ASME A112.18.2-2020/
CSA B125.2:20

National Standard of Canada
American National Standard

Plumbing waste fittings

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Preface

This is the fourth edition of ASME A112.18.2/CSA B125.2, *Plumbing waste fittings.* It supersedes the previous editions, published in 2015 and 2011.

Together with ASME A112.18.1/CSA B125.1, *Plumbing supply fittings*, CSA B125.3, *Plumbing fittings*, and ASME A112.18.6/CSA B125.6, *Flexible water connectors*, this Standard forms a series to cover plumbing fittings.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the ASME/CSA Joint Harmonization Task Group on Plumbing Fittings, under the jurisdiction of the ASME Standards Committee on Plumbing Materials and Equipment and the CSA Technical Committee on Plumbing Fixtures. The CSA Technical Committee operates under the jurisdiction of the CSA Strategic Steering Committee on Construction and Civil Infrastructure. This Standard was formally approved by the ASME Standards Committee and the CSA Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

This Standard was approved as an American National Standard by the American National Standards Institute on April 23, 2020.

ASME Notes:

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   Secretary, A112 Standards Committee
   The American Society of Mechanical Engineers
   Two Park Avenue
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A request for interpretation should be clear and unambiguous. The request should

- *cite the applicable edition of the Standard for which the interpretation is being requested.*
- *phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.*

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1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
3) *This publication was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.*
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6) *Attention is drawn to the possibility that some of the elements of this Standard may be the subject of patent rights. CSA Group is not to be held responsible for identifying any or all such patent rights. Users of this Standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.*

ASME A112.18.2-2020/CSA B125.2:20
Plumbing waste fittings

1 Scope

1.1
This Standard covers plumbing waste fittings of sizes NPS-2 and smaller.

1.2
This Standard does not cover
a) plumbing supply fittings, which are covered by ASME A112.18.1/CSA B125.1;
b) other devices (e.g., temperature-actuated in-line mixing valves), which are covered by CSA B125.3 or other plumbing product standards; and
c) flexible water connectors under continuous pressure, which are covered by ASME A112.18.6/CSA B125.6.

1.3
This Standard does not cover pipes and tubes or pipe and tube fittings that are downstream of the trap.

1.4
In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (nonmandatory) to define their application.

1.5
SI units are the units of record in Canada. In this Standard, the inch/pound units are shown in parentheses.

The values stated in each measurement system are equivalent in application; however, each system is to be used independently. Combining values from the two measurement systems can result in non-conformance with this Standard.

All references to gallons are to U.S. gallons.

For information on the conversion criteria used in this Standard, see Annex A.

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

ASME (The American Society of Mechanical Engineers)/CSA Group

ASME A112.18.1-2018/CSA B125.1-18
Plumbing supply fittings

ASME A112.18.6-2017/CSA B125.6-17
Flexible water connections

ASME (The American Society of Mechanical Engineers)

B1.20.1-2013
Pipe Threads, General Purpose, Inch

B16.23-2016
Cast Copper Alloy Solder Joint Drainage Fittings: DWV

B16.29-2017
Wrought Copper and Wrought Copper Alloy Solder — Joint Drainage Fittings — DWV

CSA Group

B125.3-18
Plumbing fittings

B1800-18
Thermoplastic nonpressure piping compendium

CAN/CSA-B181.1-18
Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings

CAN/CSA-B181.2-18
Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings

B602-16
Mechanical couplings for drain, waste, and vent pipe and sewer pipe

ASTM International (American Society for Testing and Materials)

A48/A48M-03 (2016)
Standard Specification for Gray Iron Castings

A536-84 (2019) e1
Standard Specification for Ductile Iron Castings

B16/B16M-10(2015)
Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines

B117-18
Standard Practice for Operating Salt Spray (Fog) Apparatus

D1784-11
Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

D2661-14e1
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings

D2665-14
Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

D3965-16
Standard Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings

D4101-17e
Standard Specification for Polypropylene Injection and Extrusion Materials

D5927-17
Standard Classification System for and Basis for Specifications for Thermoplastic Polyester (TPES) Injection and Extrusion Materials Based on ISO Test Methods

E29-13(2019)
Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

F628-12e3
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core

F891-16
Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe With a Cellular Core

F1498-08(2012)e1
Standard Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings

TCNA (Tile Council of North America, Inc.)

TCNA/ANSI A118.10-08
Standard Specification for Load Bearing, Bonded, Waterproof Membranes for Thin-set Ceramic Tile and Dimension Stone Installation

3 Definitions and abbreviations

3.1 Definitions

The following definitions shall apply in this Standard:

Bonding flange — an integrated edge or rim that projects from a shower drain for support and to allow attachment to the subsurface of the shower floor or a water proof membrane. See Figure 9.

Centre outlet — a lavatory waste fitting without an overflow opening.

Continuous waste assembly — a drain assembly for multiple compartments of a fixture that is connected to a common trap. See Figures 7 and 8.

Diversion tee — a fitting of a continuous waste assembly consisting of a tee fitting and an integral element that directs the flow downward to the outlet of the tee. See Figure 8.

Grey water — untreated residential wastewater from bathtubs, showers, lavatories, clothes washers, and laundry tubs that has not come into contact with kitchen waste or waste from a sanitary unit.
Note: *Grey water does not include wastewater from kitchen sinks or dishwashers.*

Grey water diverter — a waste fitting that incorporates a mechanism that can be operated by a user to direct grey water for reuse or disposal.

Linear shower drain — a receptacle containing a trench- or channel-shaped body and a solid cover or grate that is flush with the adjoining surface for receiving wastewater from a shower and conveying it to the drainage system.

Overflow — a conduit that is integral or attached to a fixture and whose function is to remove liquid from a fixture after the fixture has been filled past the desired level.

Patent overflow — a lavatory waste fitting incorporating an overflow opening.

Sanitary unit — a water closet, urinal, bidet, or bedpan washer.

Significant surface — an exposed surface that, if blemished, spoils the appearance or affects the performance of a fitting.

Slip joint — an adjustable tubing connection that consists of a compression nut and compression washer and is designed to fit a threaded adapter fitting or a standard taper pipe thread.

Standard tools — tools that are normally carried by plumbers for installing and maintaining plumbing.
Note: *Examples include screwdrivers, key wrenches, flat-jawed wrenches, and pliers.*

Strainer — a device designed to prevent debris from entering a drainage system.

Strainer basket — a removable component of a sink strainer assembly, designed to collect debris.

Strainer body — the fixed, exposed component of a sink strainer assembly connected to the fixture that accommodates the strainer basket.

Strainer shell — the unexposed component of a sink strainer assembly that connects the strainer body to the fixture that accommodates the strainer basket.

Strainer sleeve — the unexposed component of a sink strainer assembly that connects the assembly to the fixture waste connection.

Trap — a fitting that provides, when installed in a properly vented system, a liquid seal that prevents the back passage of gas without affecting the flow of sewage or wastewater through the system.

Trap seal — the vertical depth of a liquid that a trap retains, measured from the trap weir (the lowest point in the cross-section of the horizontal waterway at the trap exit) and the top of the tube at the lowest point of its bend. See Figure 1.

Trap wall adapter — a part of the waste system that is used to connect a trap outlet to a building drainage system. See Figure 2.

Twin waste elbow — a fitting of a continuous waste assembly that diverts waste from two horizontal branches in the same plane to a vertical outlet. See Figure 6.

Waste fitting — part of a waste system from a plumbing fixture to, and including, a fixture trap outlet or trap wall adapter.

3.2 Abbreviations

The following abbreviations apply in this Standard:

ABS — acrylonitrile-butadiene-styrene
ASA — American Standards Association
DWV — drain, waste, and vent
NC — National Coarse
NPS — Nominal Pipe Size
NPSM — National Pipe Straight Mechanical
NPT — National Pipe Tapered
OD — outside diameter
PBT — polybutylene terephthalate
PP — polypropylene
PVC — polyvinylchloride

4 General requirements

4.1 Materials

Note: *The requirements of Clauses 4.1.2 to 4.1.9 are not intended to prevent the use of alternative materials for components that are not part of the drainage envelope.*

4.1.1 General

The requirements specified in Clauses 4.1.2 to 4.1.9 shall apply only to wetted components that are part of the drainage envelope.

Note: *The drainage envelope includes traps, tailpieces, trap wall adapters (see Figure 2), diversion tees, twin waste elbows, overflow elbows, drain elbows, and strainer bodies. Components that are not considered part of the drainage envelope include pop-up stoppers, overflow plates, coupling nuts, strainer baskets and sleeves, and lift rods.*

4.1.2 All waste fittings

Waste fittings and waste fitting components shall be made from materials that comply with this Standard.

4.1.3 Plastic tubular waste fittings

Plastic tubular waste fittings shall be made of acrylonitrile-butadiene-styrene (ABS), polypropylene (PP),

polyvinylchloride (PVC), or polybutylene terephthalate (PBT), and shall comply with or exceed one or more of the following cell classifications:

a) ABS for fittings and mechanical joints: cell classification 20211 in ASTM D3965;
b) ABS for tubes: cell classification 42222 in ASTM D3965;
c) reinforced PP: cell classification PP0105G20A33350 in ASTM D4101;
d) unreinforced PP:
    i) cell classification PP0110B55140 in ASTM D4101; or
    ii) cell classification 55230 or higher in Table B of ASTM D4101;
e) PVC: cell classification 12454 or 14333 in ASTM D1784; or
f) PBT: cell classification TPES 0113 in ASTM D5927.

4.1.4 Plastic pipe and pipe fittings

ABS or PVC used for manufacturing drain, waste, and vent (DWV) plastic pipe and pipe fittings shall comply with one of the following Standards:

a) CAN/CSA-B181.1;
b) CAN/CSA-B181.2;
c) ASTM D2661;
d) ASTM D2665;
e) ASTM F628; or
f) ASTM F891.

4.1.5 Copper alloys

Copper alloys shall have a minimum copper content of 56% by weight.

4.1.6 Cast iron

Cast iron shall be of class 25, as specified in ASTM A48/A48M.

4.1.7 Ductile iron

Ductile iron shall be Grade 60-40-18 or Grade 60-45-12, as specified in ASTM A536.

4.1.8 Stainless steel

Stainless steel alloys shall be of the 300 or 400 Series.

4.1.9 Elastomeric fittings

4.1.9.1 Elastomers

Elastomeric waste fittings shall comply with the material requirements of CSA B602.

4.1.9.2 Elastomeric tubular parts

The wall thickness of elastomeric tubular parts shall be at least 2.0 mm (0.079 in).

4.2 Installation

4.2.1 Connection to waste system

Waste fittings shall be provided with a means to connect to a type of trap or waste system in common use.

4.2.2 Protection of finish

Provision shall be made to enable waste fittings to be connected and mounted without marring the finish or otherwise damaging the fitting or the surface on which it is to be mounted.

4.2.3 Fixture seal

Provision shall be made for a method of establishing a seal between a waste fitting and the fixture to which it is fastened.

4.3 Threads

4.3.1 DWV plastic pipe and fittings

Taper threads used on plastic tubular waste fittings complying with Clause 4.1.3 and used on ABS or PVC DWV plastic pipe and pipe fittings complying with Clause 4.1.4 shall

a) be moulded;
b) comply with ASTM F1498; and
c) be a minimum of 2.5 threads long, with a minimum of one thread engagement.

4.3.2 Metallic pipes and fittings

Threads used on pipe and fittings manufactured from metallic base materials shall comply with ASME B1.20.1.

4.3.3 Compression and union nuts

Threads for compression and union nuts shall be a minimum of 2.5 threads long, with a minimum of one thread engagement. The threads shall be NPSM threads. The thread form shall comply with Table 6 of ASME B1.20.1.

4.3.4 Tapped bosses

Tapped bosses for threaded tubing shall have 1-1/4 or 1-1/2 × 27 or 28 threads per inch ASA 60° thread and shall be at least 2.5 threads long.

4.4 Solder connections

The dimensions of solder joint ends for connection to copper tube or copper tube fittings (except factory-assembled parts) shall comply with ASME B16.23 or ASME B16.29.

4.5 Replacement parts

4.5.1 Use of standard tools

Repair and maintenance of waste fittings shall be accomplished with the use of standard tools.

4.5.2 Replacement part design

Joints that have to be taken apart to replace worn parts after the fitting is installed shall be designed so that disassembly and replacement are possible without damaging or marring the fitting or significant surface on which the fitting is installed.

4.6 Dimensions

4.6.1 Outlet size

4.6.1.1 Lavatory and bidet waste fittings

Lavatory and bidet waste fittings shall be provided with a minimum 1-1/4 in nominal outside diameter (OD) outlet.

