EASTERN
INTERLAKE
PLANNING DISTRICT

Serving the RM of Gimli, Municipality of Bifrost-Riverton
Town of Arborg and the Town of Winnipeg Beach

Plumbing Installations

A guide to plumbing requirements for
a single-family dwelling.

April 2024

This booklet has been written to:

1. Provide a summary of some more common plumbing regulations; and
2. Provide information on the extent to which the plumbing work must be completed before requesting an inspection.

It is recommended that the installation of the drainage and venting system be installed by a professional plumber. If the homeowner chooses to install the drainage and venting system in their home, it is advised that the applicable sections of this booklet be reviewed before commencing with the project.

Installations that fail to meet the requirements of the Plumbing Code must be brought up to code and re-inspected and may be subject to additional fees.

Please note that this booklet does not cover all of the plumbing regulations. Complete plumbing requirements are covered in the Manitoba Plumbing Code.

When is a plumbing permit required?

A plumbing permit must be obtained from the Eastern Interlake Planning District (EIPD) whenever:

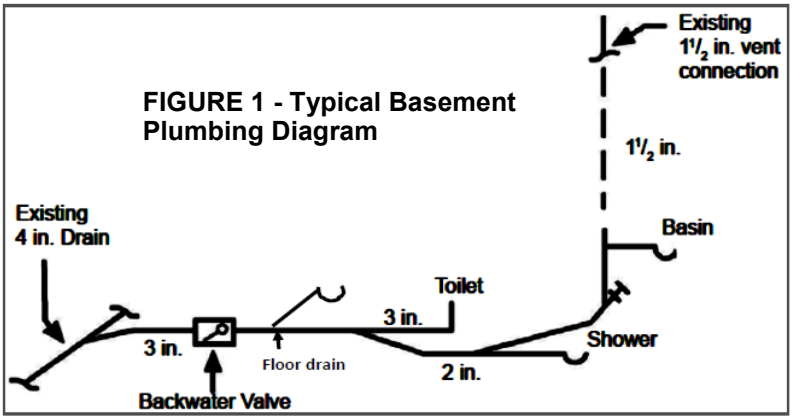
a) A plumbing system is constructed, extended, altered, renewed or repaired; and
b) When water supply lines in a building are replaced.

Note: Lead free solder is required for all water supply lines.

When is a plumbing permit not required?
A plumbing permit is not required when:
a) A stoppage in the drainage system is cleared;
b) A leak is repaired in a water distribution system;
c) A fixture is replaced without any change to the drainage system; or
d) A replacement is made to existing faucets or service water heaters.

What information is required to apply for a plumbing permit?
EIPD requires a plumbing diagram for the proposed installation with the following details:
a) The diagram must have a view from the side;
b) Be drawn as single line;
c) Show the drain and vent pipe sizes; and
d) Show the location of each fixture.
e) Show location of emergency floor drain

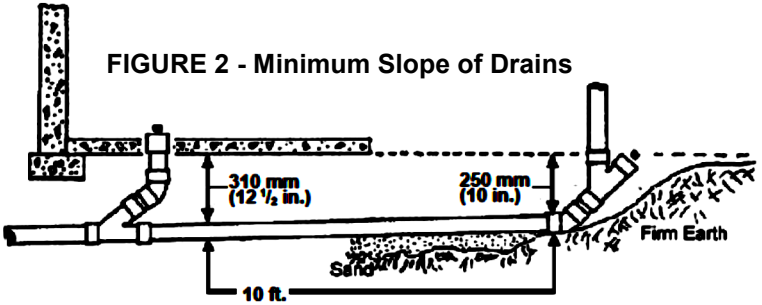
An example of a typical plumbing diagram is shown in FIGURE 1.



What must be ready for the first inspection?
Before calling for the inspection, all drains and vents should be completed. The work *must not* be covered before inspection.
If any part of the plumbing work is found deficient during inspection, alterations or replacement must be made as necessary. The work may be subject to additional inspections.
Materials and equipment used in a plumbing system shall be certified and approved by an organization accredited by the Standards Council of Canada as the certification body and bear evidence of acceptance.

What is the minimum slope requirement for drains?
All drains must be installed to provide a minimum slope away from the fixture of at least 6mm (¼ in.) for every 300mm (1 ft.) of pipe length. The drains must be supported by a firm base/hanger to remain in that position. See FIGURE 2.

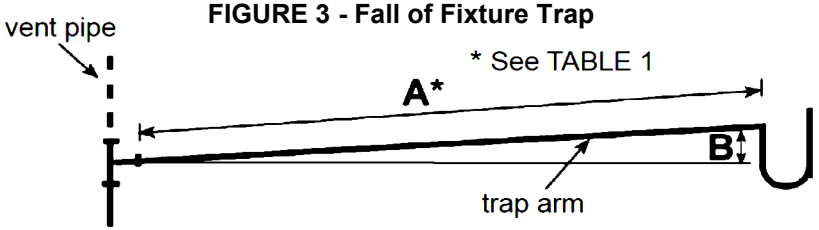
FIGURE 2 - Minimum Slope of Drains



Drain sloped at 6mm (¼ in.) for every 300mm (1ft.).

What is the total fall allowed from a fixture trap to the vent?
Except for a water closet, the total fall from the fixture trap to the vent must not exceed the diameter of the fixture drain. See FIGURE 3.

