

SQA/SNIJIB



Training and Assessment Programme for SVQ 3 SVQ level 3 Domestic Plumbing and Heating

SVQ Plumbing — Year 1

Formative Practical Pipework Installation

Stage 1: Syllabus Codes PP1.1–PP1.5

Introduction

The SVQ Plumbing Year 1 practical formative assessment covers all aspects of introductory practical installation.

Delivery of this Unit to a group of learners will involve many teaching and learning techniques and approaches.

The teaching and learning must take place in an environment where learners experience the use of working methods and tools used by a plumber installing and maintaining: hot and cold water, central heating, and sanitary pipework installations. This will prepare the learner for the summative assessment of all of the above in Year 2 (installation practice). It is anticipated that this Unit will mainly take place in a workshop. The workshop should provide a safe working environment for the fabrication, installation and testing of the various artefacts. Additionally, the workshop should be provided with 110 volt or 230 volt power outlets protected by either a residual current device (RCD) or a residual current breaker with overload (RCBO).

The syllabus document is set out in a manner to allow the tutor/lecturer to determine the areas of work to be covered within a certain time frame. This Unit will be offered over the first year of 'off the job' training. The programme structure (see Introduction) outlines the progress of the Unit and how it integrates with the other Units of the qualification.

All tasks are listed below. The tasks are set out in detail after the list. Each learner should have their own workbook containing all the tasks.

Assessment is formative for all parts of this Unit.

The tasks that the learner will carry out all reflect on the type of work they should be carrying out on site. It is important in the workshop situation that the teaching covers correct use of tools and materials. Manufacturer's instructions should always be referred to for the correct method of preparation and installation of all materials and fittings. It is also important that the learner understands which parts of fittings provide the water seal and which provide mechanical retention.

Learning should be by demonstration followed by learner participation. The learner should have sufficient practice of the various working methods to enable them to carry out the formative assessment without aid — either from the assessor or other learners.

Where tasks require the learner to identify tools or materials against a list, the assessor must complete a model answer prior to the assessment. This should be retained for both internal and external verification.

Year 1 — Practical activities

General

The learner must behave in a manner appropriate to the workshop environment.

For all tasks, the learner must:

- ◆ comply with safe working practices
- ◆ comply with safe working procedures
- ◆ wear appropriate personal protective equipment (PPE)
- ◆ comply with hygiene requirements in the workshop
- ◆ take care of tools (including maintenance and storage in an appropriate place in the workshop)

PPI 1.1

- (a) Identify a range of hand tools used in plumbing work
- (b) Identify and recommend remedial action for faulty tools
- (c) Select appropriate hand tools for a range of basic tasks
- (d) Work in a safe and appropriate manner

PPI 1.2

- (a) Identify pipework, fittings and associated materials for a range of installations including:
 - ◆ hot and cold water
 - ◆ central heating
 - ◆ above-ground drainage
 - ◆ below-ground drainage
- (b) Work in a safe and appropriate manner

PPI 1.3

- (a) Fabricate and pressure test copper pipework not exceeding 22 mm diameter
- (b) Fabricate and pressure test low-carbon steel pipework not exceeding $\frac{3}{4}$ inch diameter
- (c) Fabricate a range of plastic water supply pipework
- (d) Fabricate a range of above-ground drainage pipework
- (e) Work in a safe and appropriate manner

PPI 1.4

- (a) Identify a range of power tools and associated equipment used in plumbing work
- (b) Demonstrate safe operation of power tools and associated equipment
- (c) Select power tools for a range of basic operations
- (d) Check the power tool is safe to use
- (e) Make fixings to a range of backgrounds including:
 - ◆ brick or block
 - ◆ timber
 - ◆ plaster board
- (f) Work in a safe and appropriate manner — including PPE appropriate to the task

PPI 1.5

- (a) Working in pairs, assemble a tower scaffold over 2 m high
- (b) Working off the scaffold, each learner should fix a PVC fascia bracket to a timber background
- (c) Work in a safe and appropriate manner

Information for learners

In all work situations, and while carrying out the following tasks, you must behave in a manner appropriate to the workshop environment.

