Supplementary Assessment

(100 short answer questions)

Note: The page number given at the end of each question gives an indication where the answer can be found.

(1) The safety signs illustrated in Figure 1 indicate things the operative must or must not do. Identify the meaning of each sign. (Page 19.)

A	Wear ear protection
B	Wear hand protection
C	No naked flames

Figure 1

(2) State how hazard signs differ from prohibition and mandatory signs. (Page 18.)

Warning signs are triangular in shape with a black symbol on a yellow background – designed to indicate essential safety advice

(3) Identify the statutory document which must be observed on site at all times to ensure safety. (Page 12.)

Health and Safety at Work Act 1974

2

(4) Identify the contents of each of the fire extinguishers shown in Figure 2 and give examples of their fire preventive uses. (Page 27.)

Label	Contents	Uses (i.e. type of fire)
Blue	Powder	Everything except cooking oils
Red	Water	Wood and paper
Cream	Foam	Wood, paper and flammable liquids
Black	CO_2	Flammable liquids

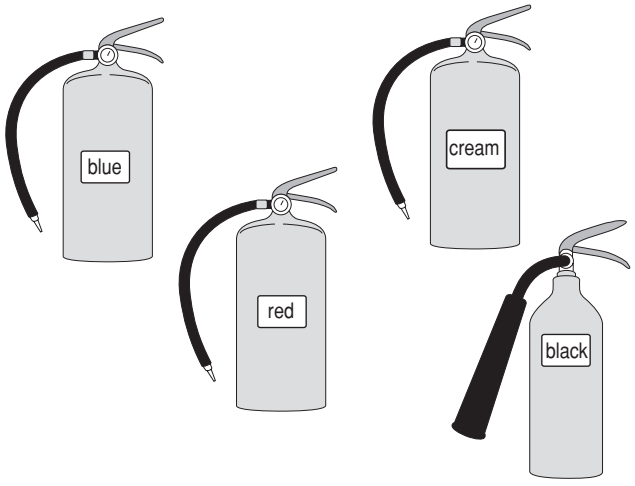


Figure 2

(5) Identify the statutory document which should be observed when carrying out work involving the following (Page 28):

Water Supply	Water Supply (water fittings) Regulations
Gas Supply	Gas Safety (installation and use) Regulations
Electricity	Electricity at Work Regulations
Building	Building Regulations

(6) State the contents of the series of pipes which have been colour-banded, as shown in Figure 3, found in a boiler house running along a wall. (Page 30.)

Pipe No	Contents
1	Steam
2	Compressed air
3	Fire extinguishing water supply
4	Drinking water supply
5	Natural gas

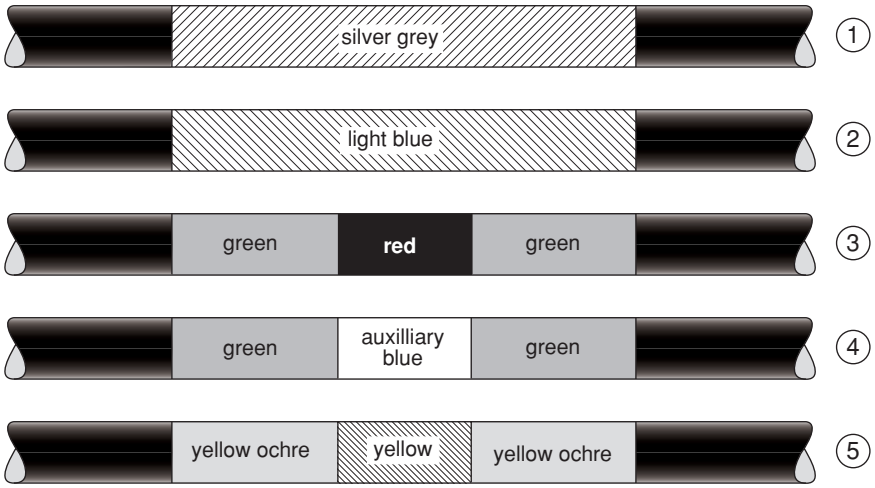


Figure 3

(7) Convert the following SI units into their British Imperial equivalents. (Page 32.)

14 kg = 14 ÷ 0.4536	=	30.86 lb
50 litres = 50 ÷ 4.536	=	11.02 gal

4

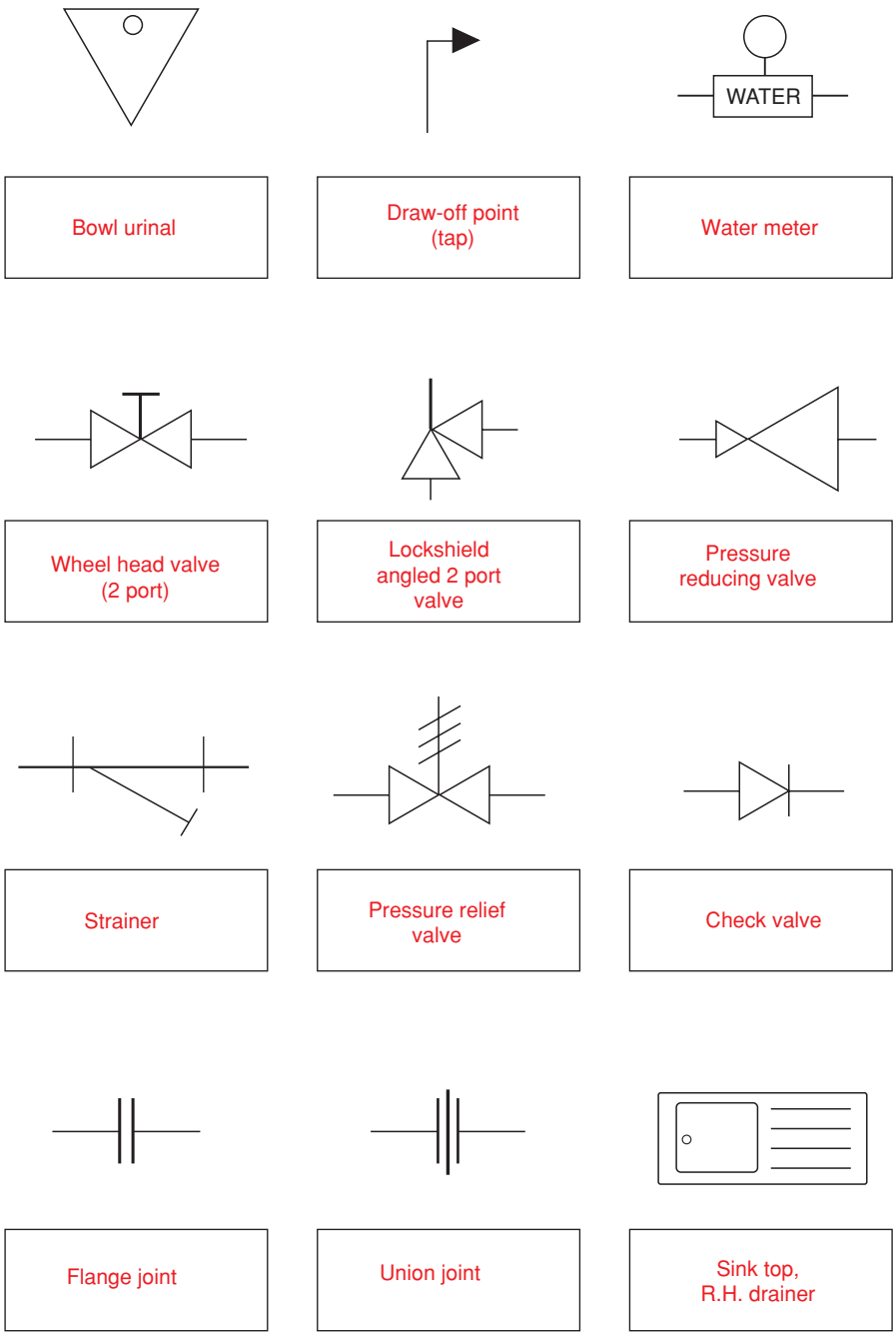

WATER
Bowl urinal
Draw-off point (tap)
Water meter
Wheel head valve (2 port)
Lockshield angled 2 port valve
Pressure reducing valve
Strainer
Pressure relief valve
Check valve
Flange joint
Union joint
Sink top, R.H. drainer

Figure 4

(8) In the space provided below each symbol, indicate the name given to the graphic symbols shown in Figure 4. (Page 31.)

(9) Convert the following British Imperial units into their SI equivalents. (Page 32.)

5 yds = 5 × 0.9144	4.572 m
60 000 Btu/h = 60 000 × 0.0002931 = 17.6 kW	

(10) What special precautions need to be observed when using LPG in or around trenches and drains, and why? (Page 14.)

To ensure no leakage of the gas because LPG is heavier than air and any leakage will accumulate in low places/pockets, leading to a possible explosion.

(11) With reference to the following materials, complete the table, listing the materials in order of their correct position within the electrochemical series, placing the cathodes above the anodes. (Page 41.)
Materials: aluminium, copper, lead, tin, zinc.

Physical properties of typical metals

Material in order of the electro-chemical series	Chemical symbol	Melting point (°C)	Relative density (kg/m^3)	Specific heat capacity (kJ/kg K)	Coefficient of expansion
Copper	Cu	1083	8.9	0.385	0.000016
Lead	Pb	327	11.3	0.125	0.000029
Tin	Sn	232	7.3	0.226	0.000021
Zinc	Zn	419	7.1	0.397	0.000029
Aluminium	Al	660	2.7	0.887	0.000026

(12) Calculate (in mm) the amount of expansion that would occur in a length of copper pipe 30 m long when subjected to a temperature rise of 62°C. (Page 43.)

30 × 62 × 0.000016 = 0.03 m ∴ 30 mm

6

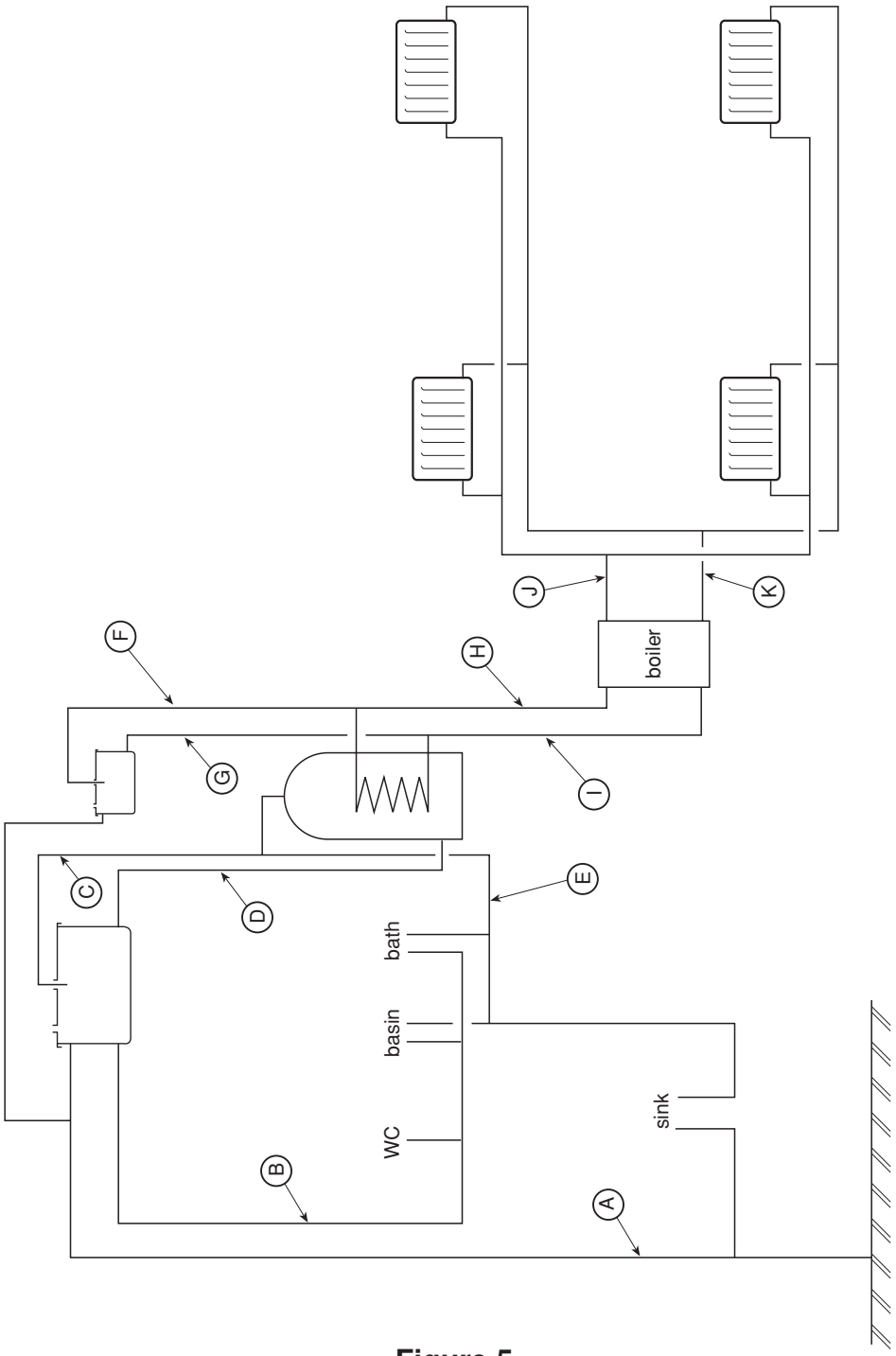


Figure 5

(13) Identify the name given to the design of systems shown in Figure 5. (Pages 89, 105 and 141.)