FIGURE 3 - Fall of Fixture Trap

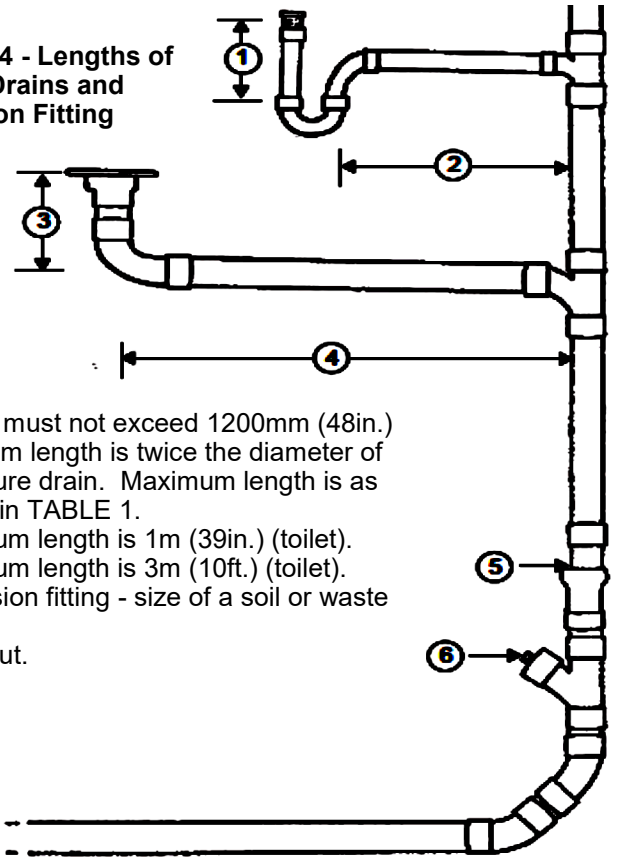


Developed length "A" must be at least twice the size of the trap arm. Fall "B" must not be greater than the size of the trap arm.

What is the maximum distance allowed between a vent pipe and a fixture trap or a water closet?
The maximum distance between a vent pipe and a fixture trap must not exceed the distances shown in TABLE 1. See FIGURE 4.

Are expansion fittings required for piping systems?
Yes! The design and installation of every piping system must, where necessary, include means to accommodate expansion and contraction of the piping system caused by temperature change. Therefore, where plastic pipe is used, expansion joints must be installed at the base of every soil or waste stack. See FIGURE 4.

FIGURE 4 - Lengths of Fixture Drains and Expansion Fitting



1. Length must not exceed 1200mm (48in.)
2. Minimum length is twice the diameter of the fixture drain. Maximum length is as shown in TABLE 1.
3. Maximum length is 1m (39in.) (toilet).
4. Maximum length is 3m (10ft.) (toilet).
5. Expansion fitting - size of a soil or waste stack.
6. Cleanout.

TABLE 1 – Vent Connections

PIPE SIZE (IN.)	MINIMUM GRADE	TOTAL ALLOWABLE DISTANCE
1¼	1/50	1.5m (5ft.)
1½	1/50	1.8m (6ft.)
2	1/50	2.4m (8ft.)
3	1/50	3.6m (12ft.)
4	1/50	4.8m (16ft.)
4	1/100	9.8m (32ft.)

What are the locations of the cleanout fittings in the drainage system?

Approved cleanout fittings must be installed at the following locations:

a) As close as practicable to the point where the building drain leaves the building;

b) At the base of every soil or waste stack;

c) To permit the cleaning of vents to the flood level rim of kitchen sinks; and

d) At every 90° change of direction in sink wastes.

See FIGURE 5.

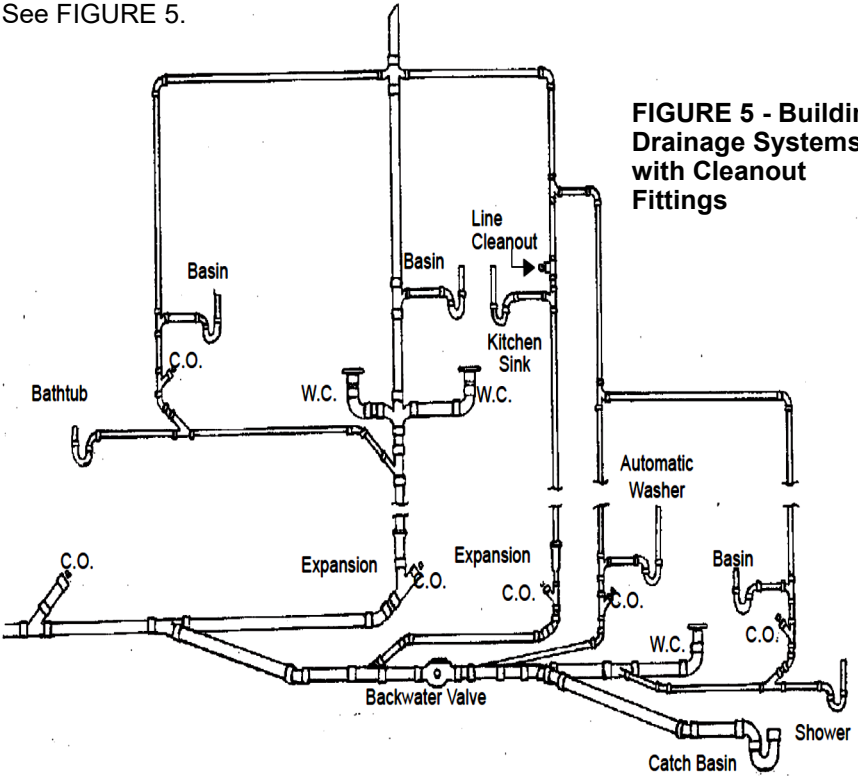
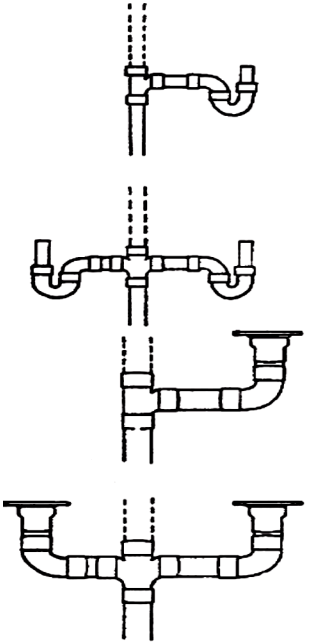


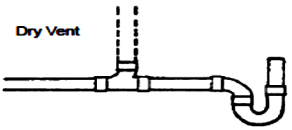
FIGURE 5 - Building Drainage Systems with Cleanout Fittings

What are the requirements for the installation of "T" and "Y" fittings in the drainage system?