4.6.1.2 Sink, shower, bathtub, laundry tub, and bar sink waste fittings

Sink, shower, bathtub, laundry tub, and bar sink waste fittings shall be provided with a minimum 1-1/2 in nominal OD outlet.

4.6.2 Slip joints

The inside diameter of slip joints shall fit with tubing of the same nominal size. Slip joints located on the inlet side of a trap shall be at least 13 mm (0.5 in) above the trap weir. See Figure 1.

4.6.3 Wall thickness

4.6.3.1 Metal tube and tubular fittings

When measured on a straight portion of the part, the wall thickness of metal tube and tubular fittings shall be at least the following:

a) brass or copper:
   i) 0.73 mm (0.029 in) unthreaded;
   ii) 0.83 mm (0.032 in) threaded by cutting; and
   iii) 0.40 mm (0.016 in) for corrugated tubing; and
b) stainless steel:
   i) 0.30 mm (0.012 in) unthreaded; and
   ii) 0.83 mm (0.032 in) threaded by cutting.

4.6.3.2 Plastic tube and tubular fittings

The wall thickness of plastic tube and tubular fittings shall be at least 1.58 mm (0.062 in).

Note: *This requirement does not apply to tapered or bevelled edges.*

4.6.4 Sink strainer assemblies

4.6.4.1

Components of sink strainer assemblies made of stainless steel or brass shall include a body, a basket, and, if applicable, a sleeve and shall have the following minimum thicknesses, measured before forming:

a) body: 0.56 mm (0.022 in);
b) basket: 0.38 mm (0.015 in); and
c) sleeve: 0.38 mm (0.015 in).

4.6.4.2

The gap between the strainer basket and the body shall be not greater than 5 mm (0.2 in). The depth of the strainer basket shall be such that, in the open position, the lip does not project above the body flange. Holes in the strainer basket shall be not greater than 5 mm (0.2 in) in the minor dimension.

4.6.4.3

The strainer body thread shall be made to accommodate a nut with a 1-1/2–11-1/2 NPSM thread that complies with ASME B1.20.1. See Figure 3.

4.6.4.4

Tailpieces incorporating an adapter for a dishwasher hose connection shall comply with Figure 4.

4.6.5 Traps

4.6.5.1

Fixture traps shall have a minimum trap seal of 50 mm (2.0 in). See Figure 1.

4.6.5.2

A cleanout plug shall not reduce the waterway through the trap and shall not have projections that could cause accumulation of debris or other matter in the trap. The plug shall be threaded and the thread may be tapered or straight.

4.6.6 Tubing stops

Tubing stops in diversion tees, other tees, and twin waste elbows shall be integral and designed in such a way that the insert tubing shall not obstruct the flow. See Figures 5 to 8.

4.6.7 Subdrains for built-up shower pans

4.6.7.1 Crown and collar material

A 24 gauge corrosion-resistant crown and/or collar or a brass ring 6 mm (0.25 in) thick shall be placed between the strainer and the cast-iron bodies in subdrains for built-up shower pans. See Figure 9.

4.6.7.2 Obstructions

There shall be no obstructions in the caulking area.

4.6.7.3 Weep holes

Subdrains shall have an open weeping area of 95 mm^2 (0.147 in^2). Weep holes shall be located in or above the clamping ring. Weep holes shall not be required on sub drain when used in applications with linear drains with integrated bonding flanges that are used with top-mounted, bonded waterproof membranes.

4.6.7.4 Clamping bolts and fasteners

Clamping bolts and fasteners shall be made of 300 Series stainless steel or copper alloy that complies with ASTM B16/B16M. At least three bolts per drain shall be provided.

Clamping bolts and fasteners for cast iron or copper alloy drains shall be a minimum of 5/16 in NC (7.9 mm), with a minimum thread length of 13 mm (0.50 in).

Clamping bolts and fasteners for plastic drains shall be a minimum of 1/4 in NC (6.4 mm), with a minimum thread length of 19 mm (0.75 in).

4.6.8 Grey water diverters

4.6.8.1 General

In addition to the requirements specified in Clauses 4.6.8.2 to 4.6.8.4, 5.8.3, and 6.4, grey water diverters shall comply with all other applicable requirements of this Standard.

4.6.8.2 Inlets and outlets

Inlets and outlets of grey water diverters shall have a minimum nominal OD of 1-1/4 in.

4.6.8.3 Internal waterway sizes

The internal waterway sizes of grey water diverters shall be equal to or larger than the size of the inlet connection.

4.6.8.4 Strainers

Grey water diverters shall incorporate a strainer with a mesh opening area not larger than 6.25 mm^2 (0.01 in^2). The strainer shall be readily removable for cleaning.

4.7 Mechanical stoppers

4.7.1

The movable parts in a mechanical stopper shall be accessible without disconnecting the body from the fixture.

4.7.2

Seals between the linkage and the body of a mechanical stopper shall be designed to allow repacking or replacement.

4.8 Additional requirements for linear shower drains

4.8.1

The free grate area of a strainer shall be not less than the cross-sectional area of the connecting pipe.

4.8.2

The strainer shall be

a) smooth and free of sharp edges; and
b) removable without the use of special tools.

4.8.3

The drain body shall have internal surfaces that convey the water to the drain outlet and shall not have any concealed fouling surfaces.

4.8.4

When provided, waterproof membrane shall comply with the

a) applicable requirements in TCNA/ANSI A118.10; and
b) requirements of Clause 5.12.1 when tested in accordance with Clause 5.12.2.

5 Performance requirements and test procedures

5.1 General

5.1.1 Preconditioning

Before testing, specimens shall be conditioned at ambient laboratory conditions for at least 12 h.

5.1.2 Installation for testing

For test purposes, each specimen shall be installed in accordance with the manufacturer's instructions.

5.1.3 Testing sequence

5.1.3.1 General

In addition to the other applicable tests and requirements specified in this Standard, two fittings shall

a) be selected at random from a lot of five production fittings;
b) be subjected to the test sequence specified in Clauses 5.1.3.2 and 5.1.3.3; and
c) comply with Clauses 5.2 to 5.11.

5.1.3.2 Specimen 1

One of the two specimens described in Clause 5.1.3.1 shall be subjected to the following test sequence:

a) thermal cycling (see Clause 5.3);
b) minimum flow rate (see Clause 5.8);
c) hydrostatic pressure (see Clause 5.9.2); and
d) load (shower drain) (see Clause 5.5).

5.1.3.3 Specimen 2

The second of the two specimens described in Clause 5.1.3.1 shall be subjected to the following test sequence:

a) thread torque strength (see Clause 5.9.1); and
b) life cycle (see Clause 5.10).

Note: *In this test sequence, the seals leakage test is conducted twice: once during the thread torque strength test and once during the life cycle test.*

5.1.3.4 Remaining specimens

The three remaining fittings from the lot of five production fittings described in Clause 5.1.3.1 shall be subjected to the remaining tests specified in this Standard.

5.2 Corrosion

5.2.1 Performance requirements

5.2.1.1

When tested in accordance with Clause 5.2.2, functional metallic parts shall not exhibit corrosion that would adversely affect the functioning of the fitting or the disassembly and reassembly of the components. Disassembly and reassembly of the functional metallic parts shall be accomplished without damage to the components or the fitting on completion of the test procedure specified in Clause 5.2.2.

5.2.1.2

After undergoing the test specified in Clause 5.2.2, the specimen described in Clause 5.2.2.1 shall comply with Clause 5.11.1.1 or 5.11.2.1, as applicable.

5.2.1.3

When tested in accordance with Clause 5.2.2, the specimen described in Clause 5.2.2.1 shall be capable of being

a) disassembled with standard tools to enable access to all serviceable parts without damage to the specimen; and
b) reassembled with standard tools without damage to the specimen.

5.2.2 Test procedure

5.2.2.1

Fittings shall be tested in accordance with ASTM B117 for 96 h. The specimen selected for the corrosion test shall be tested as received from the manufacturer and shall not have been subjected to any other test.

5.2.2.2

The specimen shall be assembled in accordance with the manufacturer's instructions, including the use of mounting hardware specified by the manufacturer.

5.2.2.3

The specimen shall be hung in the corrosion chamber in a position as similar as possible to the position it would be in when installed. If multiple specimens are being tested, no specimen shall be suspended above another specimen.

5.2.2.4

Immediately after the 96 h exposure period, the corrosion chamber shall be opened and the specimen shall be rinsed under running deionized water not warmer than 38 °C (100 °F) and immediately dried for a minimum of 24 h at ambient laboratory conditions before inspection or attempts to disassemble. The specimen shall not be rubbed during rinsing or drying or before being examined.

5.3 Thermal cycling

5.3.1 Performance requirements

When tested in accordance with Clause 5.3.2, waste fittings shall show no signs of cracking, leaking, or deformation.

5.3.2 Test procedure

5.3.2.1 Bath, shower, drinking fountain, bidet, and lavatory waste fittings

The thermal cycling test for bath, shower, drinking fountain, bidet, and lavatory waste fittings shall be conducted as follows:

a) Install the specimen in accordance with the manufacturer's instructions.
b) Subject the specimen to a water flow of 7.5 ± 0.8 L/min (2.0 ± 0.2 gpm) at 60 ± 2 °C (140 ± 3 °F) for 1.5 min, followed immediately by a water flow at 21 ± 2 °C (70 ± 3 °F) for 1.5 min.
c) Continue the test for six more cycles without pausing between cycles, for a total of seven cycles.

5.3.2.2 Other waste fittings

The thermal cycling test for waste fittings other than those specified in Clause 5.3.2.1 shall be conducted as follows:

a) Install the specimen in accordance with the manufacturer's instructions.
b) Subject the specimen to a water flow of 7.5 ± 0.8 L/min (2.0 ± 0.2 gpm) at 82 ± 2 °C (180 ± 3 °F) for 1.5 min, followed immediately by a water flow at 21 ± 2 °C (70 ± 3 °F) for 1.5 min.
c) Continue the test for six more cycles without pausing between cycles.

5.4 Coatings

Coatings shall comply with Clause 5.2 of ASME A112.18.1/CSA B125.1.

5.5 Shower drain strainers

5.5.1 Performance requirements

When tested in accordance with Clause 5.5.2, shower drain strainers shall not crack or deflect more than 3% of the largest transverse dimension with the load in place.

5.5.2 Load test procedure

The load test for shower drain strainers shall be conducted as follows:

a) Mount the specimen on the body of the drain.
b) Apply a uniformly distributed load of 1.3 kN (300 lbf) for 2 min to a 50 mm (2.0 in) diameter plate placed in the centre of the specimen.

5.6 Sink strainer assemblies

5.6.1 Performance requirements

The plastic components of sink strainer assemblies shall comply with Clauses 5.6.2 to 5.6.4.

5.6.2 Hot oil exposure

5.6.2.1 Performance requirements

When tested in accordance with Clause 5.6.2.2, the exposed components of a sink strainer shall show no change in surface texture due to cracking, crazing, blistering, or delamination, and no permanent discoloration.

Discoloration that can be removed by abrading the surface and repolishing to a maximum depth of 0.15 mm (0.006 in) shall be acceptable.

5.6.2.2 Test procedure

The hot oil exposure test shall be conducted as follows:

a) Use cooking oil with a smoke point greater than 240 °C (464 °F) (e.g., safflower, sunflower, or soybean oil).
b) Install the specimen in the sink as it would be installed in normal service, with the outlet closed.
c) Preheat the oil to 230 ± 5 °C (446 ± 9 °F).
d) Pour 750 ± 50 mL (0.20 ± 0.01 gal) of preheated oil onto the exposed surface of the specimen.
e) Allow the oil to stand in the sink at ambient conditions for 30 min ± 5 min, then drain.
f) Check the surface for defects as follows:
    i) thoroughly degrease the surface of the specimen using household detergent;

ii) apply water-soluble ink or dye of contrasting colour to the entire area to be inspected;
iii) after 30 min, rinse with fresh water and wipe dry; and
iv) examine the surface for changes in texture and permanent discoloration.

Note: *Safety clothing and eye protection should be worn when conducting this test.*

5.6.3 Water absorption

5.6.3.1 Performance requirements

When tested in accordance with Clause 5.6.3.2, no specimen shall absorb water in excess of 0.50% by mass in 24 h.