For all tasks, you must:

- ◆ comply with safe working practices
- ◆ comply with safe working procedures
- ◆ wear appropriate personal protective equipment for the task in hand
- ◆ comply with hygiene requirements in the workshop
- ◆ take care of tools (including maintenance and storage in an appropriate place in the workshop)

PPI 1.1 (a) Identify a range of hand tools used in plumbing work

Name:	Class:	Date:
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Your assessor will show you a range of hand tools. Each tool will be numbered.

You are required to match the numbers to the tools in the following list.

Plumbing tools	Tool number	Yes	No
Ball pein hammer			
Claw hammer			
Folding rule (steel)			
600 mm spirit level			
adjustable spanner			
Large hacksaw			
Junior hacksaw			
Pozidrive screwdriver			
Open-ended spanner			
Pipe wrench			
Phillips screwdriver			
Flat-bladed screwdriver			
Socket-forming tool			
Plumb bob			
15 mm and 22 mm hand bender (copper tube)			
Tape measure			
Pipe cutters for mild steel			
Pipe slice 15 or 22 mm copper tube			
Water pump pliers/gland nut pliers			
½" stocks and dies			

PPI1.1 (b) Identify and recommend remedial action for faulty tools

Name:	Class:	Date:
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Identify four faulty tools from the ones provided in PPI 1.1(a). For each faulty tool:

- ◆ name the fault
- ◆ state the repair required

Tool number from list	
Fault	
Remedial action	

Tool number from list	
Fault	
Remedial action	

Tool number from list	
Fault	
Remedial action	

Tool number from list	
Fault	
Remedial action	

PPI 1.1 (c) Select appropriate tools for a range of basic tasks

Name:	Class:	Date:
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Using the list in PPI 1.1(a), choose the tools that you would use to complete the tasks indicated in the table below.

Write the name of **one** tool beside each task.

Task	Name of tool
Measure the length of a pipe	
Assemble LCS pipe and fittings	
Cut copper tube	
Level a wash-hand basin	
Thread LCS pipe	
Tighten a 15 mm compression fitting	

Marking schedule and learner feedback

PPI 1.1 (a)–(d)

Name:		Class:	Date:
Result:	Assessor:		Date:

Marking schedule	Yes	No
(a) Identify a range of hand tools used in plumbing work		
◆ All tools identified correctly		
(b) Identify and recommend remedial action for faulty tools		
◆ Faulty tools identity numbers correct		
◆ Faults identified correctly		
◆ Appropriate remedial action recommended		
(c) Select appropriate hand tools for a range of basic tasks		
◆ Selected hand tools are suitable for purpose		
(d) Work in a safe and appropriate manner		
◆ Safe working practices have been followed		
◆ Correct use of tools		
Learner feedback		
Learner's response		
Learner's signature		

Note to assessor: Learner feedback should relate to the marking schedule

Information for learners

PPI 1.2 (a) Identify pipework, fittings and associated materials

Name:	Class:	Date:
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Identify pipework, fittings and associated materials for a range of installations including: hot and cold water; central heating; above-ground drainage; below-ground drainage

Working in a safe and appropriate manner, you are required to complete the following table — either by finding the items in the workshop or from those laid out by your assessor.

When you are identifying the system they would be used for, C = cold water, H = hot water, H&C = hot and cold water, CH= central heating, AG = above-ground drainage, BG = below-ground drainage. The first row has been completed for you.

When the identified material or component could be used in more than one system you should put letters in for all appropriate systems.