Tee fittings or 90° elbows must not be used in the horizontal portion of a drainage system. All changes or direction must be made with the use of Y's and 45° bends. Except that a 90° elbow or tee fitting may be used to change the direction of horizontal drains when the direction of flow is down to the vertical. Tee fittings may be used to make the connections to vent pipes. See FIGURE 6 & 7. For exceptions, see FIGURE 8.

FIGURE 6 - Permitted Use of Sanitary "T" ("TY") Fittings - Part 1





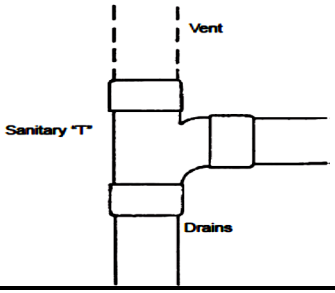
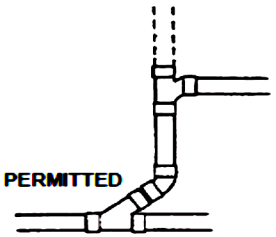
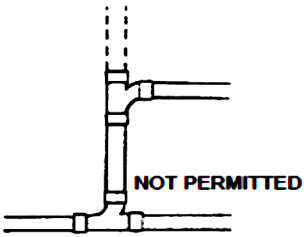
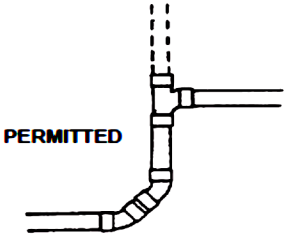


FIGURE 7 - Permitted Use of Sanitary "T" ("TY") Fittings - Part 2







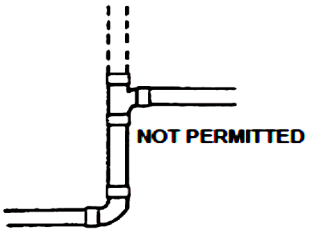
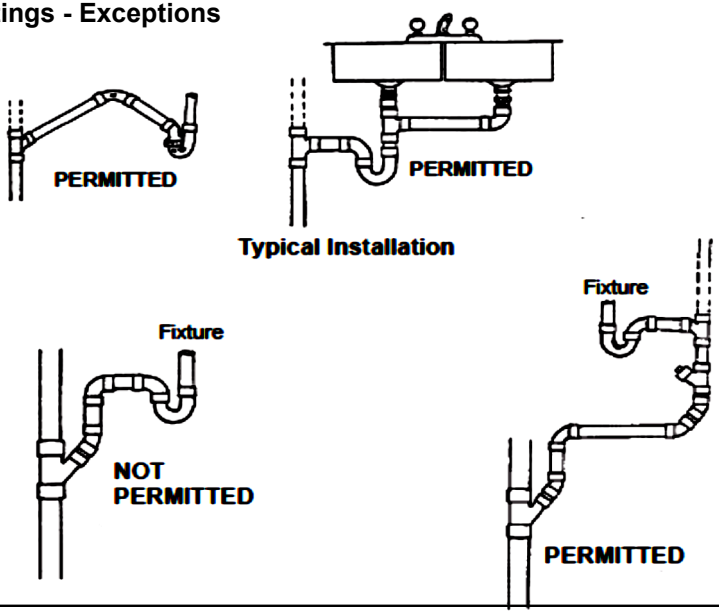


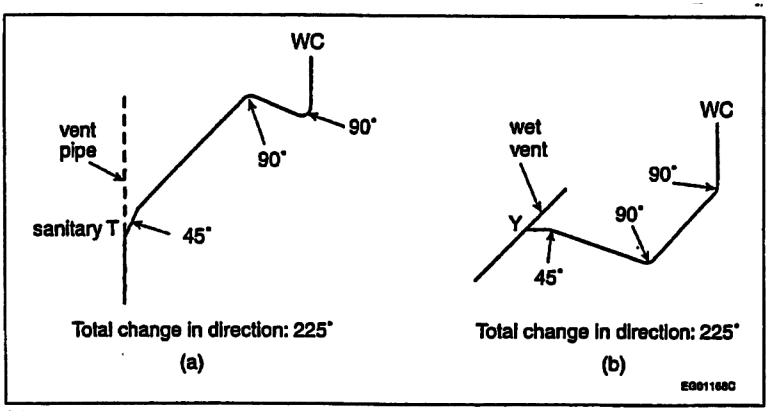
FIGURE 8 - Permitted Use of Sanitary "T" ("TY") Fittings - Exceptions



90° Elbows

90° elbows shall not be used to join two soil or waste pipes. In sanitary drainage systems, 90° elbows shall only be permitted to:

a) Change the direction of piping from horizontal to vertical, in the direction of flow;
b) Where the trap arm enters a wall, or
c) To connect trap arms as permitted by 2.5.6.3(2), see below.



Can drainage or water piping be installed in exterior walls?
Where piping may be exposed to freezing conditions, it must be protected. No drainage or water system can be installed in any exterior wall of a building. Vent pipes are permitted in exterior walls.

When is a drain water heat recovery unit required?
A drain water heat recovery unit shall be installed to receive drain water from at least one shower in the dwelling unit if there is a story beneath the shower area.

