

UNDERGROUND DRAINAGE

Wickes stock a wide range of drainage products, whether it's to replace old drainage systems in the event of collapse, or install new during home improvements.

The purpose of this leaflet is to provide you with basic details on what you may find underground. How to deal with different types of materials that have been used over recent years i.e. clay, ductile iron, cast iron and PVCu, showing you how to join new to old.

Providing you with a basic understanding of the regulations governing and testing, of underground drainage. Whilst trying to help you avoid some of the pitfalls.



BUILDING REGULATIONS

If you are altering your existing drainage, or installing a new drainage system you must always inform the Building Control Department at your local council offices. You must present plans of the work that you are undertaking and have your work inspected to ensure that it complies with The Building Regulations.

However, if you are simply replacing damaged sections, they do not need to be contacted.

DRAINAGE SYSTEMS

There are two types of drainage water: (1) Foul water (2) Surface water.

Foul water consists of anything that comes from bathrooms, kitchens, utility rooms, car washing areas etc. This must always go to your foul water drain system.

Surface Water is rainwater only.

In older properties, the existing rainwater pipes are often discharged to the foul drain. This system is known as combined drainage. In a combined system, the rainwater pipes are discharged via gully traps, to stop foul air escaping from the drains.

Modern systems keep the foul water and the surface water apart in separate drains. This is known as a separate drainage system. With this method, the rainwater is discharged either to a soakaway, watercourse or surface water sewer. Draining rainwater to these points does not create foul air. It is extremely important to ensure that you do not connect foul water to a surface water drainage system.

NOTE: if you are unsure about the drainage system around your house get advice from the Building Control Department before starting any work.

LUBRICATION

Where a pipe or fitting needs to be lubricated, always use Wickes Silicone Lubricant 432-013 to ease the connection.

Never use washing-up liquid / oil or grease, as this will damage the seal causing it to leak.

DRAINAGE FITTINGS

Wickes 110mm diameter drain pipes and fittings are made in PVCu to BSEN1401 and BS4660 and are compatible with all plastic drain pipe systems.

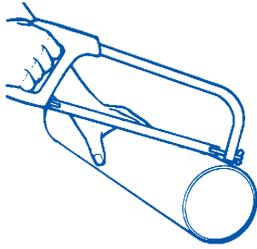
Underground drainpipes must be a golden brown colour to distinguish them from other buried services.

KEEP INFORMED

- Look for other Good Idea Leaflets that could help you with your current project.
- Check that your Good Idea Leaflets are kept up to date. Leaflets are regularly changed to reflect product changes so keep an eye on issue dates.
- If you would like to be put on our mailing list for the Wickes booklet, call our Freephone number which is:
0500 300 328
- Visit our website at www.wickes.co.uk

JOINTING PROCEDURE FOR UNDERGROUND DRAINAGE

FIG.1



1. Cut pipe square, using a fine tooth saw. Wrap paper around pipe as guide line.



2. Chamfer end of pipe, using medium file or rasp. Standard lengths of pipe are already chamfered.



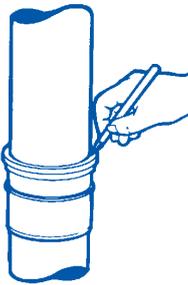
3. Remove swarf, dust and filings from end of pipe.



4. Lubricate end of pipe.



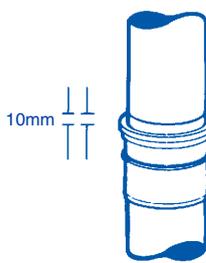
5. Check that ring seal is in position in housing.



6. Push pipe fully home mark lightly with pencil.



7. Spigot fittings will have mark already shown.



8. Withdraw pipe (10mm). This will allow for expansion. All fittings must be supported by a bracket when installed vertically.

FIG.2

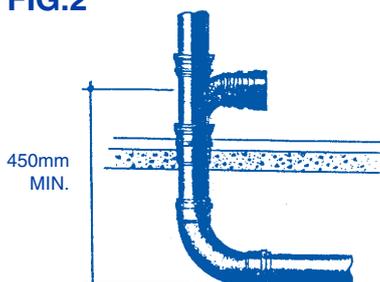
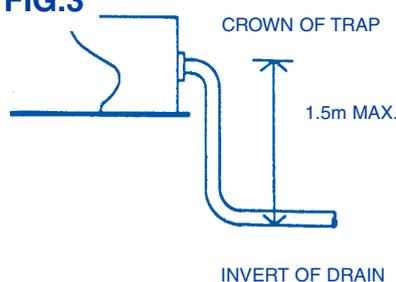


FIG.3



Never use black soil pipe underground, the Building Control Officer will tell you to replace this, using the correct drainage pipe and fittings.

