CHAPTER FIVE
PLUMBING CONNECTIONS

5-1 General

5-1.1 Plumbing Installations. This chapter of the code is intended to supplement the plumbing requirements of the federal **Manufactured Home Construction and Safety Standards 24 CFR 3280**, the **Oregon One and Two Family Dwelling Specialty Code**, and the **Oregon Plumbing Specialty Code**, but is not intended to take the place of these codes.

(a) Wherever the requirements of this code differ from the **Oregon One and Two Family Dwelling Specialty Code**, or the **Oregon Plumbing Specialty Code**, this code shall apply;

(b) Alternate methods permitted in the **Oregon One and Two Family Dwelling Specialty Code**, or the **Oregon Plumbing Specialty Code** but not mentioned in this code may be permitted if acceptable to the authority having jurisdiction;

(c) All plumbing fixtures, piping, and fittings shall be without defect. All damaged materials shall be discarded and replaced;

(d) All plumbing installations under the manufactured dwelling shall be made according to the **Manufactured Home Construction and Safety Standards 24 CFR 3280**, and, where not specific, to this code or to the material manufacturer's installation instructions;

(e) All plumbing installation methods outside the manufactured dwelling under-floor area shall be according to the material manufacturer's installation instructions, this chapter, and, where not specific, to the **Oregon One and Two Family Dwelling Specialty Code**;

(f) All plumbing fixtures and equipment used in conjunction with the installation, alteration, or conversion of a manufactured dwelling shall be approved according to **Table 5-A** of this code, or, where not specific, to the **Oregon One and Two Family Dwelling Specialty Code**; and

(g) All plumbing materials (i.e. pipe, fittings, fixtures, equipment, and devices) shall be approved and marked or labeled for the intended use according to this code or, where not specific, to either the **Manufactured Home Construction and Safety Standards 24 CFR 3280**, the **Oregon One and Two Family Dwelling Specialty Code,** or the **Oregon Plumbing Specialty Code**.

5-1.2 Manufactured Dwelling Installations. Plumbing installations and connections made during the installation of a manufactured dwelling shall comply with the following:

(a) Plumbing located under the manufactured dwelling shall be plumbed according to the federal **Manufactured Home Construction and Safety Standards, 24 CFR Subpart G,** and, where not specific, to this code; or

(b) Plumbing located outside the manufactured dwelling under-floor enclosure shall be plumbed according to this code and, where not specific, to the **Oregon One and Two Family Dwelling Specialty Code**; and

(c) When a manufactured dwelling is located in a flood hazard area, all plumbing openings shall be located a minimum of 12 inches (30 cm) above the base flood elevation or be equipped with approved backwater valves.

5-1.3 Underground Installations. Piping installed deeper than and parallel to footings shall be set away from the footing at a minimum of 45 degrees **(see Figure 5-1.4A)**. Piping shall be installed in trenches so that it rests on a solid and continuous bearing surface. When over excavated, the trench shall be back filled

to the proper grade with compacted earth, sand, fine gravel, or equal. Piping shall not be supported on rocks or blocks at any point. Where the building drain or building sewer is made of the approved materials shown in **Table 5-E** or **Table 5-F** of this code, the water and sewer piping may be laid in the same trench. If the building drain or building sewer is not made of the approved materials shown in **Table 5-E** or **Table 5-F** of this code, the water piping shall be placed on a solid ledge a minimum of 12 inches (30 cm) above the building drain or building sewer **(see Figure 5-1.4B)**. Rocky or unstable soil shall be excavated to a depth greater by two or more pipe diameters and brought to the proper grade with suitable compacted granular material. Backfill trenches with clean soil free from rocks, broken concrete, and other rubble.

5-1.4 Alterations, Additions and Repairs. All plumbing installations in connection with alterations, additions, repairs, re-manufacturing, or refurbishing of a manufactured dwelling before or at the time of sale to the first consumer shall comply with the **Manufactured Home Construction and Safety Standards 24 CFR 3280**, and, where not specific, with this code and the **Oregon One and Two Family Dwelling Specialty Code**.

5-1.5 Manufactured Dwelling Conversions. All plumbing installations in connection with a manufactured dwelling conversion or change of occupancy to a non-residential use shall be made according to the **Oregon Plumbing Specialty Code**.

5-1.6 Basements and Cabanas. All plumbing installations in basements and cabanas shall be made according to the **Oregon One and Two Family Dwelling Specialty Code**. Cabana plumbing may be connected directly to the manufactured dwelling's water and drain lines, provided they are sized to adequately handle the additional demand.

5-1.7 Plumbing Assembly. All plumbing shall be assembled according to the following:

(a) Plumbing assemblies shall be free from defect, demonstrate acceptable workmanship, and be installed in conformance with acceptable engineering practices and this code;

(b) Piping shall be installed according to the manufacturer's installation instructions using approved component parts;

(c) Threaded pipe ends shall be reamed out to the size of the bore and all burrs, chips, cutting oil and foreign matter removed;

(d) Pipe threads and slip joints shall not be wrapped with string, paper, putty, or similar fillers;

(e) Pipe joint compound used on water pipes shall be nontoxic and shall be applied to male threads only;

(f) Pipe threads shall be fully engaged into the threads of the fitting;

(g) Pipe joint cement shall be of approved type and applied to both pipe and fitting of slip joint connections;

(h) Plastic pipe shall be inserted to the full depth of the welding sockets of each fitting;

(i) Joints and connections in the plumbing system shall be gas-tight and watertight under normal operating pressures;

(j) All joints and connections shall be correctly assembled for tightness;

(k) Piping shall be installed without undue strains and stresses;

(l) Piping shall have provisions for expansion, contraction, and structural settlement;

(m) Piping shall have supports of sufficient strength to keep the piping in alignment and carry the weight of the piping and its contents. Supports may hang down from the bottom of the manufactured dwelling floor or may consist of blocking from the ground up;

(n) All horizontal piping shall be supported according to **Table 5-B;** piping support does not require upward vertical rigid support.

(o) Piping shall have hangers, clamps, brackets, blocking, or anchors that do not compress, distort, cut or abrade the water pipe;
1. Sheet metal or plastic plumbers tape may be used to support metallic water lines; or
2. Plastic plumbers tape or equal may be used to support plastic water lines.
(p) Piping penetrations through concrete slabs or footings shall be sleeved so there is ½" clearance around the pipe. The piping shall not be subject to any load from the building construction. Each penetration shall be caulked around the pipe **(see Figures 5-2.1B and 5-3.1)**; and
(q) Plumbing shall not obstruct the under-floor access area.

5-1.8 Inspection. All plumbing work shall be accessible for inspections. All excavations containing plumbing shall be left open for inspection by the authority having jurisdiction.