Cold water system:	Indirect
Hot water system:	Indirect 'vented'
Central heating system:	Two pipe with gravity primaries

(14) Complete Figure 5 (using correct graphic symbols) by indicating all the necessary valves, etc., which would be included in the design of the various systems. Also complete the following schedule to identify the name given to each pipe indicated and give a suggested pipe size. (Pages 89, 105 and 141.)

Section	Name	Pipe size
A	Supply	15
B	Cold distribution	22
C	Open vent from dhw	22
D	Cold feed to dhw	22
E	Hot distribution	22
F	Open vent from primary circuit	22
G	Cold feed to primary circuit	15
H	Primary flow	22
I	Primary return	22
J	c.h. flow	22
K	c.h. return	22

(15) Define what is meant by relative density and specific heat capacity. (Pages 40–42.)

Relative density: The mass of a substance compared to an equal volume of water

Specific heat capacity: The amount of heat (kJ) required to raise 1 kg of material by 1°C

8

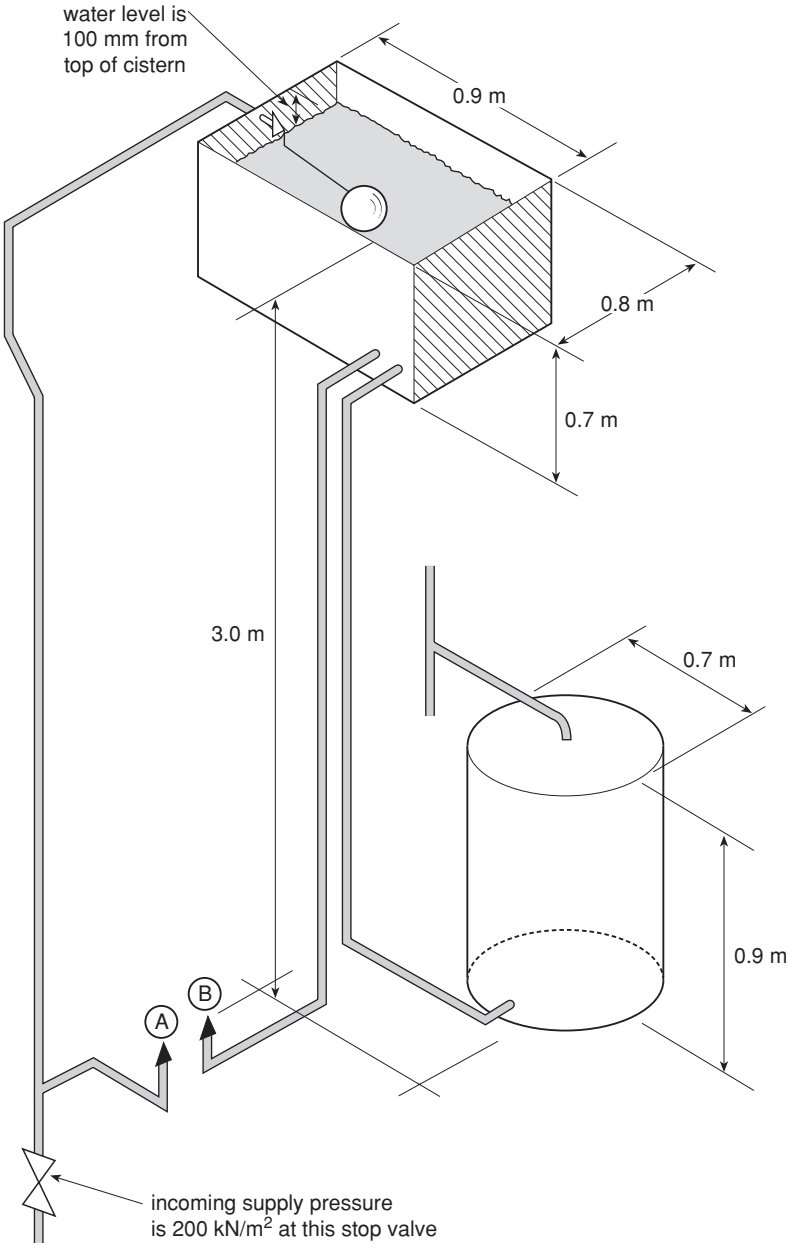

water level is
100 mm from
top of cistern
0.9 m
0.8 m
0.7 m
3.0 m
0.7 m
0.9 m
B
A
incoming supply pressure
is 200 kN/m2 at this stop valve

Figure 6

(16) With reference to the dimensions given in Figure 6, calculate the actual capacity of the storage cistern and the capacity of the dhw storage cylinder. (Page 34.)

Actual storage capacity of cistern	$L \times B \times H \times 1000 = \text{litres}$ $\therefore 0.9 \times 0.8 \times (0.7 - 0.1) \times 1000 = 432 \text{ litres}$

Storage capacity of dhw cylinder	$\pi r^2 \times H \times 1000 = \text{litres}$ $\therefore 3.142 \times 0.35^2 \times 0.9 \times 1000 = 346 \text{ litres}$

(17) With reference to the dimensions given in Figure 6, calculate the intensity of pressure at tap B and compare this to the mains pressure at tap A. Also find the height to which the mains pressure would rise above the stop valve in a vertical pipe, ignoring the frictional resistance. (Page 38.)

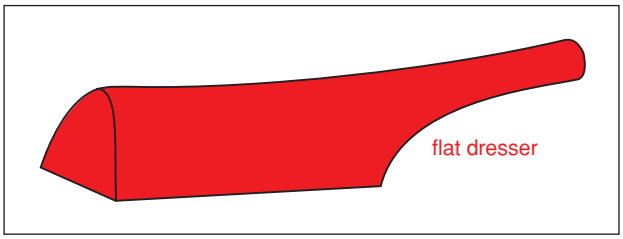
Pressure at tap B =	$\text{Head} \times 9.81 = \text{Intensity of pressure}$ $\therefore (3.0 - 0.1) \times 9.81 = 28.4 \text{ kN/m}^2$

Height to which mains pressure would rise above the stop valve	$\text{Pressure} \div 9.81 = \text{Head}$ $\therefore 200 \div 9.81 = 20 \text{ metres}$

(18) Find the total pressure at the base of the dhw cylinder in Figure 6. (Page 38.)

$\text{Intensity of pressure} \times \text{area acted upon} = \text{Total pressure}$
$\therefore H \times 9.81 \times \pi r^2 = \text{Total pressure}$
$\therefore (3.0 - 0.1) \times 9.81 \times 3.142 \times 0.35^2 = 10.9 \text{ kN}$

(19) In the space provided illustrate a flat dresser. (Page 51.)



(20) Give the name of each of the two pipe cutters, illustrated in Figure 7, used to cut low carbon steel tube. Each has an advantage over the other. State what this advantage is. (Page 49.)

Cutter A **Three wheel cutter** Allows you to cut the pipe without a full 360° rotation of the tool around the pipe

Cutter B **Roller cutter** Prevents an external burr forming, as would result using a multi-wheel cutter (i.e. as in 'A' below)

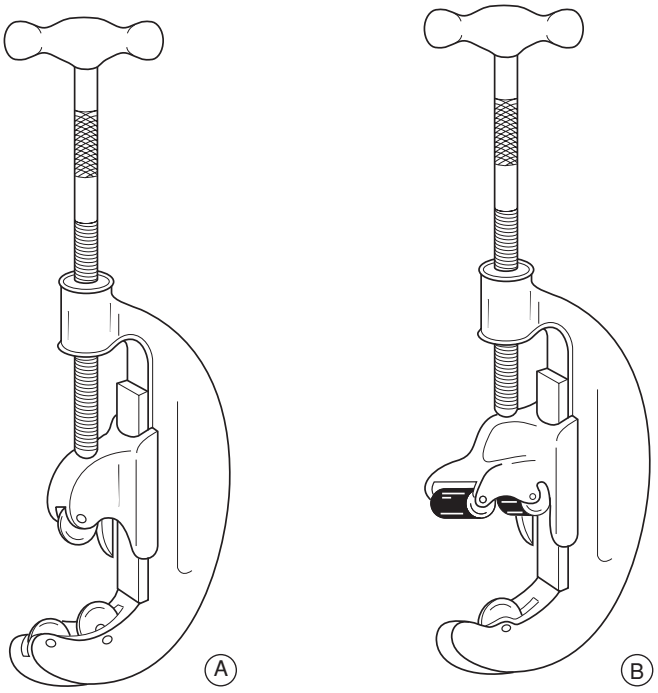


Figure 7

(21) When soft soldering, why is the application of a flux required? (Page 64.)

Main reason: to prevent the oxidation of the material to be soldered after it has been cleaned and heat applied.

(22) Figure 8 illustrates oxyacetylene welding equipment. In the spaces provided round the figure, name each of the components indicated. (Page 67.)

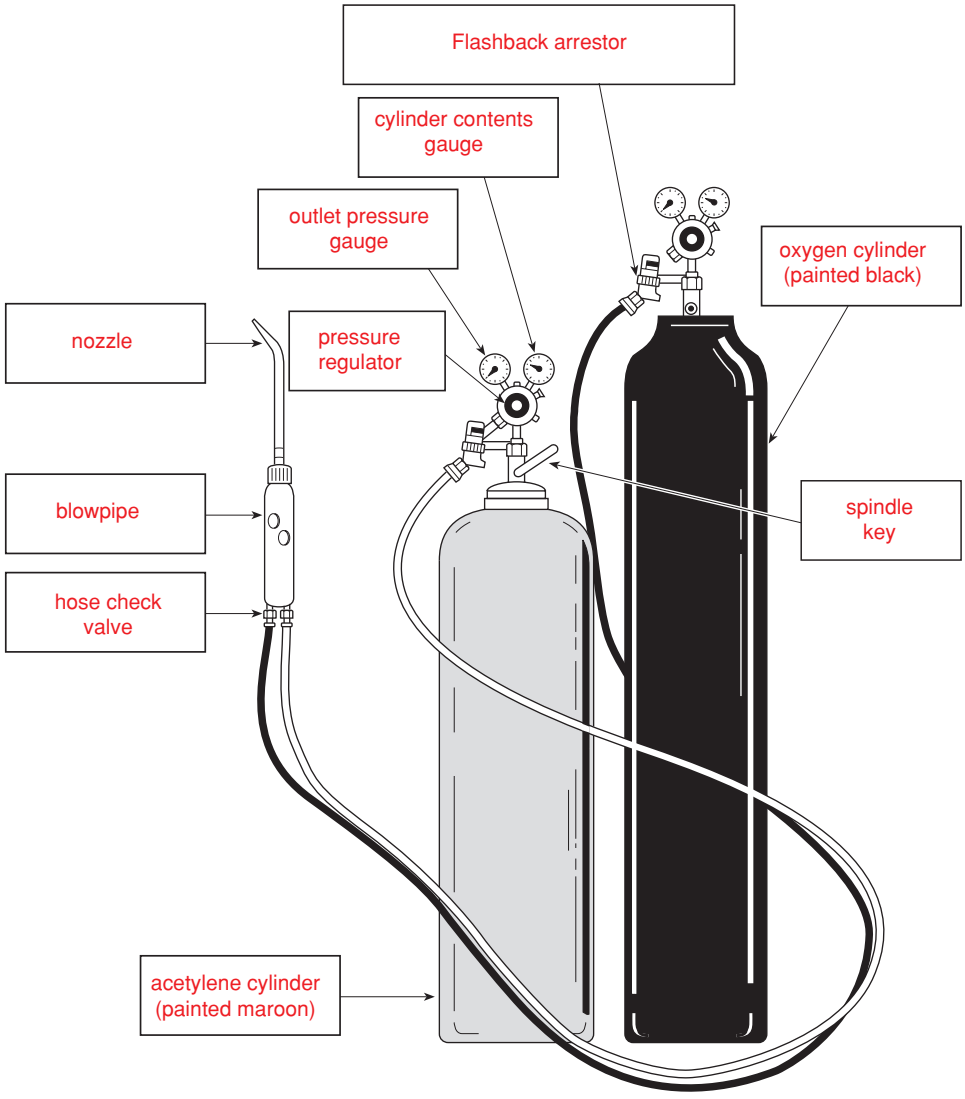
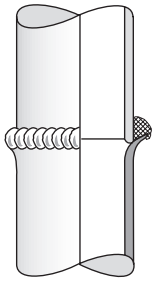


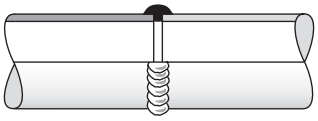
Figure 8

(23) When autogenous welding on materials such as lead and steel, no flux is required. State why this is so. (Page 68.)

