	2	5-3	2	6-3	2	5-6	2	4-11	2
	4-2 x 10	8-4	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	2	7-7	2	6-8	2	6-0	2
4-2 x 12	9-8	2	8-6	2	7-8	2	9-5	2	8-3	2	7-5	2	8-10	2	7-9	2	7-0	2	
Roof, ceiling, and two clear span floors	2-2 x 4	2-1	1	1-8	1	1-6	2	2-0	1	1-8	1	1-5	2	2-0	1	1-8	1	1-5	2
	2-2 x 6	3-1	2	2-8	2	2-4	2	3-0	2	2-7	2	2-3	2	2-11	2	2-7	2	2-3	2
	2-2 x 8	3-10	2	3-4	2	3-0	3	3-10	2	3-4	2	2-11	3	3-9	2	3-3	2	2-11	3

(continued)

FLOORS

TABLE R502.5(1)—continued
GIRDER SPANS^a AND HEADER SPANS^a FOR EXTERIOR BEARING WALLS
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) ^c																	
		30						50						70					
		Building width ^c (feet)																	
		20		28		36		20		28		36		20		28		36	
Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d		
Roof, ceiling, and two clear span floors	2-2 x 10	4-9	2	4-1	3	3-8	3	4-8	2	4-0	3	3-7	3	4-7	3	4-0	3	3-6	3
	2-2 x 12	5-6	3	4-9	3	4-3	3	5-5	3	4-8	3	4-2	3	5-4	3	4-7	3	4-1	4
	3-2 x 8	4-10	2	4-2	2	3-9	2	4-9	2	4-1	2	3-8	2	4-8	2	4-1	2	3-8	2
	3-2 x 10	5-11	2	5-1	2	4-7	3	5-10	2	5-0	2	4-6	3	5-9	2	4-11	2	4-5	3
	3-2 x 12	6-10	2	5-11	3	5-4	3	6-9	2	5-10	3	5-3	3	6-8	2	5-9	3	5-2	3
	4-2 x 8	5-7	2	4-10	2	4-4	2	5-6	2	4-9	2	4-3	2	5-5	2	4-8	2	4-2	2
	4-2 x 10	6-10	2	5-11	2	5-3	2	6-9	2	5-10	2	5-2	2	6-7	2	5-9	2	5-1	2
4-2 x 12	7-11	2	6-10	2	6-2	3	7-9	2	6-9	2	6-0	3	7-8	2	6-8	2	5-11	3	

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

- Spans are given in feet and inches.
- Tabulated values assume #2 grade lumber.
- Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.
- Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

TABLE R502.5(2)
GIRDER SPANS^a AND HEADER SPANS^a FOR INTERIOR BEARING WALLS
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING Width ^c (feet)					
		20		28		36	
		Span	NJ ^d	Span	NJ ^d	Span	NJ ^d
One floor only	2-2 x 4	3-1	1	2-8	1	2-5	1
	2-2 x 6	4-6	1	3-11	1	3-6	1
	2-2 x 8	5-9	1	5-0	2	4-5	2
	2-2 x 10	7-0	2	6-1	2	5-5	2
	2-2 x 12	8-1	2	7-0	2	6-3	2
	3-2 x 8	7-2	1	6-3	1	5-7	2
	3-2 x 10	8-9	1	7-7	2	6-9	2
	3-2 x 12	10-2	2	8-10	2	7-10	2
	4-2 x 8	9-0	1	7-8	1	6-9	1
	4-2 x 10	10-1	1	8-9	1	7-10	2
4-2 x 12	11-9	1	10-2	2	9-1	2	
Two floors	2-2 x 4	2-2	1	1-10	1	1-7	1
	2-2 x 6	3-2	2	2-9	2	2-5	2
	2-2 x 8	4-1	2	3-6	2	3-2	2
	2-2 x 10	4-11	2	4-3	2	3-10	3
	2-2 x 12	5-9	2	5-0	3	4-5	3
	3-2 x 8	5-1	2	4-5	2	3-11	2
	3-2 x 10	6-2	2	5-4	2	4-10	2
	3-2 x 12	7-2	2	6-3	2	5-7	3
	4-2 x 8	6-1	1	5-3	2	4-8	2
	4-2 x 10	7-2	2	6-2	2	5-6	2
4-2 x 12	8-4	2	7-2	2	6-5	2	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- Spans are given in feet and inches.
- Tabulated values assume #2 grade lumber.
- Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

R802.4 Allowable ceiling joist spans. Spans for ceiling joists shall be in accordance with Tables R802.4(1) and R802.4(2). For other grades and species and for other loading conditions, refer to the AF&PA *Span Tables for Joists and Rafters*.

R802.5 Allowable rafter spans. Spans for rafters shall be in accordance with Tables R802.5.1(1) through R802.5.1(8). For other grades and species and for other loading conditions, refer to the AF&PA *Span Tables for Joists and Rafters*. The span of each rafter shall be measured along the horizontal projection of the rafter.

R802.5.1 Purlins. Installation of purlins to reduce the span of rafters is permitted as shown in Figure R802.5.1. Purlins shall be sized no less than the required size of the rafters that they support. Purlins shall be continuous and shall be supported by 2-inch by 4-inch (51 mm by 102 mm) braces installed to bearing walls at a slope not less than 45 degrees (0.785 rad) from the horizontal. The braces shall be spaced not more than 4 feet (1219 mm) on center and the unbraced length of braces shall not exceed 8 feet (2438 mm).

TABLE R802.4(1)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
 (Uninhabitable attics without storage, live load = 10 psf, L/Δ = 240)

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

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.4(1)—continued
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
 (Uninhabitable attics without storage, live load = 10 psf, L/Δ = 240)

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

Check sources for availability of lumber in lengths greater than 20 feet.
 For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.
 a. Span exceeds 26 feet in length.

TABLE R802.4(2)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
 (Uninhabitable attics with limited storage, live load = 20 psf, L/Δ = 240)

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

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.4(2)—continued
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
 (Uninhabitable attics with limited storage, live load = 20 psf, L/Δ = 240)

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

Check sources for availability of lumber in lengths greater than 20 feet.
 For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.
 a. Span exceeds 26 feet in length.