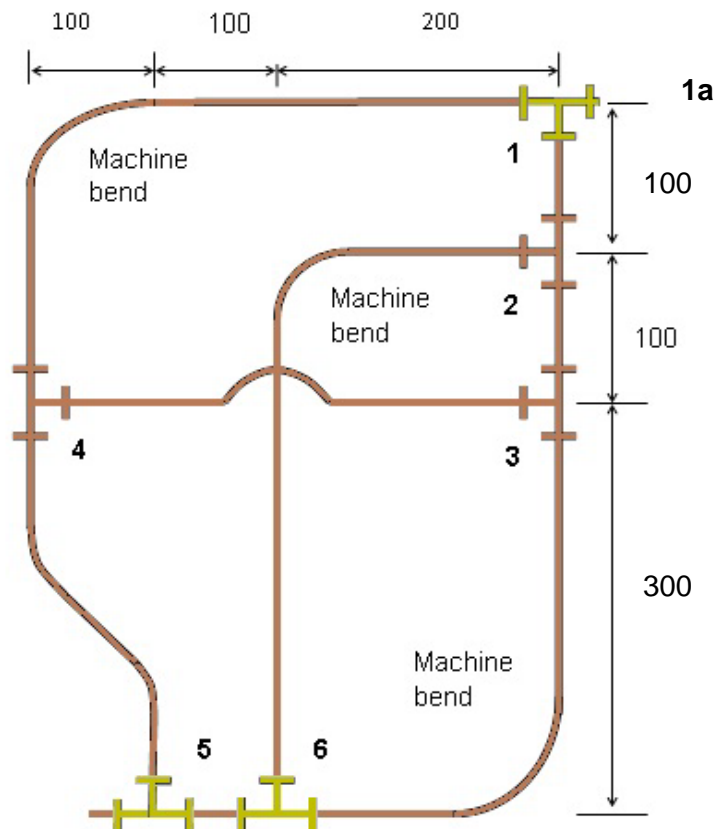
Item	Number	Used in
110 mm brown PVCu pipe	#	BG
110 mm grey PVCu pipe		
15 mm copper tube		
15 mm polybutylene pipe		
15 mm cross-linked, polyethylene pipe		
25 mm medium density polyethylene pipe		
½" low carbon steel pipe		
110 mm cast iron pipe		
15 mm integral ring solder fitting		
25 mm MDPE × 22 mm CU straight coupling		
15 mm radiator valve		
½" MC union		
110 mm grey PVCu branch		
40 mm HDPE trap		
22 mm dzr straight coupling		
15 mm cross-linked, polyethylene tee		
22 mm 2-port motorised valve		
15 mm polybutylene elbow		

Information for learners

PPI 1.3 (a) Fabricate and pressure test copper pipework not exceeding 22 mm diameter

You should have sufficient practice of bending tube and using fittings to enable you to complete the fabrication below without help.

Work in a safe and appropriate manner.



Fittings legend

1	5 mm × 1/2" × 15 mm tee	4	15 mm equal solder tee end feed
1a	1/2" air vent plug	5	15 mm equal tee (compression)
2	15 mm equal tee crimped	6	22 × 15 × 15 mm tee (compression)
3	22 × 15 × 15 mm tee integral solder ring		

Marking schedule and learner feedback

PPI 1.3 (a) and (e)

Name:	Class:	Date:
Result:	Assessor:	Date:

Marking schedule	Yes	No
(a) Fabricate copper pipework not exceeding 22 mm diameter		
♦ Machine bends to be free from excessive throating or wrinkles. Where applicable, angles were within $\pm 2^\circ$		
♦ Dimensions to be within ± 5 mm		
♦ Capillary joints to have no excessive solder runs		
♦ Pipe ends to be cut square and free from burrs		
♦ Completed exercise with no excessive markings		
♦ Finished model is tested to BS6700 with no apparent leaks		
(e) Work in a safe and appropriate manner		
♦ The learner wears appropriate personal protective equipment		
♦ The learner works in a safe manner		
♦ The working area is maintained in a condition likely to promote safety at work		
Learner feedback		
Learner's response		
Learner's signature		