The pipes are jointed by push fit sockets. **FIG.1** shows the jointing procedure for underground drainage.

Generally, soil and waste pipes from the house are joined to the underground foul water drainage by the following two methods:

- **REST BEND 432-008.** This is a large radius bend, used to connect soil stacks and ground floor sanitary appliances to the drains. The Rest Bend allows drain rods and the soil from the toilet pan to pass easily to the drains. In single dwellings of up to three storeys, the bottom of the bend should never be less than 450mm below the lowest ground floor connection into the soil stack, as can be seen in **FIG.2**. **FIG.3** shows that when a ground floor WC discharges direct to a drain, the distance between the pan outlet and the bottom of the Rest Bend must be less than 1.5 metres.

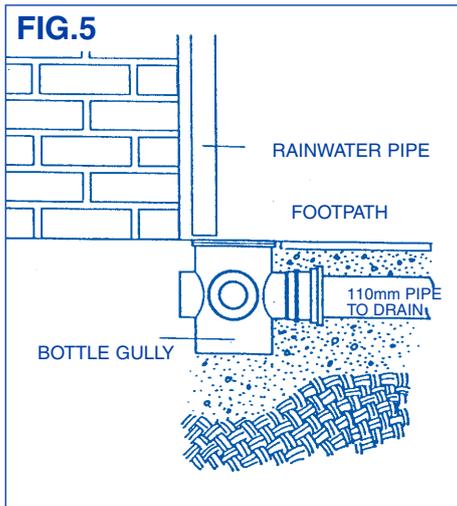
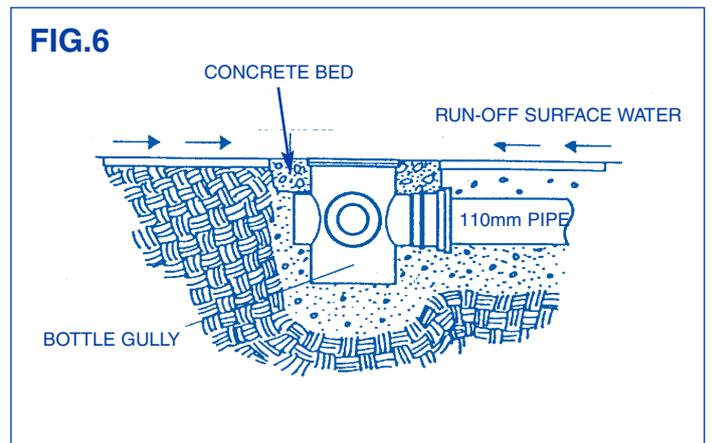
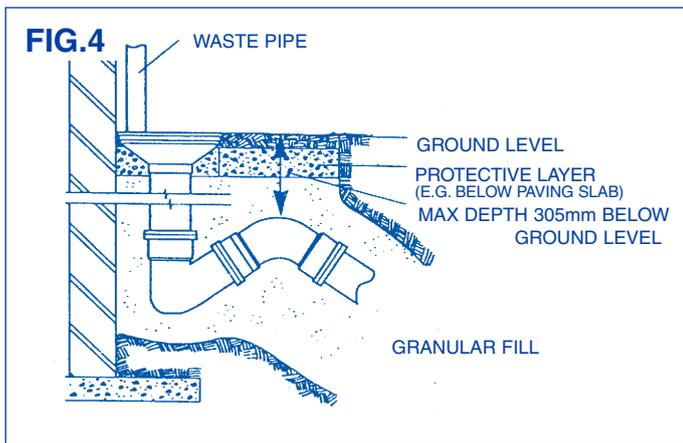
- **GULLIES.** A gully holds water like a trap, to stop foul air escaping from the drains. One of its purposes is to accept wastewater from ground floor bathrooms, kitchens and utility rooms. Wickes supply the Roddable Bottle Gully 432-002 and the Multi Gully Trap 432-053. The Roddable Bottle Gully has a removable grating and a quarter turn rodding access cap. This enables the gully to be cleaned out and the drains to be rodded if a blockage should occur. It has one 110mm outlet and three closed inlets for either waste pipe or 110mm connections.