TABLE R802.5.1(1)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch	SS	11-6	18-0	23-9	Note b	Note b	11-6	18-0	23-5	Note b	Note b
	Douglas fir-larch	#1	11-1	17-4	22-5	Note b	Note b	10-6	15-4	19-5	23-9	Note b
	Douglas fir-larch	#2	10-10	16-7	21-0	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Douglas fir-larch	#3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Hem-fir	SS	10-10	17-0	22-5	Note b	Note b	10-10	17-0	22-5	Note b	Note b
	Hem-fir	#1	10-7	16-8	21-10	Note b	Note b	10-3	14-11	18-11	23-2	Note b
	Hem-fir	#2	10-1	15-11	20-8	25-3	Note b	9-8	14-2	17-11	21-11	25-5
	Hem-fir	#3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Southern pine	SS	11-3	17-8	23-4	Note b	Note b	11-3	17-8	23-4	Note b	Note b
	Southern pine	#1	11-1	17-4	22-11	Note b	Note b	11-1	17-3	21-9	25-10	Note b
	Southern pine	#2	10-10	17-0	22-5	Note b	Note b	10-6	15-1	19-5	23-2	Note b
	Southern pine	#3	9-1	13-6	17-2	20-3	24-1	7-11	11-8	14-10	17-6	20-11
	Spruce-pine-fir	SS	10-7	16-8	21-11	Note b	Note b	10-7	16-8	21-9	Note b	Note b
	Spruce-pine-fir	#1	10-4	16-3	21-0	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Spruce-pine-fir	#2	10-4	16-3	21-0	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Spruce-pine-fir	#3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
16	Douglas fir-larch	SS	10-5	16-4	21-7	Note b	Note b	10-5	16-0	20-3	24-9	Note b
	Douglas fir-larch	#1	10-0	15-4	19-5	23-9	Note b	9-1	13-3	16-10	20-7	23-10
	Douglas fir-larch	#2	9-10	14-4	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Douglas fir-larch	#3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Hem-fir	SS	9-10	15-6	20-5	Note b	Note b	9-10	15-6	19-11	24-4	Note b
	Hem-fir	#1	9-8	14-11	18-11	23-2	Note b	8-10	12-11	16-5	20-0	23-3
	Hem-fir	#2	9-2	14-2	17-11	21-11	25-5	8-5	12-3	15-6	18-11	22-0
	Hem-fir	#3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Southern pine	SS	10-3	16-1	21-2	Note b	Note b	10-3	16-1	21-2	Note b	Note b
	Southern pine	#1	10-0	15-9	20-10	25-10	Note b	10-0	15-0	18-10	22-4	Note b
	Southern pine	#2	9-10	15-1	19-5	23-2	Note b	9-1	13-0	16-10	20-1	23-7
	Southern pine	#3	7-11	11-8	14-10	17-6	20-11	6-10	10-1	12-10	15-2	18-1
	Spruce-pine-fir	SS	9-8	15-2	19-11	25-5	Note b	9-8	14-10	18-10	23-0	Note b
	Spruce-pine-fir	#1	9-5	14-4	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir	#2	9-5	14-4	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir	#3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
19.2	Douglas fir-larch	SS	9-10	15-5	20-4	25-11	Note b	9-10	14-7	18-6	22-7	Note b
	Douglas fir-larch	#1	9-5	14-0	17-9	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Douglas fir-larch	#2	8-11	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Douglas fir-larch	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
	Hem-fir	SS	9-3	14-7	19-2	24-6	Note b	9-3	14-4	18-2	22-3	25-9
	Hem-fir	#1	9-1	13-8	17-4	21-1	24-6	8-1	11-10	15-0	18-4	21-3
	Hem-fir	#2	8-8	12-11	16-4	20-0	23-2	7-8	11-2	14-2	17-4	20-1
	Hem-fir	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
	Southern pine	SS	9-8	15-2	19-11	25-5	Note b	9-8	15-2	19-11	25-5	Note b
	Southern pine	#1	9-5	14-10	19-7	23-7	Note b	9-3	13-8	17-2	20-5	24-4
	Southern pine	#2	9-3	13-9	17-9	21-2	24-10	8-4	11-11	15-4	18-4	21-6
	Southern pine	#3	7-3	10-8	13-7	16-0	19-1	6-3	9-3	11-9	13-10	16-6
	Spruce-pine-fir	SS	9-1	14-3	18-9	23-11	Note b	9-1	13-7	17-2	21-0	24-4
	Spruce-pine-fir	#1	8-10	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir	#2	8-10	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(1)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
24	Douglas fir-larch	SS	9-1	14-4	18-10	23-4	Note b	8-11	13-1	16-7	20-3	23-5
	Douglas fir-larch	#1	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Douglas fir-larch	#2	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Douglas fir-larch	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Hem-fir	SS	8-7	13-6	17-10	22-9	Note b	8-7	12-10	16-3	19-10	23-0
	Hem-fir	#1	8-4	12-3	15-6	18-11	21-11	7-3	10-7	13-5	16-4	19-0
	Hem-fir	#2	7-11	11-7	14-8	17-10	20-9	6-10	10-0	12-8	15-6	17-11
	Hem-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Southern pine	SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	22-11	Note b
	Southern pine	#1	8-9	13-9	17-9	21-1	25-2	8-3	12-3	15-4	18-3	21-9
	Southern pine	#2	8-7	12-3	15-10	18-11	22-2	7-5	10-8	13-9	16-5	19-3
	Southern pine	#3	6-5	9-6	12-1	14-4	17-1	5-7	8-3	10-6	12-5	14-9
	Spruce-pine-fir	SS	8-5	13-3	17-5	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Spruce-pine-fir	#1	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#2	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_C/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_C = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

TABLE R802.5.1(2)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (Inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch	SS	10-5	16-4	21-7	Note b	Note b	10-5	16-4	21-7	Note b	Note b
	Douglas fir-larch	#1	10-0	15-9	20-10	Note b	Note b	10-0	15-4	19-5	23-9	Note b
	Douglas fir-larch	#2	9-10	15-6	20-5	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Douglas fir-larch	#3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Hem-fir	SS	9-10	15-6	20-5	Note b	Note b	9-10	15-6	20-5	Note b	Note b
	Hem-fir	#1	9-8	15-2	19-11	25-5	Note b	9-8	14-11	18-11	23-2	Note b
	Hem-fir	#2	9-2	14-5	19-0	24-3	Note b	9-2	14-2	17-11	21-11	25-5
	Hem-fir	#3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Southern pine	SS	10-3	16-1	21-2	Note b	Note b	10-3	16-1	21-2	Note b	Note b
	Southern pine	#1	10-0	15-9	20-10	Note b	Note b	10-0	15-9	20-10	25-10	Note b
	Southern pine	#2	9-10	15-6	20-5	Note b	Note b	9-10	15-1	19-5	23-2	Note b
	Southern pine	#3	9-1	13-6	17-2	20-3	24-1	7-11	11-8	14-10	17-6	20-11
	Spruce-pine-fir	SS	9-8	15-2	19-11	25-5	Note b	9-8	15-2	19-11	25-5	Note b
	Spruce-pine-fir	#1	9-5	14-9	19-6	24-10	Note b	9-5	14-4	18-2	22-3	25-9
	Spruce-pine-fir	#2	9-5	14-9	19-6	24-10	Note b	9-5	14-4	18-2	22-3	25-9
	Spruce-pine-fir	#3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
16	Douglas fir-larch	SS	9-6	14-11	19-7	25-0	Note b	9-6	14-11	19-7	24-9	Note b
	Douglas fir-larch	#1	9-1	14-4	18-11	23-9	Note b	9-1	13-3	16-10	20-7	23-10
	Douglas fir-larch	#2	8-11	14-1	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Douglas fir-larch	#3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Hem-fir	SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	23-8	Note b
	Hem-fir	#1	8-9	13-9	18-1	23-1	Note b	8-9	12-11	16-5	20-0	23-3
	Hem-fir	#2	8-4	13-1	17-3	21-11	25-5	8-4	12-3	15-6	18-11	22-0
	Hem-fir	#3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Southern pine	SS	9-4	14-7	19-3	24-7	Note b	9-4	14-7	19-3	24-7	Note b
	Southern pine	#1	9-1	14-4	18-11	24-1	Note b	9-1	14-4	18-10	22-4	Note b
	Southern pine	#2	8-11	14-1	18-6	23-2	Note b	8-11	13-0	16-10	20-1	23-7
	Southern pine	#3	7-11	11-8	14-10	17-6	20-11	6-10	10-1	12-10	15-2	18-1
	Spruce-pine-fir	SS	8-9	13-9	18-1	23-1	Note b	8-9	13-9	18-1	23-0	Note b
	Spruce-pine-fir	#1	8-7	13-5	17-9	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir	#2	8-7	13-5	17-9	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir	#3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
19.2	Douglas fir-larch	SS	8-11	14-0	18-5	23-7	Note b	8-11	14-0	18-5	22-7	Note b
	Douglas fir-larch	#1	8-7	13-6	17-9	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Douglas fir-larch	#2	8-5	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Douglas fir-larch	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
	Hem-fir	SS	8-5	13-3	17-5	22-3	Note b	8-5	13-3	17-5	22-3	25-9
	Hem-fir	#1	8-3	12-11	17-1	21-1	24-6	8-1	11-10	15-0	18-4	21-3
	Hem-fir	#2	7-10	12-4	16-3	20-0	23-2	7-8	11-2	14-2	17-4	20-1
	Hem-fir	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(2)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	8-9	13-9	18-1	23-1	Note b	8-9	13-9	18-1	23-1	Note b
	Southern pine	#1	8-7	13-6	17-9	22-8	Note b	8-7	13-6	17-2	20-5	24-4
	Southern pine	#2	8-5	13-3	17-5	21-2	24-10	8-4	11-11	15-4	18-4	21-6
	Southern pine	#3	7-3	10-8	13-7	16-0	19-1	6-3	9-3	11-9	13-10	16-6
	Spruce-pine-fir	SS	8-3	12-11	17-1	21-9	Note b	8-3	12-11	17-1	21-0	24-4
	Spruce-pine-fir	#1	8-1	12-8	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir	#2	8-1	12-8	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
24	Douglas fir-larch	SS	8-3	13-0	17-2	21-10	Note b	8-3	13-0	16-7	20-3	23-5
	Douglas fir-larch	#1	8-0	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Douglas fir-larch	#2	7-10	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Douglas fir-larch	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Hem-fir	SS	7-10	12-3	16-2	20-8	25-1	7-10	12-3	16-2	19-10	23-0
	Hem-fir	#1	7-8	12-0	15-6	18-11	21-11	7-3	10-7	13-5	16-4	19-0
	Hem-fir	#2	7-3	11-5	14-8	17-10	20-9	6-10	10-0	12-8	15-6	17-11
	Hem-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Southern pine	SS	8-1	12-9	16-10	21-6	Note b	8-1	12-9	16-10	21-6	Note b
	Southern pine	#1	8-0	12-6	16-6	21-1	25-2	8-0	12-3	15-4	18-3	21-9
	Southern pine	#2	7-10	12-3	15-10	18-11	22-2	7-5	10-8	13-9	16-5	19-3
	Southern pine	#3	6-5	9-6	12-1	14-4	17-1	5-7	8-3	10-6	12-5	14-9
	Spruce-pine-fir	SS	7-8	12-0	15-10	20-2	24-7	7-8	12-0	15-4	18-9	21-9
	Spruce-pine-fir	#1	7-6	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#2	7-6	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