Because the oxyacetylene flame (adjusted to give a neutral flame) prevents gases in the air coming into contact with the surface metal.

(24) Figure 9 shows two completed bronze welded joints. In the spaces provided near the figure give the name used to describe each joint. (Page 71.)





1 Bell joint

2 Butt joint

Figure 9

(25) Although the joints indicated in question 24 are referred to as welded joints they are not truly welded. State why this is so and identify what type of joints they are. (Page 70.)

Because no melting of the parent metal occurs. They are, in fact, hard soldered joints.

(26) Shown in Figure 10 is a section through a screwdown valve. State the name given to the tap illustrated and in the spaces provided name the arrowed components. (Pages 75–77.)

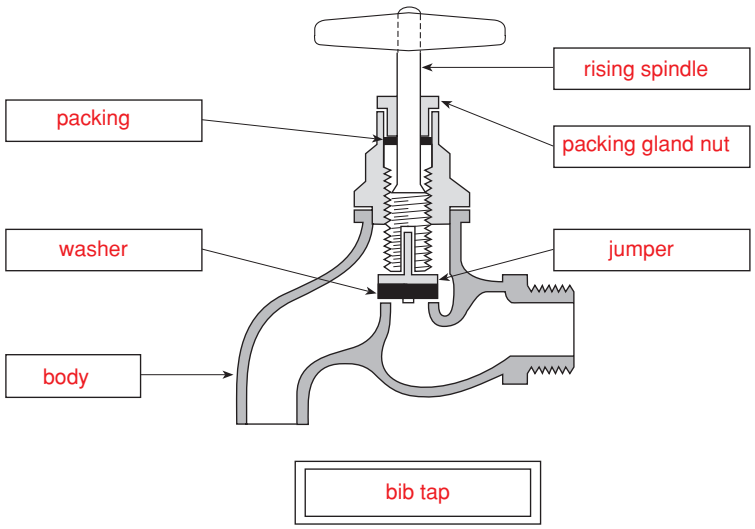


Figure 10

(27) State why a gatevalve or fullway ballvalve is fitted in the cold feed pipe to a vented system of dhw in preference to a stopcock. (Page 74.)

To limit the amount of frictional resistance of water flow through the fitting (the pipe is at low pressure).

(28) Under current Water Regulations, only float-operated valves conforming to BS 1212 Parts 2 or 3, may be fitted to cisterns in domestic premises; give the reasons for this. (Page 78.)

To allow for the provision of an air gap and to allow adjustment of the water level without the need to bend the lever arm.

(29) Complete Figure 11 using correct graphic symbols to show an indirect system of cold water supply. (Page 89.)

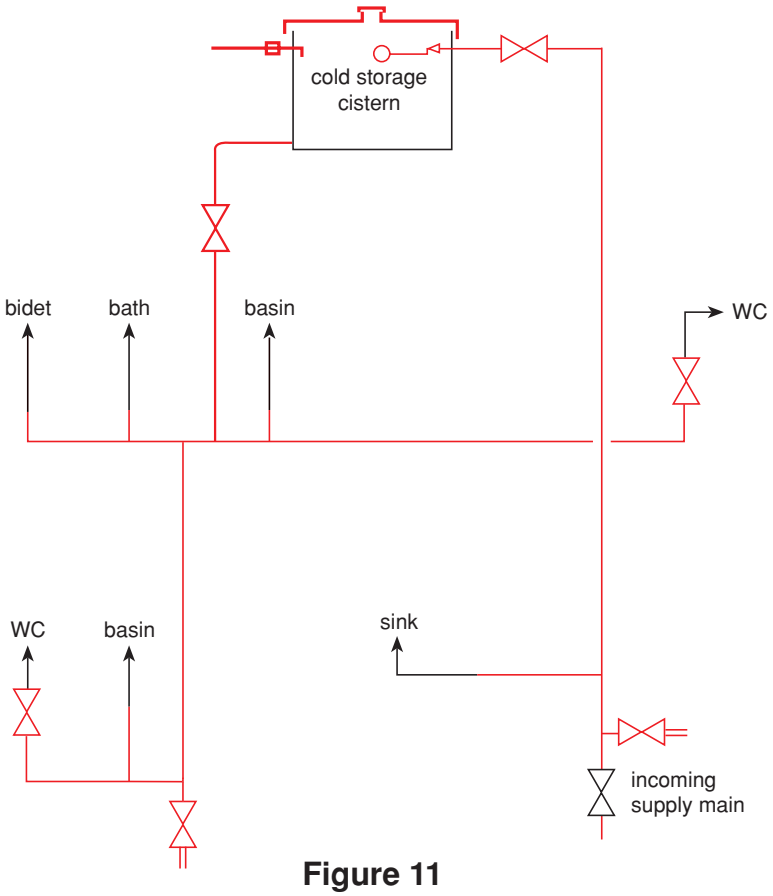
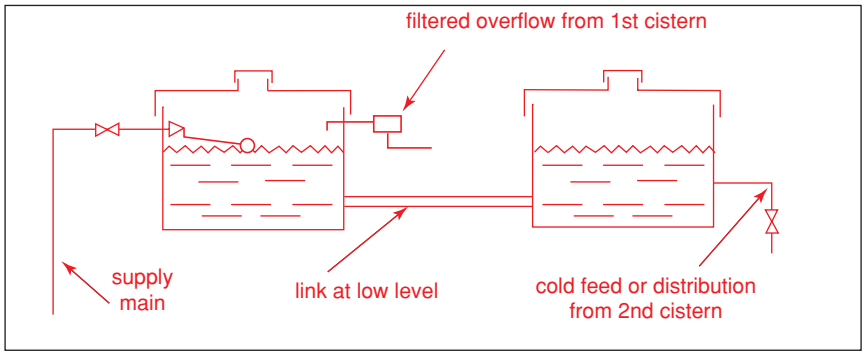


Figure 11

(30) Illustrate in the space provided how two small cisterns may be coupled together in a domestic situation to give a larger capacity, ensuring stagnation of the water will not occur. (Page 91.)



(31) With reference to Figure 12 name the components, numbered 1–6, fitted to the cold supply of the unvented system of dhw. (Page 107.)

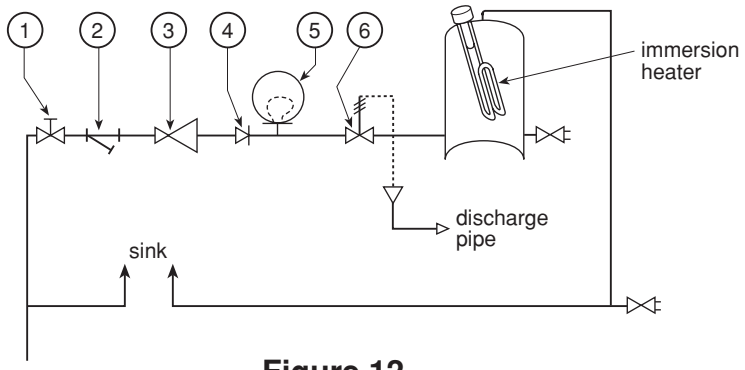


Figure 12

1. service valve	**4.** check valve
2. filter/strainer	**5.** sealed expansion vessel
3. pressure reducing valve	**6.** pressure relief valve

(32) Name the valve missing from Figure 12 which ensures complete safety regardless of excessively rising water temperatures caused by thermostat failure. (Without this device the system does not comply with the Building Regulations.) (Page 106.)

Temperature relief valve

(33) Each of the dhw systems illustrated in Figure 13 (over) shows major errors; state what these faults or contraventions are. (Pages 102–107.)

System A The cold feed supplying the primary circuit is from the same cistern as the dhw. Therefore it will lead to corrosion of the steel radiator. Also, in hard water areas limescale will form.

System B No temperature or pressure relief valves have been fitted.

System C The cold feed and vent connections have been wrongly located within the system.

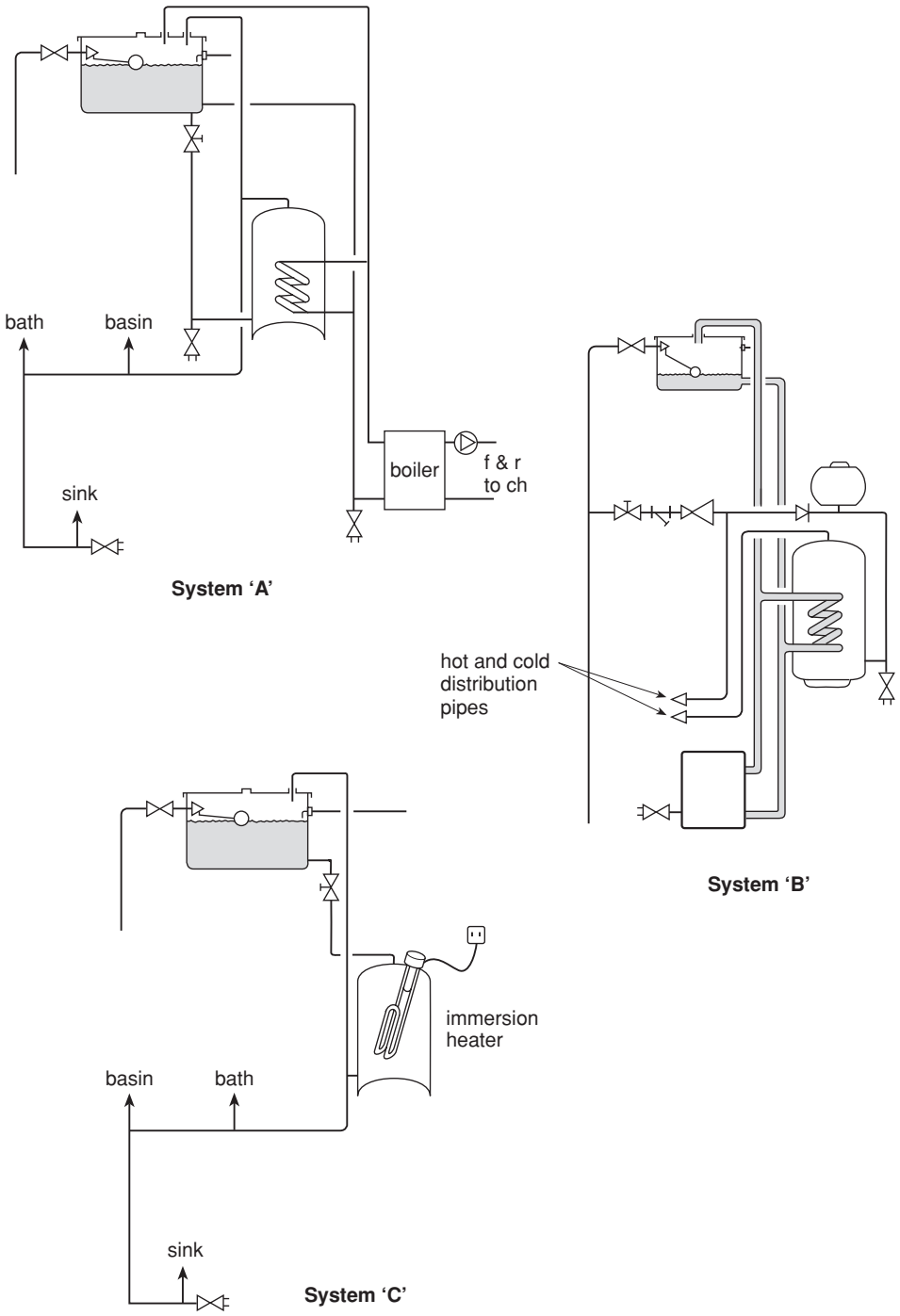

bath
basin
sink
boiler
f & r
to ch
System 'A'
hot and cold
distribution
pipes
System 'B'
immersion
heater
basin
bath
sink
System 'C'

Figure 13

(34) Name the instantaneous water heater shown in Figure 14 and state the purpose of the valve indicated at 'X'. (Page 113.)