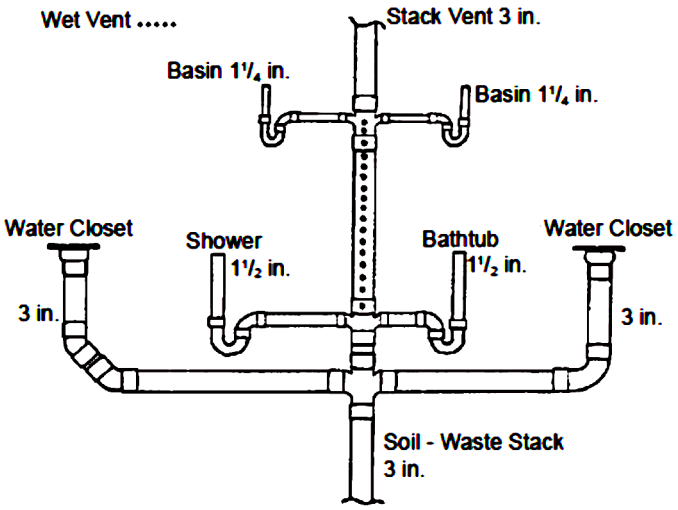
Is room ventilation for bathrooms required?
Yes! Ventilation of bathrooms or any rooms containing a water closet must be provided by a mechanical exhaust system (fan) to the outdoors with a minimum rating of 50 c.f.m.

What requirements must be met for single storey wet venting of multiple fixtures?
A soil or waste pipe extended as a stack vent or a continuous vent may serve as a single storey wet vent if:

a) All fixtures served by the vent are in the same storey;
b) No soil or waste stack is connected upstream of a wet vented fixture;
c) Water closets are connected downstream of all other fixtures; and
d) The fixture drains are connected separately and directly into the soil or waste pipe.

See FIGURES 9, 10 & 11.

FIGURE 9 - One Storey Venting (Back to Back)



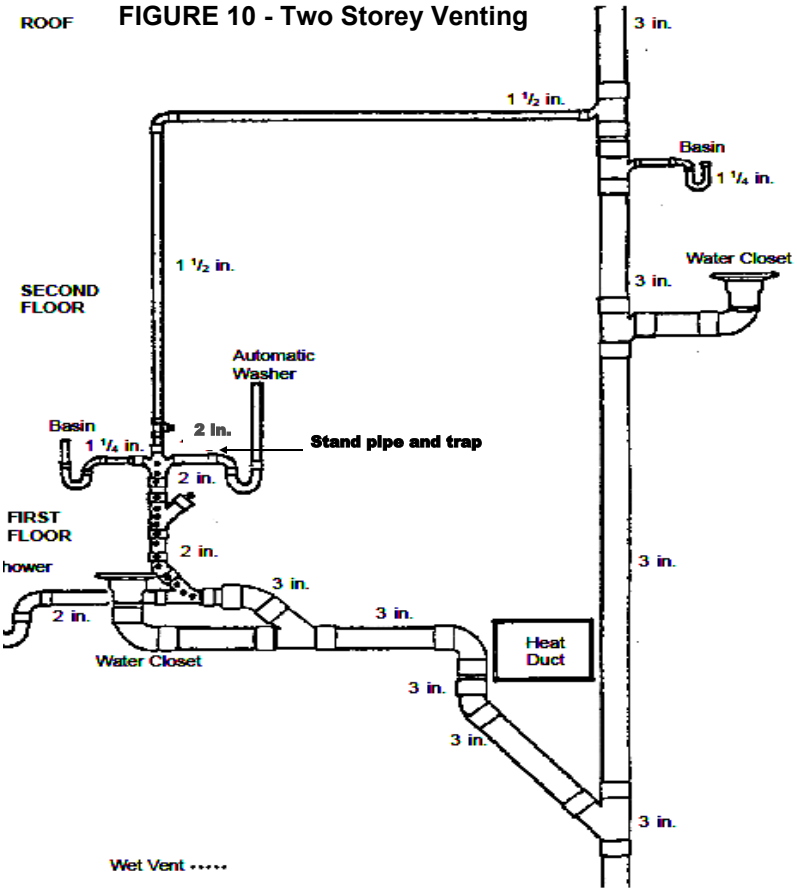
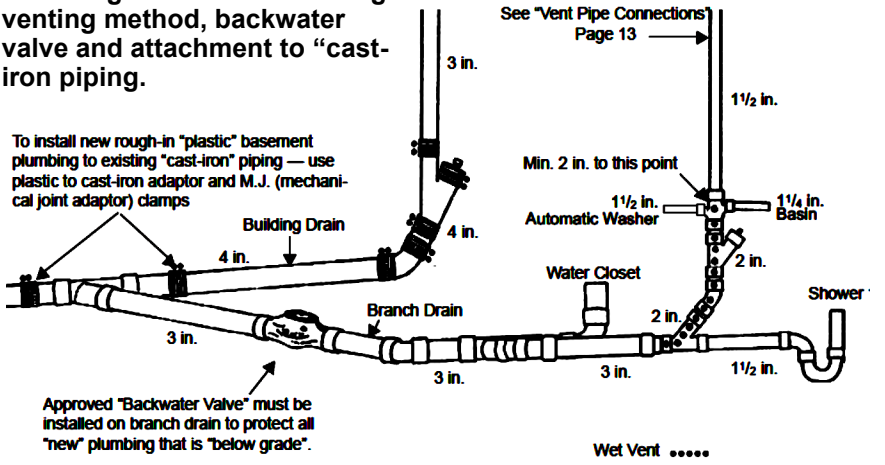


FIGURE 10 - Two Storey Venting

When is a backwater valve required?
All fixtures installed below street level must be protected by a backwater valve arranged to prevent sewer back-up. The backwater valve must be installed to protect the branch drain. A backwater valve may be installed on a building drain or building sewer if listed for that location. See FIGURE 5 and FIGURE 11.

What is the maximum cumulative change in direction permitted between a fixture trap and a vent?
The cumulative change of direction between a fixture trap and a vent must not exceed 135°. See FIGURE 12.

