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Pipework

Aims

- The aims of this session are to provide you with the knowledge and understanding of Installation of Pipework & Fittings in respect of gas safety.

Objectives

Gain an Understanding in:-

- **Copper & mild steel pipes & fittings.**
- **Flexible & rigid connections & micropoints.**
- **Jointing & cleaning agents for copper & mild steel pipes.**
- **Pipe supports, clipping & fixing requirements for copper & mild steel pipework.**

Objectives

- Sleeving & protecting pipework under floors, in walls & builders openings
- Installation of pipework externally & restrictions on the compression fittings etc.
- Precautions to be taken when soldering pipework with gas meters installed.
- Equipotential & temporary continuity bonding.

Objectives

- Sitting & installation of gas controls & isolation valves.
- Making & breaking gas connections on appliances.
- Related areas of Gas Safety Regulations.

References

- Gas Safety (Installation & Use) Regulation
  - Nos. 10, 18 to 23 & 36.
- BS 6891:2005 – Installation of low pressure gas pipework up to 35mm in domestic premises.

Designing Systems

- Internal installations must be designed in accordance with Gas Safety Regulations.
- The pressure loss between the meter outlet and the appliance must not exceed 1mbar.

Gas Pipework Materials

- **When selecting material, consideration should be given to strength, appearance, cost as well as corrosion.**
- **The composition of all pipes, fitting & jointing materials are subject to British Standard Specification.**

Gas Pipework Materials

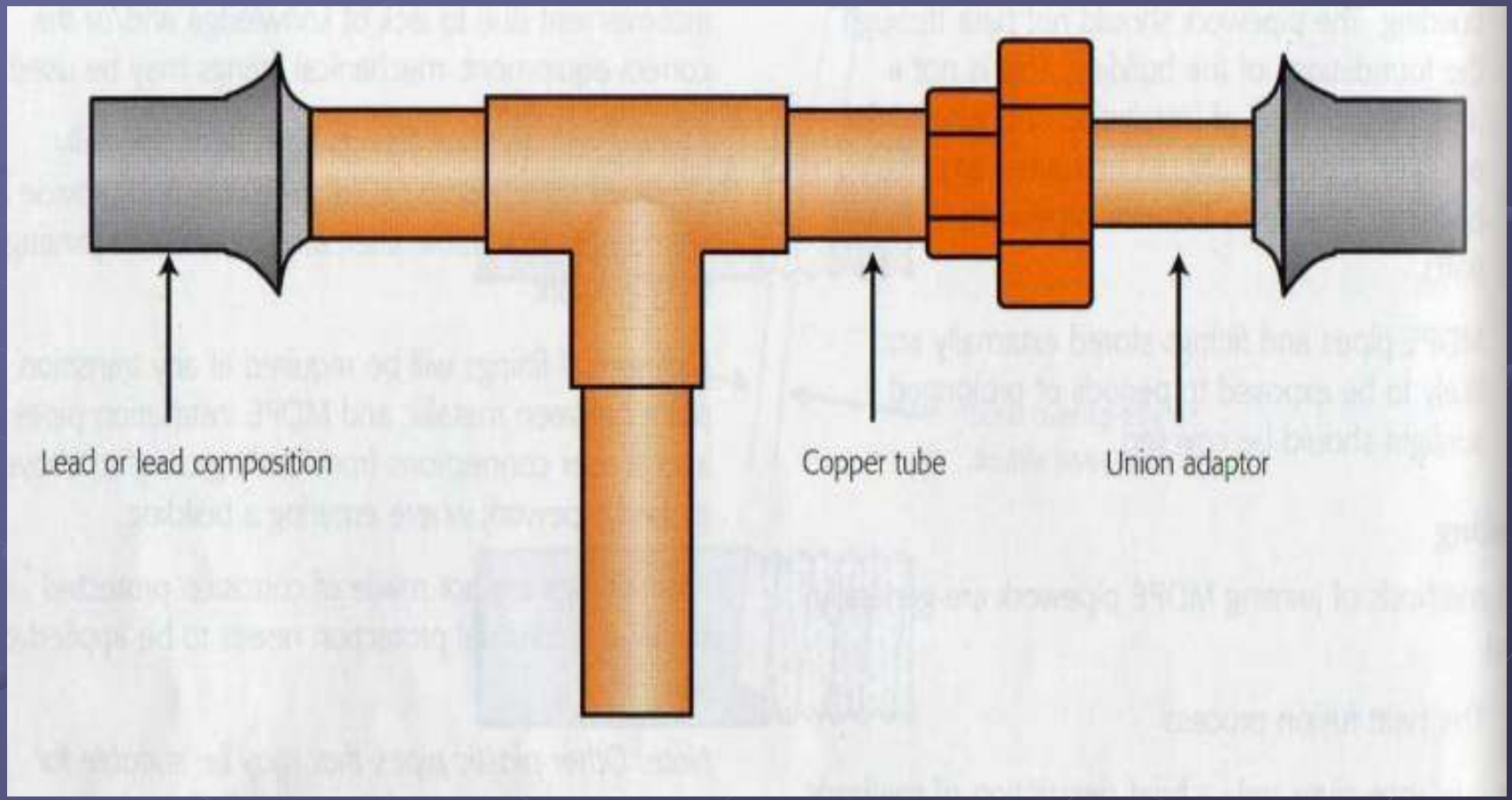
- Stainless steel pipe should comply with BS 3605 or 4127 & have the same external diameter as BS EN 1057 copper tube.
- Join with compression fittings complying with BS 864:Part 2
- Copper Tube should comply with BS EN 1057:1996.
- Capillary & compression fittings with BS 864:Part 2

Gas Pipework Materials

- Compression Fittings must not, in any way, be buried in the structure, below floorboards or underground. **Compression fittings should be readily accessible at all times.**
- Push fittings should not be used for gas installations, unless they are designed for readily moveable flueless appliances and installed to BS 6172 & BS 6173
- **P.V.C. should never be used for internal gas installations.**

Jointing Lead Pipework.