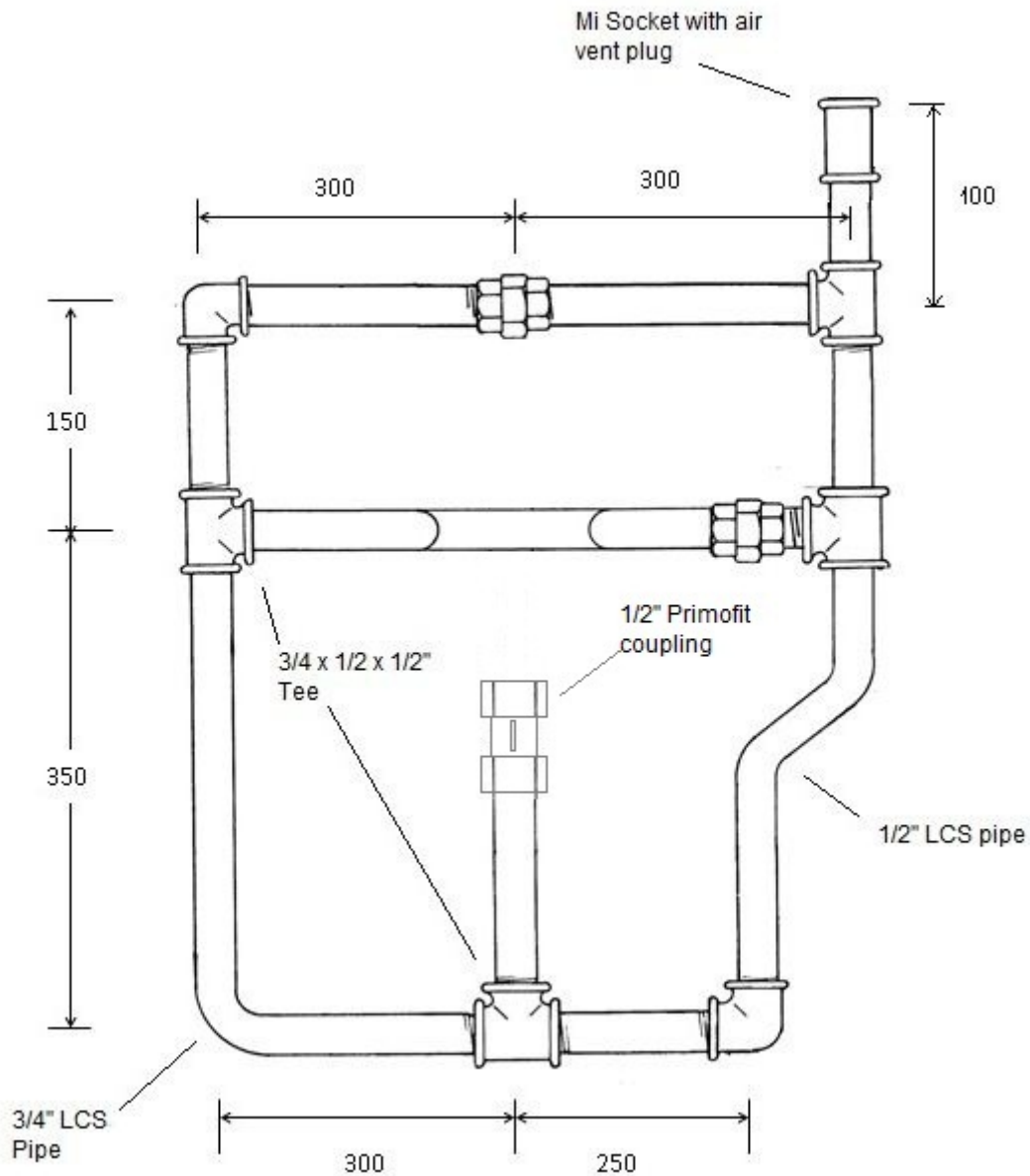
Note to assessor: Learner feedback should relate to the marking schedule

Information for learners

PPI 1.3 (b) Fabricate and pressure test low-carbon steel pipework not exceeding $\frac{3}{4}$ inch diameter

You should have sufficient practice of bending tube and using fittings to enable you to complete the fabrication below without help.