FIGURE 11 - Typical Basement Plumbing Installation showing venting method, backwater valve and attachment to "cast-iron piping.



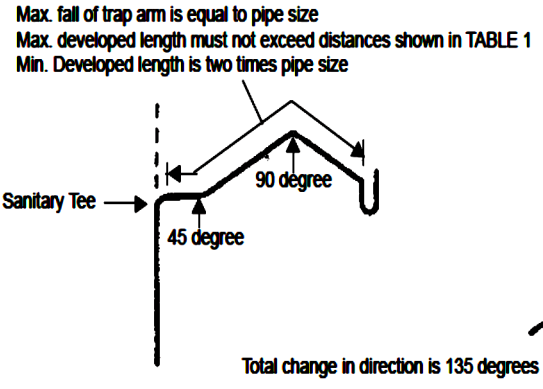
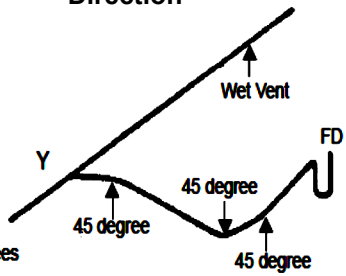


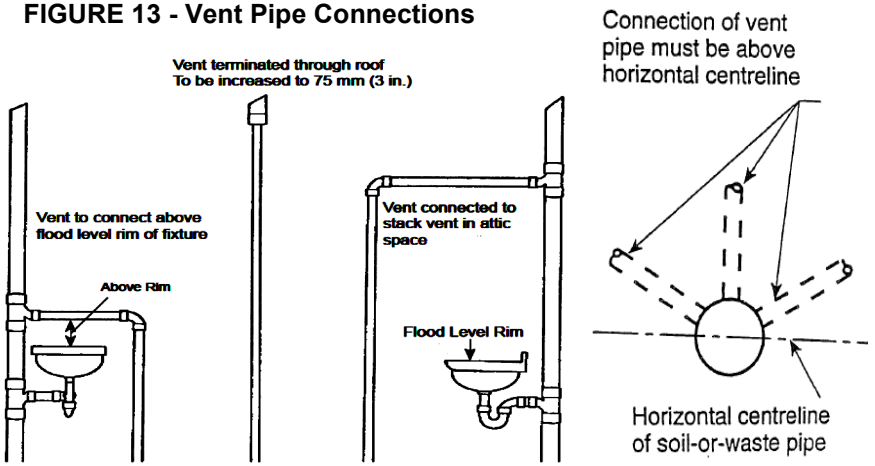
FIGURE 12 - Location of Vent Pipes Cumulative Change in Direction



What are some requirements to be met when vent pipes are being connected and being run through the dwelling to the roof?

a) Every building drain shall be terminated by at least one soil or waste stack/vent stack or vent pipe at least 3 inches in size.
b) Where a vent pipe passes through the roof, it must be protected from frost closure by increasing the pipe size to at least 3 in. in diameter immediately before penetrating the roof.
c) A vent pipe located in attic spaced must be insulated.
d) Vent pipes must be installed without depressions in which moisture can collect.
e) A vent pipe must extend vertically above the flood level rim of every fixture that it serves before being connected to another vent pipe (see FIGURE 13).

FIGURE 13 - Vent Pipe Connections



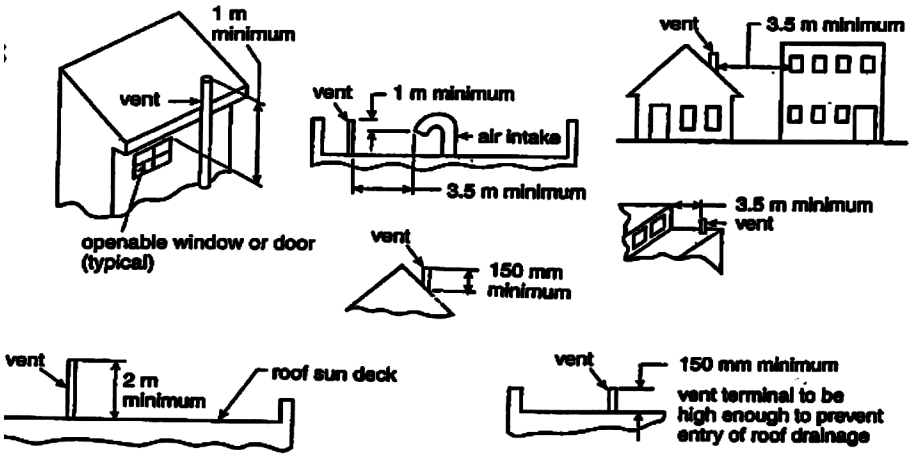
Requirements for vent pipe termination?

Except for a fresh air inlet where a vent pipe is terminated in open air the terminal shall be located:

a) Not be less than 1m above and not less than 3.5m in any other direction from every air inlet, openable window or door.
b) Not less than 2m above or not less than 3.5m in any other direction from a roof that supports an occupancy.
c) Not less than 2m above ground; and
d) Not less than 1.8m from every property line.

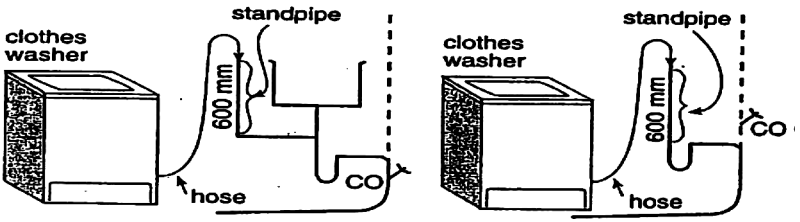
Where a vent pipe passes through the roof, it shall be a minimum of 150mm above the roof. See FIGURE 14.