- Only soldered cup joints into suitable brass union fittings or copper should be made.
- Care should be taken when soldering a joint to ensure that excessive heat is not applied.
- Modern heat producing blowlamps may cause the lead pipe to melt.


Lead or lead composition
Copper tube
Union adaptor

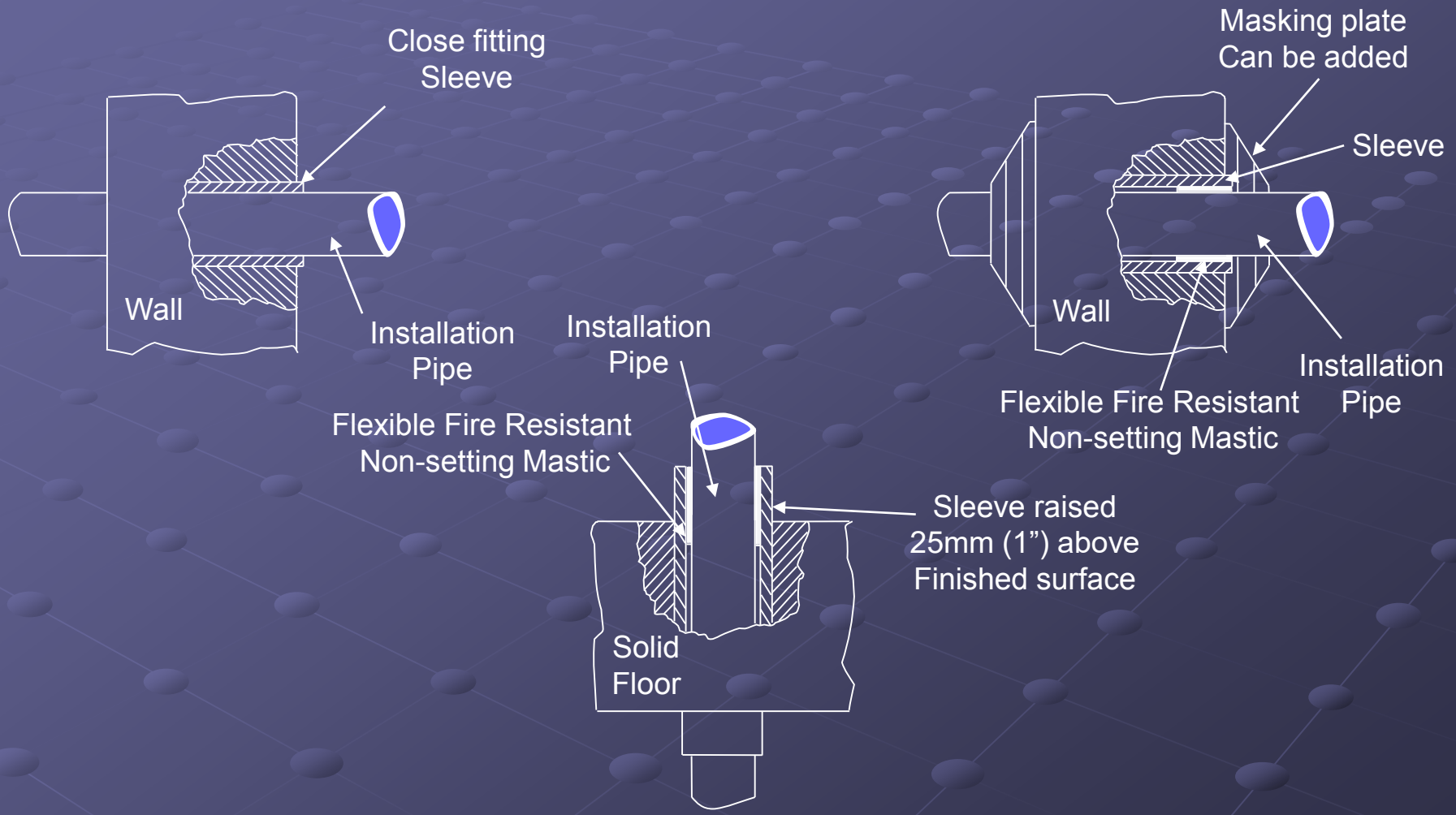
Gas Pipework Joints
Copper

- Compression Fittings
  - All compression fittings must comply with BS 864:Part 2.
  - They can ensure a perfect seal which can be dismantled & remade.
  - Unions can only be used where they will be readily accessible i.e. not in ducts or under floors.

Corrosion of Pipework

- Ways to protect pipework against corrosion.
  - Use factory bonded PVC coated pipe.
  - Use a non-corroding sleeve or duct.
  - Wrap in corrosive resistant tape.

Sleeves & Sleeving



Timber Frame Buildings.