TABLE R802.5.1(3)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch	SS	10-0	15-9	20-9	Note b	Note b	10-0	15-9	20-1	24-6	Note b
	Douglas fir-larch	#1	9-8	14-9	18-8	22-9	Note b	9-0	13-2	16-8	20-4	23-7
	Douglas fir-larch	#2	9-5	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
	Douglas fir-larch	#3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Hem-fir	SS	9-6	14-10	19-7	25-0	Note b	9-6	14-10	19-7	24-1	Note b
	Hem-fir	#1	9-3	14-4	18-2	22-2	25-9	8-9	12-10	16-3	19-10	23-0
	Hem-fir	#2	8-10	13-7	17-2	21-0	24-4	8-4	12-2	15-4	18-9	21-9
	Hem-fir	#3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Southern pine	SS	9-10	15-6	20-5	Note b	Note b	9-10	15-6	20-5	Note b	Note b
	Southern pine	#1	9-8	15-2	20-0	24-9	Note b	9-8	14-10	18-8	22-2	Note b
	Southern pine	#2	9-6	14-5	18-8	22-3	Note b	9-0	12-11	16-8	19-11	23-4
	Southern pine	#3	7-7	11-2	14-3	16-10	20-0	6-9	10-0	12-9	15-1	17-11
	Spruce-pine-fir	SS	9-3	14-7	19-2	24-6	Note b	9-3	14-7	18-8	22-9	Note b
	Spruce-pine-fir	#1	9-1	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
	Spruce-pine-fir	#2	9-1	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
	Spruce-pine-fir	#3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
16	Douglas fir-larch	SS	9-1	14-4	18-10	23-9	Note b	9-1	13-9	17-5	21-3	24-8
	Douglas fir-larch	#1	8-9	12-9	16-2	19-9	22-10	7-10	11-5	14-5	17-8	20-5
	Douglas fir-larch	#2	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Douglas fir-larch	#3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Hem-fir	SS	8-7	13-6	17-10	22-9	Note b	8-7	13-6	17-1	20-10	24-2
	Hem-fir	#1	8-5	12-5	15-9	19-3	22-3	7-7	11-1	14-1	17-2	19-11
	Hem-fir	#2	8-0	11-9	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-10
	Hem-fir	#3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Southern pine	SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	23-8	Note b
	Southern pine	#1	8-9	13-9	18-1	21-5	25-7	8-8	12-10	16-2	19-2	22-10
	Southern pine	#2	8-7	12-6	16-2	19-3	22-7	7-10	11-2	14-5	17-3	20-2
	Southern pine	#3	6-7	9-8	12-4	14-7	17-4	5-10	8-8	11-0	13-0	15-6
	Spruce-pine-fir	SS	8-5	13-3	17-5	22-1	25-7	8-5	12-9	16-2	19-9	22-10
	Spruce-pine-fir	#1	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Spruce-pine-fir	#2	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Spruce-pine-fir	#3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
19.2	Douglas fir-larch	SS	8-7	13-6	17-9	21-8	25-2	8-7	12-6	15-10	19-5	22-6
	Douglas fir-larch	#1	7-11	11-8	14-9	18-0	20-11	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch	#2	7-5	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Douglas fir-larch	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
	Hem-fir	SS	8-1	12-9	16-9	21-4	24-8	8-1	12-4	15-7	19-1	22-1
	Hem-fir	#1	7-9	11-4	14-4	17-7	20-4	6-11	10-2	12-10	15-8	18-2
	Hem-fir	#2	7-4	10-9	13-7	16-7	19-3	6-7	9-7	12-2	14-10	17-3
	Hem-fir	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(3)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	8-5	13-3	17-5	22-3	Note b	8-5	13-3	17-5	22-0	25-9
	Southern pine	#1	8-3	13-0	16-6	19-7	23-4	7-11	11-9	14-9	17-6	20-11
	Southern pine	#2	7-11	11-5	14-9	17-7	20-7	7-1	10-2	13-2	15-9	18-5
	Southern pine	#3	6-0	8-10	11-3	13-4	15-10	5-4	7-11	10-1	11-11	14-2
	Spruce-pine-fir	SS	7-11	12-5	16-5	20-2	23-4	7-11	11-8	14-9	18-0	20-11
	Spruce-pine-fir	#1	7-5	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#2	7-5	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
24	Douglas fir-larch	SS	7-11	12-6	15-10	19-5	22-6	7-8	11-3	14-2	17-4	20-1
	Douglas fir-larch	#1	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Hem-fir	SS	7-6	11-10	15-7	19-1	22-1	7-6	11-0	13-11	17-0	19-9
	Hem-fir	#1	6-11	10-2	12-10	15-8	18-2	6-2	9-1	11-6	14-0	16-3
	Hem-fir	#2	6-7	9-7	12-2	14-10	17-3	5-10	8-7	10-10	13-3	15-5
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Southern pine	SS	7-10	12-3	16-2	20-8	25-1	7-10	12-3	16-2	19-8	23-0
	Southern pine	#1	7-8	11-9	14-9	17-6	20-11	7-1	10-6	13-2	15-8	18-8
	Southern pine	#2	7-1	10-2	13-2	15-9	18-5	6-4	9-2	11-9	14-1	16-6
	Southern pine	#3	5-4	7-11	10-1	11-11	14-2	4-9	7-1	9-0	10-8	12-8
	Spruce-pine-fir	SS	7-4	11-7	14-9	18-0	20-11	7-1	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#1	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#2	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

TABLE R802.5.1(4)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch	SS	8-5	13-3	17-6	22-4	26-0	8-5	13-3	17-0	20-9	24-0
	Douglas fir-larch	#1	8-2	12-0	15-3	18-7	21-7	7-7	11-2	14-1	17-3	20-0
	Douglas fir-larch	#2	7-8	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch	#3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Hem-fir	SS	8-0	12-6	16-6	21-1	25-6	8-0	12-6	16-6	20-4	23-7
	Hem-fir	#1	7-10	11-9	14-10	18-1	21-0	7-5	10-10	13-9	16-9	19-5
	Hem-fir	#2	7-5	11-1	14-0	17-2	19-11	7-0	10-3	13-0	15-10	18-5
	Hem-fir	#3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Southern pine	SS	8-4	13-0	17-2	21-11	Note b	8-4	13-0	17-2	21-11	Note b
	Southern pine	#1	8-2	12-10	16-10	20-3	24-1	8-2	12-6	15-9	18-9	22-4
	Southern pine	#2	8-0	11-9	15-3	18-2	21-3	7-7	10-11	14-1	16-10	19-9
	Southern pine	#3	6-2	9-2	11-8	13-9	16-4	5-9	8-5	10-9	12-9	15-2
	Spruce-pine-fir	SS	7-10	12-3	16-2	20-8	24-1	7-10	12-3	15-9	19-3	22-4
	Spruce-pine-fir	#1	7-8	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#2	7-8	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
16	Douglas fir-larch	SS	7-8	12-1	15-10	19-5	22-6	7-8	11-7	14-8	17-11	20-10
	Douglas fir-larch	#1	7-1	10-5	13-2	16-1	18-8	6-7	9-8	12-2	14-11	17-3
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Hem-fir	SS	7-3	11-5	15-0	19-1	22-1	7-3	11-5	14-5	17-8	20-5
	Hem-fir	#1	6-11	10-2	12-10	15-8	18-2	6-5	9-5	11-11	14-6	16-10
	Hem-fir	#2	6-7	9-7	12-2	14-10	17-3	6-1	8-11	11-3	13-9	15-11
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Southern pine	SS	7-6	11-10	15-7	19-11	24-3	7-6	11-10	15-7	19-11	23-10
	Southern pine	#1	7-5	11-7	14-9	17-6	20-11	7-4	10-10	13-8	16-2	19-4
	Southern pine	#2	7-1	10-2	13-2	15-9	18-5	6-7	9-5	12-2	14-7	17-1
	Southern pine	#3	5-4	7-11	10-1	11-11	14-2	4-11	7-4	9-4	11-0	13-1
	Spruce-pine-fir	SS	7-1	11-2	14-8	18-0	20-11	7-1	10-9	13-8	15-11	19-4
	Spruce-pine-fir	#1	6-8	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir	#2	6-8	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
19.2	Douglas fir-larch	SS	7-3	11-4	14-6	17-8	20-6	7-3	10-7	13-5	16-5	19-0
	Douglas fir-larch	#1	6-6	9-6	12-0	14-8	17-1	6-0	8-10	11-2	13-7	15-9
	Douglas fir-larch	#2	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Douglas fir-larch	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
	Hem-fir	SS	6-10	10-9	14-2	17-5	20-2	6-10	10-5	13-2	16-1	18-8
	Hem-fir	#1	6-4	9-3	11-9	14-4	16-7	5-10	8-7	10-10	13-3	15-5
	Hem-fir	#2	6-0	8-9	11-1	13-7	15-9	5-7	8-1	10-3	12-7	14-7
	Hem-fir	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(4)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (Inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	7-1	11-2	14-8	18-9	22-10	7-1	11-2	14-8	18 7	21-9
	Southern pine	#1	7-0	10-8	13-5	16-0	19-1	6-8	9-11	12-5	14-10	17-8
	Southern pine	#2	6-6	9-4	12-0	14-4	16-10	6-0	8-8	11-2	13-4	15-7
	Southern pine	#3	4-11	7-3	9-2	10-10	12-11	4-6	6-8	8-6	10-1	12-0
	Spruce-pine-fir	SS	6-8	10-6	13-5	16-5	19-1	6-8	9-10	12-5	15-3	17-8
	Spruce-pine-fir	#1	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#2	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
24	Douglas fir-larch	SS	6-8	10-	13-0	15-10	18-4	6-6	9-6	12-0	14-8	17-0
	Douglas fir-larch	#1	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Douglas fir-larch	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Douglas fir-larch	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Hem-fir	SS	6-4	9-11	12-9	15-7	18-0	6-4	9-4	11-9	14-5	16-8
	Hem-fir	#1	5-8	8-3	10-6	12-10	14-10	5-3	7-8	9-9	11-10	13-9
	Hem-fir	#2	5-4	7-10	9-11	12-1	14-1	4-11	7-3	9-2	11-3	13-0
	Hem-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Southern pine	SS	6-7	10-4	13-8	17-5	21-0	6-7	10-4	13-8	16-7	19-5
	Southern pine	#1	6-5	9-7	12-0	14-4	17-1	6-0	8-10	11-2	13-3	15-9
	Southern pine	#2	5-10	8-4	10-9	12-10	15-1	5-5	7-9	10-0	11-11	13-11
	Southern pine	#3	4-4	6-5	8-3	9-9	11-7	4-1	6-0	7-7	9-0	10-8
	Spruce-pine-fir	SS	6-2	9-6	12-0	14-8	17-1	6-0	8-10	11-2	13-7	15-9
	Spruce-pine-fir	#1	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

