ONE AND TWO FAMILY DWELLINGS

Plumbing

July, 2007

The following are general requirements pertaining to plumbing in one and two family dwellings. This does not represent all the provisions regulating plumbing of one and two family dwellings and is not intended to replace the adopted codes and ordinances of the City of Lee's Summit, MO. For all requirements pertaining to plumbing in one and two family dwellings refer to the 2006 International Residential Code and Chapter 7 of the Lee's Summit Code of Ordinances.

GENERAL:

1. Permit Fees- The amount of all plumbing related fees are available upon request.

2. Contractor Licenses - All contractors/builders are required to have a business license. Certification of at least one employee of the company as a master electrician, master plumber or master mechanical shall be a requisite for licensing an electrical, plumbing or mechanical contractor. The certification of the master and the 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 of officer of the company. Except for 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 mechanical business, construction or installations. (LSCO 7-130)

3. 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, waste & vent system is not altered. Contact Codes Administration for more information.

4. 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 (LSCO 7-134)

5. Placement of Permit – Permits shall be posted on site and 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. (LSCO 7-136)

6. Erosion Control – As necessary, erosion control devices shall be installed and maintained throughout the construction process in accordance with the City of Lee's Summit Design and Construction Manual. Failure to install or maintain erosion

control devices may result in inspections not being performed, stop work orders being issued or court charges filed against the permit applicant.

7. Required Inspections – The following plumbing related inspections are required: (LSCO 7-160)

   A. Concrete Slab or Under-Floor - Under-floor piping shall be inspected after all water and wastewater piping has been installed and supported but prior to being covered.

   B. Top-Rough Plumbing – 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.

   C. Gas Test – 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.

   D. Water Service – Shall be made after the water service piping has been installed but prior to being covered.

   E. Sewer Service – Shall be made after the sewer service piping has been installed but prior to being covered.

   F. Plumbing Final – 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.

   G. Erosion Control – Erosion control devices will be inspected each time an inspector is on site. If erosion is not being controlled in accordance with the City of Lee's Summit Design and Construction Manual, requested inspections may not be performed until corrections have been made. In addition, stop work orders and court actions may be also be initated if adjacent property, streams and streets are not being adequately protected from erosion.

8. Appeals/Interpretations/Disputes – Concerns as a result of inspection activities should first be addressed with the Manager of Inspection Services. Concerns/disputes regarding permit issuance or plan approval should first be

addressed with the Manger of Plan Review. The Director of Codes Administration is available to address any concerns regarding any facet of the Codes Administration Dept. In order to hear and decide upon appeals of orders, decisions or determinations made by the Director of Codes Administration, building official, an application may filed to be heard before the Board of Appeals.

Applications for appeal to the Board of 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 Appeals may not waive the requirements of the code. However, they may recommend waivers of the code to the City Council, which may waive the requirements of the code. (LSCO 7-173)

GENERAL CODE REQUIREMENTS:

1. Required Sanitary Sewer Connection – Residential properties within 150 feet of public sewer shall be required to connect to the public sewer in accordance with LSCO Chapter 32 and the 2006 IRC.

2. Protection from Physical Damage – In concealed areas, where piping other than cast-iron or galvanized, is installed through holes or notches through studs, joists or other members less than 1 ½ inches from the nearest edge of the member, the pipe shall be protected by shield plates. (IRC 2603.2.1)

3. 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 wall a sleeve two pipe sizes larger than the pipe passing through. (IRC 2603.5)

4. Sleeves – Shall be filled or tightly caulked. (IRC 2603.4)

5. Freezing – Water, soil, or waste pipe shall not be installed in exterior walls, attics, crawl spaces, outside of the building or other locations subject to freezing 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 2603.6)

6. Breakage and Corrosion – Pipes passing through concrete, cinder or cold-formed steel shall be protected from corrosion by a protective sheathing at least ¼ inch thick. The sheathing shall allow for expansion and contraction of the piping to prevent rubbing action. (IRC 2603.3)

7. Trenches – Pipes shall be installed in trenches so that the piping rests on solid and continuous bearing. Piping may not be supported on rocks (other than gravel or other granular material) or blocks at any point. Rocky or unstable soil shall be

overexcatvated by two or more pipe diameters and brought to proper grade with suitable compacted granular material. (IRC 2604.1)

8. Backfill – Backfill shall be free from discarded construction material and debris. Backfill shall be free from rocks, frozen chunks and other rubble until the pipe is covered by at least 12 inches of tamped earth. Backfill shall be placed on both sides of the pipe and tamped to retained alignment. Loose dirt shall be carefully placed in the trench in 6-inch layers and tamped into place. (IRC 2604.3)

9. Waterproofing of Openings – Roof and exterior wall penetrations shall be made watertight. (IRC 2606.1)

10. 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 2607.1)

11. Materials – All plastic pipes, fittings and components shall be third-party certified as conforming to ANSI/NSF 14 by an approved agency (IRC 2608.3). 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 2608.1). All materials used shall be installed in strict accordance with the standards under which the materials are accepted and approved (IRC 2608.2). Table P2701.1 contains plumbing fixture, faucet and fitting standards.