IGE/UP7/Edition 2 states:

- **Pipework passing through a masonry wall/timber frame must accommodate movement of the building fabric.**
- **To achieve this on reaching the entry point of the building the pipework changes to a semi-rigid material.**

Figure showing pipe arrangement before any movement of timber

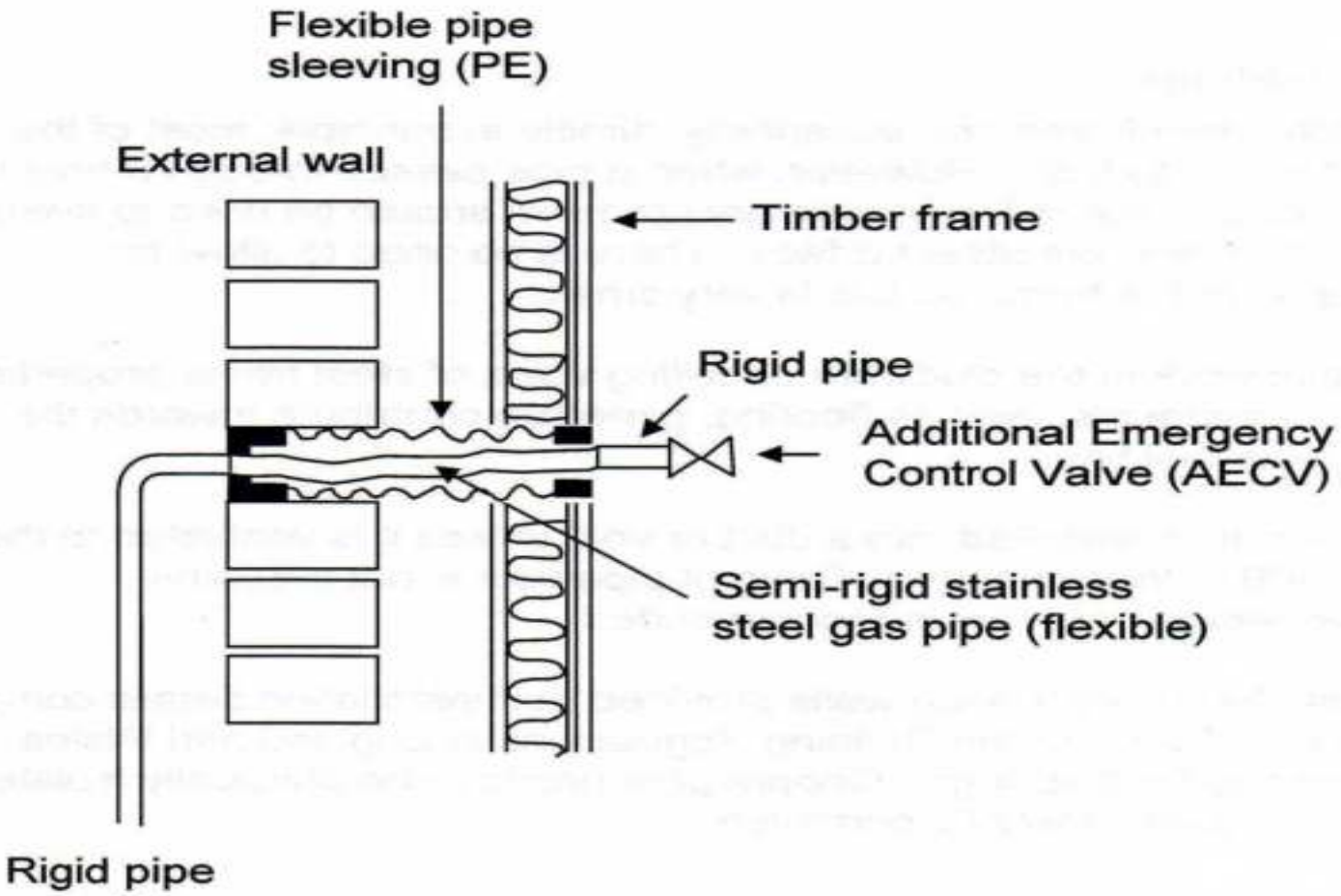
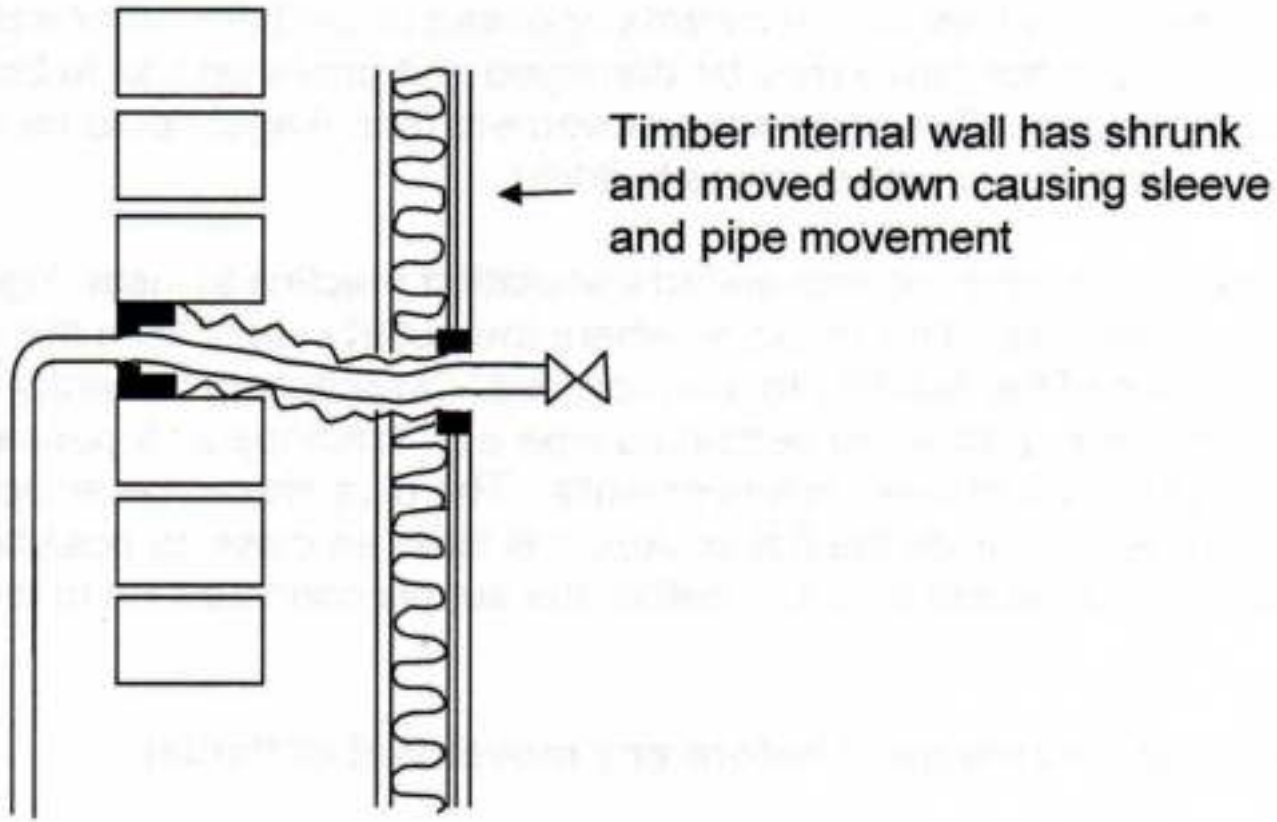