Work in a safe and appropriate manner.



Marking schedule and learner feedback

PPI 1.3 (b) and (e)

Name:		Class:	Date:
Result:	Assessor:		Date:

Marking schedule	Yes	No
(b) Fabricate and pressure test low-carbon steel pipework not exceeding $\frac{3}{4}$ inch diameter		
◆ Made machine bends that were free from flattening and, where applicable, within $\pm 2^\circ$		
◆ Completed the task with no dimension exceeding ± 10 mm		
◆ Made all joints in true alignment		
◆ Had no excessive jointing material visible		
◆ Cut pipe ends square and free from burrs		
◆ Completed model with no excessive markings		
◆ Pressure-tested the model with water to 1 bar with no apparent leaks		
(e) Work in a safe and appropriate manner		
◆ Wore appropriate personal protective equipment		
◆ Worked in a safe manner		
◆ Maintained the working area in a condition likely to promote safety at work		
Learner feedback		
Learner's response		
Learner's signature		

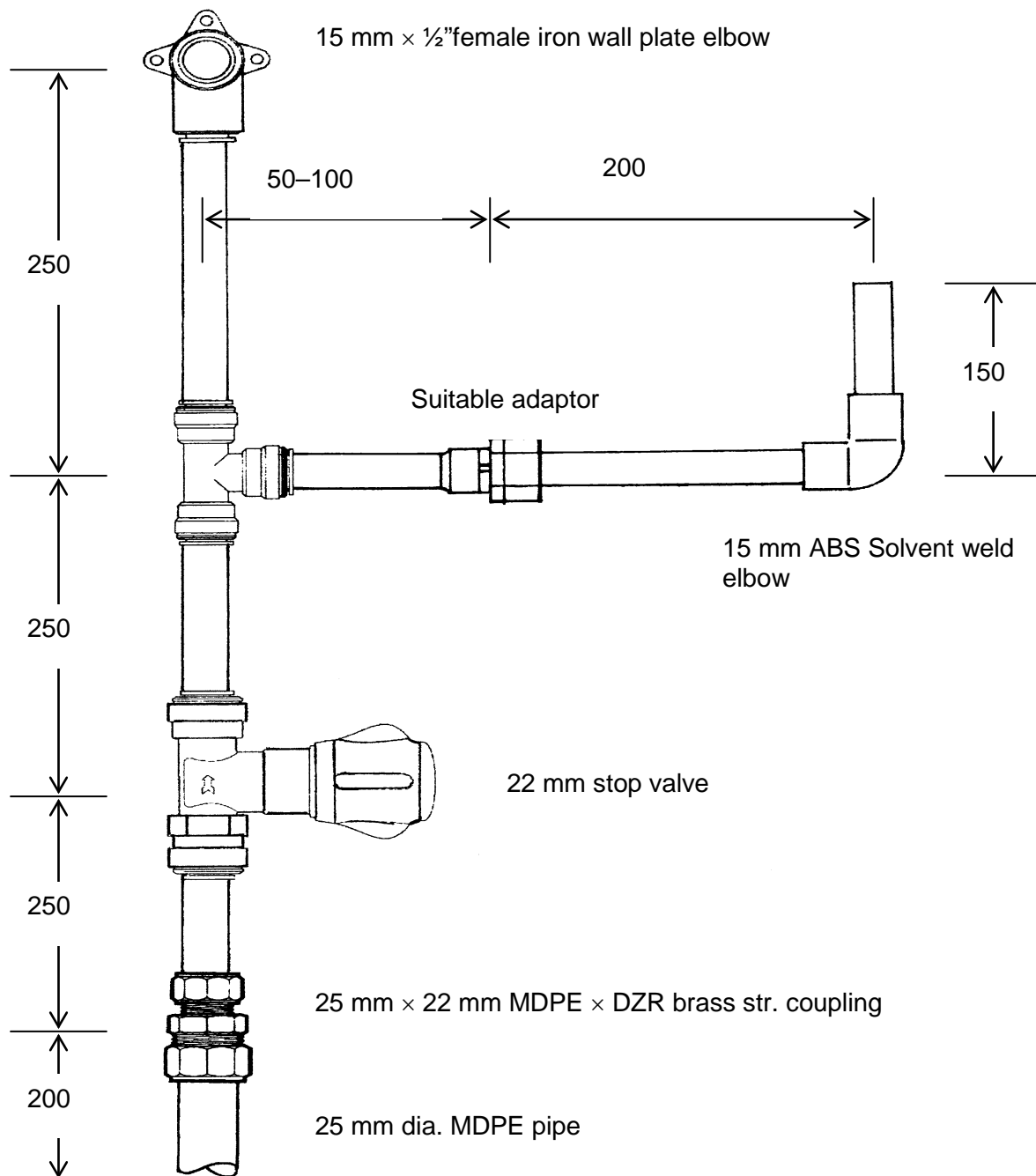
Note to assessor: Learner feedback should relate to the marking schedule