A 110mm pipe can be glued directly into the side inlets after the centre has been removed. Should you wish to discharge your waste pipes to this gully, adapt the smaller closed inlets by drilling them out with a 48mm hole cutter and inserting the appropriate rubber reducer (431-950 and 431-951) to accept the 32mm and 40mm waste pipe. These items will be found in the soil and waste range of products.

Where a Roddable Gully is not required, the Multi Gully Trap may be used.

A square hopper and grating act as the inlet into the gully trap. Hoppers are joined to gully traps with a short piece of 110mm diameter drain pipe. Glue the hopper to the pipe and push the chamfered and lubricated end into the socket of the gully trap. The waste pipe should pass through the grating and stop above the water line. A 45° or 90° drain bend is fitted to the gully to achieve the required angle of the outlet, as seen in **FIG.4**.

FIG.5&6 show that as well as wastewater from domestic appliances, the Bottle Gully may be used to receive rainwater from paved areas and roofs. The Rainwater Gully 158-828 is designed to be the



connecting point between a rainwater downpipe and a soakaway drain. 68mm downpipes are simply connected to the top inlet. The outlet is 110mm pipe spigot sized.

The cover can be lifted to allow the removal of debris such as leaves. The gully can be rodded should the drain become blocked.

The 68mm Rainwater Reducer (432-009) is used to connect the 68mm circular rainwater pipe directly to the drain. It is fitted over a section of chamfered drainpipe, lubricated and pushed into the Multi Gully Trap. Use the square-to-round adaptor (432-040) with the reducer to enable 65mm square rainwater pipes to be connected to the drain.

The Roddable Bottle Gully and the Multi Gully Trap should be supported by either a lean mix of concrete (no richer than 1:18) or a ready made concrete slab before surrounding them with granular backfill. To ensure a gully is easily accessible for cleaning out, the base should be within easy reach from ground level. Refer to FIG.4.

Due to the tightness of the trap bend, the Multi Gully Trap is not roddable, it should therefore be connected to the nearest manhole. If possible the Roddable Gully should be connected to a manhole also, but as it is roddable it may be positioned up to 22 metres away from one. It can be connected straight into a drainpipe section with a 45° junction. (432-005) However, the Gully must be less than 12

metres from the drain and a set of drain rods must be able to pass right through to the junction. If the drain is made of clay, convert it to plastic by using two suitable drain connectors. Full details are given later in this leaflet.

PIPE LAYING

When a PVCu pipe passes through a wall of a building, a lintel should be built in above the opening which has been formed to give at least 50mm clearance all round the pipe. The hole should be covered with a rigid sheet to prevent the entry of soil or vermin. See FIG.8. Other alternatives can be discussed with the Building Control Officer.

TRENCH PREPARATION

A drain trench should not impair the stability of a building. When drains are laid parallel to the foundations, care should be taken that the foundations are not undermined. See FIG.9. When installing a new drainage system do not dig the trench too long before laying the pipe. Then backfill as soon as possible after having the system inspected and tested. For maximum safety it should be open for the minimum time and the trench walls should be adequately supported.

The trench should be as narrow as possible for at least 300mm above the top of the pipe. To permit room to work in the trench allow the width of the pipe plus 150mm on each side.

BACKFILLING

The material dug from the trench may be suitable to surround the pipe but it will need to be examined to ensure that it meets the required standard. Always reject any material that has sharp edges such as broken bricks. The maximum particle size should generally not exceed 20mm but occasional particles up to 40mm may be acceptable as long as they are only a small fraction of the total quantity.

When the dug material is not suitable as backfill a nominal 10mm sized aggregate complying with BS882: Part 2 must be spread evenly on the trimmed trench bottom before the pipes are installed.

The trench should be excavated to allow for a 100mm thickness of the granular bedding under the pipe.

NOTE: Bricks and / or other hard materials will damage the pipe, this must never be used as temporary or permanent support.