5-2 Water Installation Requirements
5-2.1 Water Connections. The installation and connection of manufactured dwelling water distribution system (utility connection) to the building water supply (utility termination) shall comply with the following:
(a) The building water supply piping shall be new and made of approved materials listed in **Table 5-C** of this code;
(b) The building water supply shall be a minimum ¾ inches (2 cm) inside diameter based on 12 fixture units as identified in **Table 6-5** of the **Oregon Plumbing Specialty Code**. Where the building water supply exceeds 100 lineal feet, the building water supply shall be sized according to **Table 5-D** of this code. Where plumbing fixtures are added on site, see Section 5-2.5 of this chapter for the correct sizing;
(c) The installation and connection by the MDI (Licensed Manufactured Dwelling Installer) of the manufactured dwelling water distribution system to the building water supply provided on a lot shall consist of not more than 30 lineal feet (914 cm) of pipe and fittings starting from the exterior of the manufactured dwelling;
(d) When a backflow device (check valve) is installed in the building water supply, an approved thermal expansion tank or other device designed for intermittent operation for thermal expansion control shall be installed according to the manufacturer's installation instructions;
(e) Expansion tanks shall be adequately supported to carry twice the weight of the tank filled with water without placing any strain on the connecting piping;
(f) An accessible full way shutoff valve shall be installed under or within 5 feet (152 cm) of the manufactured dwelling on the building water supply serving the manufactured dwelling **(see Figure 5-2.1B)**. The valve on the water meter may not serve as the shutoff valve for the manufactured dwelling;
(g) The water distribution system shall be connected to the building water supply under the manufactured dwelling with an approved connector as listed in **Table 5-C.** The piping connections shall not be subjected to any loads from the building structure;
(h) Where static water pressure exceeds 80 pounds per square inch (552 KPa) at the building water supply connection to the manufactured dwelling water distribution system, an approved pressure regulator shall be installed;
(i) There shall be no cross connection between potable and non-potable water;

5-2.2 Protection. Water fixtures, piping, and devices shall be protected according to the following requirements:
(a) Water heaters shall be equipped with pressure relief valves and drain pipes that terminate and discharge beneath manufactured dwellings;
(b) Pressure relief valve drain pipes shall not be trapped, tapped, threaded, capped, plugged, altered, diverted, or extended;
(c) The building water supply piping, water distribution system inlet, expansion tank, when required, and main shut off valve located under the manufactured

dwelling shall be protected from freezing with pipe insulation or with the installation of a electric heat tape listed and approved for manufactured home use;

5-2.3 Marriage Line Water Connections. The water line crossovers on multi-section manufactured dwellings shall be connected according to the following **(see Figure 5-2.3A and 5-2.3B)**:
(a) With the connectors supplied by the manufacturer; or
(b) With an approved flexible water connector sized no less than the water lines being connected or with other approved materials listed in **Table 5-C** of this code; and
(c) Exposed water line crossover connections shall be protected from freezing with pipe insulation or with the installation of an approved electric heat tape listed for use with manufactured homes.

5-2.4 Underground Installations. In addition to those requirements in Section 5-1.4 of this chapter, building water supply piping shall be installed in trenches according to the following:
(a) No portion of the building water supply pipe shall be installed above ground outside the manufactured dwelling's under-floor enclosure except as approved by the local jurisdiction;
(b) Piping in a trench must be supported on a continuous bed of approved material **(see Figures 5-1.4A and 5-1.4B)**;
(c) Building water supply piping shall be buried a minimum of 18 inches (46 cm) below grade and at least 12 inches (30 cm) below the frost line **(see Figure 5-2.1B)**; and
(d) All non-metallic water piping laid in a trench to be covered shall have a tracer wire installed to the following requirements **(see Figure 5-2.1B)**:
1. Tracer wire shall be blue 18 gauge insulated copper electrically conductive wire or greater;
2. Tracer wire shall be installed in the trench along the entire length of the pipe; and
3. Each end of the tracer wire shall be left above the finished grade and be clearly marked, one end shall be at the manufactured dwelling connection and the other terminated in the meter box, well head, or reservoir tank.

5-2.5 Accessories. All plumbing installations in connection with an accessory building, accessory structure, or other external systems (i.e. basement, cabana, shed, garage, hose bibbs, patio sinks, and sprinkler systems) shall be made according to this code and, where not specific, to the **Oregon One and Two Family Dwelling Specialty Code**:
(a) External plumbing systems may be connected directly to the manufactured dwelling's water supply inlet provided the diameter of the water supply piping to the manufactured dwelling is increased when necessary to adequately handle the additional demand according to **Table 6-4** and **Table 6-5** of the **Oregon Plumbing Specialty Code**;
(b) When external water systems (i.e. hose bibbs, sprinkler systems, or accessory building fixtures) are added at the water inlet of the manufactured dwelling, an approved back flow prevention device shall be installed between the building supply connection and the external fixtures or system;
(c) Hose bibbs installed through an uninsulated under-floor enclosure shall be equipped with an accessible stop-and-waste-type valve inside the under-floor area (crawl space) of the manufactured dwelling so that they are capable of being controlled and/or drained during freezing weather;
(d) Hose bibbs installed into an insulated floor or wall cavity shall be frost proof but are not required to have the stop-and-waste-type valves installed.

5-2.6 Main Water Valve Access. The main water valve shall be accessible from the exterior of the manufactured dwelling

according to the following **(see Figure 5-2.1B)**:

(a) Water valves located under the manufactured dwelling shall be accessible through a minimum 6 inch by 6 inch (15 cm by 15 cm) hand hole through the under-floor enclosure (foundation wall or skirting) within reach and not more than 12 inches (30 cm) from the access opening; or

(b) Water valves located outside the manufactured dwelling under-floor enclosure, shall be below ground and inside a vault having a minimum 7 inches (18 cm) diameter opening or equal at or above ground level.

5-2.7 Access. The following access shall be provided to the manufactured dwelling water distribution system piping and connections:

(a) Water crossover connections shall be accessible, but may be covered with insulation and/or an access panel; and

(b) All access panels in walls and floors shall be insulated and secured in place after all plumbing tests are complete **(see Figure 5-2.3B)**.

5-3 Drain Installation Requirements

5-3.1 Sewer/Drain Connection. The installation and connection of the manufactured dwelling drain outlet, to the building drain (utility connection), building sewer (utility termination) shall comply with the following:

(a) The building drain piping shall be made of approved materials as listed in **Table 5-E** of this code;

(b) The building sewer piping shall be made of approved materials as listed in **Table 5-F** of this code;

(c) The building drain and building sewer shall be a minimum of 3 inches (76 mm) inside diameter based on 12 fixture units as identified in **Table 7-3** of the **Oregon Plumbing Specialty Code**;

(d) The installation and connection by the MDI (Licensed Manufactured Dwelling Installer) of the manufactured dwelling building drain to the building sewer provided on a lot shall consist of not more than 30 lineal feet (914 cm) of pipe and fittings from the exterior of the manufactured dwelling;

(e) Each manufactured dwelling shall have only one drain outlet; and

(f) Each manufactured dwelling shall be connected to the building sewer by means of a building drain connector consisting of approved piping not less than schedule 40, no smaller than the manufactured dwelling drain outlet or a minimum of 3 inches (8 cm) in diameter. Listed and approved shielded flexible connectors may be used to join the drainpipe to the sewer inlet **(see Figure 5.3.1)**.