Information for learners

PPI 1.3 (c) Fabricate a range of plastic water supply pipework

You should fabricate the pipework assembly to the stated dimensions as shown below. All dimensions are measured from centre to centre and are stated in millimetres.

Work in a safe and appropriate manner.



Marking schedule and learner feedback sheet

PPI 1.3 (c) and (e)

Name:		Class:	Date:
Result:	Assessor:		Date:

Marking schedule	Yes	No
(c) Fabricate a range of plastic water supply pipework		
◆ Cut pipe ends square, free from burrs and (where appropriate) chamfered ends		
◆ Used support sleeves used where appropriate		
◆ Pushed pipe in to the correct depth when assembling, push-fit joints		
◆ Correctly assembled and tightened compression fittings		
◆ Completed the task with no dimension exceeding ± 5 mm		
◆ Completed the task with all joints in true alignment		
◆ Ensured the working area was adequately ventilated		
◆ Ensured solvent weld joints were free from excessive solvent		
(e) Work in a safe and appropriate manner		
◆ Wore appropriate personal protective equipment		
◆ Worked in a safe manner		
◆ Maintained the working area in a condition likely to promote safety at work		
Learner feedback		
Learner's response		
Learner's signature		

Note to assessor: Learner feedback should relate to the marking schedule

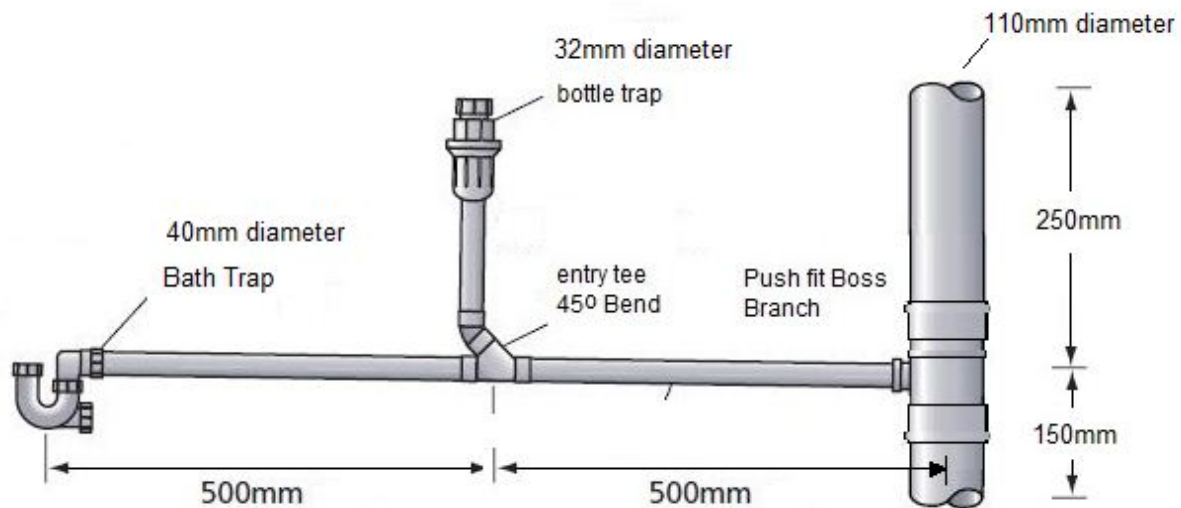
Information for learners

PPI 1.3 (d) Fabricate a range of above-ground drainage pipework

You should fabricate the pipework assembly to the stated dimensions as shown below. All dimensions are measured from centre to centre, or centre to end, and are stated in millimetres.