The bedding should be properly compacted with shallow hollows made to accommodate the pipe sockets. This provides continuous and uniform support for the pipe.

After inspection and testing of the drainage the granular material should be evenly backfilled and compacted to a depth of at least 100mm above the pipe. Above this, the original dug material is used to further backfill the trench. It should be compacted in 300mm layers. Do not use heavy compactors until there is at least 300mm of cover but light vibratory tampers may be used sensibly to aid compaction. FIG.10 shows a typical trench cross section.

NOTE: When drains are located under roads / pavements seek specialist advice in relation to backfill.

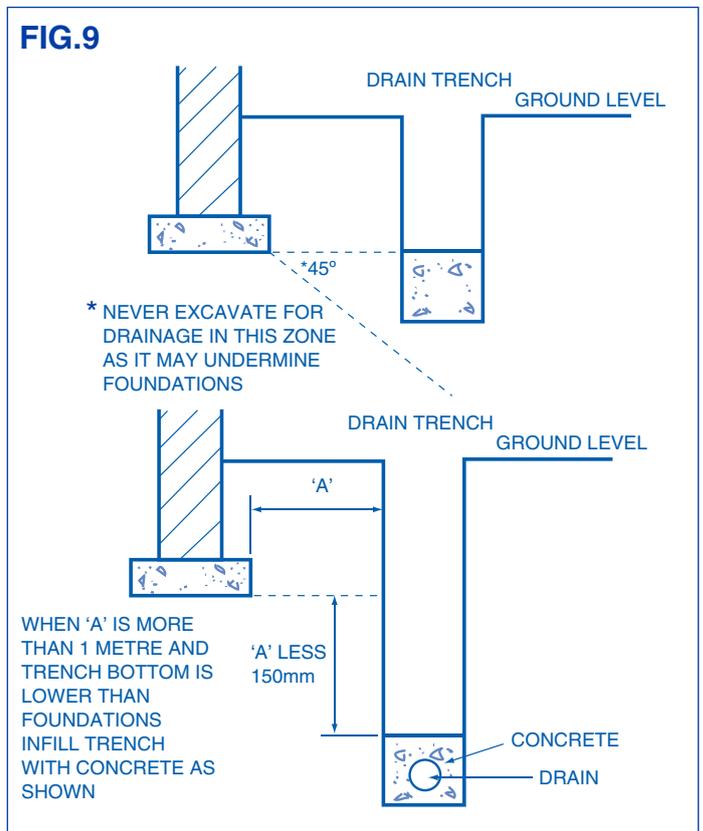
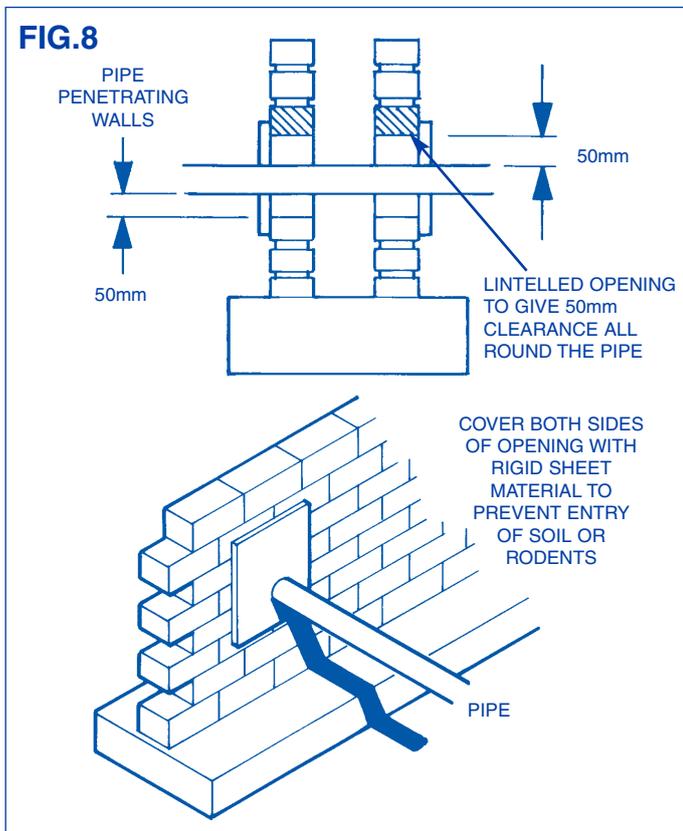
GRADIENTS

110mm diameter main foul water drains that carry the discharge from multiple soil stacks and buildings may be laid at a fall of not less than 1:80 (12.5mm fall per metre). However, branch drains from individual gullies, sanitary fittings or soil stacks should be laid at a steeper gradient of 1:40 (25mm fall per metre).