TABLE R802.5.1(5)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (Inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	
12	Douglas fir-larch	SS	9-1	14-4	18-10	24-1	Note b	9-1	14-4	18-10	24-1	Note b
	Douglas fir-larch	#1	8-9	13-9	18-2	22-9	Note b	8-9	13-2	16-8	20-4	23-7
	Douglas fir-larch	#2	8-7	13-6	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
	Douglas fir-larch	#3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Hem-fir	SS	8-7	13-6	17-10	22-9	Note b	8-7	13-6	17-10	22-9	Note b
	Hem-fir	#1	8-5	13-3	17-5	22-2	25-9	8-5	12-10	16-3	19-10	23-0
	Hem-fir	#2	8-0	12-7	16-7	21-0	24-4	8-0	12-2	15-4	18-9	21-9
	Hem-fir	#3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Southern pine	SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	23-8	Note b
	Southern pine	#1	8-9	13-9	18-2	23-2	Note b	8-9	13-9	18-2	22-2	Note b
	Southern pine	#2	8-7	13-6	17-10	22-3	Note b	8-7	12-11	16-8	19-11	23-4
	Southern pine	#3	7-7	11-2	14-3	16-10	20-0	6-9	10-0	12-9	15-1	17-11
	Spruce-pine-fir	SS	8-5	13-3	17-5	22-3	Note b	8-5	13-3	17-5	22-3	Note b
	Spruce-pine-fir	#1	8-3	12-11	17-0	21-4	24-8	8-3	12-4	15-7	19-1	22-1
	Spruce-pine-fir	#2	8-3	12-11	17-0	21-4	24-8	8-3	12-4	15-7	19-1	22-1
	Spruce-pine-fir	#3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
16	Douglas fir-larch	SS	8-3	13-0	17-2	21-10	Note b	8-3	13-0	17-2	21-3	24-8
	Douglas fir-larch	#1	8-0	12-6	16-2	19-9	22-10	7-10	11-5	14-5	17-8	20-5
	Douglas fir-larch	#2	7-10	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Douglas fir-larch	#3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Hem-fir	SS	7-10	12-3	16-2	20-8	25-1	7-10	12-3	16-2	20-8	24-2
	Hem-fir	#1	7-8	12-0	15-9	19-3	22-3	7-7	11-1	14-1	17-2	19-11
	Hem-fir	#2	7-3	11-5	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-10
	Hem-fir	#3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Southern pine	SS	8-1	12-9	16-10	21-6	Note b	8-1	12-9	16-10	21-6	Note b
	Southern pine	#1	8-0	12-6	16-6	21-1	25-7	8-0	12-6	16-2	19-2	22-10
	Southern pine	#2	7-10	12-3	16-2	19-3	22-7	7-10	11-2	14-5	17-3	20-2
	Southern pine	#3	6-7	9-8	12-4	14-7	17-4	5-10	8-8	11-0	13-0	15-6
	Spruce-pine-fir	SS	7-8	12-0	15-10	20-2	24-7	7-8	12-0	15-10	19-9	22-10
	Spruce-pine-fir	#1	7-6	11-9	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Spruce-pine-fir	#2	7-6	11-9	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Spruce-pine-fir	#3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
19.2	Douglas fir-larch	SS	7-9	12-3	16-1	20-7	25-0	7-9	12-3	15-10	19-5	22-6
	Douglas fir-larch	#1	7-6	11-8	14-9	18-0	20-11	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch	#2	7-4	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Douglas fir-larch	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
	Hem-fir	SS	7-4	11-7	15-3	19-5	23-7	7-4	11-7	15-3	19-1	22-1
	Hem-fir	#1	7-2	11-4	14-4	17-7	20-4	6-11	10-2	12-10	15-8	18-2
	Hem-fir	#2	6-10	10-9	13-7	16-7	19-3	6-7	9-7	12-2	14-10	17-3
	Hem-fir	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(5)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	7-8	12-0	15-10	20-2	24-7	7-8	12-0	15-10	20-2	24-7
	Southern pine	#1	7-6	11-9	15-6	19-7	23-4	7-6	11-9	14-9	17-6	20-11
	Southern pine	#2	7-4	11-5	14-9	17-7	20-7	7-1	10-2	13-2	15-9	18-5
	Southern pine	#3	6-0	8-10	11-3	13-4	15-10	5-4	7-11	10-1	11-11	14-2
	Spruce-pine-fir	SS	7-2	11-4	14-11	19-0	23-1	7-2	11-4	14-9	18-0	20-11
	Spruce-pine-fir	#1	7-0	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#2	7-0	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
24	Douglas fir-larch	SS	7-3	11-4	15-0	19-1	22-6	7-3	11-3	14-2	17-4	20-1
	Douglas fir-larch	#1	7-0	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Hem-fir	SS	6-10	10-9	14-2	18-0	21-11	6-10	10-9	13-11	17-0	19-9
	Hem-fir	#1	6-8	10-2	12-10	15-8	18-2	6-2	9-1	11-6	14-0	16-3
	Hem-fir	#2	6-4	9-7	12-2	14-10	17-3	5-10	8-7	10-10	13-3	15-5
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Southern pine	SS	7-1	11-2	14-8	18-9	22-10	7-1	11-2	14-8	18-9	22-10
	Southern pine	#1	7-0	10-11	14-5	17-6	20-11	7-0	10-6	13-2	15-8	18-8
	Southern pine	#2	6-10	10-2	13-2	15-9	18-5	6-4	9-2	11-9	14-1	16-6
	Southern pine	#3	5-4	7-11	10-1	11-11	14-2	4-9	7-1	9-0	10-8	12-8
	Spruce-pine-fir	SS	6-8	10-6	13-10	17-8	20-11	6-8	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#1	6-6	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#2	6-6	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

b. Span exceeds 26 feet in length.