5-3.2 Drainage Piping. Building drain and building sewer piping shall comply with the following:

(a) Piping shall be semi-rigid, durable, corrosion resistant, non-absorbent, and have a smooth interior surface;

(b) Piping shall be installed according to the manufacturer's installation instructions using the component parts supplied or required by the manufacturer;

(c) Piping shall be installed to provide a 1/4 inch (6 mm) per foot (305 meters) grade in all horizontal drain piping. When a full size cleanout is installed at the upper end, the grade may be reduced to 1/8 inch (3 mm) per foot (305 mm);

(d) Piping shall use appropriate approved fittings for all changes in direction:

1. For all horizontal to vertical drain pipe connections, use 45 degree "Y" branches, 60 degree "Y" branches, long-turn "TY" branches, sanitary "T" branches or other approved fittings, or combination of fittings having equivalent sweep; and

2. For all horizontal to horizontal and vertical to horizontal drainpipe connections, use 45 degree "Y" branches, long-turn "TY" branches, or other approved fittings or combination of fittings having equivalent sweep.

(e) Piping shall be installed without undue strains and stresses;

(f) Piping shall have provisions for expansion, contraction, and structural settlement;

(g) Piping shall be supported and secured according to **Table 5-B (see Figures 5-3.2 and 5-3.4).** Piping support does not require upward vertical rigid support;
(h) Piping shall have supports sufficient to keep the pipe in alignment and carry the weight of the pipe and its contents. Supports may hang down from the bottom of the manufactured dwelling floor or may consist of blocking from the ground up attached in place with brackets or plumbers tape **(see Figures 5-3.2 and 5-3.4)**;
(i) Piping shall have hangers, slings, blocking, clamps, or brackets which do not compress, distort, cut or abrade the drainpipe. Sheet metal straps or plumbers tape may be used for support of plastic drain lines as long as the strap is flat against the drain pipe **(see Figures 5-3.2 and 5-3.4)**; and
(j) Piping shall have cleanouts provided according to the following:
1. Cleanouts shall be located so a cleaning tool does not have to pass through more than 360 degrees of fittings, excluding removable "P" traps;
2. Cleanout fittings shall be installed so they allow for cleaning in the direction of the flow or at right angles to the pipe; and
3. Cleanouts shall not be less in diameter than the pipes they are being connected to.

5-3.3 Sewer Cleanout Access. A main drain cleanout fitting shall be installed in the building drain under or within 5 feet (152 cm) of the manufactured dwelling according to the following requirements **(see Figure 5-3.1)**:
(a) The main drain cleanout shall be made with a directional fitting above ground or a two-way cleanout fitting if underground;
(b) The main drain cleanout shall have 18 inch (46 cm) of clearance directly in front of the cleanout opening without removing any permanent construction;
(c) The main drain cleanout shall have the same diameter as the largest drain pipe contained in the building drain; and
(d) The main drain cleanout shall be accessible from the exterior of the manufactured dwelling according to the following **(see Figure 5-3.1)**:
1. Main drain cleanouts located under the manufactured dwelling shall be accessible through a minimum 6 inch by 6 inch (15 cm by 15 cm) hand hole through the under-floor enclosure (foundation wall or skirting) within reach and not more than 12 inches (30 cm) from the access opening; or
2. Main drain cleanouts located outside the manufactured dwelling under-floor enclosure, shall be below ground and inside a vault having a minimum 11 inch (28 cm) diameter opening or equal, at or above ground level.

5-3.4 Marriage Line Drain Connections. The drain line crossovers on multi-section manufactured dwellings shall be connected according to one the following **(see Figure 5-3.4)**:
(a) With the connectors supplied by the manufacturer;
(b) With approved pipe and fittings **(see Table 5-E)** not less than schedule 40 and of the same diameter as the pipes being connected; or
(c) With approved shielded flexible connectors.

5-3.5 Underground Installations. In addition to those requirements in Section 5-1.4 of this chapter, building drain and building sewer piping installed in trenches shall conform to the following:
(a) No portion of the building drain or building sewer pipe shall be installed above ground outside the manufactured dwelling's under-floor enclosure;
(b) Building drain and building sewer piping in a trench must be supported on a continuous bed of approved material **(see Figures 5-1.4A and 5-1.4B)**;
(c) All building drain and building sewer pipe shall be graded at 1/4 inch (6 mm) per foot (30 cm) except as otherwise permitted by the authority having jurisdiction; and

(d) All nonmetallic building drain and building sewer pipe laid in a trench to be covered shall have a tracer wire installed to the following requirements **(see Figure 5-3.1)**:
1. It shall be green, 18 gauge, insulated, electrically conductive wire or greater;
2. It shall be installed in the trench along the entire length of the pipe; and
3. One end of the tracer wire shall be left above the finished grade at the cleanout next to the manufactured dwelling.

5-3.6 Ship-Loose Drain Lines. Manufactured dwelling under-floor drainage systems may be shipped by the manufacturer by one of the following methods:
(a) Complete and ready to be connected to the site building drain;
(b) Loose in one or more pre-assembled sections to be attached with unions and then connected to the site building drain;
(c) Loose sections intended for site assembly as approved by the DAPIA and provided with all pipe, fittings, cement, supports and DAPIA approved manufacturer's instructions necessary for proper site installation; or
(d) Loose with no pre-assembled sections, supports, or instructions, requiring extensive plumbing design and work on site.

5-3.7 Accessories. All plumbing installations in connection with an accessory building, accessory structure, or other external systems (i.e. basement, cabana, shed, garage, hose bibbs, patio sinks, and sprinkler systems) shall be made according to this code and, where not specific, to the **Oregon One and Two Family Dwelling Specialty Code**:
(a) External systems may be connected directly to the manufactured dwelling's building drain provided the diameter of the building drain is increased when necessary to adequately handle the additional demand according to **Table 7-3** of the **Oregon Plumbing Specialty Code**;
(b) When external water systems are added, an approved backflow prevention device shall be installed between the building supply connection and the external fixture or system; and
(c) When roof additions or ramadas are installed on or over a manufactured dwelling, the manufactured dwelling's plumbing vents shall be extended at least 6 inches (15 cm) above the new roof and properly flashed.

5-3.8 Access and Clearances. The following accesses and clearances shall be provided for manufactured dwelling drainage system:
(a) There shall be an unobstructed minimum clearance of 18 inches (46 cm) directly in front of each cleanout opening;
(b) Concealed cleanouts inside a floor or wall shall be accessible through access panels;
(c) Traps with mechanical joints located inside a floor or wall shall be accessible through an access panel;
(d) Drain cross-over connections shall be accessible; and
(e) All access panels in walls and floors shall be insulated and secured in place after all plumbing tests are complete.

5-4 Plumbing Tests
5-4.1 Water Test. Upon completion of the building water supply connection, marriage line crossover connections, and all additional accessory plumbing connections, the person making the water supply connection shall test the manufactured dwelling water distribution system to assure there is no evidence of leakage under normal operating pressure according to the following:
(a) Pressurize all water lines from the site's water supply;
1. If water under normal operating pressure is not available, the manufactured dwelling water distribution system shall be pressurized with a minimum of 80 pounds per square inch (552 KPa) of air pressure. If the water lines are made of CPVC, reduce pressure

test to 30 pounds per square inch (206.7 KPa);
2. Record the pressure at the beginning of the test and hold at that pressure for 15 minutes; and
3. After 15 minutes of pressure testing, check the pressure gauge to assure there has been no drop in pressure.
(b) After the water lines are full of water, check the building water supply connection, marriage line crossover connections, and each fixture connection for leaks.