FIGURE 14 - Vent Pipe Termination



Clothes Washer Drain Waste and Vent:
Where clothes washers do not drain to a laundry sink, the 2in. trap inlet shall be fitted with a 2in. vertical standpipe that is not less than 600mm (24in.) long and not more than 1200mm (48in.) long measured from the trap weir and terminates above the flood level rim of the clothes washer. The trap must be accessible for cleaning. See FIGURE 15.

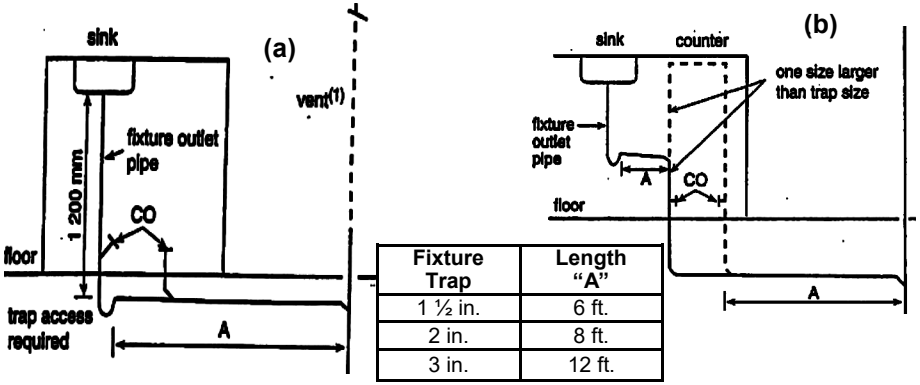
FIGURE 15 - Clothes Washer DWV



The standpipe must extend above the flood level rim of the washer and measure a minimum of 600 mm.

Island Fixture Installation:
The location of island fixtures to a vented soil or waste stack can present venting problems if the trap arm distance is greater than length "A" shown in FIGURE 16.
Diagram (a) and (b) in FIGURE 16 illustrate solutions to this problem when the trap arm length "A" is within the length provided for the fixture trap size. When the trap arm length "A" is greater, the installation of an approved air admittance valve to provide trap arm venting is allowed. The admittance valve used for this application must conform to ASSE 1051. The air admittance valve shall be located not less than 100mm above horizontal branch drain, be accessible and located in a space that allows air to enter the valve. FIGURE 17 illustrates dishwasher drainage.

FIGURE 16 - Island Fixture Installation



Fixture Trap	Length "A"
1 ½ in.	6 ft.
2 in.	8 ft.
3 in.	12 ft.

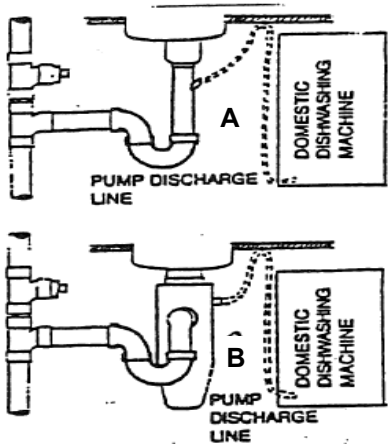
FIGURE 17 - Dishwasher Drainage

Domestic Dishwasher:
Where a domestic dishwasher discharges into the fixture outlet pipe of an adjacent kitchen sink or disposal unit, the pump discharge line shall rise as high as possible to just under the counter and connect:

A: On the inlet side of the sink trap by means of a Y fitting.

Or

B: To the disposal unit.



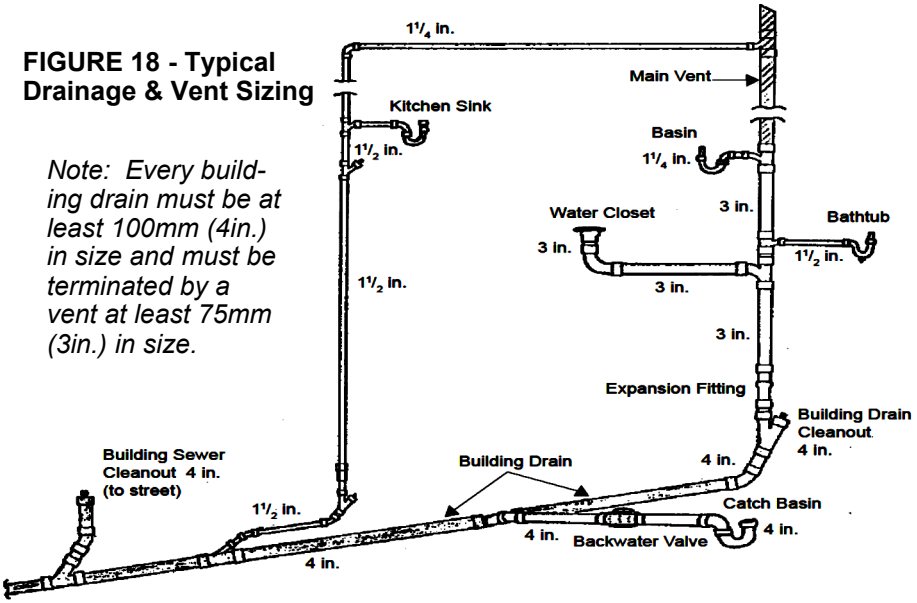
What are the size requirements for the fixture outlet pipes?
The sizes of all fixture outlet pipes must comply with TABLE 2 and FIGURE 18.

TABLE 2 – Fixture Size Requirements

FIXTURE	MIN. SIZE OF FIXTURE OUTLET PIPES
Bathtub (with or without shower)	1 ½ in.
Bidet	1 ¼ in.
Clothes Washer	2 in.
Dishwasher (no load when connected to a garbage disposal unit or a kitchen sink trap)	1 ½ in.
Garbage Disposal Units – residential type	1 ½ in.
Laundry Sinks	1 ½ in.
Lavatories (basin)	1 ¼ in.
Shower Drain – 1 head	1 ½ in.
Sink – one and two compartments with garbage disposal unit	1 ½ in.
Water Closet	3 in.