Figure showing pipe arrangement after relative movement of timber frame



Pipe Support & Fixings

Material	Nominal Size	Vertical Run Intervals	Horizontal run Intervals
Mild Steel	**Up to DN 15 R ½** **DN 20 R ¾** **DN 25 R 1**	**2.5 meters** **3.0 meters** **3.0 meters**	**2.0 meters** **2.5 meters** **2.5 meters**
Light Gauge Copper	**Up to 15 mm** **22 mm** **28 mm**	**2.0 meters** **2.5 meters** **2.5 meters**	**1.5 meters** **2.0 meters** **2.0 meters**

Pipework

- Consideration must be given to the support & protection of the pipework when it is installed within the structure of the building.

Note

The integrity & strength of the building must never be impaired.

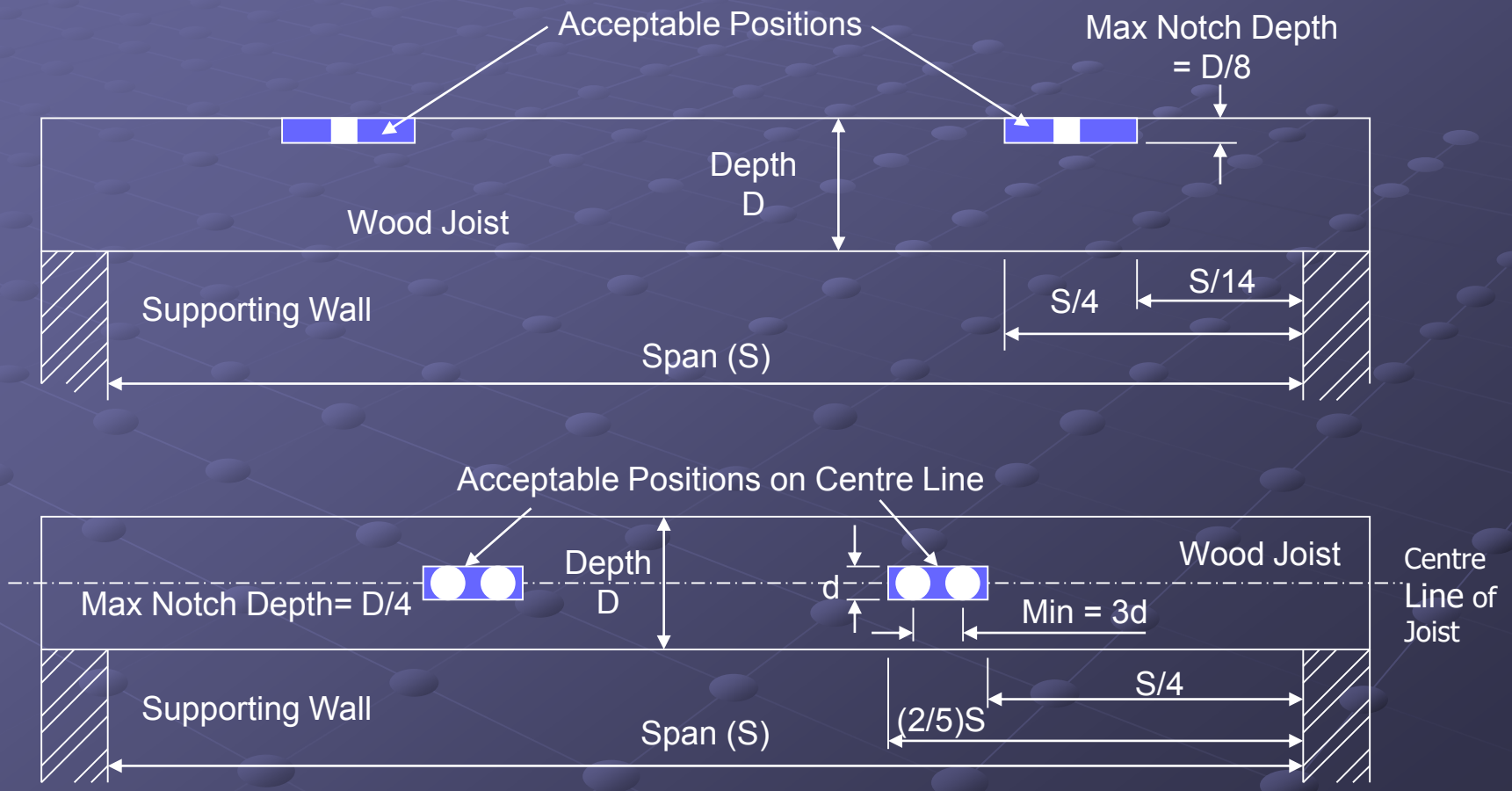
Pipework
Laid in Suspended Floors

- Carry out visual inspection
- Pipes should be supported when installed between joists
- Pipes laid across joists should be located in purpose made notches or circular holes.
- **Notches should not be made in joists of less than 100mm depth.** Greater than this, they should not be located in excess of 25% of the span from the end of the support.

Pipework
Laid in Suspended Floors