TABLE R802.5.1(6)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (Inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)
12	Douglas fir-larch	SS	7-8	12-1	15-11	20-3	24-8	7-8	12-1	15-11	20-3	24-0
	Douglas fir-larch	#1	7-5	11-7	15-3	18-7	21-7	7-5	11-2	14-1	17-3	20-0
	Douglas fir-larch	#2	7-3	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch	#3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Hem-fir	SS	7-3	11-5	15-0	19-2	23-4	7-3	11-5	15-0	19-2	23-4
	Hem-fir	#1	7-1	11-2	14-8	18-1	21-0	7-1	10-10	13-9	16-9	19-5
	Hem-fir	#2	6-9	10-8	14-0	17-2	19-11	6-9	10-3	13-0	15-10	18-5
	Hem-fir	#3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Southern pine	SS	7-6	11-10	15-7	19-11	24-3	7-6	11-10	15-7	19-11	24-3
	Southern pine	#1	7-5	11-7	15-4	19-7	23-9	7-5	11-7	15-4	18-9	22-4
	Southern pine	#2	7-3	11-5	15-0	18-2	21-3	7-3	10-11	14-1	16-10	19-9
	Southern pine	#3	6-2	9-2	11-8	13-9	16-4	5-9	8-5	10-9	12-9	15-2
	Spruce-pine-fir	SS	7-1	11-2	14-8	18-9	22-10	7-1	11-2	14-8	18-9	22-4
	Spruce-pine-fir	#1	6-11	10-11	14-3	17-5	20-2	6-11	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#2	6-11	10-11	14-3	17-5	20-2	6-11	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
16	Douglas fir-larch	SS	7-0	11-0	14-5	18-5	22-5	7-0	11-0	14-5	17-11	20-10
	Douglas fir-larch	#1	6-9	10-5	13-2	16-1	18-8	6-7	9-8	12-2	14-11	17-3
	Douglas fir-larch	#2	6-7	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Hem-fir	SS	6-7	10-4	13-8	17-5	21-2	6-7	10-4	13-8	17-5	20-5
	Hem-fir	#1	6-5	10-2	12-10	15-8	18-2	6-5	9-5	11-11	14-6	16-10
	Hem-fir	#2	6-2	9-7	12-2	14-10	17-3	6-1	8-11	11-3	13-9	15-11
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Southern pine	SS	6-10	10-9	14-2	18-1	22-0	6-10	10-9	14-2	18-1	22-0
	Southern pine	#1	6-9	10-7	13-11	17-6	20-11	6-9	10-7	13-8	16-2	19-4
	Southern pine	#2	6-7	10-2	13-2	15-9	18-5	6-7	9-5	12-2	14-7	17-1
	Southern pine	#3	5-4	7-11	10-1	11-11	14-2	4-11	7-4	9-4	11-0	13-1
	Spruce-pine-fir	SS	6-5	10-2	13-4	17-0	20-9	6-5	10-2	13-4	16-8	19-4
	Spruce-pine-fir	#1	6-4	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir	#2	6-4	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
19.2	Douglas fir-larch	SS	6-7	10-4	13-7	17-4	20-6	6-7	10-4	13-5	16-5	19-0
	Douglas fir-larch	#1	6-4	9-6	12-0	14-8	17-1	6-0	8-10	11-2	13-7	15-9
	Douglas fir-larch	#2	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Douglas fir-larch	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
	Hem-fir	SS	6-2	9-9	12-10	16-5	19-11	6-2	9-9	12-10	16-1	18-8
	Hem-fir	#1	6-1	9-3	11-9	14-4	16-7	5-10	8-7	10-10	13-3	15-5
	Hem-fir	#2	5-9	8-9	11-1	13-7	15-9	5-7	8-1	10-3	12-7	14-7
	Hem-fir	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(6)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans*									
			(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)
19.2	Southern pine	SS	6-5	10-2	13-4	17-0	20-9	6-5	10-2	13-4	17-0	20-9
	Southern pine	#1	6-4	9-11	13-1	16-0	19-1	6-4	9-11	12-5	14-10	17-8
	Southern pine	#2	6-2	9-4	12-0	14-4	16-10	6-0	8-8	11-2	13-4	15-7
	Southern pine	#3	4-11	7-3	9-2	10-10	12-11	4-6	6-8	8-6	10-1	12-0
	Spruce-pine-fir	SS	6-1	9-6	12-7	16-0	19-1	6-1	9-6	12-5	15-3	17-8
	Spruce-pine-fir	#1	5-11	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#2	5-11	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
24	Douglas fir-larch	SS	6-1	9-7	12-7	15-10	18-4	6-1	9-6	12-0	14-8	17-0
	Douglas fir-larch	#1	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Douglas fir-larch	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Douglas fir-larch	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Hem-fir	SS	5-9	9-1	11-11	15-2	18-0	5-9	9-1	11-9	14-5	15-11
	Hem-fir	#1	5-8	8-3	10-6	12-10	14-10	5-3	7-8	9-9	11-10	13-9
	Hem-fir	#2	5-4	7-10	9-11	12-1	14-1	4-11	7-3	9-2	11-3	13-0
	Hem-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Southern pine	SS	6-0	9-5	12-5	15-10	19-3	6-0	9-5	12-5	15-10	19-3
	Southern pine	#1	5-10	9-3	12-0	14-4	17-1	5-10	8-10	11-2	13-3	15-9
	Southern pine	#2	5-9	8-4	10-9	12-10	15-1	5-5	7-9	10-0	11-11	13-11
	Southern pine	#3	4-4	6-5	8-3	9-9	11-7	4-1	6-0	7-7	9-0	10-8
	Spruce-pine-fir	SS	5-8	8-10	11-8	14-8	17-1	5-8	8-10	11-2	13-7	15-9
	Spruce-pine-fir	#1	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_C/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_C = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

TABLE R802.5.1(7)
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum Rafter Spans ^a									
			(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)
12	Douglas fir-larch	SS	7-7	11-10	15-8	19-5	22-6	7-7	11-10	15-0	18-3	21-2
	Douglas fir-larch	#1	7-1	10-5	13-2	16-1	18-8	6-8	9-10	12-5	15-2	17-7
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Hem-fir	SS	7-2	11-3	14-9	18-10	22-1	7-2	11-3	14-8	18-0	20-10
	Hem-fir	#1	6-11	10-2	12-10	15-8	18-2	6-6	9-7	12-1	14-10	17-2
	Hem-fir	#2	6-7	9-7	12-2	14-10	17-3	6-2	9-1	11-5	14-0	16-3
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Southern pine	SS	7-5	11-8	15-4	19-7	23-10	7-5	11-8	15-4	19-7	23-10
	Southern pine	#1	7-3	11-5	14-9	17-6	20-11	7-3	11-1	13-11	16-6	19-8
	Southern pine	#2	7-1	10-2	13-2	15-9	18-5	6-8	9-7	12-5	14-10	17-5
	Southern pine	#3	5-4	7-11	10-1	11-11	14-2	5-1	7-5	9-6	11-3	13-4
	Spruce-pine-fir	SS	7-0	11-0	14-6	18-0	20-11	7-0	11-0	13-11	17-0	19-8
	Spruce-pine-fir	#1	6-8	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Spruce-pine-fir	#2	6-8	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
16	Douglas fir-larch	SS	6-10	10-9	13-9	16-10	19-6	6-10	10-3	13-0	15-10	18-4
	Douglas fir-larch	#1	6-2	9-0	11-5	13-11	16-2	5-10	8-6	10-9	13-2	15-3
	Douglas fir-larch	#2	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Douglas fir-larch	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Hem-fir	SS	6-6	10-2	13-5	16-6	19-2	6-6	10-1	12-9	15-7	18-0
	Hem-fir	#1	6-0	8-9	11-2	13-7	15-9	5-8	8-3	10-6	12-10	14-10
	Hem-fir	#2	5-8	8-4	10-6	12-10	14-11	5-4	7-10	9-11	12-1	14-1
	Hem-fir	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Southern pine	SS	6-9	10-7	14-0	17-10	21-8	6-9	10-7	14-0	17-10	21-0
	Southern pine	#1	6-7	10-2	12-9	15-2	18-1	6-5	9-7	12-0	14-4	17-1
	Southern pine	#2	6-2	8-10	11-5	13-7	16-0	5-10	8-4	10-9	12-10	15-1
	Southern pine	#3	4-8	6-10	8-9	10-4	12-3	4-4	6-5	8-3	9-9	11-7
	Spruce-pine-fir	SS	6-4	10-0	12-9	15-7	18-1	6-4	9-6	12-0	14-8	17-1
	Spruce-pine-fir	#1	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Spruce-pine-fir	#2	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Spruce-pine-fir	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
19.2	Douglas fir-larch	SS	6-5	9-11	12-7	15-4	17-9	6-5	9-4	11-10	14-5	16-9
	Douglas fir-larch	#1	5-7	8-3	10-5	12-9	14-9	5-4	7-9	9-10	12-0	13-11
	Douglas fir-larch	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Douglas fir-larch	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
	Hem-fir	SS	6-1	9-7	12-4	15-1	17-4	6-1	9-2	11-8	14-2	15-5
	Hem-fir	#1	5-6	8-0	10-2	12-5	14-5	5-2	7-7	9-7	11-8	13-7
	Hem-fir	#2	5-2	7-7	9-7	11-9	13-7	4-11	7-2	9-1	11-1	12-10
	Hem-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(7)—continued
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum Rafter Spans ^a									
			(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)
19.2	Southern pine	SS	6-4	10-0	13-2	16-9	20-4	6-4	10-0	13-2	16-5	19-2
	Southern pine	#1	6-3	9-3	11-8	13-10	16-6	5-11	8-9	11-0	13-1	15-7
	Southern pine	#2	5-7	8-1	10-5	12-5	14-7	5-4	7-7	9-10	11-9	13-9
	Southern pine	#3	4-3	6-3	8-0	9-5	11-2	4-0	5-11	7-6	8-10	10-7
	Spruce-pine-fir	SS	6-0	9-2	11-8	14-3	16-6	5-11	8-8	11-0	13-5	15-7
	Spruce-pine-fir	#1	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
24	Douglas fir-larch	SS	6-0	8-10	11-3	13-9	15-11	5-9	8-4	10-7	12-11	15-0
	Douglas fir-larch	#1	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Douglas fir-larch	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Douglas fir-larch	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Hem-fir	SS	5-8	8-8	11-0	13-6	13-11	5-7	8-3	10-5	12-4	12-4
	Hem-fir	#1	4-11	7-2	9-1	11-1	12-10	4-7	6-9	8-7	10-6	12-2
	Hem-fir	#2	4-8	6-9	8-7	10-6	12-2	4-4	6-5	8-1	9-11	11-6
	Hem-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Southern pine	SS	5-11	9-3	12-2	15-7	18-2	5-11	9-3	12-2	14-8	17-2
	Southern pine	#1	5-7	8-3	10-5	12-5	14-9	5-3	7-10	9-10	11-8	13-11
	Southern pine	#2	5-0	7-3	9-4	11-1	13-0	4-9	6-10	8-9	10-6	12-4
	Southern pine	#3	3-9	5-7	7-1	8-5	10-0	3-7	5-3	6-9	7-11	9-5
	Spruce-pine-fir	SS	5-6	8-3	10-5	12-9	14-9	5-4	7-9	9-10	12-0	12-11
	Spruce-pine-fir	#1	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