5-4.2 Drain Test. Upon completion of the building drain connection to the building sewer, the marriage line crossover connections, and any additional accessory drainage connections, the person making the drain connection shall test the manufactured dwelling drainage system to assure there is no evidence of leakage under normal operating conditions according to the following:
(a). Remove all access panels to all P-traps, cleanout, and fixture drain connections inside the walls and floor;
(b) Test each fixture or receptor, including the clothes washer standpipe, for a minimum of 3 minutes by letting water flow at the normal operating pressure. If water under pressure is not available, test each fixture and receptor by pouring at least 3 gallons (11 liters) of water into each fixture and receptor;
(c) Visually check each P-trap, cleanout, and fixture or receptor connection for leaks during the test; and
(d) After the test has been successfully completed, replace all insulation and access panels in floors and walls.

NOTE: Inspectors have the authority to witness each test but are not obligated to do so.

5-4.3 Test Failures. Upon failure of any of the above tests, check all applicable field connections, correct any leaks, and repeat the applicable test. If tests continue to fail, notify factory authorized service personnel immediately and report failures. Other than during testing, do not turn on the water supply to the manufactured dwelling until all leaks have been repaired.

TABLE 5-A

APPROVED PLUMBING FIXTURES AND DEVICES

APPROVED MATERIALS	REFERENCE STANDARDS
AIR GAPS	**ANSI A 112.1.2 or IAPMO PS 23**
BACKWATER PREVENTION ASSEMBLIES	**IAPMO P5 31**
BACKWATER VALVES	**ASME A 112.14.1**
CLOTHES WASHER	**ASSE 1007 or ANSI/AHAM HLW-2PR**
CONTROL VALVES (SHOWER)	**ASSE 1016**
DIVERTERS (W/ HOSE SPRAY)	**ASSE 1025**
DISHWASHERS	**ASSE 1006 and UL 749**
DISPOSALS	**ASSE 1008**
ENAMELED CAST-IRON FIXTURES	**ASME A 112.19.1**
GATE VALVES	**ASME B 16.34, AWWA C500, MSS-SP-70, or MSS-SP-42**
HANDHELD SHOWERS	**ASSE 1014**
HOSE BIBBS	**ASSE 1019**
HOT WATER DISPENSERS	**ASSE 1023**
MIXING VALVES	**ASSE 1017**
NONVITREOUS CERAMIC FIXTURES	**ANSI A112.19.9**
PLASTIC FIXTURES	**ANSI Z 124.1, ANSI Z 124.2, ANSI Z 124.3, ANSI Z 124.4, or ANSI Z 124.6**
PLUMBING SYSTEM COMPONENTS (MH)	**NSF 24**
PORCELAIN ENAMELED STEEL FIXTURES	**ASME A 112.19.4M**
PRESSURE REDUCING VALVE	**ASSE 1003**
PRESSURIZED FLUSHING DEVICES	**ASSE 1037**
STAINLESS STEEL FIXTURES	**ASME A 112.19.3M**
THERMAL EXPANSION TANK	**IAPMO PS 88**
VITREOUS CHINA FIXTURES	**ASME A112.19.2M**
WATER COOLERS	**ANSI/ARI 1010 and UL 399**
WATER HEATER (ELECTRIC)	**UL 174**
WATER HEATER (GAS)	**ANSI Z 21.10.1**
WATER HEATER (OIL)	**ANSI Z 21.10.1, UL 174, and UL 732**
WATER HEATER RELEAF VALVES	**ANSI Z 21.22a or ASSE 1003**
WHIRLPOOL BATHTUBS	**ASME A 112.19.7M**

NOTES:

1. The materials shown in this table are the most common used in manufactured dwellings, see the **Oregon Plumbing Specialty Code** for a more comprehensive list of approved plumbing fixtures and devices.

2. In order to be approved, a plumbing fixture or device must be labeled or marked by the manufacturer with one of the corresponding numbers in the right column of this table to indicate that it conforms to that specific reference standard.

TABLE 5-B

HORIZONTAL PIPING SUPPORT

PIPING MATERIAL	MAXIMUM SUPPORT
CAST-IRON SOIL PIPE	5 Feet o/c for lengths less than 10 feet 10 Feet o/c where 10 foot lengths of pipe are used
THREADED STEEL PIPE	10 Feet o/c for ¾ inch diameter or smaller 12 Feet o/c for 1 inch diameter or larger
COPPER TUBE AND PIPE	6 Feet o/c for 1-¼ inch diameter or smaller 10 Feet o/c for 1-½ inch diameter or larger
LEAD PIPE	Continuous Support
PLASTIC PIPING	4 Feet o/c for rigid drain piping (ABS or PVC) 3 Feet o/c for rigid water piping (PVC or CPVC) 32 Inches o/c for flexible water tubing (PB or PEX)

TABLE 5-C
APPPROVED WATER PIPING

APPROVED MATERIALS	REFERENCE STANDARDS
ACRYLONITE BUTADIENE STYRENE (ABS)	ASTM D 2282 or ASTM D 1527
CHLORINATED POLYVINYL CHLORIDE (CPVC)	ASTM D 2846, ASTM F 441, or ASTM F 442
CROSS-LINKED POLYETHYLENE (PEX)	ASTM F 877 or ASTM F876
FLEXIBLE CONNECTOR	ASME A 112.18.6 or IAPMO PS 74
POLYBUTYLENE (PB)	ASTM D 3309, ASTM D 3000, ASTM D 2662, or ASTM D 2666
POLYETHYLENE (PE)	ASTM D 2447, ASTM D 2104, ASTM D 2239, or ASTM D 2737
POLYVINYL CHLORIDE (PVC)	ASTM D 1785 or ASTM D 2241
SEAMLESS BRASS	ASTM B 135 or ASTM B43
SEAMLESS COPPER	ASTM B 75 or ASTM B 88
STEEL HOT DIPPED ZINC COATED	ASTM A 53
WELDED COPPER	ASTM B 447

NOTES:

1. The materials shown in this table are the most common used, see the **Oregon Plumbing Specialty Code** for a more comprehensive list of approved piping material.
2. In order to be approved, piping must be labeled or marked by the manufacturer with one of the corresponding numbers in the right column to indicate that it conforms to that specific reference standard.

TABLE 5-D

BUILDING WATER SUPPLY SIZING

METER/ SERVICE	BUILDING SUPPLY	30 – 45 PSI	46 – 60 PSI	61 – 80 PSI
¾ INCH	¾ INCH	100 FEET	150 FEET	200 FEET
¾ INCH	1 INCH	300 FEET	600 FEET	800 FEET
1 INCH	1 INCH	400 FEET	600 FEET	800 FEET
¾ INCH	1-¼ INCH	800 FEET	1000 FEET	1000 FEET
1 INCH	1-¼ INCH	800 FEET	1000 FEET	1000 FEET
1-½ INCH	1-¼ INCH	800 FEET	1000 FEET	1000 FEET

NOTES:

1. This table indicates the minimum inside diameter of the building water supply size for a manufactured dwelling based maximum length necessary to reach the manufactured dwelling from the meter or service.
2. This table is based on 12 fixture units from **Table 6-5** of the **Oregon Plumbing Specialty Code**.