- The notch should be ‘U’ shaped with minimum width to accommodate the pipe or pipes.
- Do not extend the notch across floor board joints.

Pipework Laid in Suspended Floors



Pipework Laid in Solid Floors

Must be protected against:-

- **Corrosion.**
- **Failure due to movement.**

Pipework
Laid in Solid Floors

Methods of protection:-

- **Large plastic tube, set into the floor slab and/or base hard core. With a continuous fully annealed factory sheathed soft copper tube inserted.**
- **Steel or copper pipe laid on top of concrete slab & covered by screed.**
- **Steel or copper pipe inserted into a duct with protective covering.**

Pipework
Laid in Solid Floors

Methods of protection cont:-

- **Soft covering material, thick enough to accommodate movement & resilient enough to support the concrete during setting can be fitted around the pipe.**

Pipework
Laid in Solid Floors

Never:-

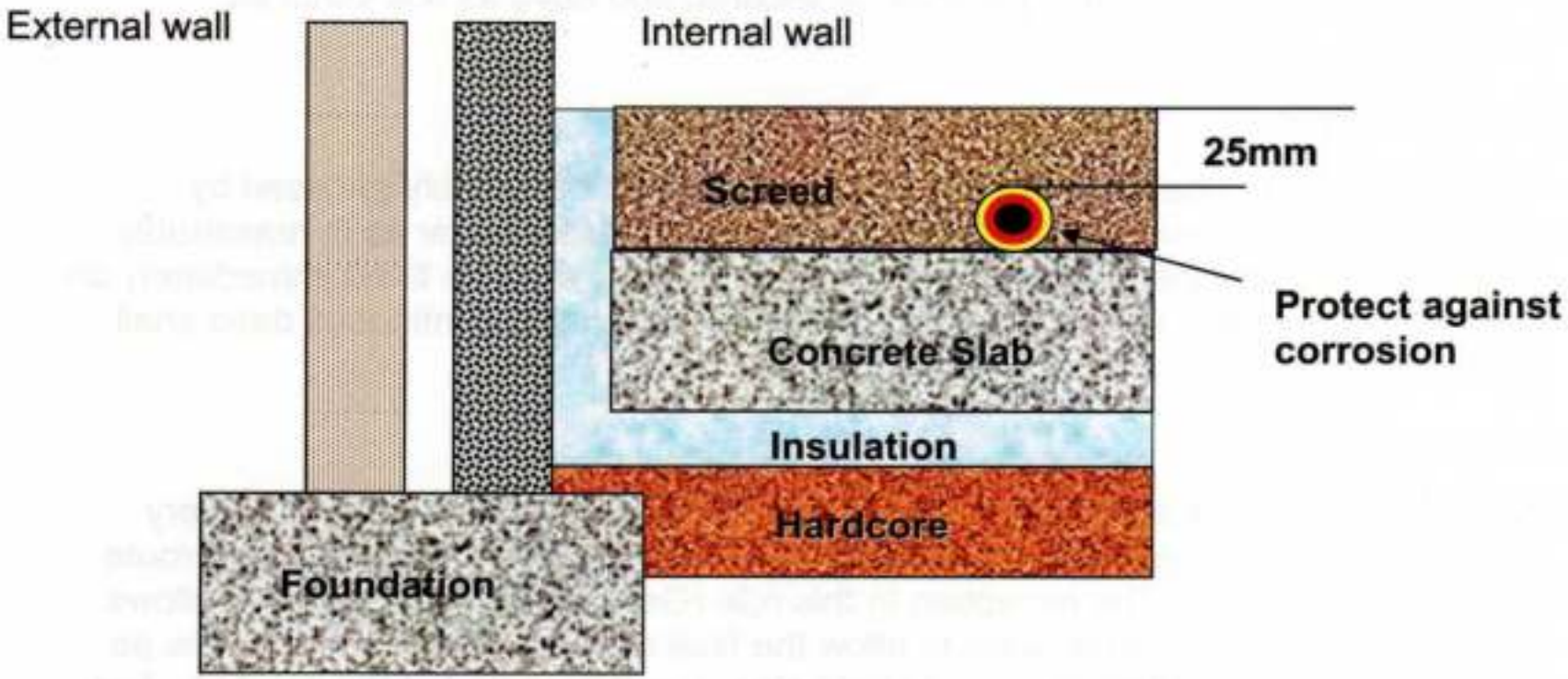
- **Install pipework within a concrete slab. (lay in chases & cover with screed).**
- **Use compression fittings & keep all other joints to a minimum.**
- **Never Use stainless steel.**
- **Install galvanised or painted pipework without additional protection.**