5.6.3.2 Test procedure

The water absorption test shall be conducted as follows:

a) Use specimens (one each) of any plastic strainer component that will be exposed to water.
b) Condition the specimens for 24 h in an oven at 50 ± 3 °C (122 ± 5 °F).
c) Cool the specimens in a desiccator.
d) Weigh the specimens immediately after cooling to ambient room temperature.
e) Place the specimens in distilled water at 23 ± 1 °C (73 ± 2 °F) for 24 h, with the specimens entirely immersed and resting on an edge.
f) At the end of the 24 h, remove the specimens from the water, one at a time.
g) Wipe off all surface water with a dry cloth.
h) Weigh the specimens within 30 s of removal from the water.
i) Calculate the percentage increase in mass to the nearest 0.01%.

5.6.4 Point impact

5.6.4.1 Performance requirements

When tested in accordance with Clause 5.6.4.2, the strainer assembly shall not crack.

5.6.4.2 Test procedure

The point impact test shall be conducted as follows:

a) Install the specimen in a kitchen sink as it would be installed in normal service.
b) Drop a 38 mm (1.5 in) diameter steel ball weighing 230 g (0.5 lb) from a height of 600 mm (24 in) so that it strikes the upper flat rim surface of the strainer body.
c) Drop a 38 mm (1.5 in) diameter steel ball weighing 230 g (0.5 lb) from a height of 600 mm (24 in) so that it strikes
    i) another location on the rim surface; and
    ii) a location on the strainer basket.
d) Rub the surface of the specimen with a sponge containing a 50% solution of tap water and water-soluble ink (either black or another contrasting colour).
e) Wipe excess solution from the specimen.
f) Check for evidence of cracks.

5.7 Body and clamping rings of subdrains for built-up shower pans

When tested in accordance with Clause 5.11.2.2, the body and clamping rings of subdrains for built-up shower pans shall provide a watertight joint when installed in accordance with the manufacturer's instructions.

5.8 Minimum flow rate

5.8.1 Performance requirements

The minimum flow rate for a waste fitting with all of its component parts installed shall be 27 L/min (7.0 gpm) when a sustained water head of 150 mm (6.0 in) is applied above the inlet and the outlet is open to the atmosphere.

For purposes of determining compliance with this flow rate, an observed or calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification limit in accordance with the rounding method specified in ASTM E29.

5.8.2 Test procedure

The minimum flow rate test shall be conducted using water at 10 ± 6 °C (50 ± 10 °F). Each inlet of a multiple-inlet fitting shall be tested separately.

Note: *This test is not applicable to the overflow, condensate, and branch of the tailpiece connection components of waste fitting assemblies.*

5.8.3 Grey water diverters

5.8.3.1 General

Grey water diverters shall comply with Clause 5.8.3.2. The outlets of grey water diverters shall meet the minimum flow rate requirements specified in Clause 5.8.1. See Figures 10 and 11.

5.8.3.2 Performance requirements

When tested in accordance with Clause 5.8.3.3, grey water diverters shall have a minimum excess flow of 27 L/min (7.0 gpm) out of the sanitary outlet when a sustained water head of 150 mm (6.0 in) is applied above the inlet. See Figure 12.

5.8.3.3 Test procedure

The test shall be conducted as follows:

a) Conduct the test as specified in Clause 5.8.2 with the diversion outlet of the specimen blocked and the diversion mechanism directing the flow to the blocked outlet.
b) Measure the flow rate out of the sanitary drainage outlet.

5.9 Strength

5.9.1 Thread torque strength

5.9.1.1 Performance requirements

Field-assembled threaded connections of union joints, slip joints, and gasketed joints shall not show evidence of stripping, cracking, or thread damage when tested in accordance with Clause 5.9.1.2 and shall not leak when tested in accordance with Clause 5.11.

5.9.1.2 Procedure

The test shall be conducted as follows:

a) Subject the joint(s) to a torque of 20 N•m (15 ft•lbf).
b) Disassemble the joint(s).

c) Examine the joint(s) for evidence of stripping, cracking, or thread damage. If no such evidence is found, proceed with Item d).
d) Reassemble and retighten the joint(s) with a torque of 20 N•m (15 ft•lbf).
e) Test the joint(s) in accordance with Clause 5.11 and check for leaks.

5.9.2 Hydrostatic pressure

5.9.2.1 Performance requirements

The drainage envelope parts of waste fittings shall show no signs of leakage, cracking, or permanent deformation when tested in accordance with Clause 5.9.2.2.

5.9.2.2 Procedure

The hydrostatic pressure test shall be conducted using water at 10 ± 6 °C (50 ± 10 °F). Waste fittings shall be assembled in accordance with the manufacturer's instructions and subjected to a hydrostatic pressure of 34 kPa (5.0 psi) for at least 1 min.

5.10 Life cycle

5.10.1 Performance requirements

During and after the test described in Clause 5.10.2, waste fittings shall continue to function as they did at the beginning of the test and shall not develop defects that might adversely affect their serviceability. In addition, they shall comply with Clause 5.11.

5.10.2 Test procedure

Waste fittings incorporating moving or potentially wearing parts shall be tested for 10 000 cycles. The speed of the life cycle test apparatus shall be adjusted to a minimum of 600 cycles per hour. The fitting shall be cycled without water.

Note: *If the design of a device is such that 600 cycles per hour cannot be attained, a more suitable cycle rate specified by the manufacturer may be used.*

5.11 Seals leakage

5.11.1 Waste fittings for drainage flow control

5.11.1.1 Performance requirements

When tested in accordance with Clause 5.11.1.2, the seals of waste fittings used to control drainage flow shall not leak more than 63 mL/min (1.0 gph).

5.11.1.2 Test procedure

The seals leakage test for waste fittings for drainage flow control shall be conducted as follows:
a) Install the specimen in accordance with the manufacturer's instructions.
b) Subject the specimen to the static pressure of a 150 mm (6.0 in) column of water at 10 ± 6 °C (50 ± 10 °F).
c) Measure the leakage rate over a period of 5 min.

5.11.2 Other waste fittings

5.11.2.1 Performance requirements

When tested in accordance with Clause 5.11.2.2, the seals of waste fittings other than waste fittings for drainage flow control shall not leak.

5.11.2.2 Test procedures

5.11.2.2.1 Pop-up assemblies

The joint in a pop-up assembly at the entry of the assembly's operating rod into the drain body shall be subjected for 5 min to the static pressure of a 150 mm (6.0 in) column of water at 10 ± 6 °C (50 ± 10 °F) above the entry to the drain with the drain open and the outlet plugged. See Figure 13.

5.11.2.2.2 Overflow gaskets

Overflow gaskets and seals shall not leak when subjected for 5 min to the static pressure of a 150 mm (6.0 in) column of water at 10 ± 6 °C (50 ± 10 °F) above the midpoint of the inlet. See Figure 14.

5.11.2.2.3 Other seals

Except as specified in Clauses 5.11.2.2.1 and 5.11.2.2.2, seals used in waste fittings shall be subjected for 5 min to the static pressure of a 500 mm (20.0 in) column of water at 10 ± 6 °C (50 ± 10 °F).

5.12 Leakage test for the seam between the bonding flange and membrane

5.12.1 Performance requirements

There shall be no signs of leakage under the drain body at the location of attachment between the bonding flange and membrane.

5.12.2 Test procedures

The leakage test for the seam between the bonding flange and the membrane shall be conducted as follows:

a) Attach the membrane to the bonding flange in accordance with the manufacturer's installation instructions. When the membrane is factory installed skip this step.
b) Clamp the outer ends of the membrane at a level higher than the linear shower drain body to create a "pond" with a slope towards the drain outlet.
c) Seal the linear shower drain outlet.
d) Fill the "pond" with water to a depth of at least 6.4 mm (0.25 in) along the seam.
e) Let the water stand for 24 h.
f) Check for leaks along the seam.

6 Markings, packaging, and installation instructions

6.1 General

Products covered by and complying with the this Standard shall be marked with

a) the manufacturer's recognized name, trademark, or other mark; or
b) in the case of private labelling, the name, trademark, or other mark of the customer for whom the fitting was manufactured.

The marking shall be accomplished by use of a permanent mark or by placing a permanent label on the product.

Markings shall be located in such a way so that they are visible after installation.

6.2 Packaging

Packaging shall be marked with

a) the manufacturer's recognized name, trademark, or other mark as well as the model number; or
b) in the case of private labelling, the name, trademark, or other mark of the customer for whom the fitting was manufactured as well as the model number.

6.3 Instructions for elastomeric waste fittings

Installation instructions shall be provided for elastomeric waste fittings and shall describe the methods for properly aligning the fittings.

6.4 Grey water diverters

6.4.1 Markings

The following shall be clearly marked on grey water diverters:

a) the inlet;
b) the outlet to the sanitary drainage system;
c) the diversion outlet; and
d) the direction of flow.

6.4.2 Instructions

Installation instructions shall be provided with grey water diverters. At a minimum, instructions shall indicate the direction of installation and how to operate and maintain the grey water diverter.

Figure 1
Sink and lavatory waste, trap, centre outlet, and patent overflow fittings
(See Clauses 3, 4.6.2, and 4.6.5.1.)

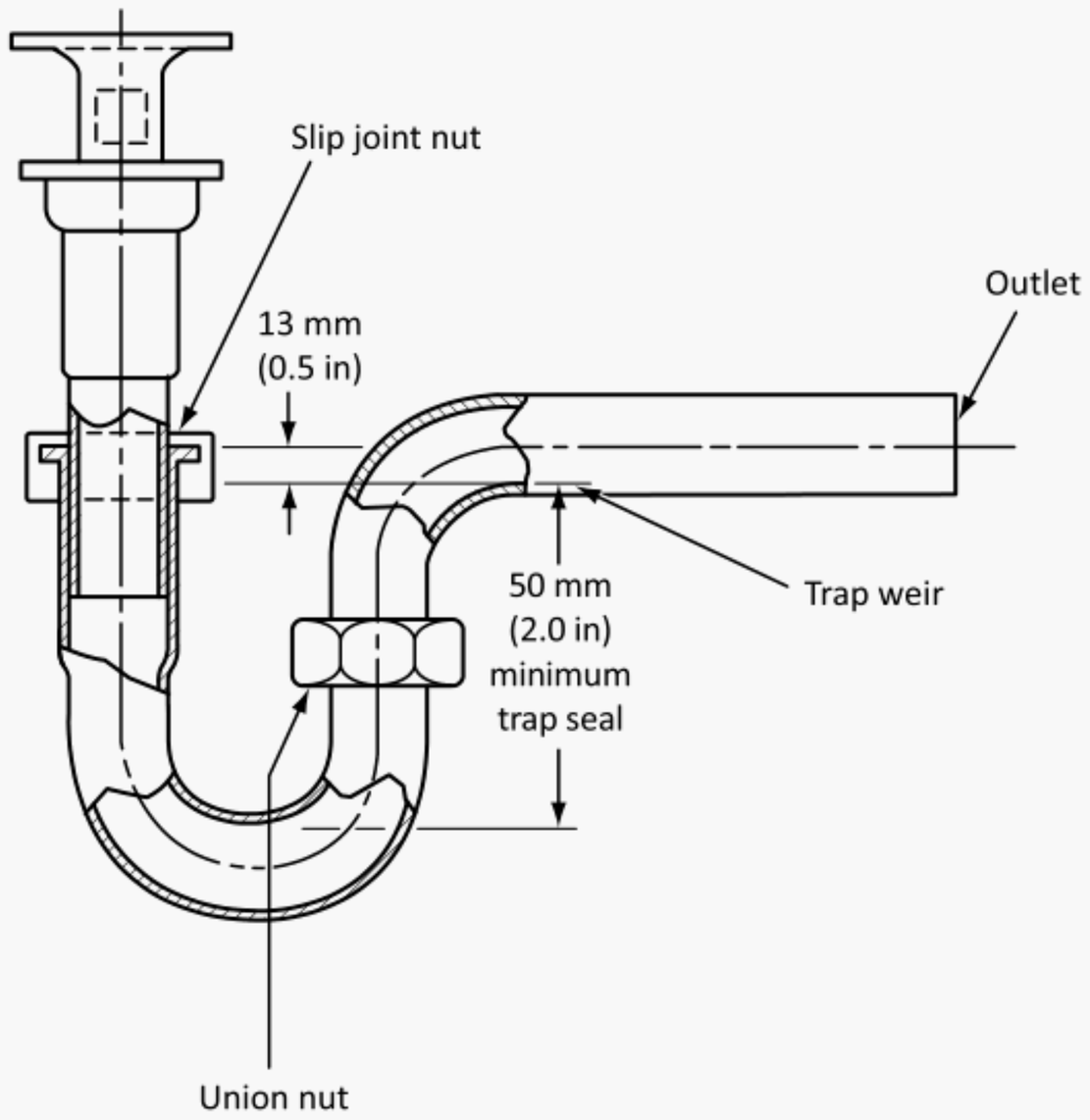


Figure 2
Trap wall adapter
(See Clauses 3 and 4.1.1.)