TABLE 5-E
APPROVED BUILDING DRAIN (DWV) PIPING

APPROVED MATERIALS	REFERENCE STANDARDS
ACRYLONITE BUTADIENE STYRENE (ABS)	ASTM D 2661 or ASTM F 628
CAST-IRON/MALLEABLE IRON	CISPI HS74, CISPI 301, ASTM A 888, ASTM 126, or ASTM A 197
CAST-COPPER-ALLOY	ASME B 16.23
COPPER	ASTM B 306
POLYVINYL CHLORIDE (PVC)	ASTM D 2665, ASTM D 2949, or ASTM F 891
SEAMLESS BRASS	ASTM B 43
SEAMLESS COPPER	ASTM B 42, ASTM B 75, or ASTM B 88
WELDED OR SEAMLESS CAST-IRON	ASTM A 74
WELDED OR SEAMLESS STEEL	ASTM A 53

NOTES:

1. The materials shown in this table are the most common used, see the **Oregon Plumbing Specialty Code** for a more comprehensive list of approved piping material.
1. **2.** In order to be approved, piping must be labeled or marked by the manufacturer with one of the corresponding numbers in the right column to indicate that it conforms to that specific reference standard.

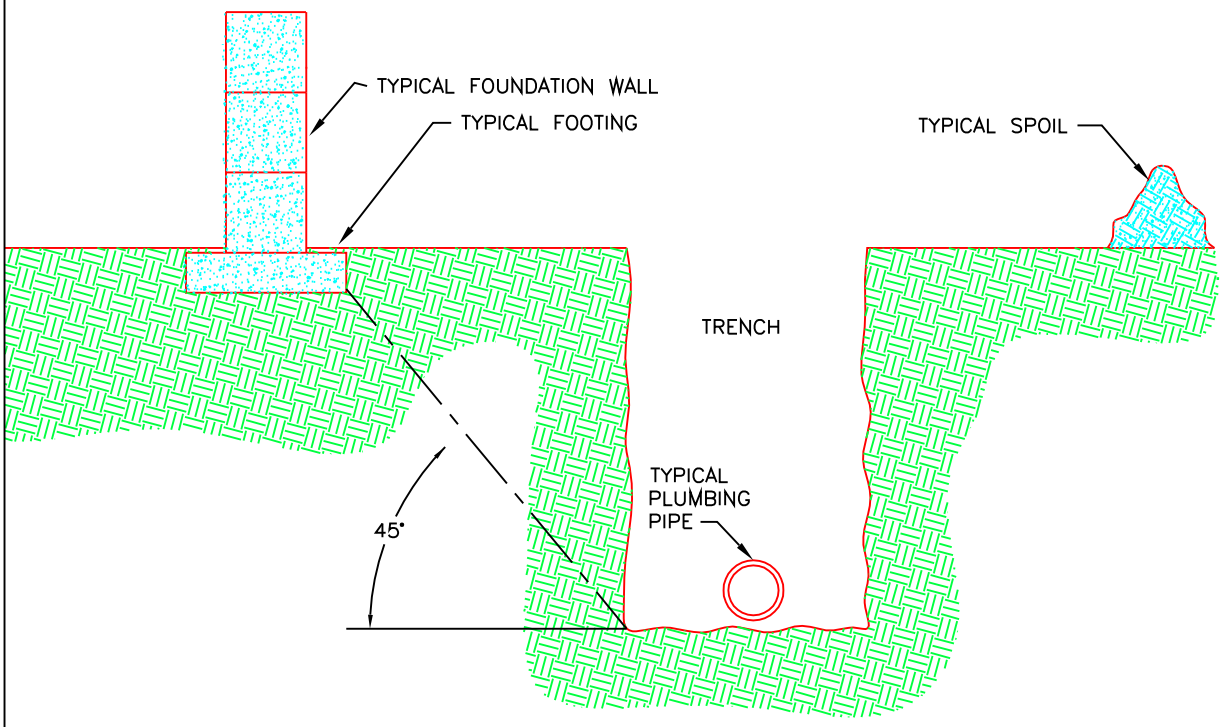
TABLE 5-F

APPROVED BUILDING SEWER PIPING

APPROVED MATERIALS	REFERENCE STANDARDS
ACRYLONITE BUTADIENE STYRENE (ABS)	**ASTM D 2661, ASTM D 2751, ASTM D 2949, or ASTM F 628**
CAST-IRON	**CISPI HS74, CISPI 301, ASTM A 74, or ASTM A 888**
CONCRETE	**ASME C 14**
COPPER	**ASTM B 88 or ASTM B 306**
POLYVINYL CHLORIDE (PVC)	**ASTM D 2665, ASTM D 2949, ASTM D 3034, or ASTM F 891**
SEAMLESS COPPER	**ASTM B 75**
WELDED OR SEAMLESS CAST-IRON	**ASTM A 74**
WELDED OR SEAMLESS STEEL	**ASTM A 53**
VITRIFIED CLAY	**ASTM C 700**

NOTES:

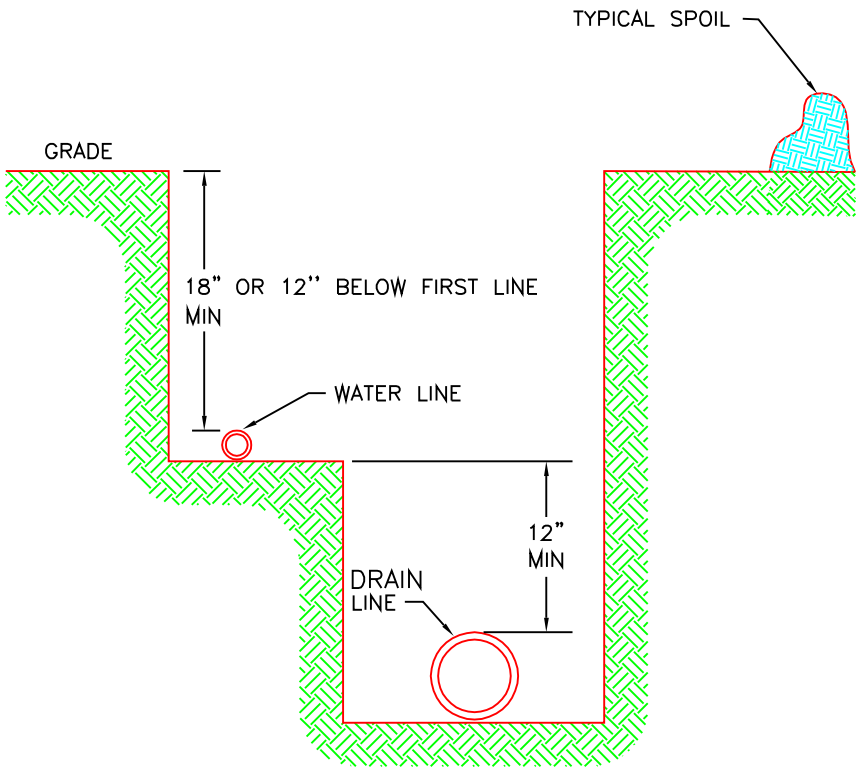
1. The materials shown in this table are the most common used, see the **Oregon Plumbing Specialty Code** for a more comprehensive list of approved piping material.
1. **2.** In order to be approved, piping must be labeled or marked by the manufacturer with one of the corresponding numbers in the right column to indicate that it conforms to that specific reference standard.