FIGURE 18 - Typical Drainage & Vent Sizing

Note: Every building drain must be at least 100mm (4in.) in size and must be terminated by a vent at least 75mm (3in.) in size.

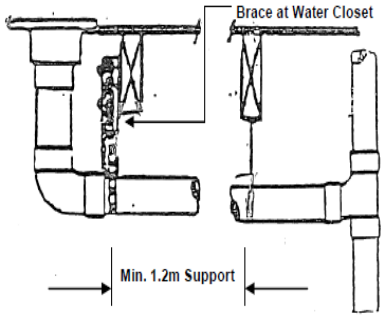


Requirements for support of piping:

Vertical piping shall be supported at its base and at the floor level of alternating storey's by metal rests.

Nominally horizontal piping that is inside a building shall be braced to prevent swaying and buckling and to control the effects of thrust. See FIGURE19.

FIGURE 19



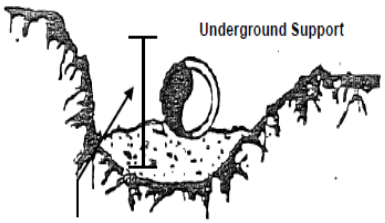
Nominally horizontal piping shall be supported so that:

a) ABS or PVC plastic pipe is supported:
   i) At intervals not exceeding 1.2m;
   ii) At the end of branches;
   iii) At changes of direction or elevation; and
   iv) If the pipe is a fixture drain more than 1m in length, as close as possible to the trap.

The pipe shall be aligned without adding strain on the piping and shall not be bent or pulled into position after being welded.

Nominally horizontal piping that is underground shall be supported on a base that is firm and continuous under the whole of the pipe. See FIGURE 20.

FIGURE 20



Backfill in this part of the trench must be carefully placed and tamped. It must not contain stones, boulders, cinders or frozen earth.

b) CPVC or Polybutylene plastic pipe is supported at intervals not exceeding 1m.
c) Copper, brass and copper tube pipe is supported at intervals not exceeding:
   i) 3m if the tube or pipe is hard temper and larger than 1in. in size.
   ii) 2.5m if the tube or pipe is hard temper and larger than 1in. In size.
   iii) 2.5m if the pipe is soft temper.

What are the requirements that must be met for the installation of a potable water system?

All potable water systems must meet the following standards:

a) Every water service pipe must be provided with a shut-off valve where the pipe enters the building.

b) A water distribution system must be installed so that the system can be drained or blown out with air.

c) Every fixture supplied with hot and cold water controls must have the hot water control on the left and the cold water control on the right.

d) Every water closet must be provided with a shut-off valve on the water supply pipe.

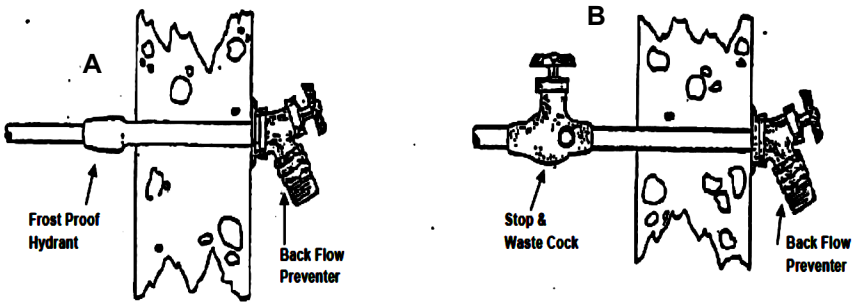
e) Every pipe that passes through an exterior wall to supply water (i.e. lawn service) must be provided with a:
   i) frost-proof hydrant; - see FIGURE 21, A; or
   ii) a stop-and-waste cock located inside the building and close to the outside wall or other approved location. see FIGURE 21, B.

   Also, a hose bib vacuum breaker must be installed on a hose bib located outside a building or inside a garage to protect against backflow. See FIGURE 21 A & B.

f) Every hot water tank must be provided with a shut-off valve and a pressure and temperature relief valve. The pressure and temperature relief valve must be designed to open when the water pressure in the tank exceeds the rated working pressure of the tank or when the water temperature exceeds 99°C (210°F). Every temperature and pressure relief valve must be provided with a drain and the drain must extend to within 300mm (12in.) of the floor or to a safe location. See FIGURE 22.

g) All shower valves must be pressure-balanced or thermostatic-mixing valves conforming to CSA B125, “Plumbing Fittings”.

FIGURE 21 - Outdoor Lawn Services



Water Hammer: What is it and how can it be controlled?
Provisions shall be made to protect the water distribution system from the adverse effects of water hammer. Water hammer is a buildup of pressure in a length of horizontal or vertical pipe that occurs when a faucet or valve is closed suddenly. This pressure exerted on the pipe can be great enough to damage the piping system. Since air chambers are made from pieces of vertical pipe they do not provide acceptable protection and are no longer acceptable. Pre-manufactured water hammer arresters are required to address this potential problem. Water hammer arresters need not be installed in every piping system. Water hammer arresters should conform to ASSE 1010.

Hot Water Tank Installation Requirements:
Every hot water tank shall be equipped with a temperature relief valve to keep the water from exceeding 99°C. The relief valve shall be located within the top 150mm of the tank. The rigid drain pipe connected to the relief valve shall be at least the size of the relief valve outlet, slope downward and terminate in a safe location with an air break of not more than 300mm. Both supply and service lines shall be insulated 2m out from tank where permissible.
Water heaters located in ceiling spaces or over a floor of wood construction shall be installed within a corrosion resistant water tight drain pan to deal with slow leakage in hot water tanks.