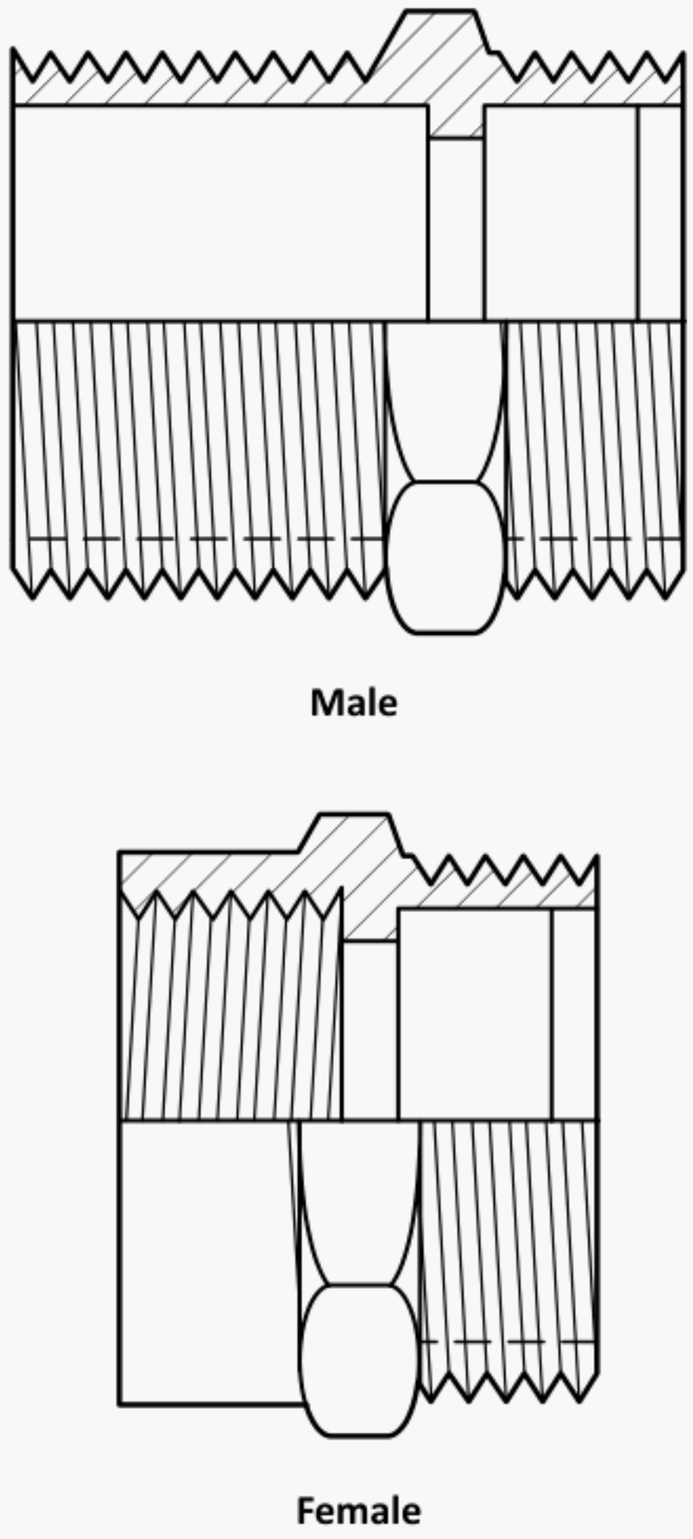


Figure 3
Sink strainer
(See Clause 4.6.4.3.)

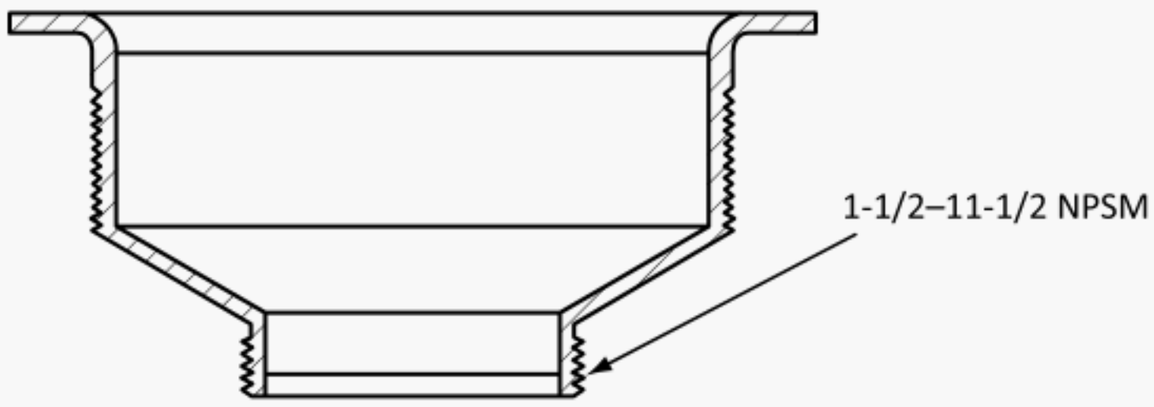


Figure 4
Sink strainer tailpiece
(See Clause 4.6.4.4.)

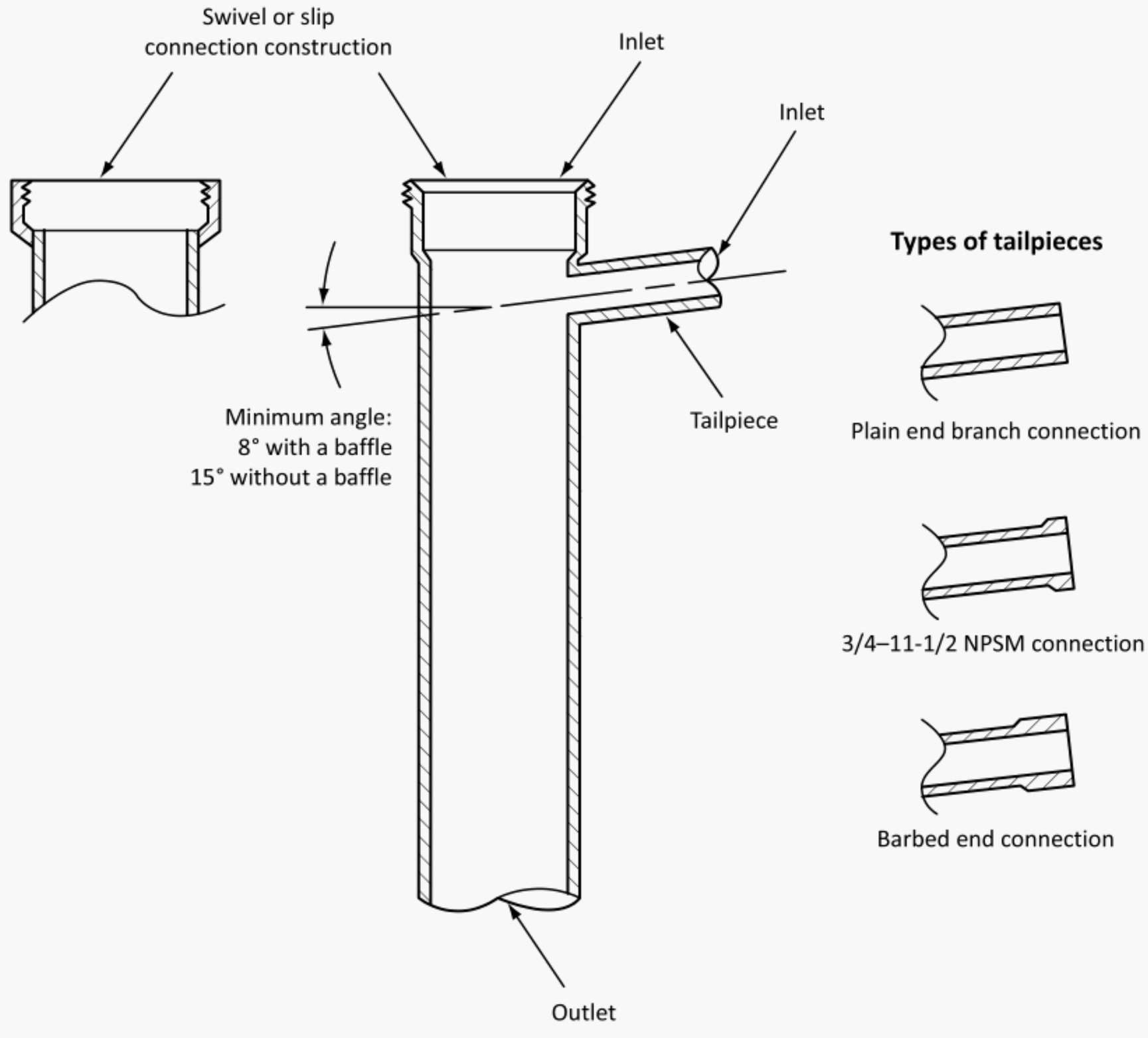


Figure 5
Tee
(See Clause 4.6.6.)

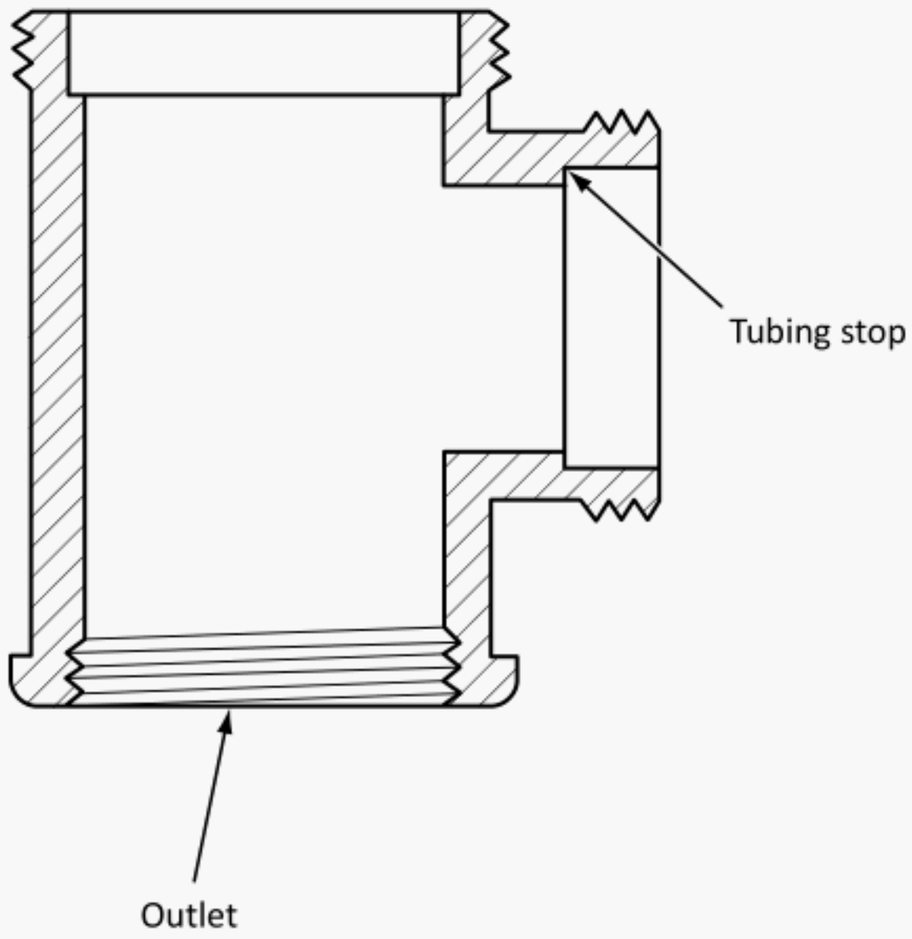


Figure 6
Twin waste elbow
(See Clauses 3 and 4.6.6.)