NOTE: ALL TRENCHES DEEPER THAN THE FOOTING OF THE MANUFACTURED DWELLING AND RUNNING PARALLEL TO IT MUST BE AT LEAST AT AN ANGLE OF 45° UNLESS OTHERWISE PERMITTED BY THE AUTHORITY HAVING JURISDICTION.

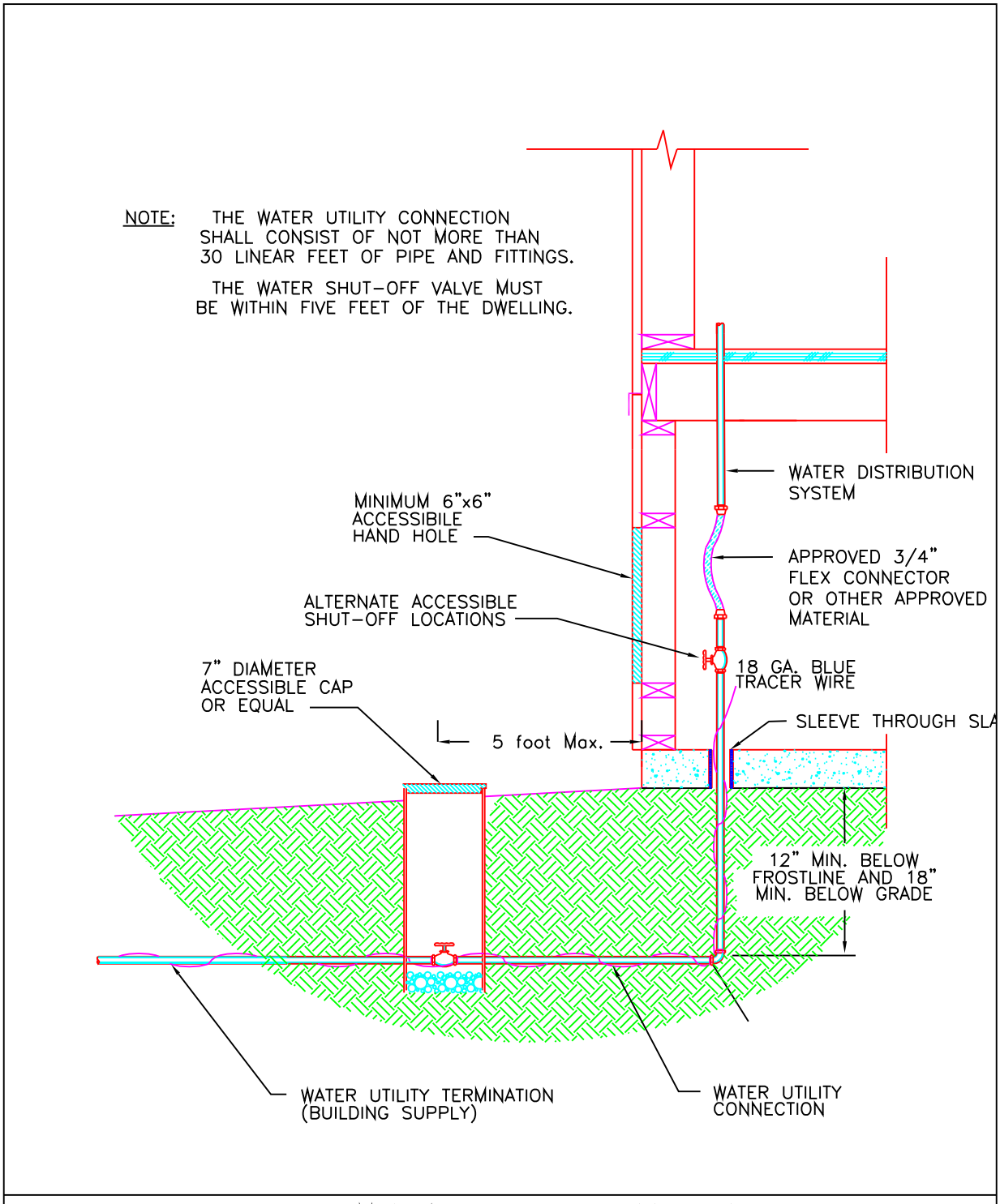
TYPICAL FOOTING SETBACK FROM TRENCH

REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5–1.4A



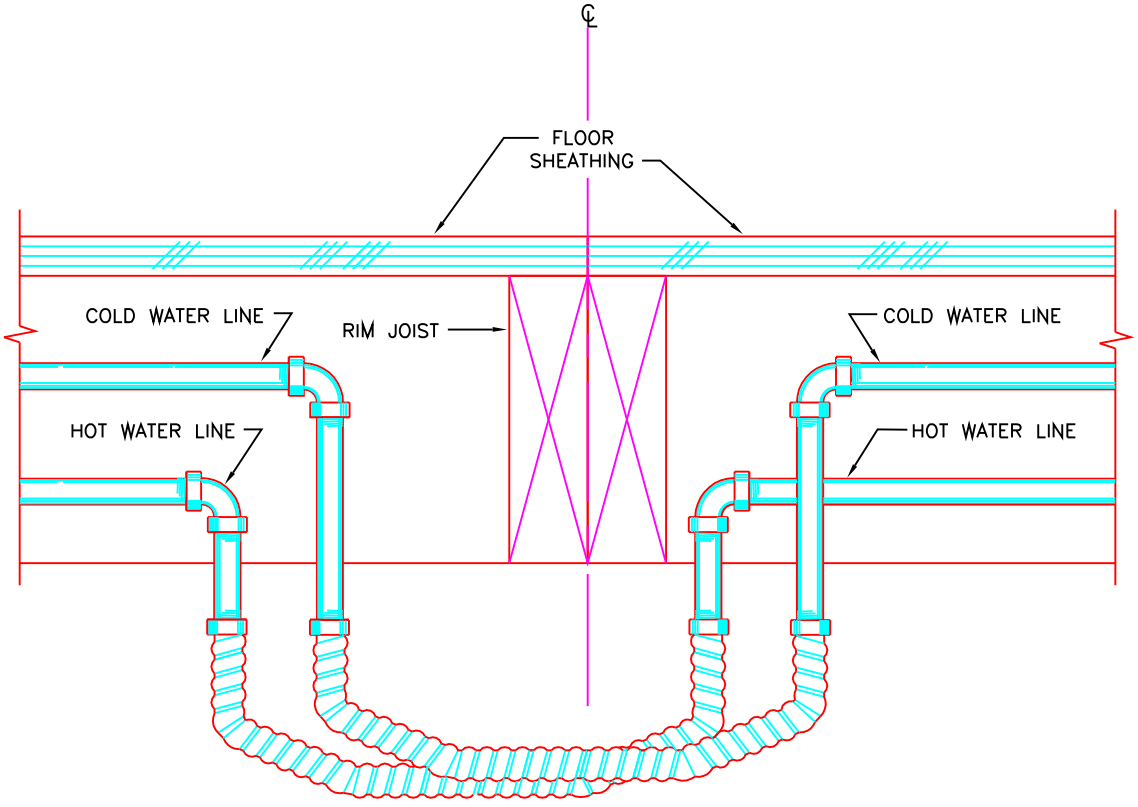
TYPICAL DRAIN & WATER SEPARATION IN TRENCH

REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5–1.4B



TYPICAL MAIN WATER SUPPLY CONNECTION