TABLE R802.5.1(8)
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling attached to rafters, $L/\Delta = 240$)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch	SS	6-10	10-9	14-3	18-2	22-1	6-10	10-9	14-3	18-2	21-2
	Douglas fir-larch	#1	6-7	10-5	13-2	16-1	18-8	6-7	9-10	12-5	15-2	17-7
	Douglas fir-larch	#2	6-6	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Hem-fir	SS	6-6	10-2	13-5	17-2	20-10	6-6	10-2	13-5	17-2	20-10
	Hem-fir	#1	6-4	10-0	12-10	15-8	18-2	6-4	9-7	12-1	14-10	17-2
	Hem-fir	#2	6-1	9-6	12-2	14-10	17-3	6-1	9-1	11-5	14-0	16-3
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Southern pine	SS	6-9	10-7	14-0	17-10	21-8	6-9	10-7	14-0	17-10	21-8
	Southern pine	#1	6-7	10-5	13-8	17-6	20-11	6-7	10-5	13-8	16-6	19-8
	Southern pine	#2	6-6	10-2	13-2	15-9	18-5	6-6	9-7	12-5	14-10	17-5
	Southern pine	#3	5-4	7-11	10-1	11-11	14-2	5-1	7-5	9-6	11-3	13-4
	Spruce-pine-fir	SS	6-4	10-0	13-2	16-9	20-5	6-4	10-0	13-2	16-9	19-8
	Spruce-pine-fir	#1	6-2	9-9	12-4	15-1	17-6	6-2	9-2	11-8	14-2	16-6
	Spruce-pine-fir	#2	6-2	9-9	12-4	15-1	17-6	6-2	9-2	11-8	14-2	16-6
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
16	Douglas fir-larch	SS	6-3	9-10	12-11	16-6	19-6	6-3	9-10	12-11	15-10	18-4
	Douglas fir-larch	#1	6-0	9-0	11-5	13-11	16-2	5-10	8-6	10-9	13-2	15-3
	Douglas fir-larch	#2	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Douglas fir-larch	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Hem-fir	SS	5-11	9-3	12-2	15-7	18-11	5-11	9-3	12-2	15-7	18-0
	Hem-fir	#1	5-9	8-9	11-2	13-7	15-9	5-8	8-3	10-6	12-10	14-10
	Hem-fir	#2	5-6	8-4	10-6	12-10	14-11	5-4	7-10	9-11	12-1	14-1
	Hem-fir	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Southern pine	SS	6-1	9-7	12-8	16-2	19-8	6-1	9-7	12-8	16-2	19-8
	Southern pine	#1	6-0	9-5	12-5	15-2	18-1	6-0	9-5	12-0	14-4	17-1
	Southern pine	#2	5-11	8-10	11-5	13-7	16-0	5-10	8-4	10-9	12-10	15-1
	Southern pine	#3	4-8	6-10	8-9	10-4	12-3	4-4	6-5	8-3	9-9	11-7
	Spruce-pine-fir	SS	5-9	9-1	11-11	15-3	18-1	5-9	9-1	11-11	14-8	17-1
	Spruce-pine-fir	#1	5-8	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Spruce-pine-fir	#2	5-8	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Spruce-pine-fir	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
19.2	Douglas fir-larch	SS	5-10	9-3	12-2	15-4	17-9	5-10	9-3	11-10	14-5	16-9
	Douglas fir-larch	#1	5-7	8-3	10-5	12-9	14-9	5-4	7-9	9-10	12-0	13-11
	Douglas fir-larch	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Douglas fir-larch	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
	Hem-fir	SS	5-6	8-8	11-6	14-8	17-4	5-6	8-8	11-6	14-2	15-5
	Hem-fir	#1	5-5	8-0	10-2	12-5	14-5	5-2	7-7	9-7	11-8	13-7
	Hem-fir	#2	5-2	7-7	9-7	11-9	13-7	4-11	7-2	9-1	11-1	12-10
	Hem-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10

(continued)

ROOF-CEILING CONSTRUCTION

TABLE R802.5.1(8)—continued
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling attached to rafters, $L/\Delta = 240$)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	5-9	9-1	11-11	15-3	18-6	5-9	9-1	11-11	15-3	18-6
	Southern pine	#1	5-8	8-11	11-8	13-10	16-6	5-8	8-9	11-0	13-1	15-7
	Southern pine	#2	5-6	8-1	10-5	12-5	14-7	5-4	7-7	9-10	11-9	13-9
	Southern pine	#3	4-3	6-3	8-0	9-5	11-2	4-0	5-11	7-6	8-10	10-7
	Spruce-pine-fir	SS	5-5	8-6	11-3	14-3	16-6	5-5	8-6	11-0	13-5	15-7
	Spruce-pine-fir	#1	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
24	Douglas fir-larch	SS	5-5	8-7	11-3	13-9	15-11	5-5	8-4	10-7	12-11	15-0
	Douglas fir-larch	#1	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Douglas fir-larch	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Douglas fir-larch	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Hem-fir	SS	5-2	8-1	10-8	13-6	13-11	5-2	8-1	10-5	12-4	12-4
	Hem-fir	#1	4-11	7-2	9-1	11-1	12-10	4-7	6-9	8-7	10-6	12-2
	Hem-fir	#2	4-8	6-9	8-7	10-6	12-2	4-4	6-5	8-1	9-11	11-6
	Hem-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Southern pine	SS	5-4	8-5	11-1	14-2	17-2	5-4	8-5	11-1	14-2	17-2
	Southern pine	#1	5-3	8-3	10-5	12-5	14-9	5-3	7-10	9-10	11-8	13-11
	Southern pine	#2	5-0	7-3	9-4	11-1	13-0	4-9	6-10	8-9	10-6	12-4
	Southern pine	#3	3-9	5-7	7-1	8-5	10-0	3-7	5-3	6-9	7-11	9-5
	Spruce-pine-fir	SS	5-0	7-11	10-5	12-9	14-9	5-0	7-9	9-10	12-0	12-11
	Spruce-pine-fir	#1	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10