12. Pipe Support – Pipe shall be supported in accordance with IRC Section P2605.1 and Table 2605.1.

13. Fixture Installation – The contact area of where fixtures come into contact with walls 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. (IRC 2705.1)

14. Access to Connections – 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 2704.1)

15. Laundry Tray Connection – 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 2706.2.1)

16. Hot Water – Fixture fittings, faucets and diverters shall be installed so that the flow of hot water from the fittings corresponds with the left-hand side of the fitting. Shower and tub/shower valves are excempt from this requirement when the flow of hot water corresponds to markings on the device. (IRC 2722.2)

SHOWERS:

1. Size – 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, with the exception that a 25 inch minimum dimension is allowed if the shower compartment has a minimum 1300 square inches of cross-sectional area. (IRC 2708.1)

2. Bathtub and Shower Spaces – Bathtub and Shower floors and walls above bathtubs installed with showerheads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surface shall extend to a height of not less than 6 feet above the floor of the bathtub or shower. (IRC 307.2)

3. Shower Control Valves – Showers and tub/shower combinations shall be equipped with valves of the pressure balance, the thermostatic mixing or combination pressure balance/thermostatic mixing valve types with high limit stops set to a maximum of 120 degrees F. (IRC 2708.3)

4. Water Supply Riser – The supply riser from the valve to the shower head outlet shall be secured to the permanent structure. (IRC 2708.2)

FOOD –WASTE GRINDERS:

1. Waste Outlet – Food grinders shall be connected to a drain of not less than 1 ½ inches. (IRC 2716.1)

2. Directional Fittings – Tail pieces receiving discharge from disposal units or dishwashers shall be provided with an approved directional type branch fitting. (IRC 2707.1)

DISHWASHERS:

1. Protection of Water Supply – The water supply shall be protected by an air gap or integral backflow preventor. (IRC 2717.1)

2. Sink and Dishwasher, Sink, Dishwasher and Food Grinder – The combined discharge from a sink, dishwasher and food grinder is permitted to discharge through a single 1 ½ inch trap. The discharge from the dishwasher shall be increased to ¾ inch and shall connect with a wye fitting between the discharge of

the food grinder and the trap or to the head of the food grinder. The dishwasher waste line shall rise and be securely fastened to the underside of the counter before connecting to the tail piece or food grinder. (IRC 2717.3)

WHIRLPOOL BATHTUBS:

1. Access Panel – A door or panel shall be installed to provide access to the pump for repair and/or replacement. (IRC 2720.1)

2. Piping Drainage – The pump shall be located above the crown of the weir of the trap. The pump drain line shall be installed to ensure minimum water retention in the volute after fixture use. The circulation piping shall be installed to be self-draining. (IRC 2720.2)

3. Manufactures Instructions – The product shall be installed in accordance with the manufacturer's instructions. (IRC 2720.4)

WATER HEATERS:

1. Required Pans – Where water heaters are installed in locations where leakage will cause damage, the water heater shall be installed in a galvanized pan. The pan shall be drained by an indirect waste pipe having a minimum diameter of 1 inch or the outlet diameter of the relief valve, whichever is larger. (IRC 2801.5)

2. Installed in Garages – Water heaters installed in garages shall have the source of ignition elevated above the floor not less than 18 inches. (IRC 2801.6)

3. Relief Valves – Appliances and equipment used for heating or storing hot water shall be protected per IRC 2803.1. Water tank relief valves shall be set to open at least 25 psi above the system operating temperature but not more than 150 psi. The relief valve setting shall not exceed the tanks rated operating temperature. The discharge from the relief valve shall be piped full size separately to the floor, the outside of a building or to an indirect waste receptor located within the building. (IRC 2803)

WATER:

1. Backflow – A means of protection against backflow shall be provided in accordance with IRC Sections 2902.2.1 through 2902.2.6.