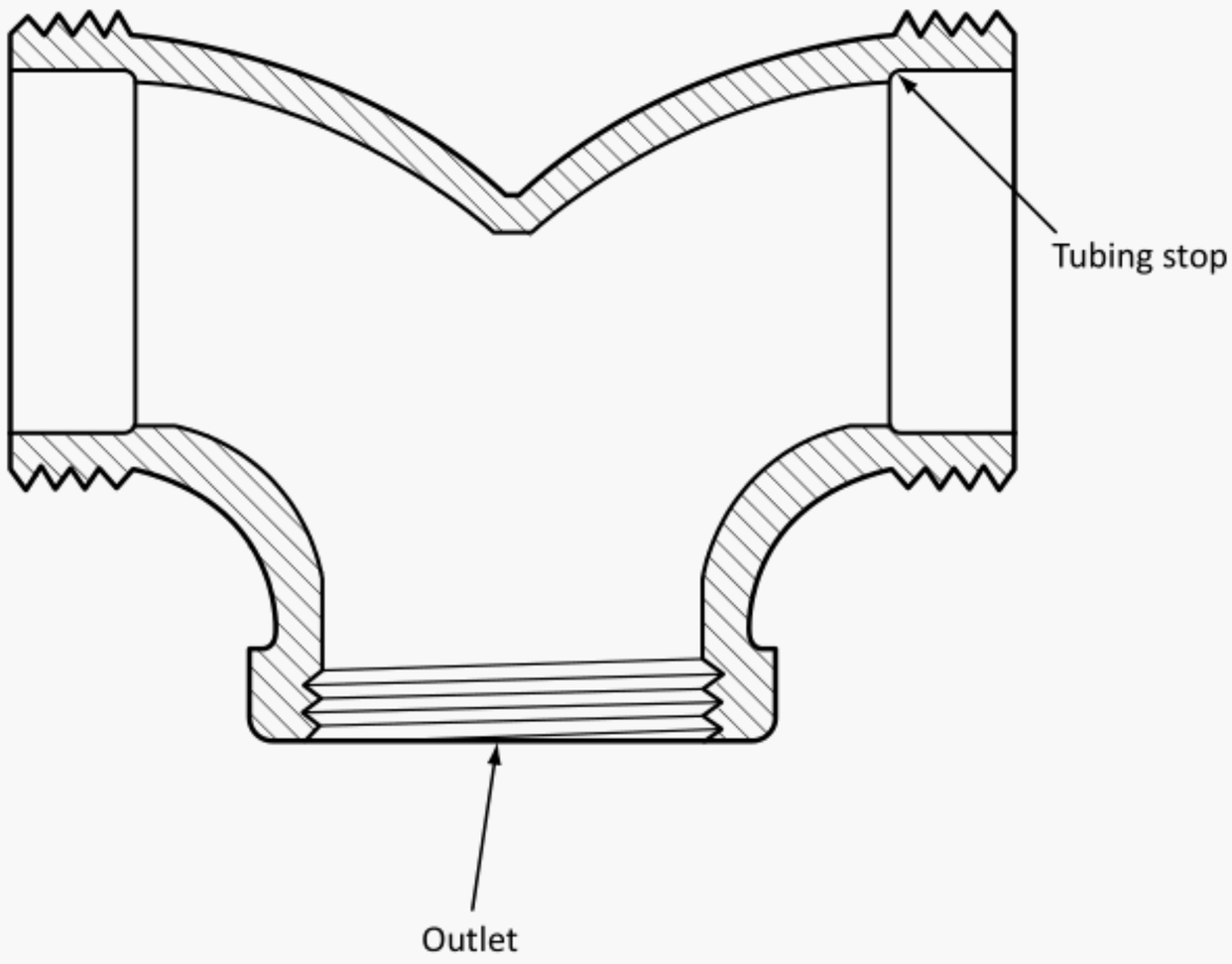


Figure 7
Centre outlet — Continuous waste assembly
(See Clauses 3 and 4.6.6.)

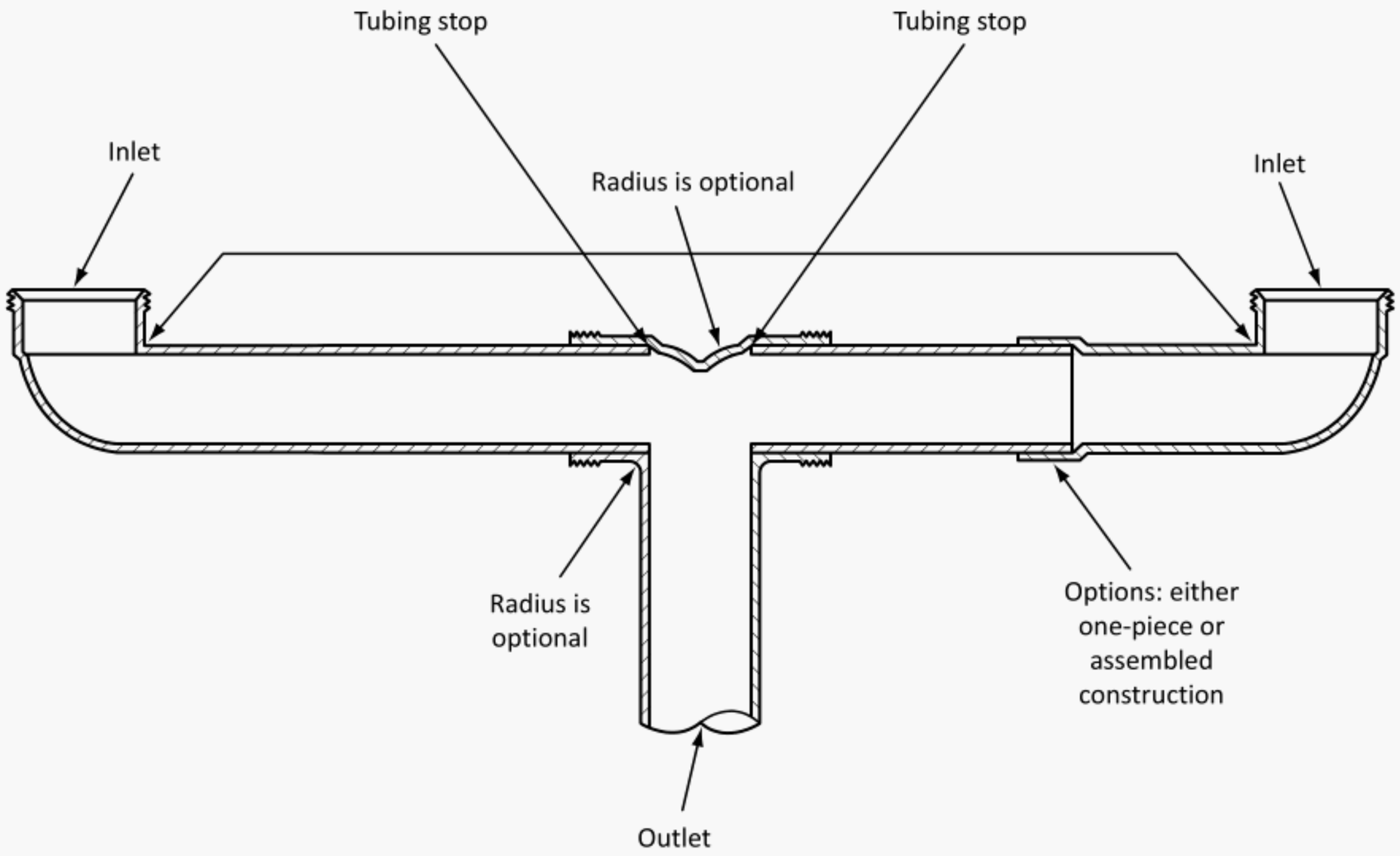


Figure 8
End outlet — Continuous waste assembly
(See Clauses 3 and 4.6.6.)