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

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

a. The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

TABLE R802.5.1(9)
 RAFTER/CEILING JOIST HEEL JOINT CONNECTIONS^{a, b, c, d, e, f, h}

RAFTER SLOPE	RAFTER SPACING (Inches)	GROUND SNOW LOAD (psf)															
		20 ^a				30				50				70			
		Roof span (feet)															
		12	20	28	36	12	20	28	36	12	20	28	36	12	20	28	36
Required number of 16d common nails ^{a, b} per heel joint splices ^{c, d, e, f}																	
3:12	12	4	6	8	10	4	6	8	11	5	8	12	15	6	11	15	20
	16	5	8	10	13	5	8	11	14	6	11	15	20	8	14	20	26
	24	7	11	15	19	7	11	16	21	9	16	23	30	12	21	30	39
4:12	12	3	5	6	8	3	5	6	8	4	6	9	11	5	8	12	15
	16	4	6	8	10	4	6	8	11	5	8	12	15	6	11	15	20
	24	5	8	12	15	5	9	12	16	7	12	17	22	9	16	23	29
5:12	12	3	4	5	6	3	4	5	7	3	5	7	9	4	7	9	12
	16	3	5	6	8	3	5	7	9	4	7	9	12	5	9	12	16
	24	4	7	9	12	4	7	10	13	6	10	14	18	7	13	18	23
7:12	12	3	4	4	5	3	3	4	5	3	4	5	7	3	5	7	9
	16	3	4	5	6	3	4	5	6	3	5	7	9	4	6	9	11
	24	3	5	7	9	3	5	7	9	4	7	10	13	5	9	13	17
9:12	12	3	3	4	4	3	3	3	4	3	3	4	5	3	4	5	7
	16	3	4	4	5	3	3	4	5	3	4	5	7	3	5	7	9
	24	3	4	6	7	3	4	6	7	3	6	8	10	4	7	10	13
12:12	12	3	3	3	3	3	3	3	3	3	3	3	4	3	3	4	5
	16	3	3	4	4	3	3	3	4	3	3	4	5	3	4	5	7
	24	3	4	4	5	3	3	4	6	3	4	6	8	3	6	8	10

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

- a. 40d box nails shall be permitted to be substituted for 16d common nails.
- b. Nailing requirements shall be permitted to be reduced 25 percent if nails are clinched.
- c. Heel joint connections are not required when the ridge is supported by a load-bearing wall, header or ridge beam.
- d. When intermediate support of the rafter is provided by vertical struts or purlins to a load-bearing wall, the tabulated heel joint connection requirements shall be permitted to be reduced proportionally to the reduction in span.
- e. Equivalent nailing patterns are required for ceiling joist to ceiling joist lap splices.
- f. When rafter ties are substituted for ceiling joists, the heel joint connection requirement shall be taken as the tabulated heel joint connection requirement for two-thirds of the actual rafter slope.
- g. Applies to roof live load of 20 psf or less.
- h. Tabulated heel joint connection requirements assume that ceiling joists or rafter ties are located at the bottom of the attic space. When ceiling joists or rafter ties are located higher in the attic, heel joint connection requirements shall be increased by the following factors:

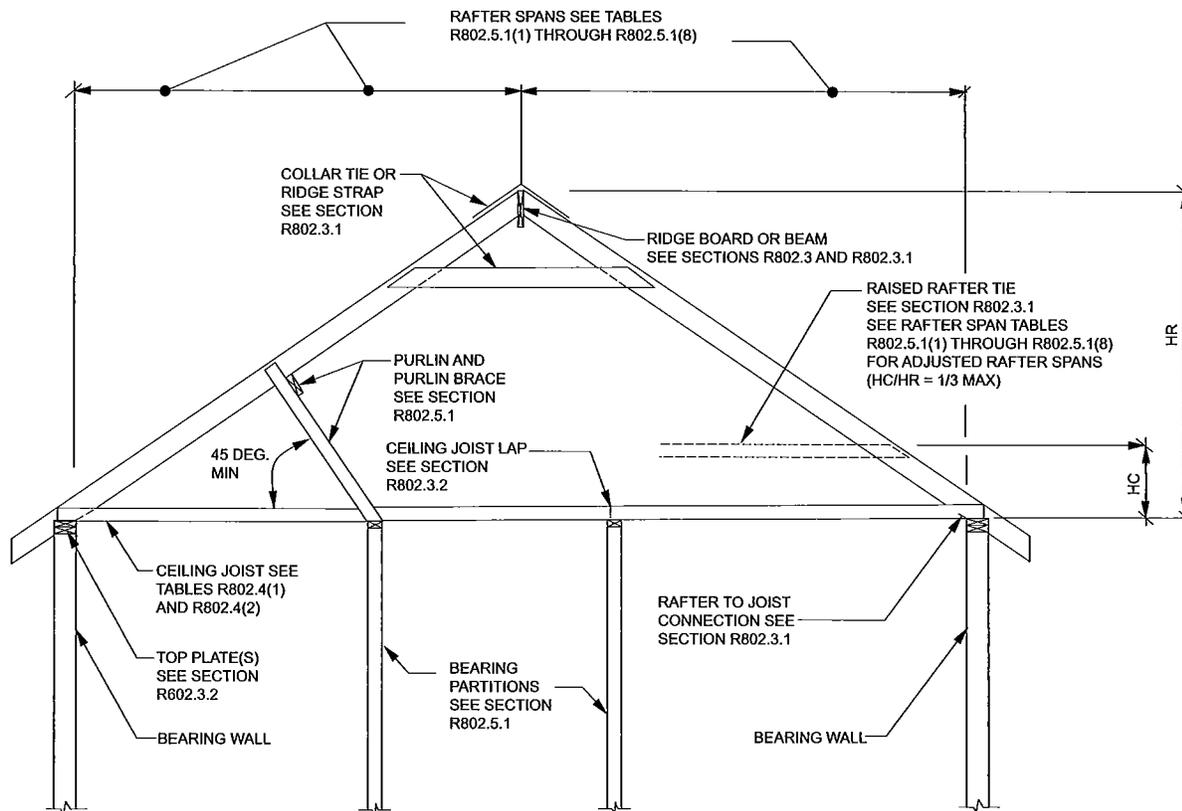
H_C/H_R	Heel Joint Connection Adjustment Factor
1/3	1.5
1/4	1.33
1/5	1.25
1/6	1.2
1/10 or less	1.11

where:

H_C = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

ROOF-CEILING CONSTRUCTION



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 degree = 0.018 rad.

Note: Where ceiling joists run perpendicular to the rafter, rafter ties shall be installed in accordance with Section R802.3.1.

H_C = Height of ceiling joists or rafter ties measured vertically above the top of rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

FIGURE R802.5.1
BRACED RAFTER CONSTRUCTION

R802.6 Bearing. The ends of each rafter or ceiling joist shall have not less than 1½ inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete. The bearing on masonry or concrete shall be direct, or a sill plate of 2-inch (51 mm) minimum nominal thickness shall be provided under the rafter or ceiling joist. The sill plate shall provide a minimum nominal bearing area of 48 square inches (30 865 mm²).

R802.6.1 Finished ceiling material. If the finished ceiling material is installed on the ceiling prior to the attachment of the ceiling to the walls, such as in construction at a factory, a compression strip of the same thickness as the finish ceiling material shall be installed directly above the top plate of bearing walls if the compressive strength of the finish ceiling material is less than the loads it will be required to withstand. The compression strip shall cover the entire length of such top plate and shall be at least one-half the width of the top plate. It shall be of material capable of transmitting the loads transferred through it.

R802.7 Cutting, drilling and notching. Structural roof members shall not be cut, bored or notched in excess of the limitations specified in this section.

R802.7.1 Sawn lumber. Cuts, notches, and holes in solid lumber joists, rafters, blocking and beams shall comply with the provisions of R502.8.1 except that cantilevered portions of rafters shall be permitted in accordance with Section R802.7.1.1.

R802.7.1.1 Cantilevered portions of rafters. Notches on cantilevered portions of rafters are permitted provided the dimension of the remaining portion of the rafter is not less than 3½ inches (89 mm) and the length of the cantilever does not exceed 24 inches (610 mm) in accordance with Figure R802.7.1.1.

R802.7.1.2 Ceiling joist taper cut. Taper cuts at the ends of the ceiling joist shall not exceed one-fourth the depth of the member in accordance with Figure R802.7.1.2.

R802.7.2 Engineered wood products. Cuts, notches and holes bored in trusses, structural composite lumber, structural glue-laminated members or I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a registered *design professional*.

Community Development Department
Fastener Schedule For Structural Members

December 2013

The attached span tables are based on the 2012 International Residential Code and are reproduced with the permission from the International Code Council.