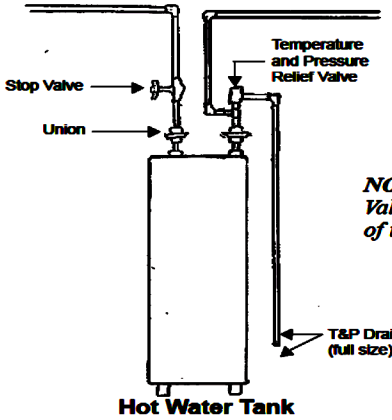


FIGURE 22 - Hot Water Tank Fittings & Water Supply Shut-Off Valves.

NOTE: A Temperature & Pressure Relief Valve is to be installed within 150 mm (6 in.) of the top of the Hot Water Tank.

What are the requirements for solder-joists in potable water systems?
1) Solder for solder joint fittings shall conform to ASTM B 32-08, “Solder Metal”.
2) Solders and fluxes having a lead content in excess of 0.2% shall not be used in a potable water system.
3) Fluxes for solder joints shall conform to ASTM B 183, “Liquid and Paste Fluxes for Soldering Copper and Copper Alloy Tube”.
4) Soldered joints shall be made in accordance with ASTM B 828-02, “Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings”.

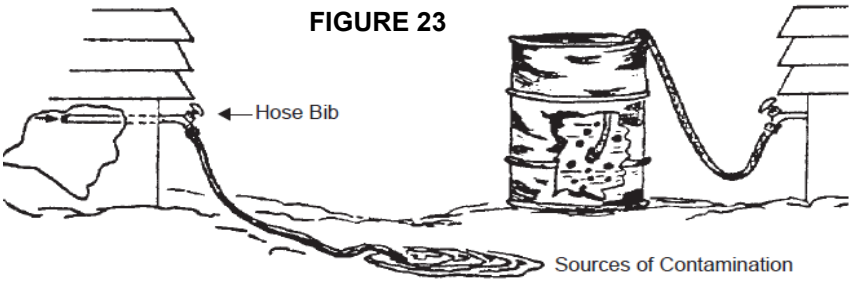
When Type M copper tube is used it shall not be bent.

How can your potable water system be protected from contamination by cross connection?
A hose bib vacuum breaker must be installed on every hose bib located outside a building or in a garage to isolate garden hose applications thus protecting the potable water supply from contamination.
Connections to potable water systems must be designed so that non-potable water, foreign matter, foreign chemicals or substances that may render the water non-potable cannot enter the system. A cross connection is a direct arrangement of piping which allows the potable water supply to be connected to a line that contains a contaminant. The purpose of a hose bib is to permit easy attachment of a hose for outside watering purposes. The ordinary garden hose is the most common offender as it can be easily connected to the potable water supply and used for a variety of potentially dangerous applications. See FIGURE 23. Some of these are listed below:

1) Left submerged in a swimming pool;
2) Placed in elevated locations watering shrubs;
3) Have chemical sprayers attached for spraying pesticides or herbicides;
4) Positioned lying on the ground that may be contaminated with fertilizer and or garden chemicals;
5) Attached to a laundry tub with the end of the hose submerged in a tub full of detergent;
6) Connected to the supply lines of bottom fed tanks, boilers, etc.

What is Back Siphonage?
A reversal of normal flow in the system caused by a negative pressure (vacuum or partial vacuum) in the supply pipe.

FIGURE 23



Size and capacity of pipes:
Every water distribution system shall be designed to provide peak demand flow when the flow pressures at the supply openings conform to the plumbing supply fittings manufacturer's specification. Water distribution lines and water supply pipes shall be sized in accordance with the number of fixture units in the system.
The flow rate of a fitting that supplies water to a fixture shall not exceed the maximum flow rate for that fitting in Table 2.2.11.1.

TABLE 2.2.11.1.
Maximum Flow Rates for Water Supply Fittings
Forming Part of Sentence 2.2.11.1.(1)

Fitting	Max. Flow l/min (gpm US)
Lavatory and hand faucet	5.7 (1.50)
Kitchen Faucet (residential only)	8.4 (2.20)
Laundry Tub Faucet	15.1 (4.0)
Shower Head (primary only)	6.6 (1.75)
Pre-Rinse Spray Valve	6.1 (1.60)

TABLE 2.2.11.2.
Plumbing Fixture Efficiency
Forming Part of Sentence 2.2.11.2.(2)

Fixture	Water Consumption lpf (gpf US)
Water Closet	6.0 (1.59)
Urinals	3.8 (1.0)

The flush cycle for a water closet or urinal shall not exceed the maximum flush cycle listed for that fixture in Table 2.2.11.2.

Who enforces all of these requirements?
The Eastern Interlake Planning District is responsible for monitoring construction for compliance with the Building Code and By-Laws. This monitoring is carried out by means of a permit approval process and site inspections.
The ultimate responsibility for compliance rests with the owner and contractor.

Is there any way that compliance with a certain aspect of the Building Code can be waived?
The Eastern Interlake Planning District does not have the authority to waive the requirements but it does have the authority to accept equivalents which meet the intent of the Building Code. If you feel you can satisfy a Building Code requirement by using an equivalent building material or construction method, contact the Building Inspector.

The following inspections are required:

- Plumbing drain waste and vent installation
- Final

The Contractor, Applicant and Owner are <u>co-responsible</u> for notifying our office when inspections are needed.

<u>Other Contacts:</u>

- Contact Department of Environment with regard to Septic Fields and Holding Tanks.
- Contact Water Stewardship with regard to Water Wells.

For more information please contact :

EASTERN INTERLAKE PLANNING DISTRICT

Box 1758

62 Second Avenue

Gimli, Manitoba R0C 1B0

Phone: 204-642-5478

Fax: 204-642-4061

Email: eipd@mymts.net

Web: www.interlakeplanning.com