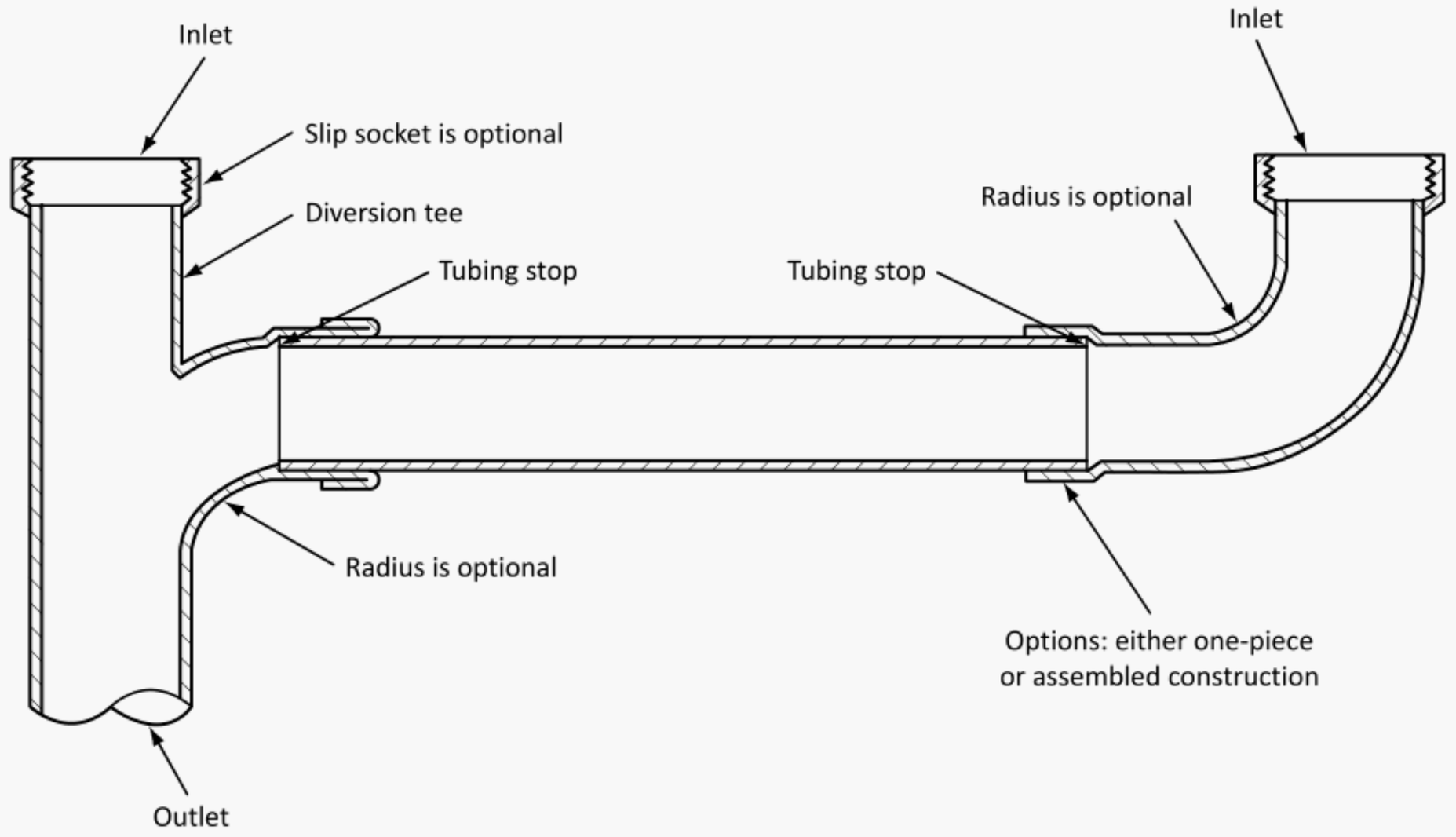
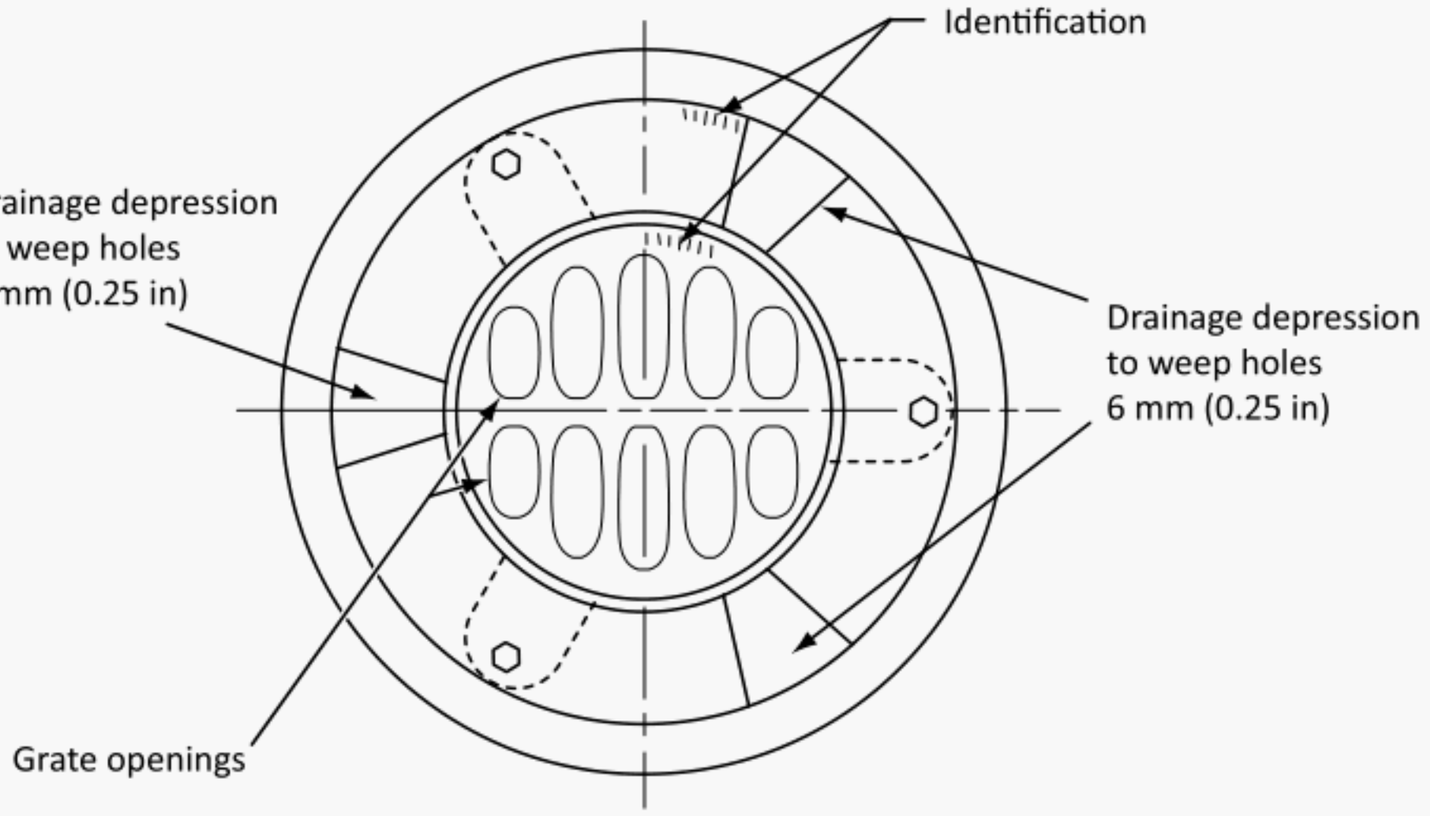
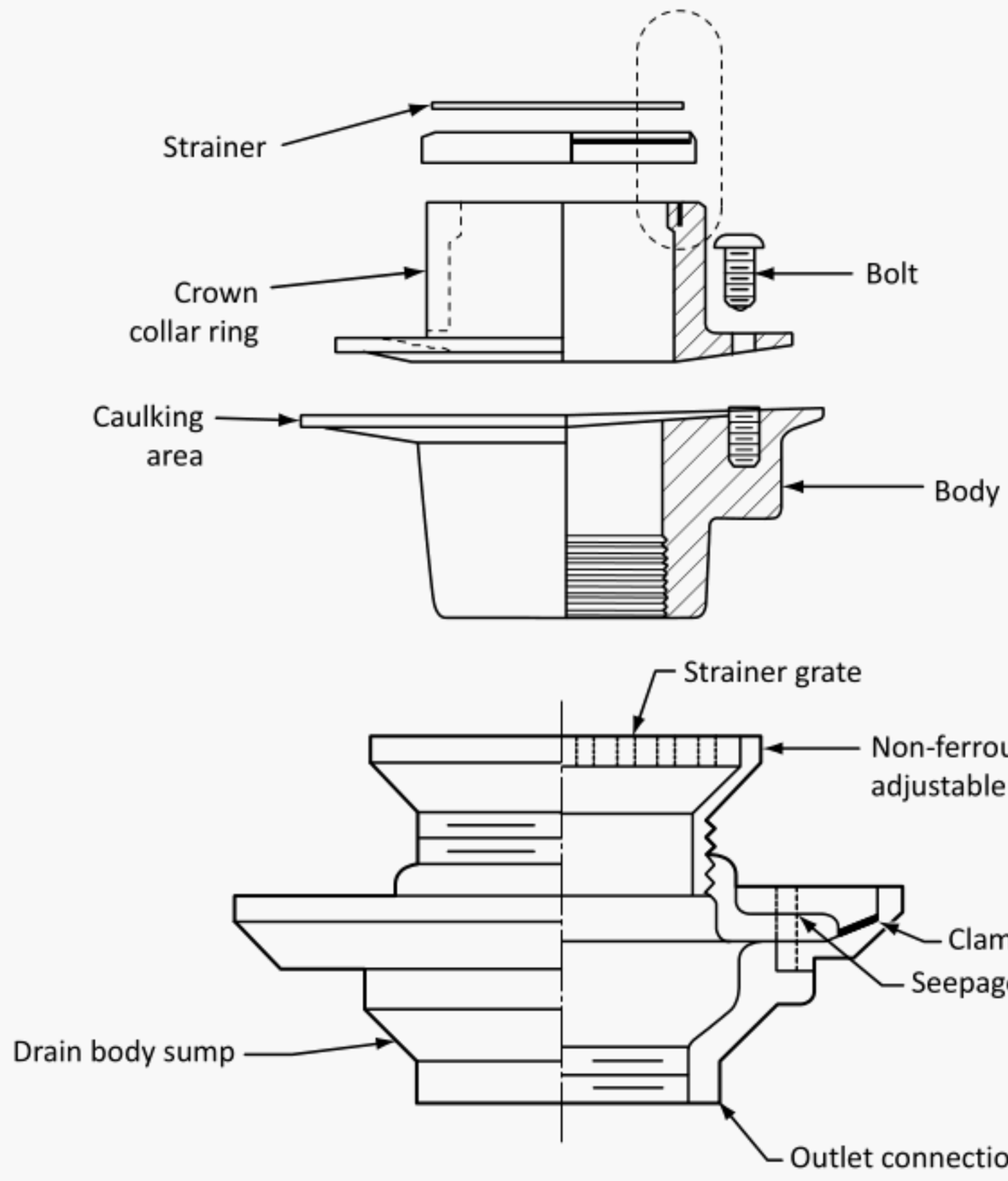


Figure 9
Typical subdrain for built-up shower pans
(See Clauses 3 and 4.6.7.1.)



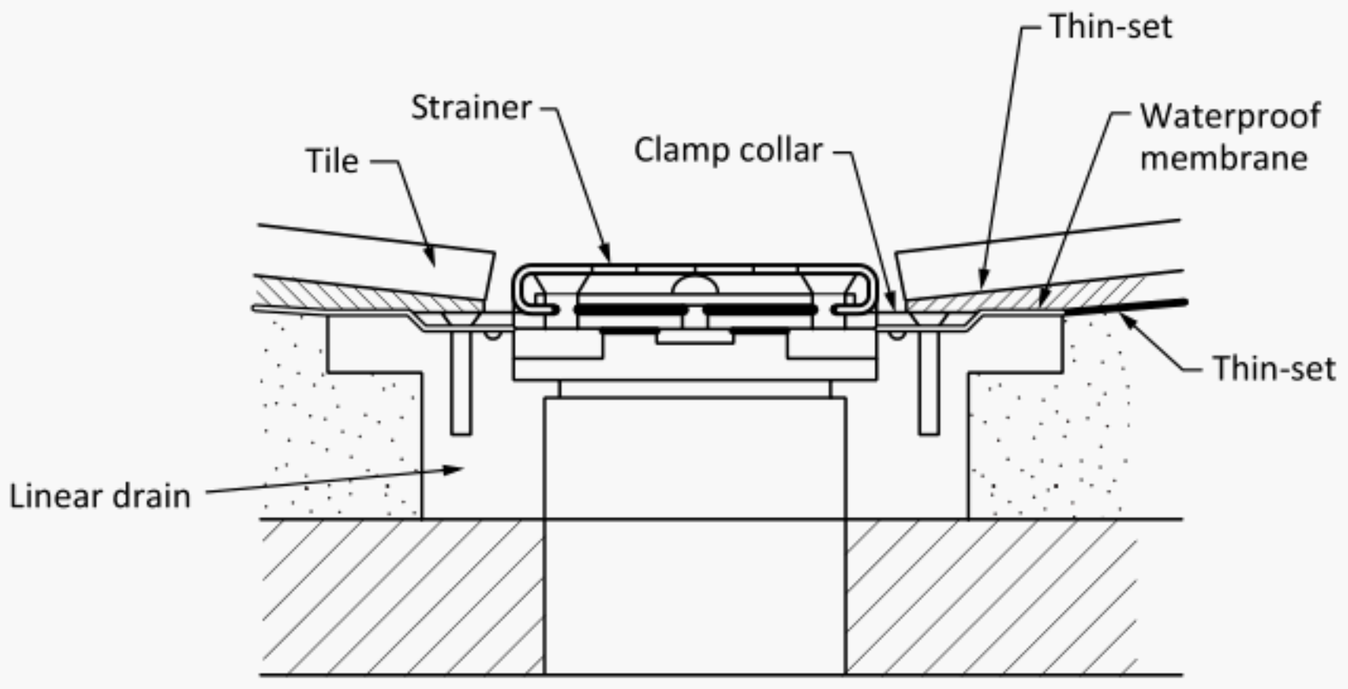
a) Top view of the drain



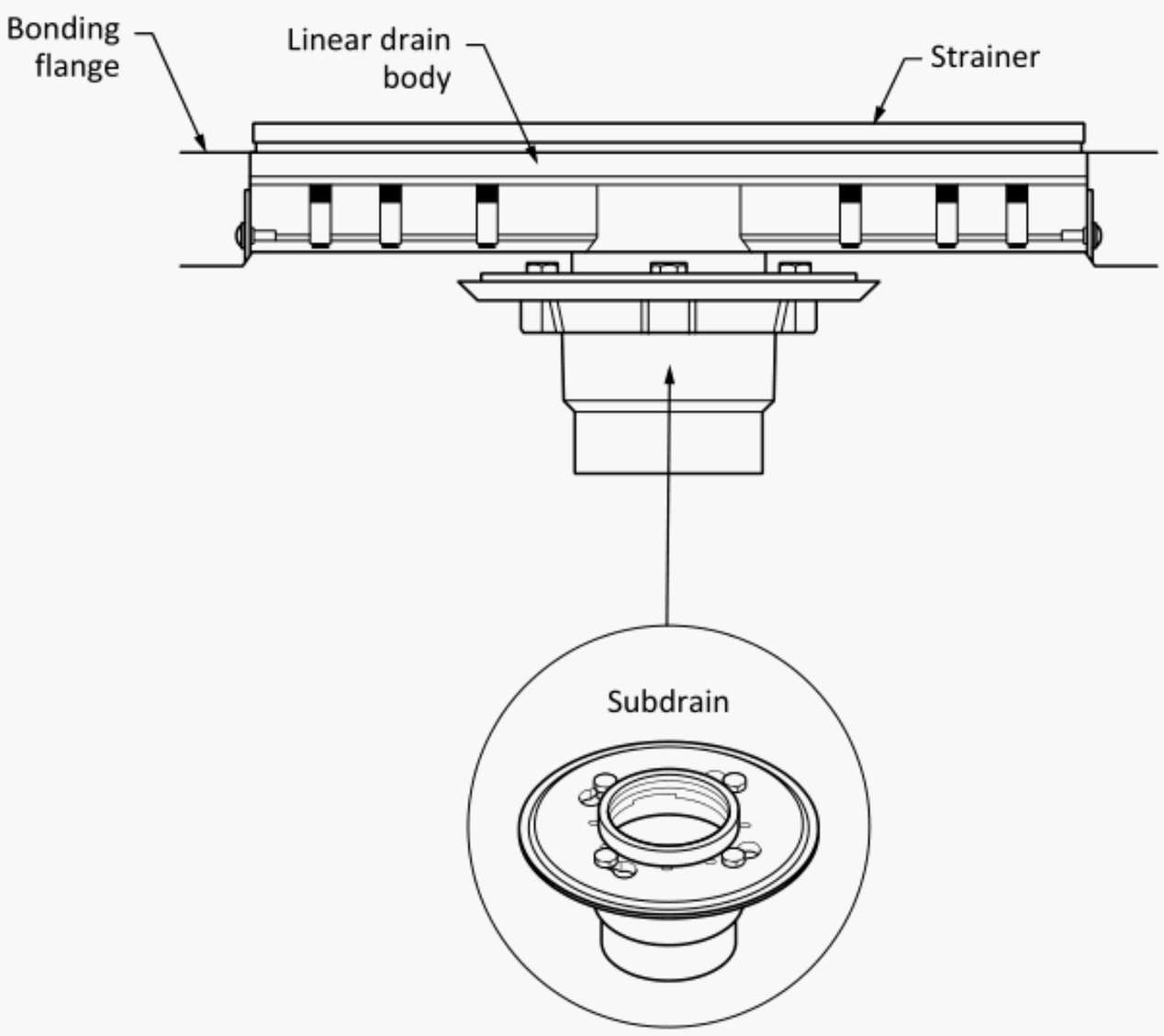
b) Side views of the drain

(Continued)

Figure 9 (Concluded)



c) Linear drain side view section



d) Linear drain with subdrain

Figure 10
Grey water diverter — Test of water flow through the sanitary drainage system outlet
(See Clause 5.8.3.1.)