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER ^{a,b,c}	SPACING OF FASTENERS
Roof			
1	Blocking between joists or rafters to top plate, toe nail	3-8d (2½" × 0.113")	—
2	Ceiling joists to plate, toe nail	3-8d (2½" × 0.113")	—
3	Ceiling joists not attached to parallel rafter, laps over partitions, face nail	3-10d	—
4	Collar tie to rafter, face nail or 1¼" × 20 gage ridge strap	3-10d (3" × 0.128")	—
5	Rafter or roof truss to plate, toe nail	3-16d box nails (3½" × 0.135") or 3-10d common nails (3" × 0.148")	2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss ¹
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	4-16d (3½" × 0.135") 3-16d (3½" × 0.135")	—
Wall			
7	Built-up studs-face nail	10d (3" × 0.128")	24" o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" × 0.135")	12" o.c.
9	Built-up header, two pieces with ½" spacer	16d (3½" × 0.135")	16" o.c. along each edge
10	Continued header, two pieces	16d (3½" × 0.135")	16" o.c. along each edge
11	Continuous header to stud, toe nail	4-8d (2½" × 0.113")	—
12	Double studs, face nail	10d (3" × 0.128")	24" o.c.
13	Double top plates, face nail	10d (3" × 0.128")	24" o.c.
14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (3½" × 0.135")	—
15	Sole plate to joist or blocking, face nail	16d (3½" × 0.135")	16" o.c.
16	Sole plate to joist or blocking at braced wall panels	3-16d (3½" × 0.135")	16" o.c.
17	Stud to sole plate, toe nail	3-8d (2½" × 0.113") or 2-16d (3½" × 0.135")	—
18	Top or sole plate to stud, end nail	2-16d (3½" × 0.135")	—
19	Top plates, laps at corners and intersections, face nail	2-10d (3" × 0.128")	—
20	1" brace to each stud and plate, face nail	2-8d (2½" × 0.113") 2 staples 1¾"	—
21	1" × 6" sheathing to each bearing, face nail	2-8d (2½" × 0.113") 2 staples 1¾"	—
22	1" × 8" sheathing to each bearing, face nail	2-8d (2½" × 0.113") 3 staples 1¾"	—
23	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d (2½" × 0.113") 4 staples 1¾"	—
Floor			
24	Joist to sill or girder, toe nail	3-8d (2½" × 0.113")	—
25	Rim joist to top plate, toe nail (roof applications also)	8d (2½" × 0.113")	6" o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½" × 0.113")	6" o.c.
27	1" × 6" subfloor or less to each joist, face nail	2-8d (2½" × 0.113") 2 staples 1¾"	—
28	2" subfloor to joist or girder, blind and face nail	2-16d (3½" × 0.135")	—
29	2" planks (plank & beam - floor & roof)	2-16d (3½" × 0.135")	at each bearing
30	Built-up girders and beams, 2-inch lumber layers	10d (3" × 0.128")	Nail each layer as follows: 32" o.c. at top and bottom and staggered. Two nails at ends and at each splice.
31	Ledger strip supporting joists or rafters	3-16d (3½" × 0.135")	At each joist or rafter

(continued)

WALL CONSTRUCTION

TABLE R602.3(2)
ALTERNATE ATTACHMENTS TO TABLE R602.3(1)

NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION ^{a, b} OF FASTENER AND LENGTH (inches)	SPACING ^c OF FASTENERS	
		Edges (inches)	Intermediate supports (inches)
Wood structural panels subfloor, roof^g and wall sheathing to framing and particleboard wall sheathing to framing^f			
Up to 1/2	Staple 15 ga. 1 3/4	4	8
	0.097 - 0.099 Nail 2 1/4	3	6
	Staple 16 ga. 1 3/4	3	6
19/32 and 5/8	0.113 Nail 2	3	6
	Staple 15 and 16 ga. 2	4	8
	0.097 - 0.099 Nail 2 1/4	4	8
23/32 and 3/4	Staple 14 ga. 2	4	8
	Staple 15 ga. 1 3/4	3	6
	0.097 - 0.099 Nail 2 1/4	4	8
	Staple 16 ga. 2	4	8
1	Staple 14 ga. 2 1/4	4	8
	0.113 Nail 2 1/4	3	6
	Staple 15 ga. 2 1/4	4	8
	0.097 - 0.099 Nail 2 1/2	4	8
NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION ^{a, b} OF FASTENER AND LENGTH (inches)	SPACING ^c OF FASTENERS	
Floor underlayment; plywood-hardboard-particleboard^f			
Plywood			
1/4 and 5/16	1 1/4 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter	3	6
	Staple 18 ga., 7/8, 3/16 crown width	2	5
11/32, 3/8, 15/32, and 1/2	1 1/4 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter	6	8 ^e
19/32, 5/8, 23/32 and 3/4	1 1/2 ring or screw shank nail-minimum 12 1/2 ga. (0.099") shank diameter	6	8
	Staple 16 ga. 1 1/2	6	8
Hardboard^f			
0.200	1 1/2 long ring-grooved underlayment nail	6	6
	4d cement-coated sinker nail	6	6
	Staple 18 ga., 7/8 long (plastic coated)	3	6
Particleboard			
1/4	4d ring-grooved underlayment nail	3	6
	Staple 18 ga., 7/8 long, 3/16 crown	3	6
3/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 1/8 long, 3/8 crown	3	6
1/2, 5/8	6d ring-grooved underlayment nail	6	10
	Staple 16 ga., 1 5/8 long, 3/8 crown	3	6

For SI: 1 inch = 25.4 mm.

- a. Nail is a general description and may be T-head, modified round head or round head.
- b. Staples shall have a minimum crown width of 7/16-inch on diameter except as noted.
- c. Nails or staples shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater. Nails or staples shall be spaced at not more than 12 inches on center at intermediate supports for floors.
- d. Fasteners shall be placed in a grid pattern throughout the body of the panel.
- e. For 5-ply panels, intermediate nails shall be spaced not more than 12 inches on center each way.
- f. Hardboard underlayment shall conform to CPA/ANSI A135.4
- g. Specified alternate attachments for roof sheathing shall be permitted for windspeeds less than 100 mph. Fasteners attaching wood structural panel roof sheathing to gable end wall framing shall be installed using the spacing listed for panel edges.



City of

Harrisonville

est.
1836

P.O. Box 367, 300 East Pearl Street - Harrisonville, Missouri 64701 p. (816) 380-8900 f. (816) 380-8906

To: All Harrisonville Licensed Electrical Contractors

From: Steven P. Rauscher, C.B.O., Director of Codes Administration

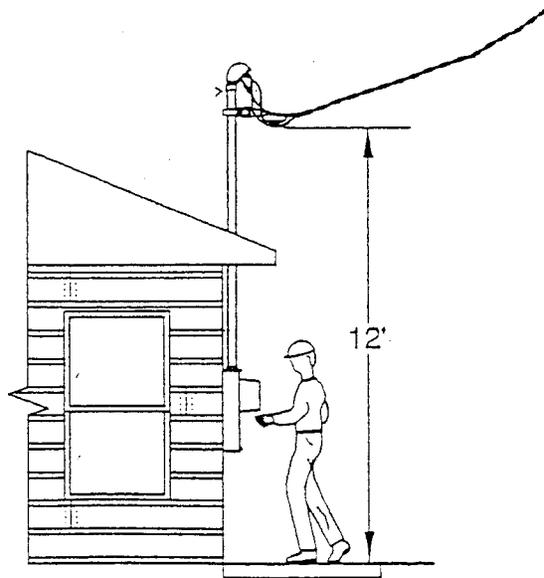
Re: Overhead Service-Drop Conductors-Vertical Clearance from Ground

Date: June 9, 2009

Rules of the National Electrical Safety Code (NESC) and National Electrical Code (NEC) overlap at the service point. The City of Harrisonville will be adopting the latest edition of the National Electrical Safety Code in July, and as the electrical distribution provider, will be amending the previous NEC 230.24(B) provision of ten (10') feet vertical clearance from the ground.

Effective September 1, 2009, the vertical clearance from the ground to the lowest point of the drip loop shall be twelve (12') feet per NESC 230C3.

Please let me know if you need anything further. Thanks very much.



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Underground utilities exist everywhere, even in your yard.

Whether you're a homeowner or excavator, digging without knowing where it's safe to dig can cause tremendous damage and even loss of lives.

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or **811**

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A stylized black and white illustration of a hand holding a shovel. The hand is shown from the side, with fingers wrapped around the handle. The shovel is positioned vertically, with the blade pointing downwards. The background is plain white.

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City of

Harrisonville^{est. 1836}

P. O. Box 367

300 E. Pearl Street

Harrisonville, Missouri 64701

816-380-8900