The completed assembly should be fixed to a background using pipe clips. After the assembly is fixed, an air test should be applied.

On successful completion of the test, the fabrication should be removed to allow other learners to use the background. (Ask your assessor to mark your work prior to removing it from the wall.)



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Marking schedule and learner feedback

PPI 1.3 (d) and (e)

Name:		Class:	Date:
Result:	Assessor:		Date:

Marking schedule	Yes	No
(d) Fabricate a range of above-ground drainage pipework		
◆ Cut pipe ends square, free from burrs and (where appropriate) with chamfered ends		
◆ Pushed pipe in to the correct depth when assembling, push-fit joints		
◆ Correctly assembled and tightened compression fittings		
◆ Completed the task with no dimension exceeding ± 5 mm		
◆ Completed the task with all joints in true alignment		
◆ Ensured that the working area was adequately ventilated		
◆ Did not have excessive solvent on solvent weld joints		
(e) Work in a safe and appropriate manner		
◆ Wore appropriate personal protective equipment		
◆ Worked in a safe manner		
◆ Maintained the working area in a condition likely to promote safety at work		
Learner feedback		
Learner's response		
Learner's signature		

Note to assessor: Learner feedback should relate to the marking schedule

Information for learners

PPI 1.4 (a) Identify a range of power tools and equipment used in plumbing work

Name:	Class:	Date:
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Power tools and their associated equipment are dangerous if not used properly. You must receive instruction in the correct use of tools, and any associated hazards, prior to using them for the first time.

Your assessor will show you a range of power tools. Each tool will be numbered. You are required to match the numbers to the tools in the following list.

Power tools	Power tool number
Electric CI pipe cutter	
230 V double insulated electric drill	
110 V electric drill	
Cordless electric drill	
Jig saw	
Circular saw	
110 V transformer	
110 V extension cable	
230 V extension cable	

Marking schedule and learner feedback

PPI 1.4 (a)

Name:	Class:	Date:
Result:	Assessor:	Date:

Marking schedule	Yes	No
(a) Identify a range of power tools and associated equipment used in plumbing work.		
♦ The correct identity number was selected		
Learner feedback		
Learner's response		
Learner's signature		

Note to assessor: Learner feedback should relate to the marking schedule

Information for learners

PPI 1.4 (b)–(g) Make fixings to a range of backgrounds

Make fixings to a range of backgrounds including:

- ◆ brick or block
- ◆ timber
- ◆ plaster board

You should:

- ◆ select the correct power tools/tools and equipment required to make fixings to the above backgrounds
- ◆ select the correct type of fixings to attach pipe clips to the above backgrounds
- ◆ fix clips to the above backgrounds at correct centres using the selected power tools/tools with the selected fixings

Work in a safe and appropriate manner.

Note to tutor/lecturer

Timber, brick or block and plaster board need not be a permanent part of structure. They should be fixed in place securely to enable the learner to work safely.

Where practical, the learner should fix clips in either vertical or horizontal rows with 50 mm space from centre to centre.