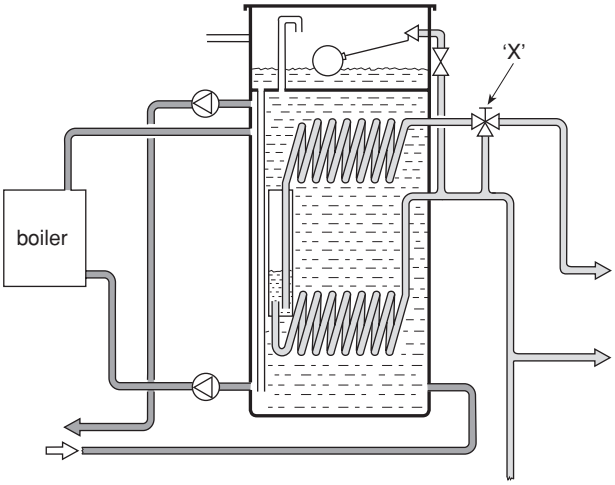


Figure 14

System referred to as: water jacketed tube heater or thermal storage
Purpose of valve 'X': to allow adjustment of the water temperature

(35) With reference to Figure 15, indicate in the space provided the maximum permissible depth which can be cut into the floor joist. Also indicate the maximum permissible distance at which the notch can be cut from the supporting wall. (Page 121.)

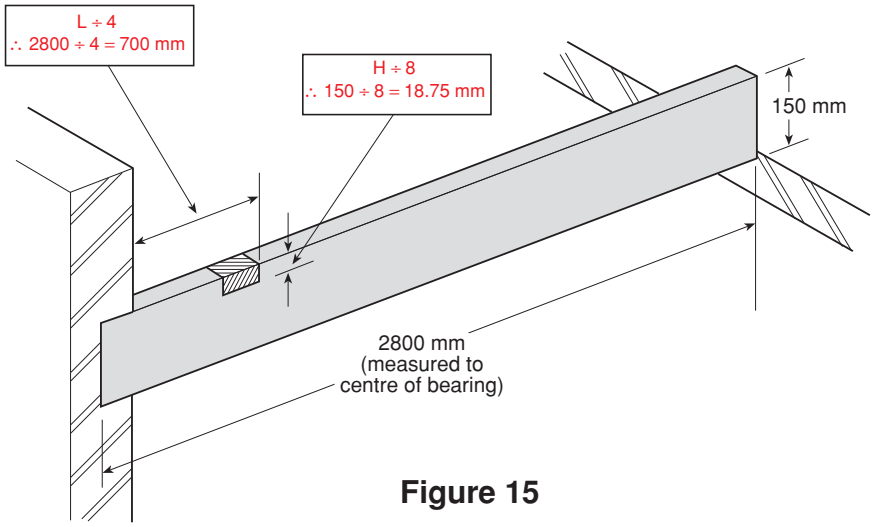


Figure 15

(36) Complete the illustration in Figure 16 to show (Page 141):

(a) A one pipe wet c.h. system
(b) A two pipe wet c.h. system
(c) A two pipe reversed return wet c.h. system

(37) State why the water level is adjusted low down in the f & e cistern feeding a wet c.h. system. (Page 144.)

To allow for the expansion of water from the c.h. system as it is heated.

(38) With reference to the bungalow illustrated on page 171 under the entry of Radiator and Boiler Sizing, complete the table below to find the heat emitter requirements for the bathroom. (Page 172.)

Heat requirements. Location: bathroom

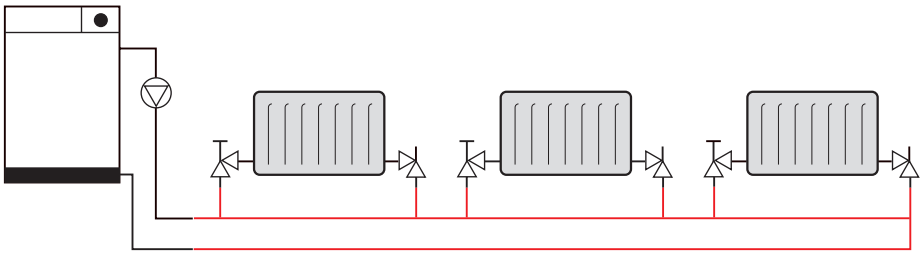
Fabric loss Element	Area L × B = (m^2)		Temp. diff. (°C)		U value (W/m^2°C)	Rate of heat loss (W)
Window	0.5 × 0.8 = 0.4	×	22	×	5.7	50.16
External walls	4.8 × 2.4 − 0.4 = 11.12	×	22	×	2.0	489.28
Internal walls	4.8 × 2.4 = 11.52	×	3	×	2.2	76.03
Floor	3.0 × 1.8 = 5.4	×	22	×	0.45	53.46
Roof	3.0 × 1.8 = 5.4	×	22	×	0.34	40.39
					Fabric loss	709.32
Ventilation loss						
					volume × air change × temp. diff. × factor =	
					3.0 × 1.8 × 2.4 × 2 × 2.2 × 0.33 =	188.18
					fabric loss + ventilation loss =	897.50
					plus 15% for intermittent heating =	134.63
					Total rate of heat loss =	1032.13

(39) What dangerous gas is produced as a result of incomplete combustion of natural gas? (Page 190.)

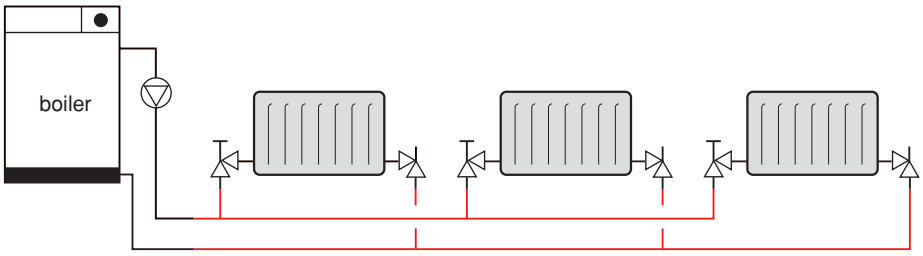
Carbon monoxide

(40) What do the initials LPG stand for? (Page 228.)

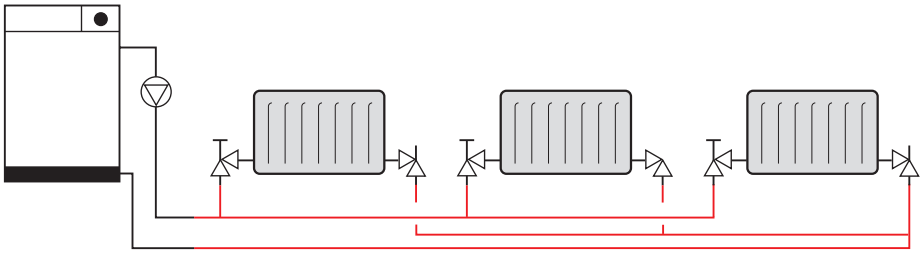
Liquefied petroleum gas



'A' one pipe wet c.h. circuit



'B' two pipe wet c.h. circuit



'C' two pipe reversed return wet c.h. circuit

Figure 16

(41) When carrying out a tightness test to an existing natural gas installation what is the pressure (in mbar) to which the system should be tested? (Page 200.)

20 mbar

(42) What is meant by the term let-by when testing gas installations? Describe how this test is carried out. (Page 200.)

The main emergency control valve at the meter is not shutting off the gas supply completely. To test, observe a manometer connected to the system with a pressure of just 10 mbar. Over a period of one minute the pressure should not rise, as seen on the manometer gauge.

(43) What is the name given to the device fitted in the pipeline to a gas appliance which maintains the gas at a constant pressure as recommended by the manufacturer? (Page 204.)

Gas regulator (or governor)

(44) Complete Figure 17 to show the flue pipe, terminal and minimum distances to be observed when terminating the natural draught open flue from a natural gas appliance. (Page 213.)

(45) What is meant by the term 'room sealed appliance' and why should these appliances generally be fitted in preference to open-flued appliances? (Page 220.)

An appliance which extracts the flue gas and draws its air supply for combustion from an adjacent point outside the building. It should be fitted in preference because it does not affect the air supply within the room.

(46) Calculate the effective free air ventilation requirements for an open-flued appliance of 18 kW natural gas net heat input. (Page 224.)

$(18 - 7) \times 5 = 55\ \text{cm}^2$

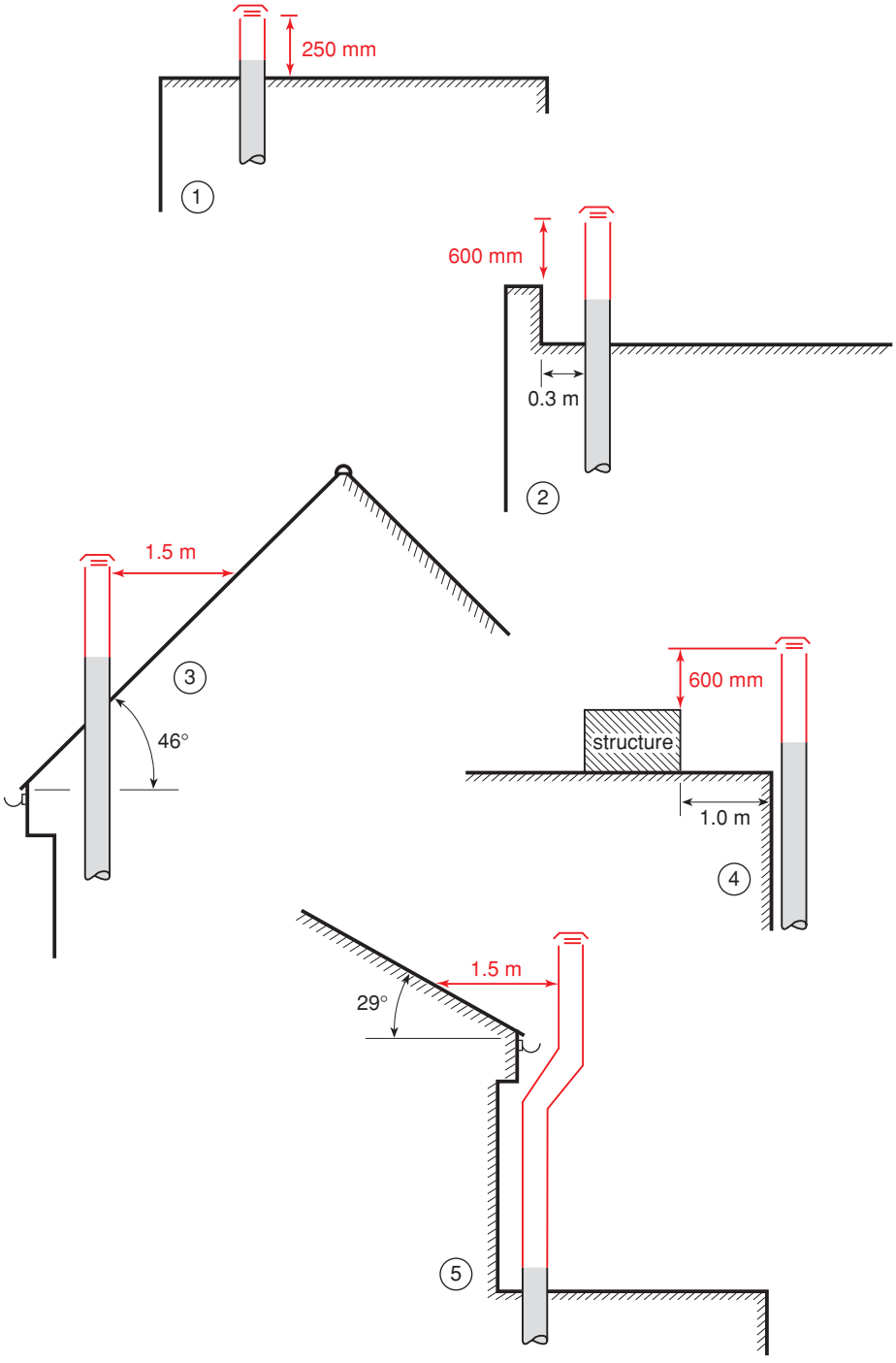


Figure 17

(47) With reference to the air grille illustrated in Figure 18, calculate its effective free air size. (Page 225.)