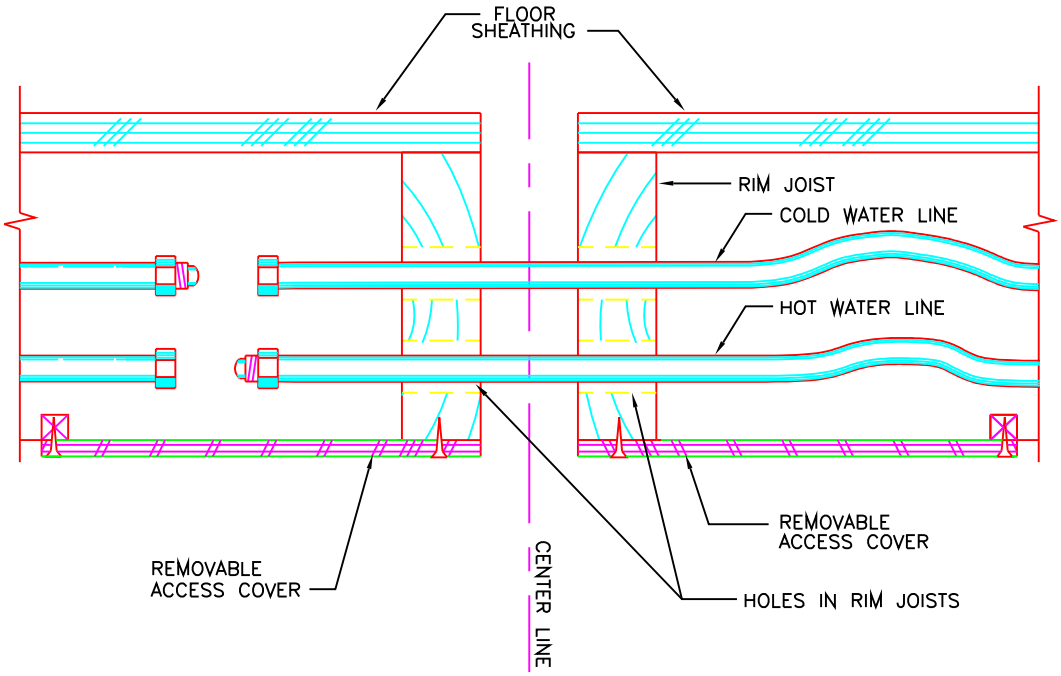
REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5-2.1B



NOTE: EXPOSED WATER LINE CROSSOVER CONNECTIONS SHALL BE PROTECTED FROM FREEZING WITH INSULATION OR A HEAT TAPE.

TYPICAL EXPOSED WATER CROSSOVER CONNECTION

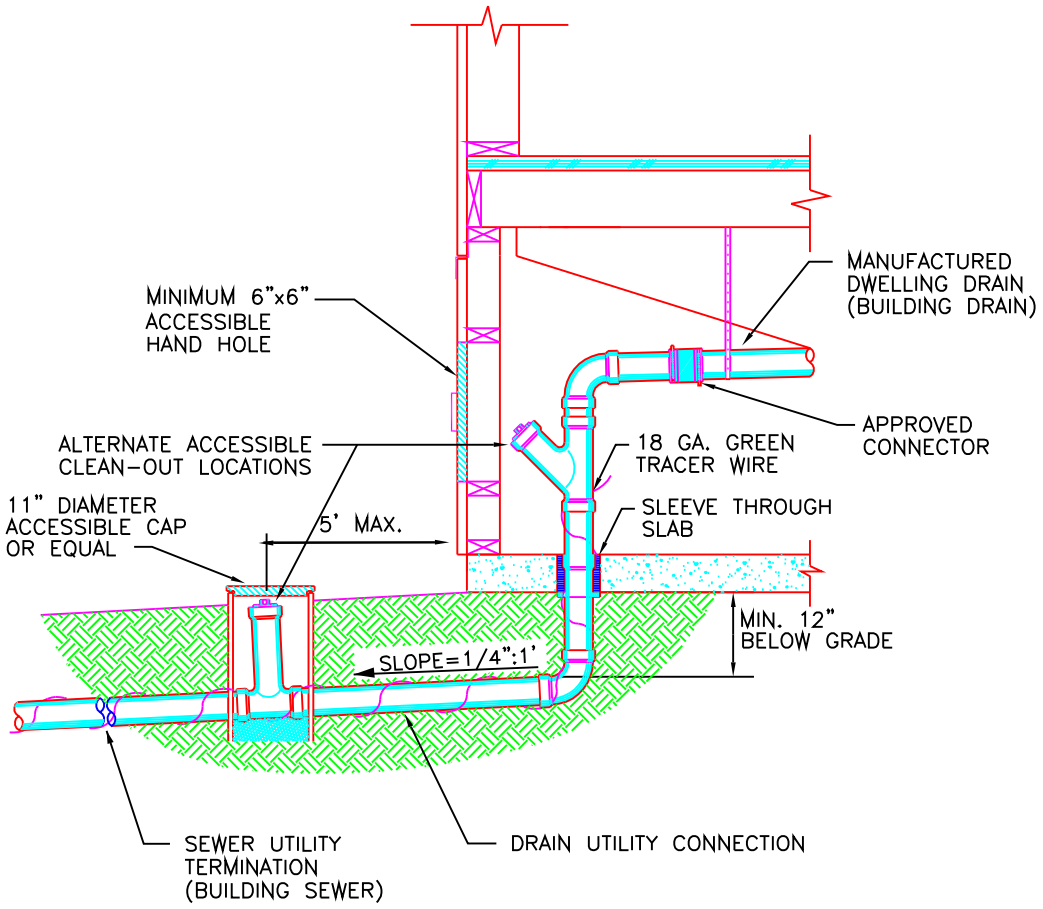
REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5–2.3A



NOTE: CONCEALED PLUMBING CONNECTIONS SHALL BE VISIBLE DURING TESTS. ACCESS PANELS AND INSULATION SHALL BE REPLACED AND SECURED AFTER ALL PLUMBING TESTS ARE COMPLETED.