Pipework
Laid in Solid Floors

Note:-

- **In accordance with BS 1710, all wrapping or paint should be coloured yellow ochre.**
- **A minimum of 75mm screed is required by the building regulations. This will give 50mm protection over a 22mm pipe.**
- **The shortest practical route must be taken when pipework passes vertically through a solid wall which must be sleeved.**

Installation pipework buried in ground floor concrete screeds shall have a minimum of 25 mm cover.

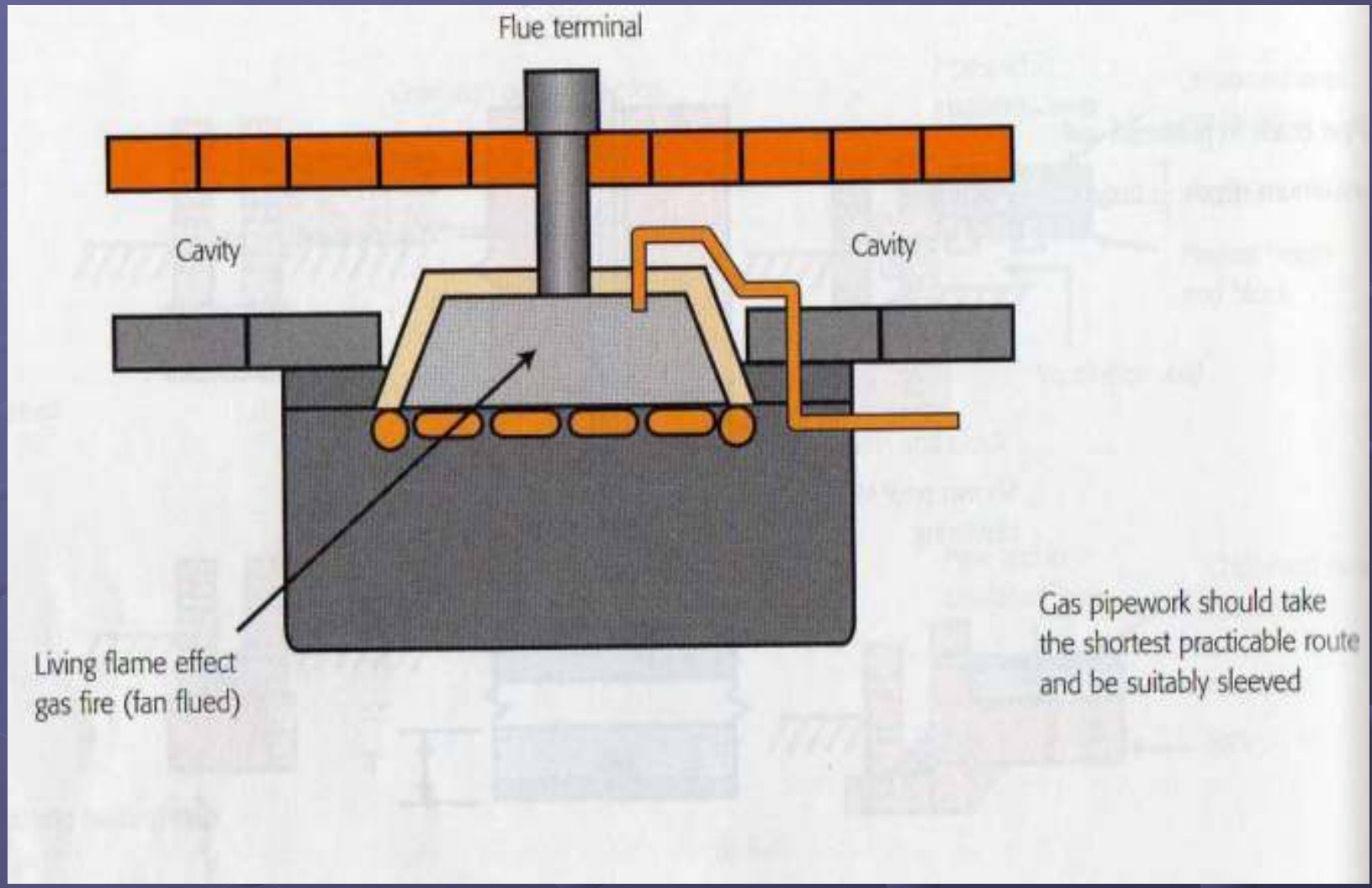


Pipes laid in Walls

- Ducts, with convenient access, should be used for vertical pipework installations.
- If this is impractical, the installation may be placed in pipe chases, provided adequate wall thickness is available.
- Protection against corrosion must also be provided.