$9 \times 9 \times 42 = 3402\ mm^2\ (34\ cm^2)$

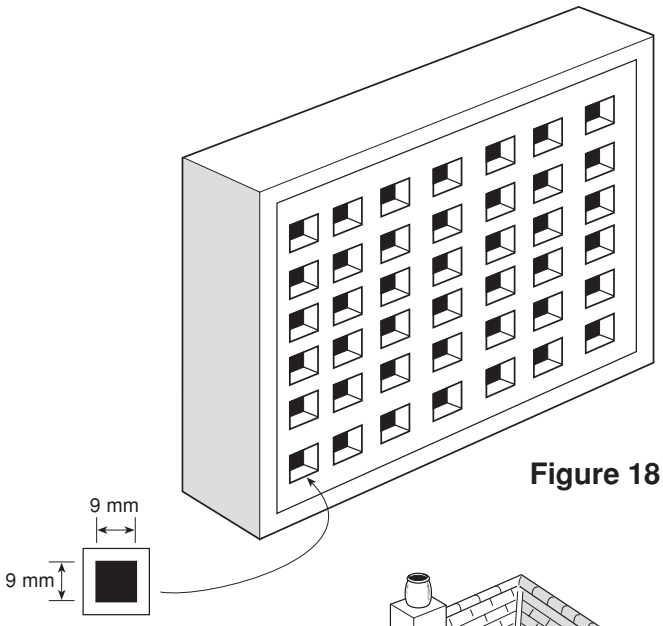


Figure 18

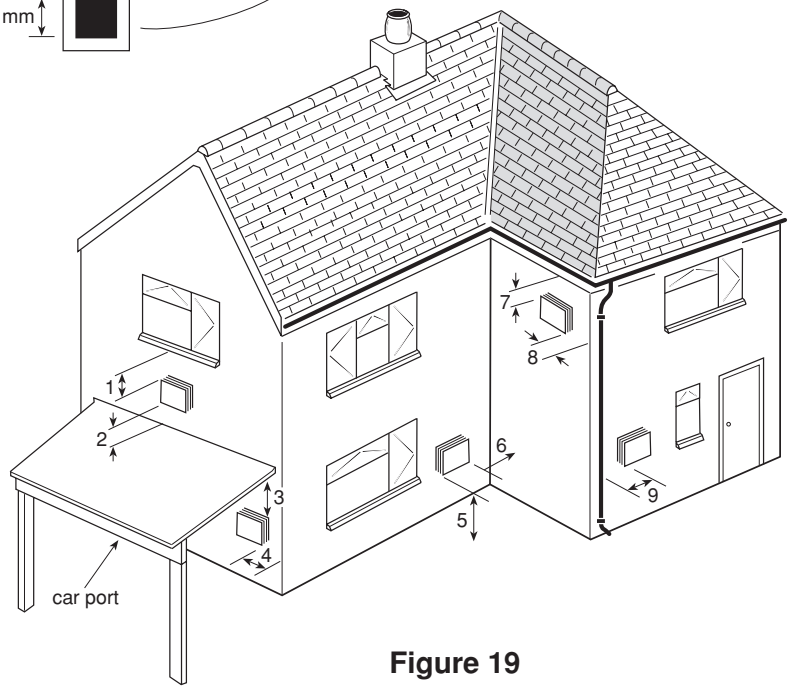


Figure 19

(48) Identify the minimum terminal location dimensions indicated for the 22 kW natural draught balanced flue appliances shown in Figure 19. (Page 221.)

1. 1500 mm	**4.** 600 mm	**7.** 300 mm
2. 300 mm	**5.** 300 mm	**8.** 600 mm
3. 600 mm	**6.** 600 mm	**9.** 300 mm from pipe 600 mm from corner

(49) State the minimum ventilation requirements (in mm^2) for a decorative fuel effect gas fire of 6 kW input rating into a room. (Page 224.)

100 cm^2 ∴ 10 000 mm^2

(50) Two grades of fuel are used for domestic oil fired burners; name these and explain how the fuels differ. (Page 246.)

Class C2 28 second fuel or kerosene
Class D 35 second fuel or gas oil
The main noticeable difference in the fuels is their colour; 28 second oil is clear, while 35 second fuel is red and also tends to wax up in winter.

(51) With reference to Figure 20, complete the illustration of the gravity-fed one-pipe oil supply system to show the necessary components and controls to be located on the storage tank and pipeline to enable its safe, efficient and effective use. (Page 251.)

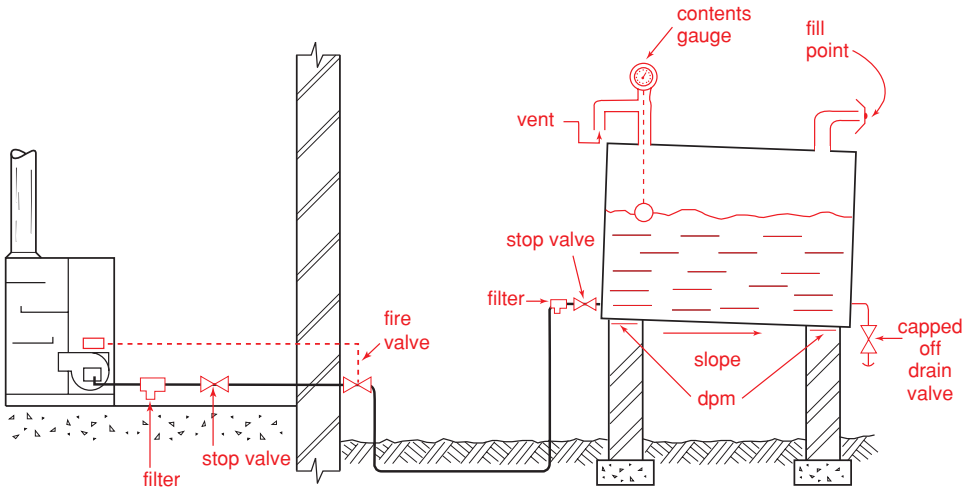


Figure 20

(52) Complete the illustration of the 'fusible link' type fire valve as shown in Figure 21, and explain its operation. (Page 253.)

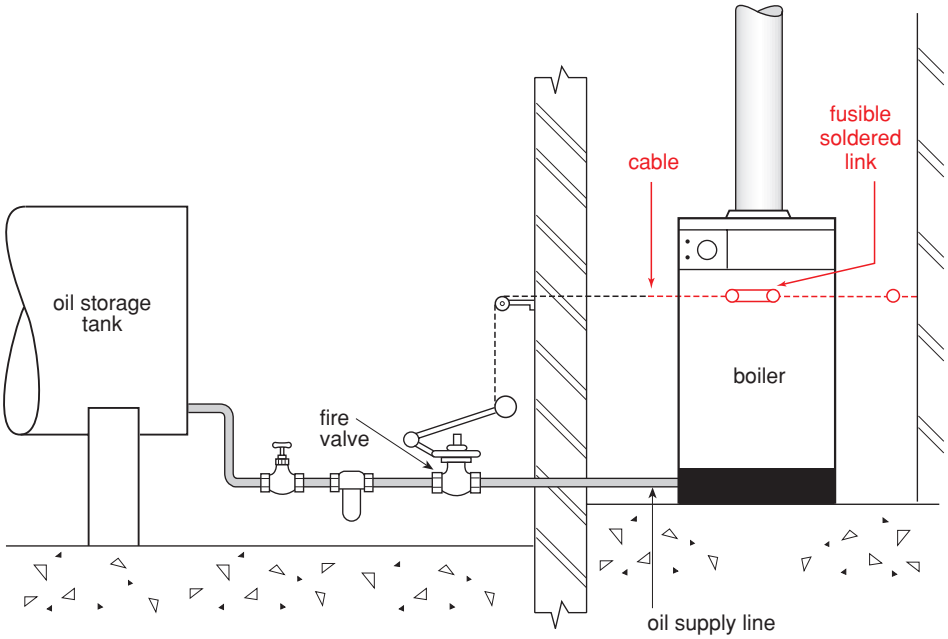


Figure 21

Operation of fire valve: should a fire develop within the vicinity of the boiler, the soldered joint of the fusible link melts and the weight of the arm of the fire valve forces it to close.

(53) State the purpose of a constant oil level control and indicate where one would be found. (Page 253.)

To maintain a constant level of oil at the base of a vaporising burner, irrespective of the oil level within the oil tank. It would be found adjacent to a vaporising burner, at its base.

(54) Use the spaces provided to name the arrowed components on the pressure jet burner shown in Figure 22. (Page 257.)

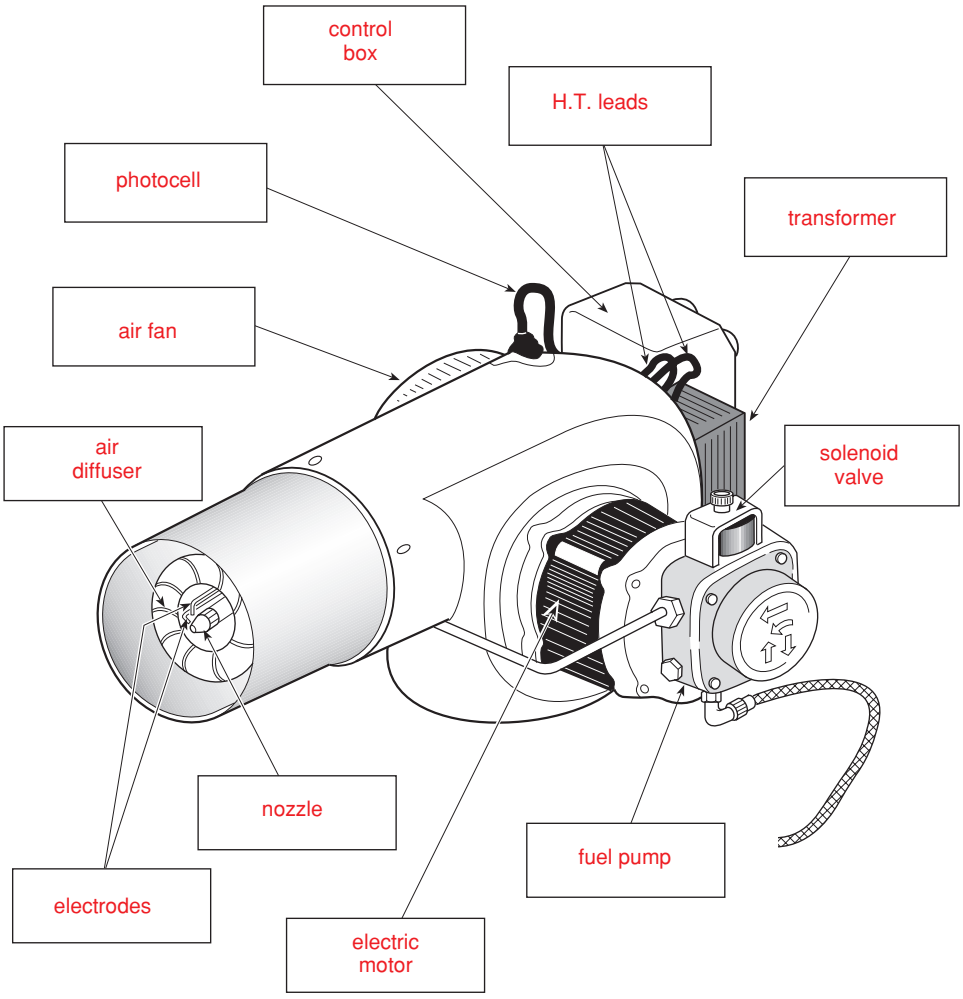


Figure 22

(55) Identify the device located in a pressure jet burner to detect light rays from within the combustion chamber to confirm ignition of the fuel and as a result making or breaking an electrical circuit. (Page 257.)