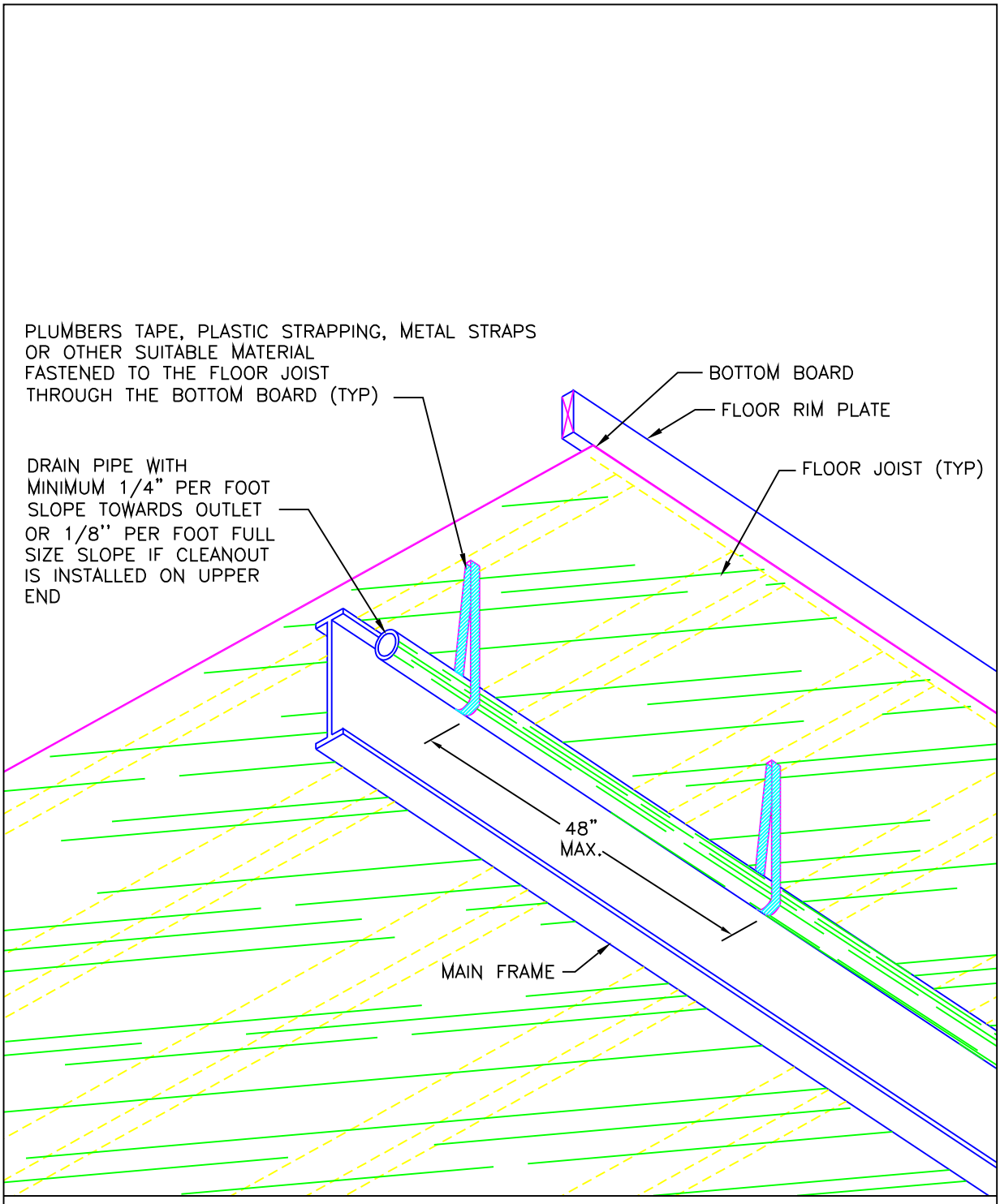
TYPICAL PLASTIC WATERLINE CROSSOVER

REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5-2.3B



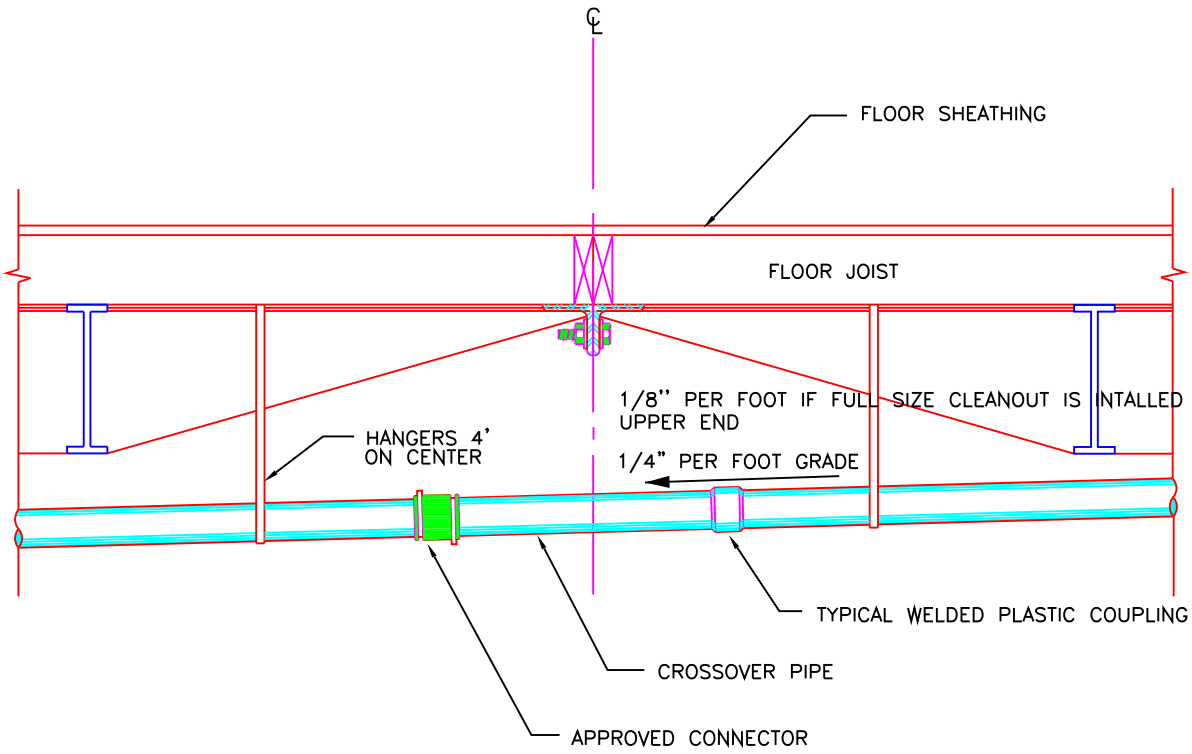
TYPICAL DRAIN LINE CONNECTION

REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5-3.1



TYPICAL DRAIN LINE SUPPORT

REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 5 FIGURE 5-3.2



TYPICAL DRAIN LINE CROSSOVER CONNECTION

REV. 12/01/01 RHW	MANUFACTURED STRUCTURE AND PARK SPECIALTY CODES	CHAPTER 6 FIGURE 5-3.4