Cavity Walls

- Pipework must not be installed in cavity walls due to the possible build up of gas from an escape.
- Pipes passing through a cavity must take the shortest possible route & must be sleeved.
- The fanned flued live fuel effect fire installed within the inner leaf cavity is an exception.


Flue terminal
Cavity
Cavity
Living flame effect
gas fire (fan flued)
Gas pipework should take
the shortest practicable route
and be suitably sleeved

Dry Lined Walls

- Pipework should run within purpose designed channels where reasonably practical.

If this is not possible then;-

- An accepted method is to run the pipe on the wall surface behind the dry lining. The pipework must be completely covered & sealed from the cavity.
- Note, This is not the preferred method.

Solid Walls

Prior to the chasing of solid walls:-

- **Visually inspect & note the proximity of cables & socket outlets.**
- **Be aware of the possibility of buried cables within the plaster.**
- **Use a suitable sleeve for any pipe passing through the wall.**

Exterior Pipework

- Exterior pipework may be more straightforward & easier to install. If an escape occurs, it will safely vent directly to the atmosphere.
- However, steps must be taken to protect the pipework against damage from structural movement of building foundations & ground movement.

Exterior Pipework Protection from Mechanical Damage

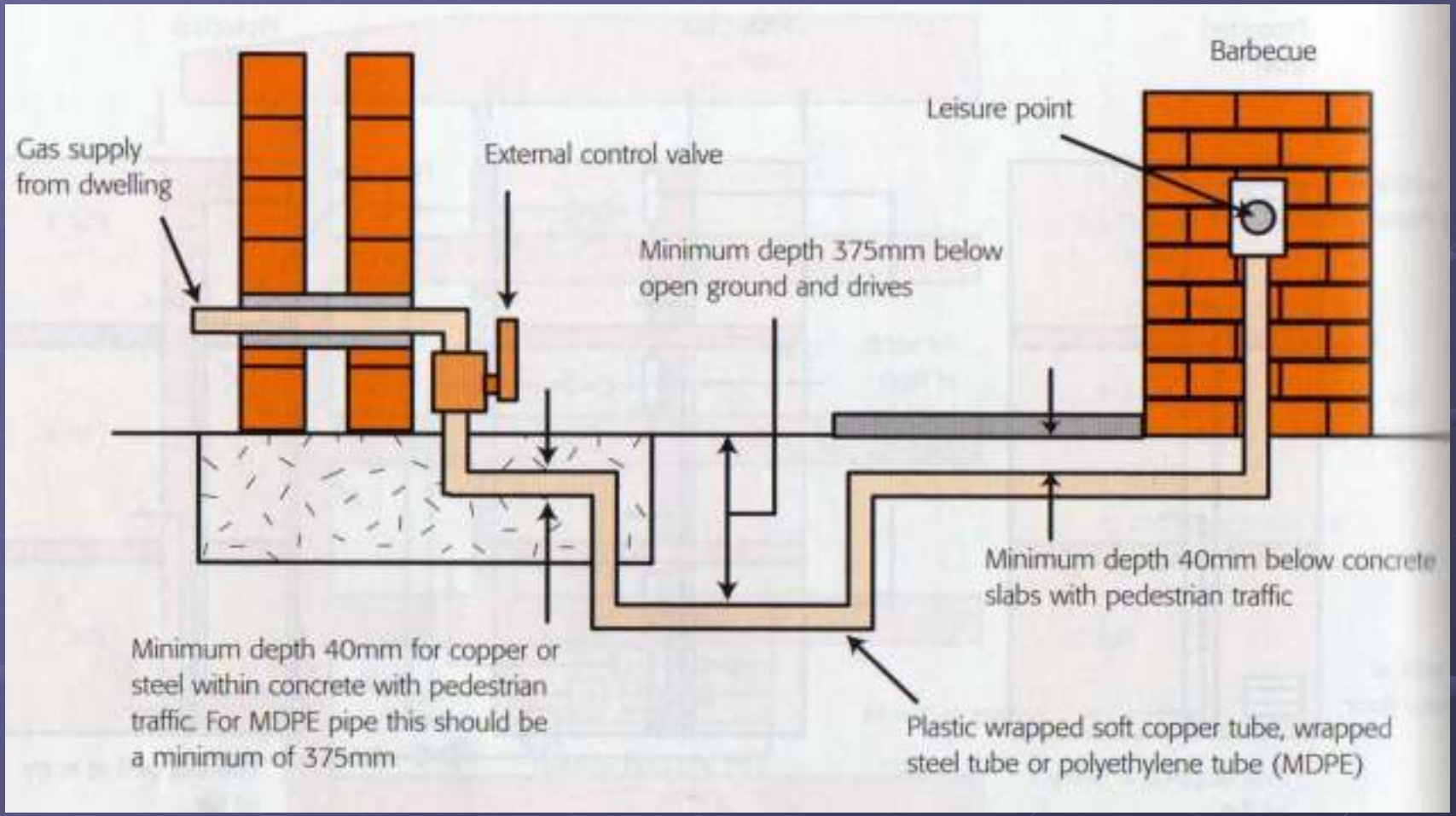
- Exterior pipes should be positioned to avoid mechanical damage.