Photocell

(56) Calculate the free air ventilation requirements for an open-flued pressure jet burner with an input rating of 18 kW. (Page 260.)

$(18 - 5) \times 5.5 = 71.5\ cm^2$

(57) When should a draught stabiliser be fitted to the flue way of an open-flued oil burning appliance? (Page 260.)

If the flue draught exceeds 0.4 mbar

(58) Name the four separate tests which are carried out when completing a combustion efficiency test to an oil burning appliance. Also indicate with an 'X' the test which is not applicable to balanced flued appliances. (Page 266.)

1.	Flue draught 'X'
2.	Smoke reading
3.	CO_2 percentage
4.	Flue gas temperature

(59) Show the correct location of the fuse to be fitted into the electrical circuit shown in Figure 23. Also calculate the size of fuse to be fitted into the 13 A 3-pin plug of an electric drill with a power rating of 550 W, designed to run on 230 V. (Page 273.)

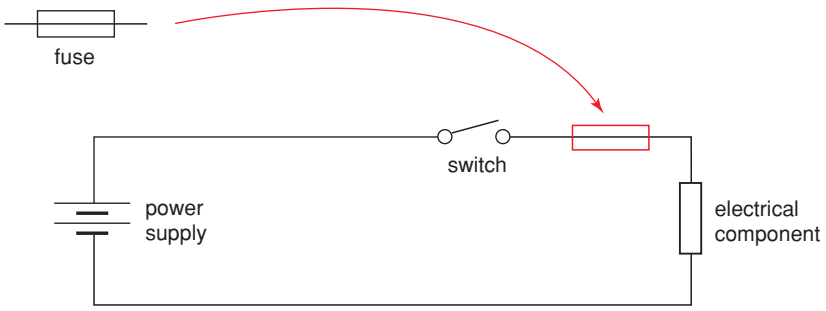


Figure 23

Fuse rating: W ÷ V = A ∴ 550 ÷ 230 = 2.39
∴ a 3 amp fuse is to be selected

(60) Complete the two wiring diagrams shown in Figure 24 to produce one circuit in series and one in parallel. (Page 275.)

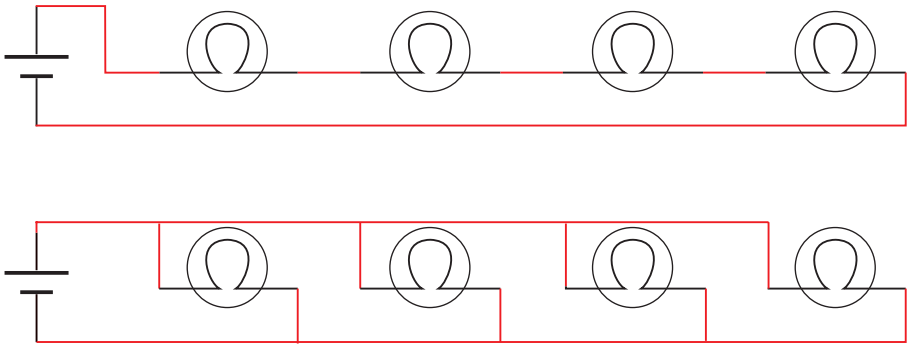


Figure 24

(61) What is the common name given to the circuit protective conductor found in domestic house wiring? (Page 276.)

Earth

(62) When would a temporary bonding wire be used? (Page 280.)

To cross bond a section of metalwork (e.g. pipe) should it be removed for any reason, thus maintaining earth continuity.

(63) When replacing a water supply main what responsibility has the plumber to the client with regard to electrical safety? (Page 280.)

To ensure that the equipotential bonding is maintained and reinstated upon completion. Where no bonding is provided, they should inform the client.

(64) Figure 25 shows a completed ring circuit; show how the wiring can be altered to accommodate the connection of the spur outlet. (Page 283.)

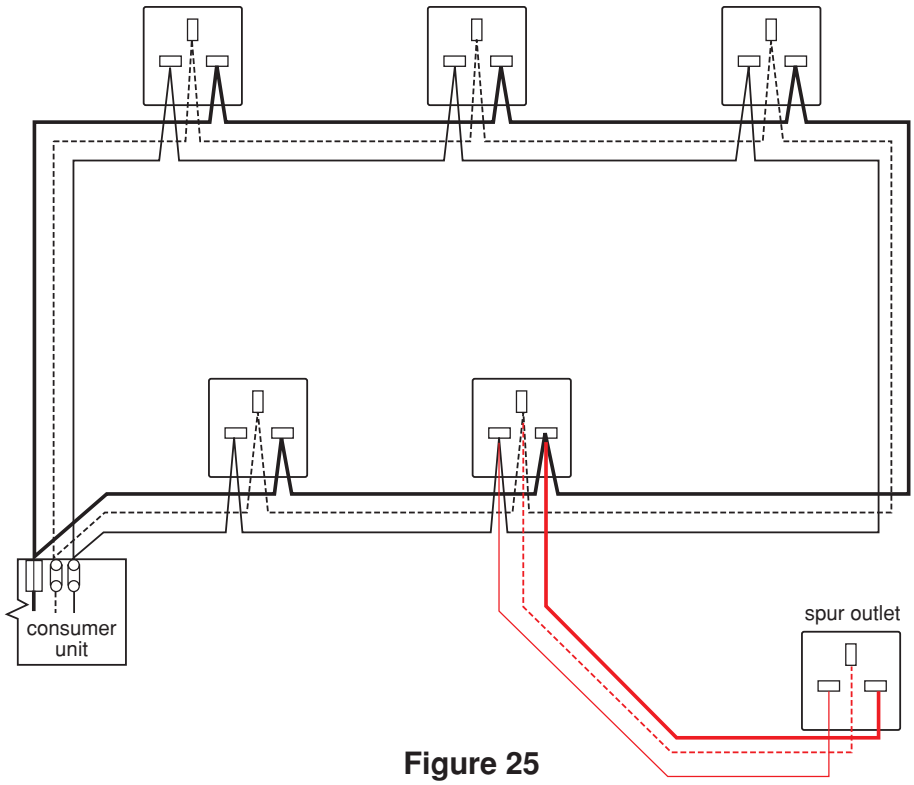


Figure 25

(65) Using coloured pencils, or the key which identifies the colour of cables, complete Figure 26 to indicate the location of the brown, blue, and green and yellow conductors into the 13 A 3-pin plug. (Page 285.)

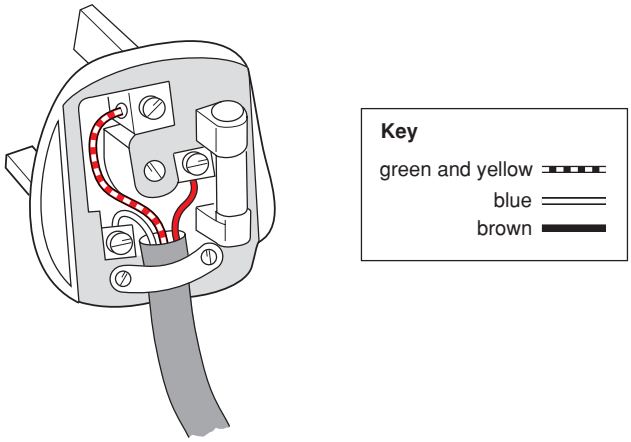
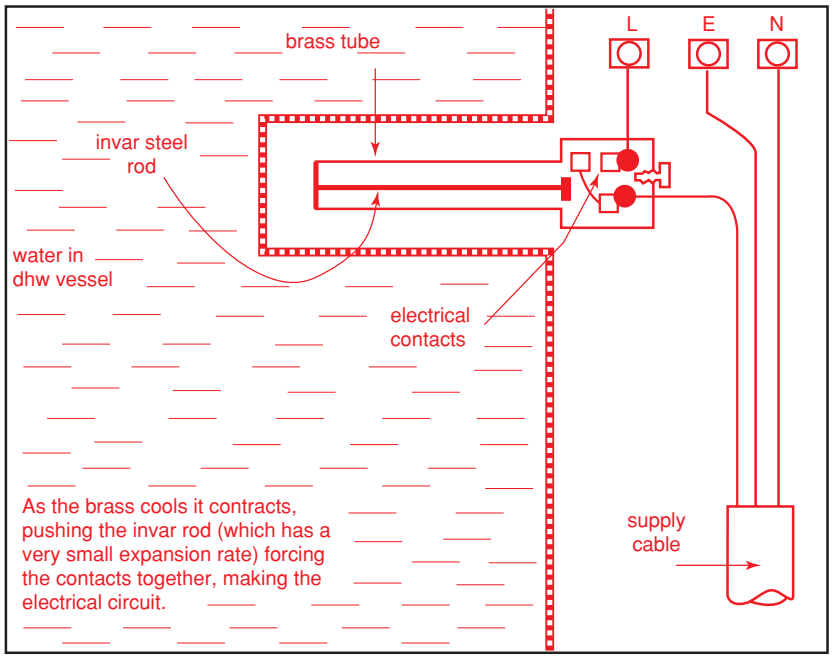


Figure 26

(66) How should cables be protected from damage when passing through metalwork? (Page 287.)

Suitably bushed using rubber grommets

(67) Using a simple illustration explain the operation of the rod thermostat found inside an immersion heater to a dhw storage cylinder. (Page 289.)



(68) A transformer has half the number of coils on the secondary windings as those on the primary coil. Is it a step up or step down transformer? (Page 290.)

Step down transformer

(69) Figure 27 shows the top of an immersion heater with the cover removed; using coloured pencils (or the key in Figure 26) complete the illustration to show the electrical connections to the heater element. Also, in the space provided, state the size and type of flex to be used. (Page 285.)

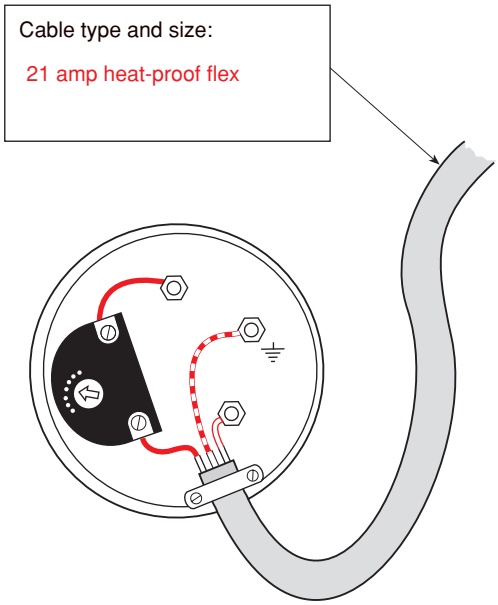


Figure 27

(70) What is a 'waterless' urinal. (Page 302.)

A urinal that does not require flushing with water.

(71) Figure 28 shows a trap. In the space provided give the name of the trap design and indicate the depth of water seal. (Page 309.)

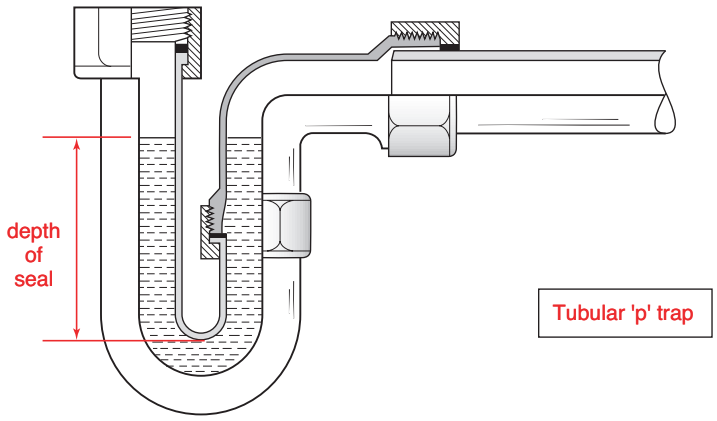


Figure 28

(72) Complete the table below to indicate the minimum size of waste fitting, trap and discharge pipe size. (Page 308.)