2. Design Criteria – Water service and water distribution systems shall be designed and 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 2903.1. The maximum flow rates for fittings and fixtures shall be in accordance with IRC Table 2903.2.

3. Maximum Pressure – The maximum static pressure shall be 80 psi. An approved pressure-reducing valve shall be installed on the domestic water branch main or riser at the point of connection to the water service pipe. (IRC 2903.3.1)

4. Pipe Sizing – Shall be in accordance with IRC 2903.7.

5. Required Valves – Each unit shall be provided with an accessible main shutoff valve, with provision to drain, located near the entrance of the water service. A readily accessible valve shall be installed on the cold water supply pipe to the water heater. An individual shutoff shall be provided on the water supply to each water closet. (IRC 2903)

6. Hose Bibbs – Hose bibbs subject to freezing, including frost-proof type, shall be provided with a valve inside the building so they may be controlled and/or drained during cold periods. This does not apply when the stem extends through the building insulation into an open heated or semi-conditioned space. (IRC 2903.10)

7. Lead Content – Pipes and fittings utilized in water supply systems shall have a maximum of 8% lead. (IRC 2904.2) Solders and fluxes used in potable water supply systems shall have a maximum of .2%lead. (IRC 2904.13)

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 3001.2)

2. Fittings - Fittings shall be approved and compatible with the type of piping being used and shall be of a sanitary or DWV design for drainage and venting. Water-pipe fittings shall be permitted for use in engineer designed systems where the design indicates compliance with Section P3101.2.1 (IRC 3002.3)

3. Tightness - Joints and connections in the DWV system shall be gas tight and water tight for the intended use. (IRC 3003.1)

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 3005.1.6)

5. Cleanouts - Drainage pipe cleanouts shall comply with Sections P3005.2.1 through P3005.2.11. (IRC 3005.2)

6. Drainage Piping Slope - Horizontal drainage piping shall be installed in uniform alignment at uniform slopes not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for 2 1 /2 -inch (64 mm) diameter and less, and not less than one-eighth unit vertical in 12 units horizontal (1-percent slope) for diameters of 3 inches (76 mm) or more. (IRC 3005.3)

7. 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 3005.4)

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.

2. Main Vent Required - Every building shall have a main vent that is either a vent stack or a stack vent. Such vent shall run undiminished in size and as directly as possible from the building drain through to the open air above the roof. Terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening. (IRC 3102.1)

3. Roof Extension - All open vent pipes which extend through a roof shall be terminated at least 6 inches above the roof, except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 7 feet (2134 mm) above the roof. (IRC 3103.1)

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 an opening unless it is at least 2 feet above the top of such opening. (IRC 3103.5)

5. Vent Grade - All vent and branch vent pipes shall be so graded, connected and supported as to allow moisture and condensate to drain back to the soil or waste pipe by gravity. (IRC 3104.2)

6. 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. The connection shall be identified to indicate that the connection is a vent. (IRC 3104.6)

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.

TABLE P3105.1
MAXIMUM DISTANCE OF FIXTURE TRAP FROM VENT

SIZE OF TRAP (inches)	SLOPE inch/foot	DISTANCE FROMTRAP (feet)
1 1 /4	1 /4	5
1 1 /2	1 /4	6
2	1 /4	8
3	1 /8	12
4	1 /8	16

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 3112

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 backpressure by an approved system of venting (see Section P3101). (IRC 3201.3)

3. Size of Fixture Traps - Fixture trap size shall be sufficient to drain the fixture rapidly and in no case less than given in Table P3201.7. Traps shall not be larger than the drainage pipe into which it discharges.

TABLE P3201.7
SIZE OF TRAPS AND TRAP ARMS FOR PLUMBING FIXTURES

PLUMBING FIXTURE	TRAP SIZE MINIMUM
Bathtub (with or without shower head and/or whirlpool attachments)	1 1 /2
Clothes washer standpipe	2
Dishwasher (on separate trap)	1 1 /2
Floor drain	2
Kitchen sink (one or two traps, with or	

without dishwasher and garbage grinder)	1 1 /2
Laundry tub (one or more compartments)	1 1 /2
Lavatory	1 1 /4
Shower (based on the total flow rate through Shower heads and bodysprays)	
Flow rate:	
5.7 gpm or less	1 ½
More than 5.7 gpm up to 12.3 gpm	2
More than 12.3 gpm up to 25.8 gpm	3
More than 25.8 gpm up to 55.6 gpm	4
Water closet	Consult Fixture Standard