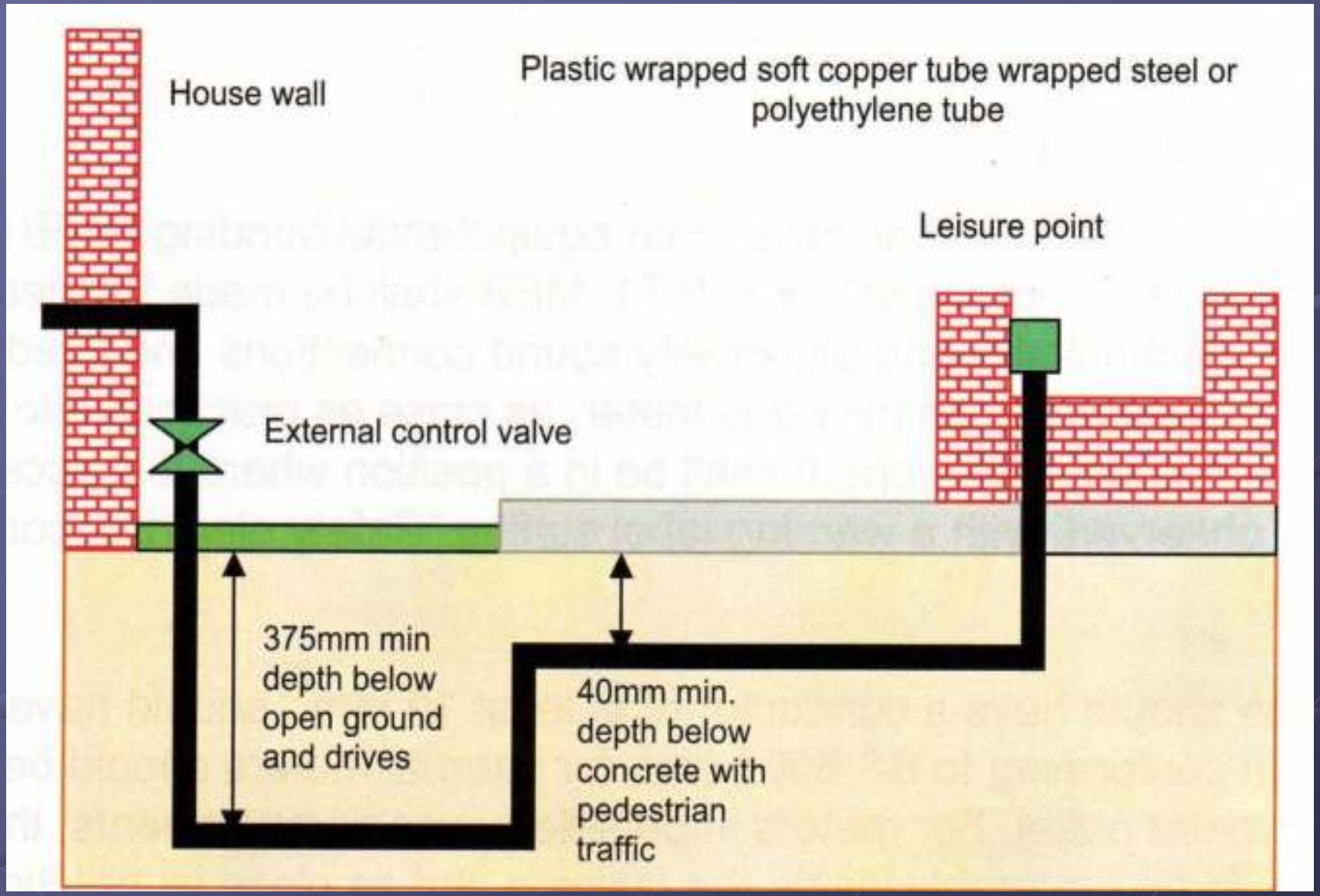
Or

- Should be protected with a cover.

Or

- Material with a greater resistance to damage such as a steel pipe should be used.


Barbecue
Leisure point
Gas supply from dwelling
External control valve
Minimum depth 375mm below open ground and drives
Minimum depth 40mm below concrete slabs with pedestrian traffic
Minimum depth 40mm for copper or steel within concrete with pedestrian traffic. For MDPE pipe this should be a minimum of 375mm
Plastic wrapped soft copper tube, wrapped steel tube or polyethylene tube (MDPE)


House wall
Plastic wrapped soft copper tube wrapped steel or polyethylene tube
Leisure point
External control valve
375mm min depth below open ground and drives
40mm min. depth below concrete with pedestrian traffic

Remote Appliances

For remote appliances

- **An isolation valve should be located close to the point where the supply exits the building. It may be labelled, identifying the appliance it is feeding.**

Protection Against Corrosion

- Wrapping, painting or pipe material selection.
- Copper pipe dose not require further protection unless subject to an additional corrosive source i.e. coastal areas.
- Use stand off clips when securing to brick, concrete etc., to prevent direct contact.

Effect of Other Services

- If electrical under-floor heating is present, installation pipework cannot be buried in that floor, unless it has been physically & permanently disconnected.
- Pipework should be a minimum of 150mm away from electricity meters & associated current control boxes, & a minimum of 25mm electricity cables & other services.
- Where this can't be achieved, insulating material must be wrapped around the pipe or placed in between it and electrical equipment.

Pipework Installed in Ducts

- It is important to provide ventilation for ducts carrying gas pipes, with the exception of the smaller ducts.

Cross section area of duct m^2	Minimum free area of each opening m^2
Not exceeding 0.01	0
0.01 to 0.05	Cross sectional area of duct
0.05 to 7.5	0.05
Exceeding 7.5	1/150 of the cross sectional area of the duct

Thank you for your attention.