Type of appliance	Size of waste fitting	Discharge pipe and trap size
Wash basin	$1\frac{1}{4}''$	32 mm
Sink	$1\frac{1}{2}''$	40 mm
Bath	$1\frac{1}{2}''$	40 mm
Bidet	$1\frac{1}{4}''$	32 mm
Shower tray	$1\frac{1}{2}''$	40 mm
Bowl urinal	$1\frac{1}{4}''$	32 mm
Stall urinal	$2\frac{1}{2}''$	65 mm
Drinking fountain	$1\frac{1}{4}''$	32 mm

(73) With reference to Figure 29, in the spaces provided, give the minimum distances which need to be maintained for the proposed discharge pipes in order to avoid cross-flow of effluent from one discharge pipe into another. (Page 311.)

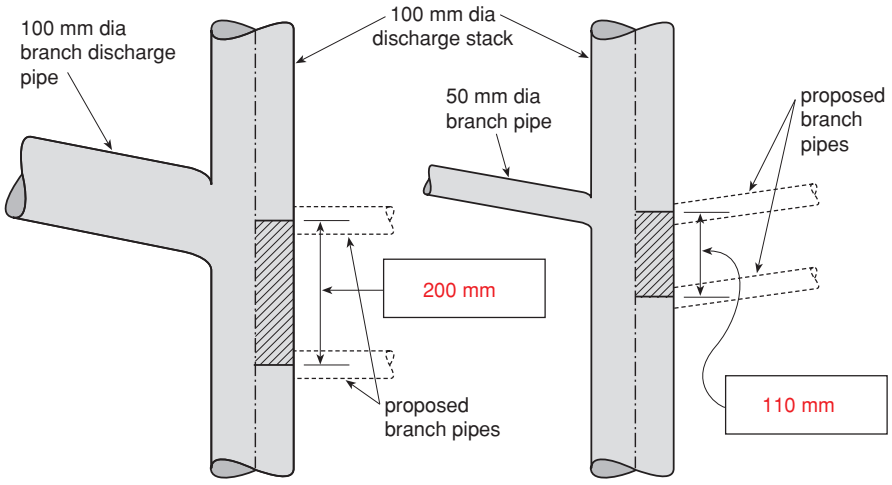


Figure 29

(74) Name the system of sanitary pipework shown in Figure 30, where no additional ventilation pipework is required. Also indicate in the space provided the maximum dimensions to be observed. (Page 313.)

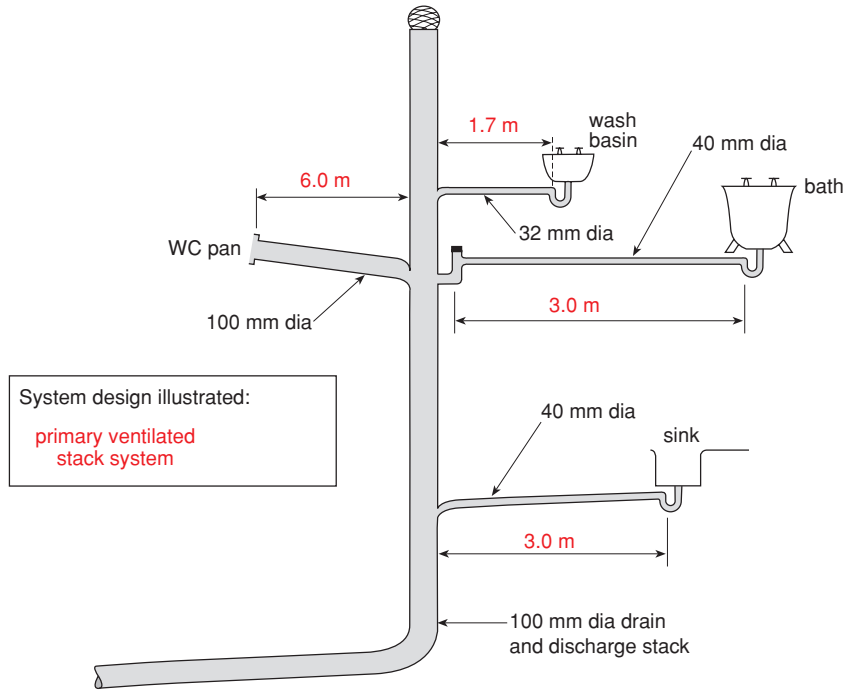


Figure 30

(75) Complete the following table to give the maximum number of appliances to be installed within a single unvented branch discharge pipe. (Page 312.)

Unvented branch discharge pipes serving more than one appliance

Appliance	Maximum no. of appliances to be fitted	Minimum pipe diameter
Wash basins	4	50 mm
Bowl urinals	5	50 mm
WC pans	8	100 mm

(76) What is the purpose of a resealing trap? (Page 316.)

To maintain a trap seal due to self, or induced, siphonage.

(77) What is meant by the term 'induced siphonage'? (Page 316.)

A situation where a discharge of water through a waste pipe of one appliance causes a negative pressure within the branch pipe to another appliance causing its trap water seal to be siphoned out.

(78) Complete the illustration in Figure 31 (over page) to show how an air test is maintained in above-ground soundness testing. Also state the minimum air test pressure. (Page 323.)

Minimum air pressure: 38 mm water head

(79) State what is meant by the term 'performance test'. (Page 322.)

A test carried out to above ground sanitary pipework to ensure a minimum 25 mm water trap seal is maintained when subjected to the worst possible working conditions.

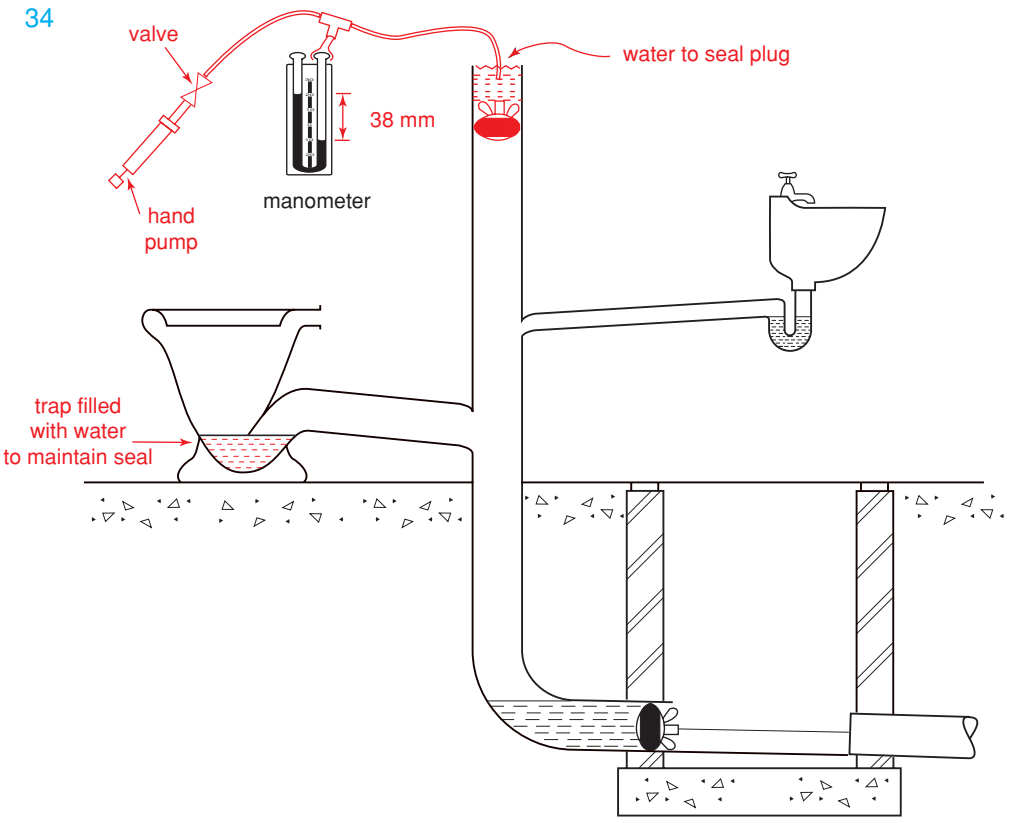


Figure 31

(80) Complete Figure 32 to show a partially separate system of drainage. (Page 329.)

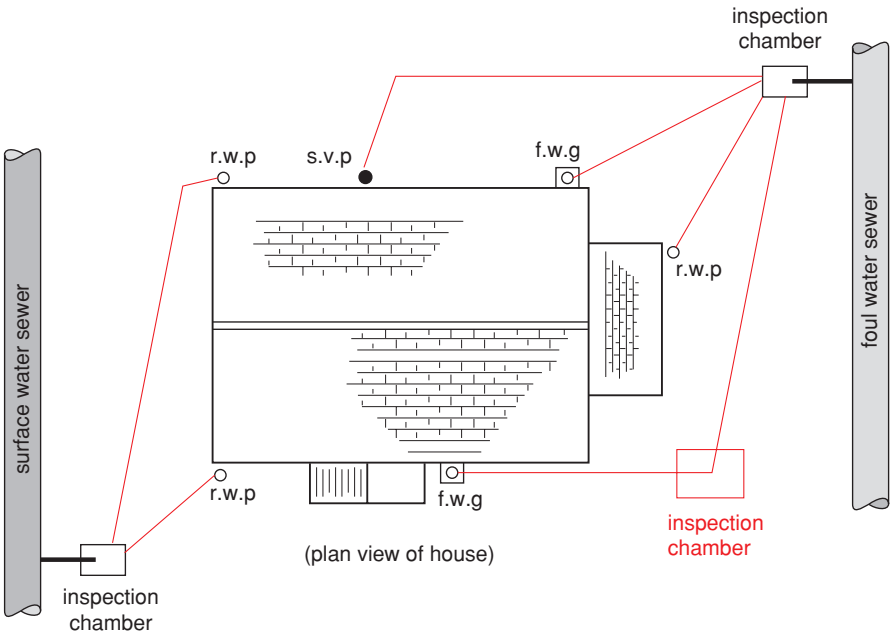


Figure 32

(81) Identify the purpose of an anti-flood gully and state the type of drainage system in which it may be found. (Page 332.)

A fitting designed to prevent surcharging or backflow of water, as found with a surface water drainage system.

(82) Give four different possible locations where a point of access will be required to a system of drainage. (Page 334.)

1. At or near the head of a drainage run

2. Between long drainage runs

3. Changes of gradient, direction or size

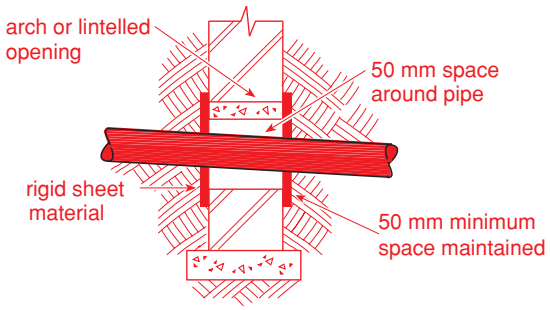
4. At branch connections

(83) What is meant by the term 'benching'? (Page 335.)

A raised sand and cement base at the bottom of an inspection chamber or manhole, raising it above the channel.

(84) Show by illustration how a drainage pipe run can be made to pass through a wall, or foundation, below ground level to ensure the pipe will not fracture due to movement. (Page 331.)

One method:



(85) What is the name given to a piece of wood cut to an angle and used in conjunction with a spirit level for setting out the gradient to a short drainage run? (Page 339.)

Gradient board

(86) Complete Figure 33 to show the material, and indicate the depths of bedding material to be used when laying the 100 mm uPVC drainage pipe into the ground. (Page 331.)