Marking schedule and learner feedback

PPI 1.4 (b)–(f)

Name:		Class:	Date:
Result:	Assessor:		Date:

Marking schedule	Yes	No
(b) Demonstrate safe operation of power tools and associated equipment		
(c) Select power tools for a range of basic operations		
(d) Check the power tool is safe to use		
(e) Make fixings to a range of backgrounds including: brick or block; timber; plaster board.		
◆ Marked to correct centres		
◆ Selected the correct power tools and equipment		
◆ Selected the correct type of fixings		
◆ Used power tools/tools to insert fixings in background materials		
◆ Fixed pipe clip securely to background		
◆ Completed the task with no dimension exceeding ± 5 mm		
(f) Work in a safe and appropriate manner — including PPE appropriate to the task		
◆ Wore appropriate personal protective equipment		
◆ Wore appropriate personal protective equipment for operation of power tools		
◆ Worked in a safe manner		
◆ Maintained the working area in a condition likely to promote safety at work		
Learner feedback		

Learner's response

Learner's signature

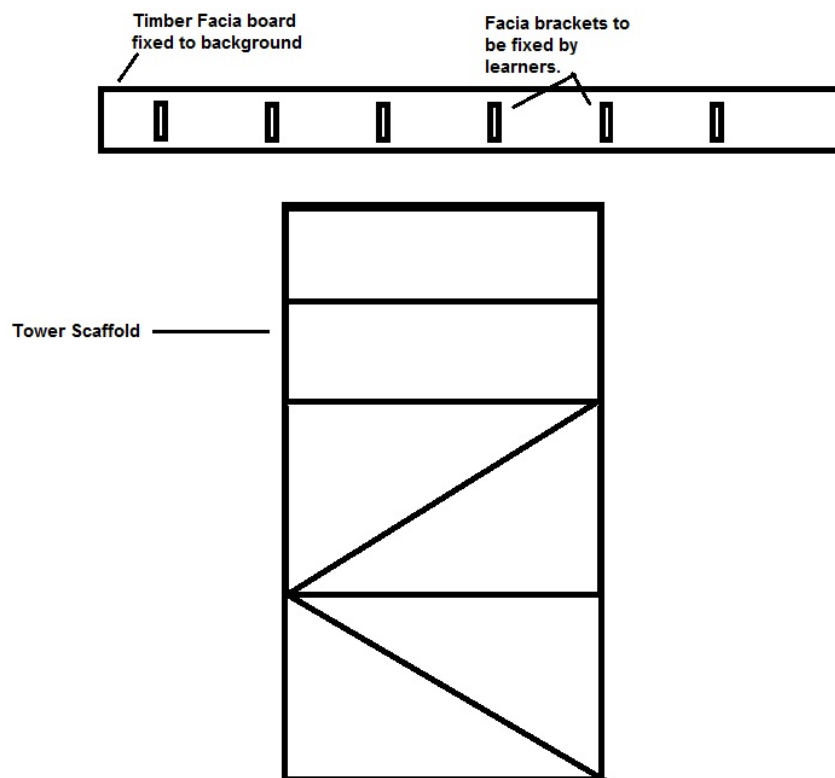
Note to assessor: Learner feedback should relate to the marking schedule

Information for learners

PPI 1.5 Assemble and work off a tower scaffold

Working in pairs, assemble a tower scaffold over 2 m high.

Working off the scaffold, each learner should fix a PVC fascia bracket to a timber background.



Marking schedule and learner feedback

PPI 1.5 (a) and (b)

Name/s	Class:	Date:
Result:	Assessor:	Date:

Marking schedule	Yes	No
(a) Working in pairs, assemble a tower scaffold over 2 m high.		
◆ The learner checked the condition of the tower scaffold components prior to erection		
◆ Erected the scaffold in accordance with the manufacturer's instructions		
◆ Inspected completed scaffold in accordance with manufacturer's instructions		
(b) Working off the scaffold, each learner should fix a PVC fascia bracket to a timber background.		
◆ Fixed fascia brackets in accordance with manufacturer's instructions		
◆ Dismantled and stored scaffold safely after completion of work		
◆ Wore appropriate personal protective equipment		
◆ Worked in a safe manner		
◆ Maintained the working area in a condition likely to promote safety at work		
Learner feedback		
Learner's response		
Learner's signature		

Note to assessor: Learner feedback should relate to the marking schedule