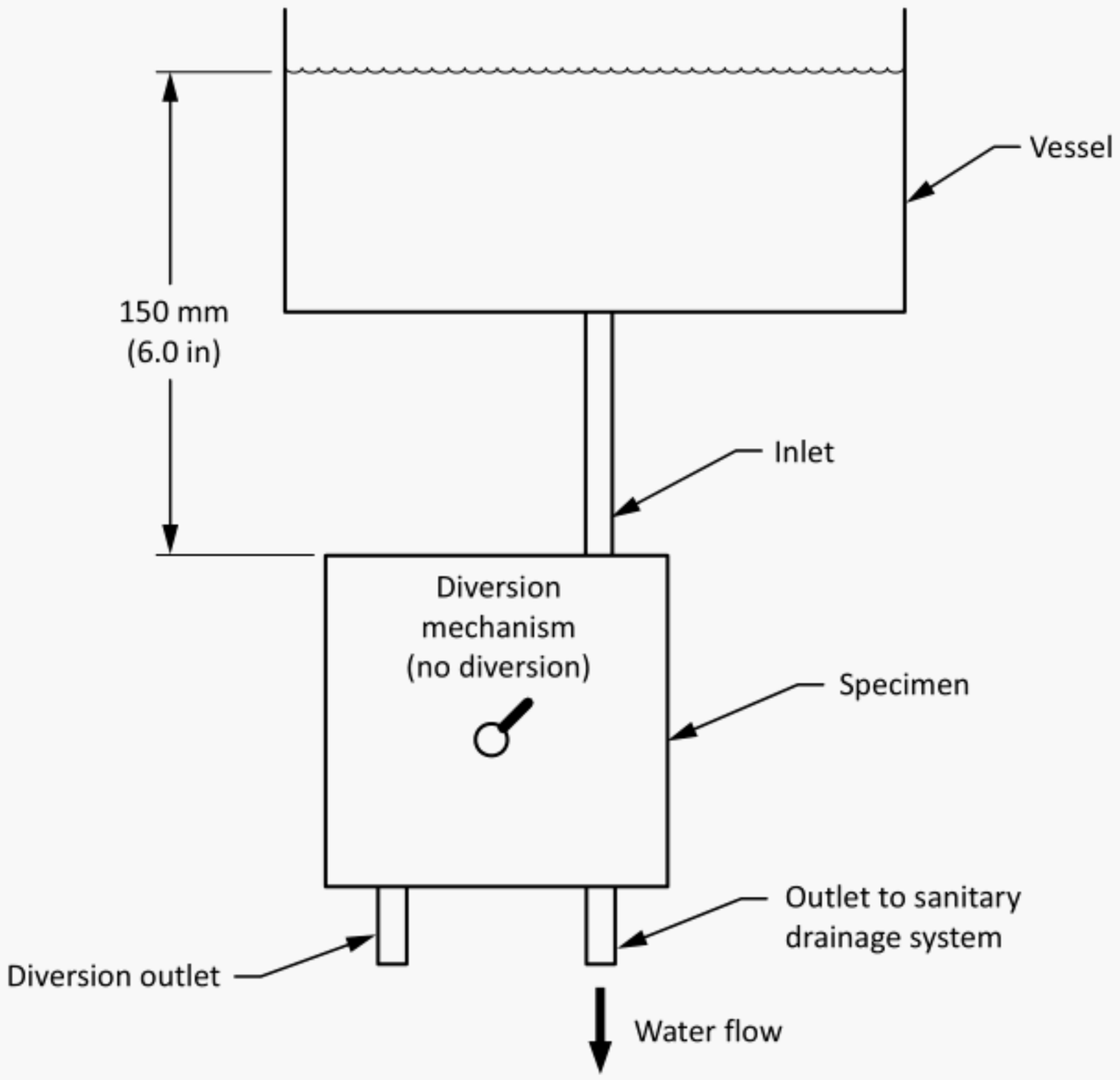


Figure 11
Grey water diverter — Test of water flow through the diversion outlet
(See Clause 5.8.3.1.)

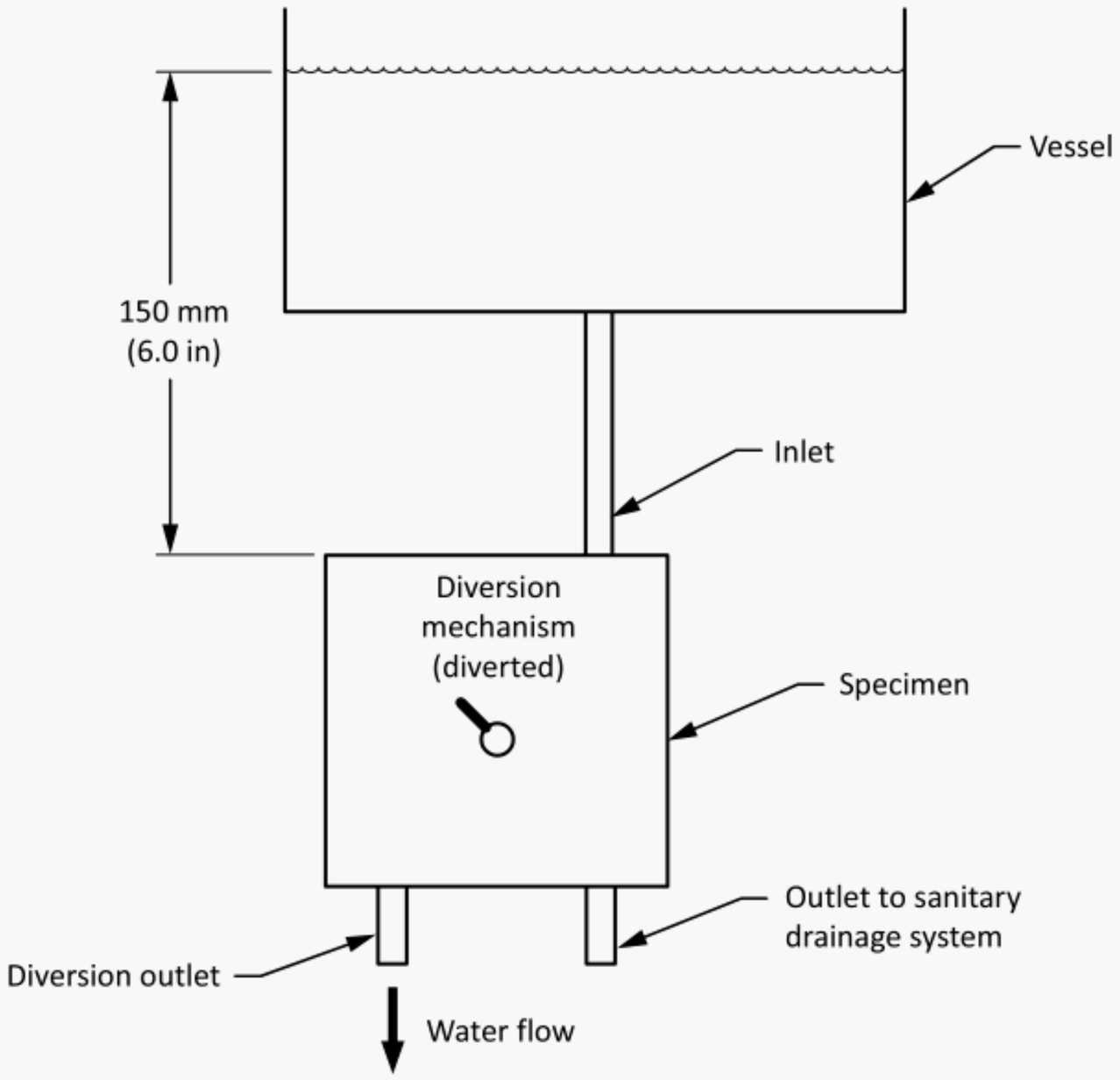


Figure 12
Grey water diverter — Test of water with the diversion mechanism in the diverted position and the diversion outlet blocked
(See Clause 5.8.3.2.)

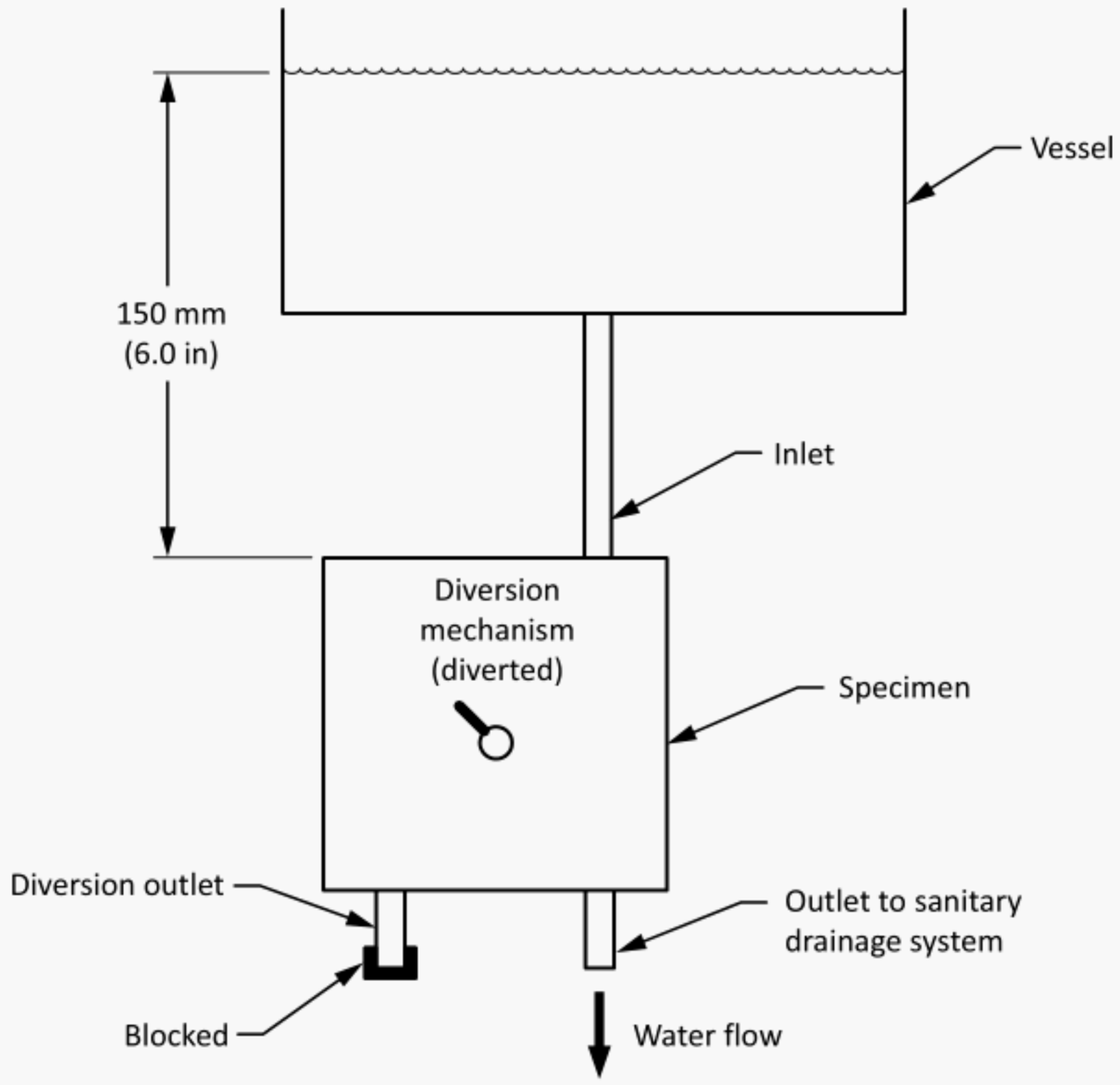


Figure 13
Typical lavatory pop-up drain
(See Clause 5.11.2.2.1.)