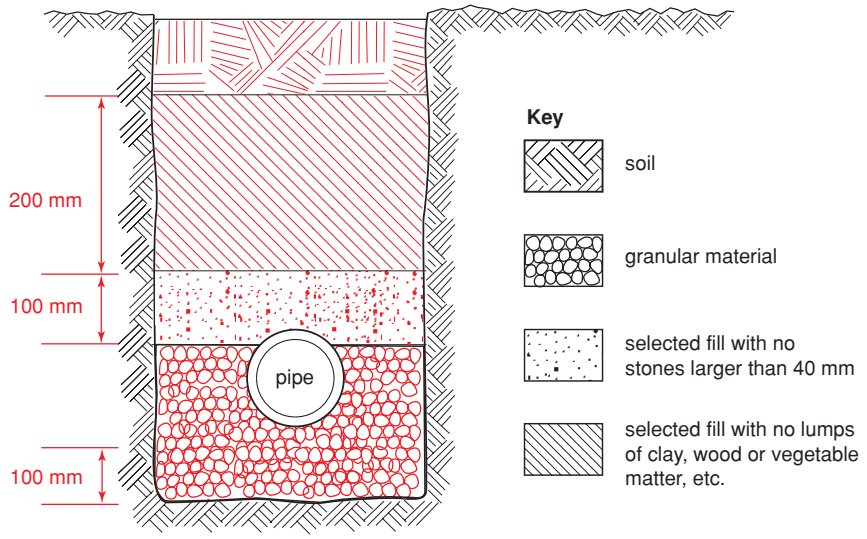


Figure 33

(87) Complete Figure 34 to show how the uPVC drain at high level can be made to connect suitably to the drain at the lower level. (Page 337.)

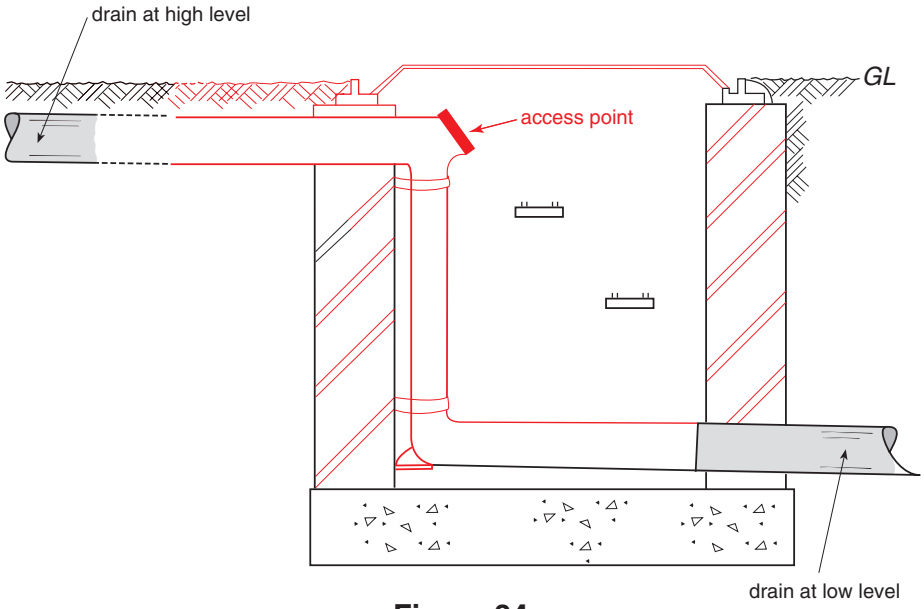


Figure 34

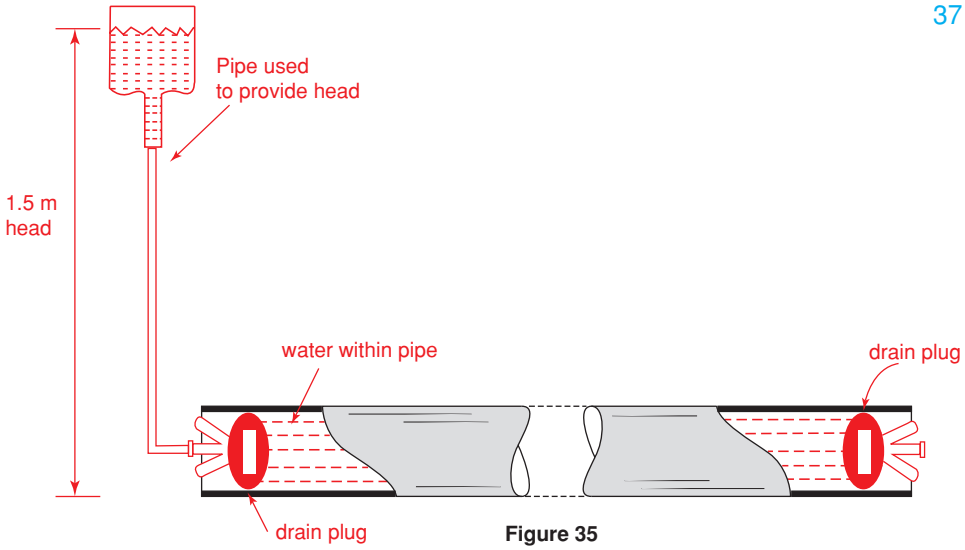


Figure 35

(88) Complete Figure 35 to show how a 1.5 m minimum water head pressure test can be achieved to the drainage pipe. (Page 349.)

(89) With reference to the previous question state the maximum water loss permitted from the pipe over a 30 min test period. (Page 348.)

0.05 litres per metre run for 100 mm diameter pipe
0.08 litres per metre run for 150 mm diameter pipe
0.12 litres per metre run for 225 mm diameter pipe
0.15 litres per metre run for 300 mm diameter pipe

(90) State the purpose of a soakaway. (Page 346.)

To receive surface water where no surface water drainage system is available

(91) Complete the following table, giving the British Standard specifications for sheet lead. (Page 352.)

BS1178 Code No.	Colour code	Thickness Diameter
3	Green	1.32 mm
4	Blue	1.80 mm
5	Red	2.24 mm
6	Black	2.65 mm

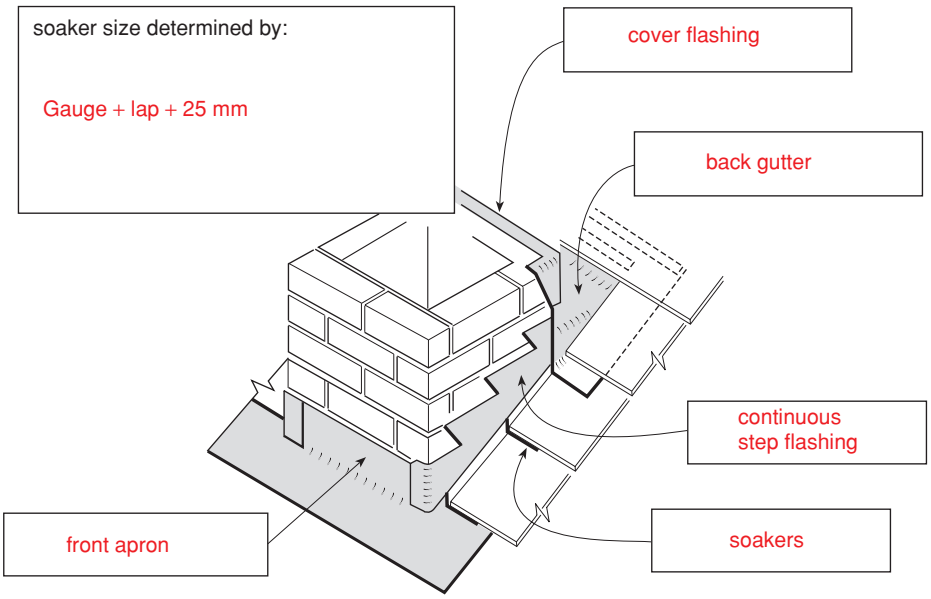


Figure 36

(92) In the space provided name the chimney flashing details shown in Figure 36 and give the calculation used to determine the length of a soaker. (Pages 362–365.)

(93) State the maximum length to be observed for any flashing detail. (Page 362.)

1.5 m

(94) Figures 37 and 38 show a wood-cored roll and drip, as used for sheet lead. Complete the illustrations to show how the lead is weathered at these details, giving dimensions and explanatory notes as necessary. (Page 360.)

(95) State the name of the fixing used to secure a cover flashing into the brick course. (Page 362.)

Lead wedge

(96) Given that code 5 sheet lead is going to be used to weather a small gutter lining, with a distance of 600 mm between the wood-cored rolls, state the maximum length to be observed between drips. (Page 358.)

2000 mm

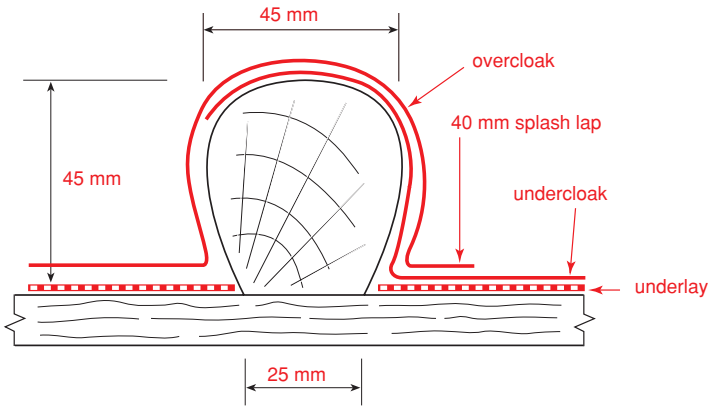


Figure 37

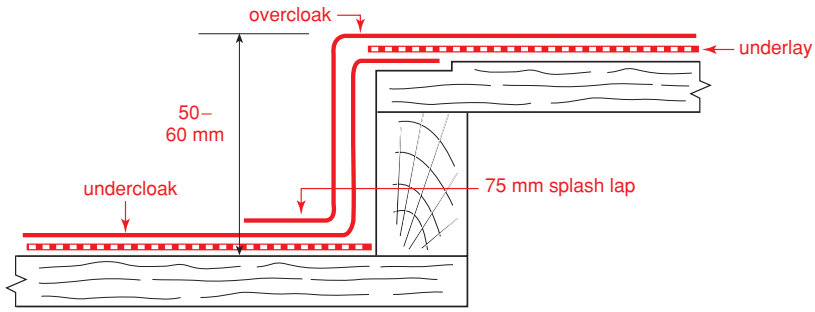


Figure 38

(97) Name the weathered detail shown in Figure 39. (Page 367.)

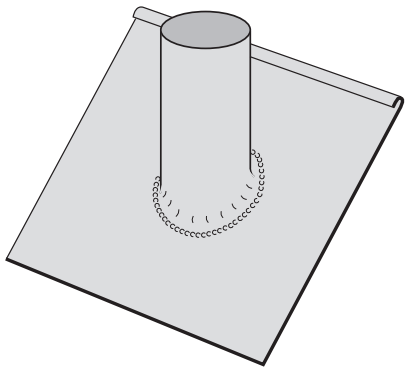


Figure 39

Lead slate

(98) State the minimum vertical cover that needs to be maintained with any lap joint, such as at cover flashings. (Page 362.)

75 mm

(99) State the recommended finish height for a standing seam as used for copper and aluminium roof coverings. (Page 373.)

25 mm

(100) Figure 40 shows a batten roll as used for copper and aluminium roof coverings. Complete the illustration to show how the sheet material is weathered at this detail, giving dimensions and explanatory notes as necessary. (Page 373.)

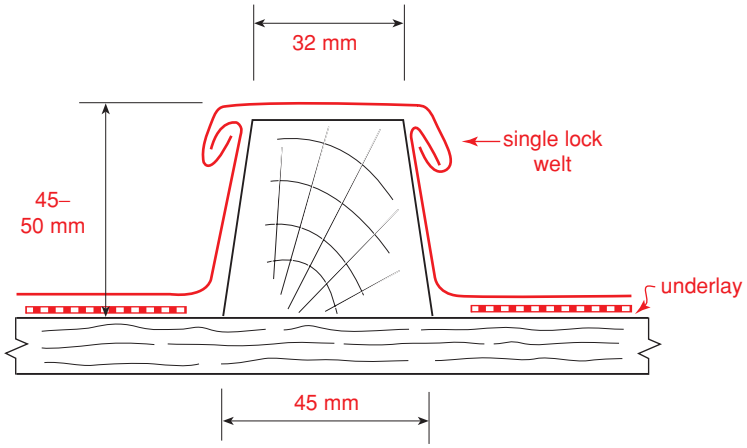


Figure 40