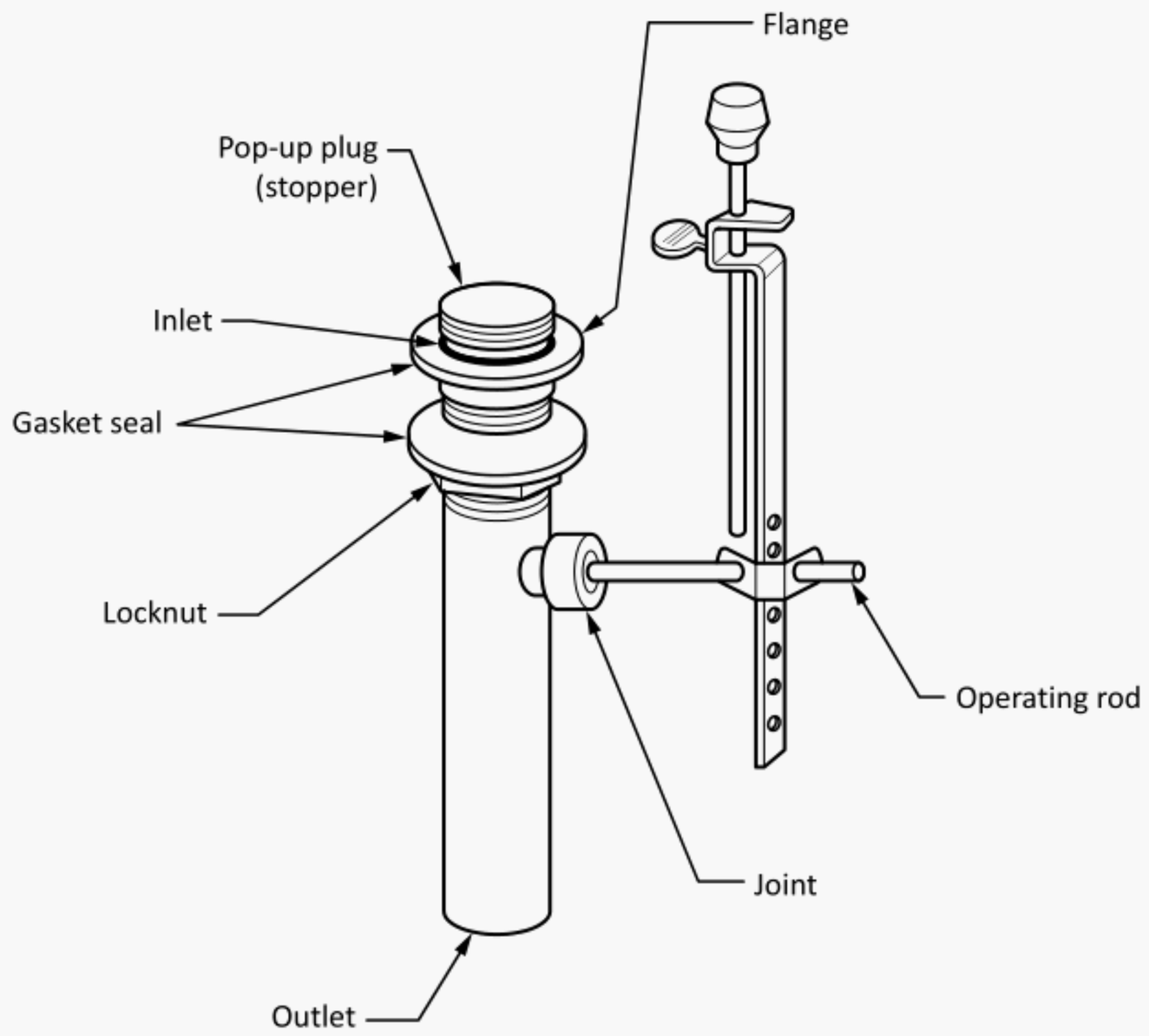
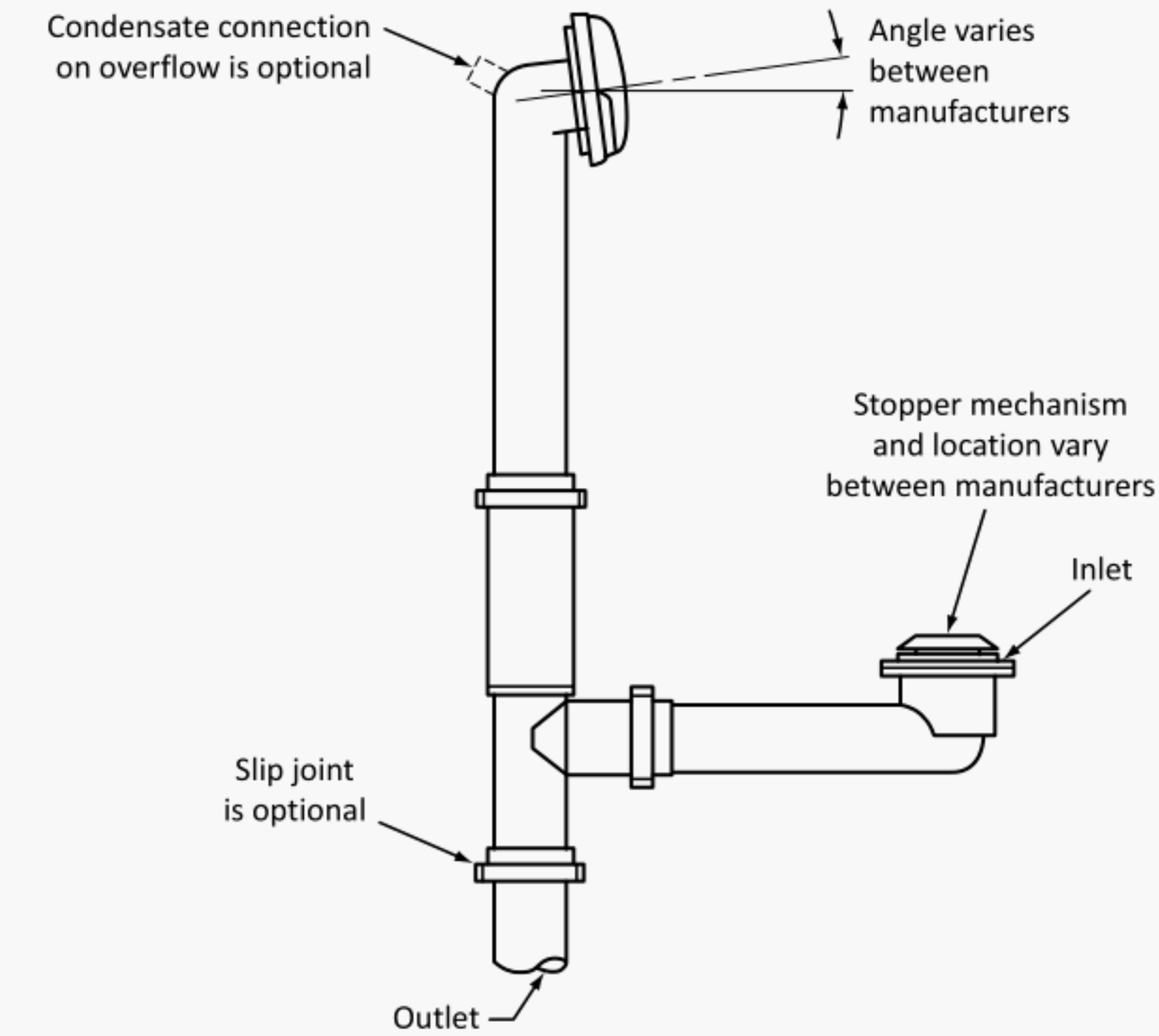
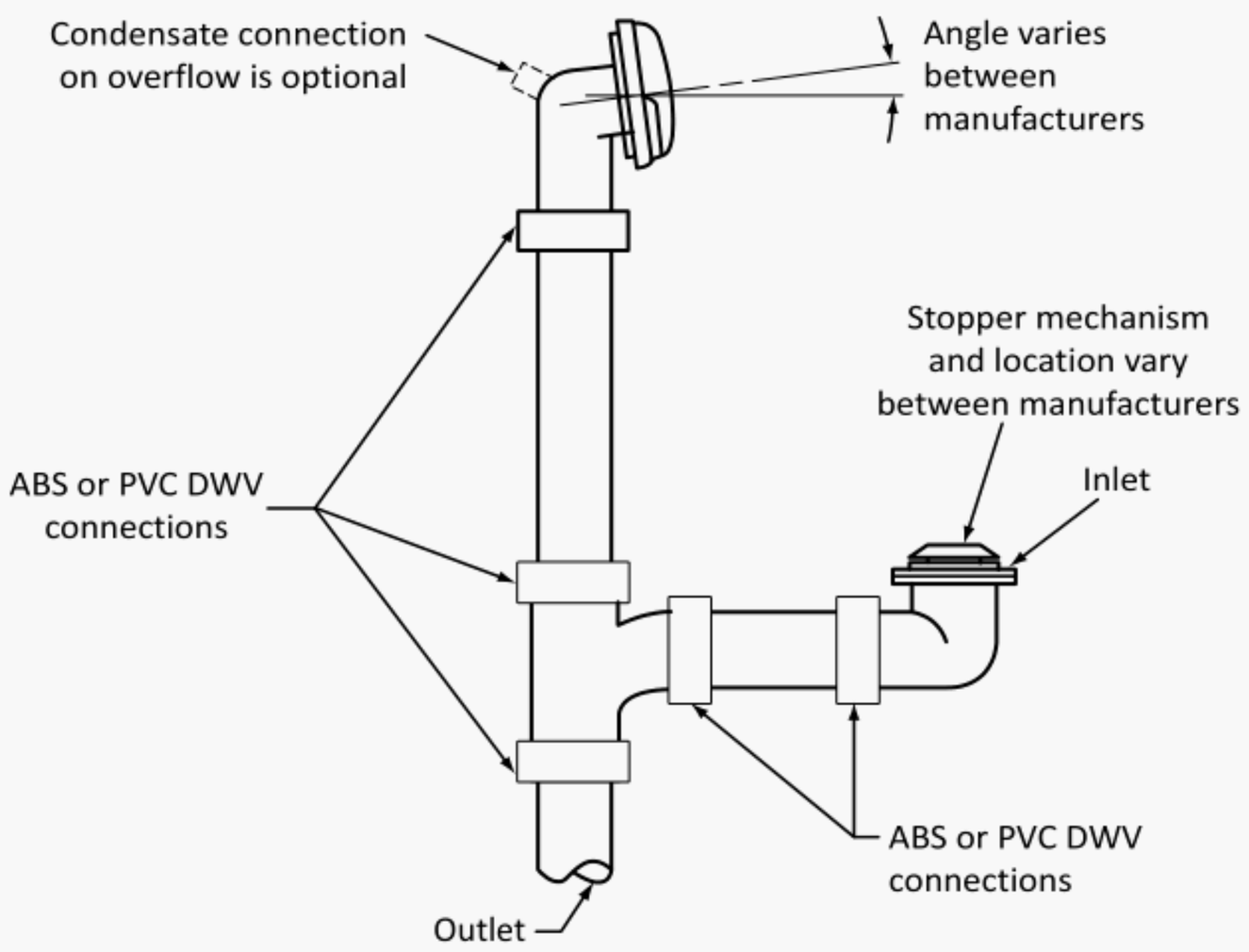


Figure 14
Waste and overflow
(See Clause 5.11.2.2.2.)



a) Tubular waste and overflow



b) DWV waste and overflow

Annex A (informative)
Unit conversion and rounding criteria

Note: *This Annex is an informative (non-mandatory) part of this Standard.*

A.1 Conversion

The following conversion rules are used in this Standard:

a) Zeros to the left of the first non-zero digit are not significant.
b) If the number is greater than 1, all zeros to the right of the decimal point are significant.
c) In multiplication and division, the original number with the smallest number of significant digits determines the number of significant digits in the product or quotient.
d) If an exact constant is used (e.g., 3 ft = 1 yd), it does not affect the number of significant digits in the calculated value.
e) If inexact constants are used (e.g., π = 3.1416), the constant with at least one more significant digit than the smallest number of significant digits in the original data is used.

A.2 Rounding

The following rounding rules are used in this Standard:

a) The digits that follow the last significant digit are dropped if the first digit is less than 5.
b) If the first digit dropped is greater than 5, the preceding digit is increased by 1.
c) If the first digit dropped is 5 and there are non-zero digits following the 5, the preceding digit is increased by 1.
d) If the first digit dropped is 5 and there are only zeros following the 5, the digit is rounded to the even number (e.g., for three significant digits, 1.655000 becomes 1.66, 1.625000 becomes 1.62).
e) For maximums and minimums, rounding is performed within the range of the maximum and minimum values in a way that does not violate the original limits.

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