110mm diameter main surface water drains that carry the discharge from multiple rainwater pipes may be laid at a fall of not less than 1:100 (10mm fall per metre), while branch drains from individual rainwater pipes should be laid at a steeper gradient of 1:50 (20mm fall per metre).

PROTECTION

Any part of the drain system that is less than 600mm below a garden should be protected from damage by garden tools. A preformed concrete slab should be buried 100mm above the top of the drain if the system is not protected by paving or concrete at ground level.



NOTE:

Where flexible pipes are in a road and where adequate cover cannot be provided, the pipes should be protected by concrete encasement not less than 100mm thick and having movement joints formed with compressible board at each socket or sleeve joint face.

CLEARING BLOCKAGES

Your drainage system must be designed so that all parts of the pipework are accessible to a set of drain rods. This means that a drain route should be as straight as possible between two points. Nevertheless bends are allowed in the system but should not be less than 45° and should be positioned near to an access point within the system.

ACCESS TO DRAINAGE SYSTEM COMPONENTS

W.C. Pans, whether on wood or concrete floors, should always be screwed to the floor. The joints between the pan and floor and the pan and drainpipe should never be made with a cement mortar mix. This ensures that the pan can be easily disconnected if it is necessary to remove a difficult blockage in the pipe.

MANHOLES AND CHAMBERS

FIG. 7 shows Wickes Inspection Chambers allow easy access to the drainage system for maintenance, inspection and the removal of debris. Traditional manholes can be built around channel pipe and fittings, while preformed plastic inspection chambers are a simple push-fit assembly. Manholes and inspection chambers

should be provided in the following situations:

1. At all changes in direction (except where the change is not too great for rodding).
2. At all changes in gradient (except where the change is not too great for rodding).
3. At all drain junctions that are inaccessible to a set of drain rods.
4. Where a junction between two drains does not have a manhole. Access should be sited on the branch drain within 12 metres of the junction.
5. At the head of each run of drain.
6. At changes in pipe diameter.

INSPECTION CHAMBERS 250 & 450mm

Wickes Inspection Chambers have been designed to offer easier and more economical alternatives to traditional construction methods. They are made of a tough polypropylene material, are impact resistant, simple and straightforward to install.

The chamber raising pieces are designed for simple dry jointing, providing an instant watertight joint. They have strengthening ribs and webbing. The raising pieces can be simply built-up to the required overall height between the chamberbase and cover.

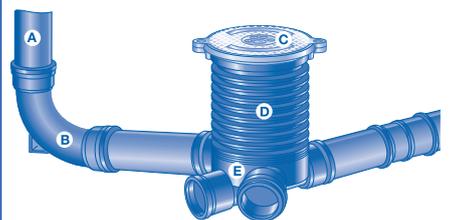
Both Wickes 250 & 450mm pre-formed units comply with all current regulations. They are designed with a built-in fall for good flow performance.

Wickes 250mm diameter, three waste port inspection chambers allow easy access to drains within close proximity to any building.

***NOTE:**

Whilst the 45° rule is a good guide, the trench should be open for the minimum time and the trench walls must be adequately supported. Even greater care must be taken when trenching in sandy, gravel, loose or saturated soils. If in any doubt, seek professional advice.

FIG.7



- A. 432-001 Underground Pipe 3m
- B. 432-008 87.5° Rest Bend
- C. 432-004 Chamber Aluminium Cover
- D. 432-029 Chamber Raising Piece
- E. 432-028 Shallow Access Chamberbase

The chamber base accepts up to three connections and comes complete with two removable blanking plugs to seal any unused inlets. Two 45° swept side inlets and one rear entry inlet allows for an efficient flow into the main 110mm channel. The full assembly comprises a base (432-028); two raising pieces (432-029) and a round aluminium cover (432-004).

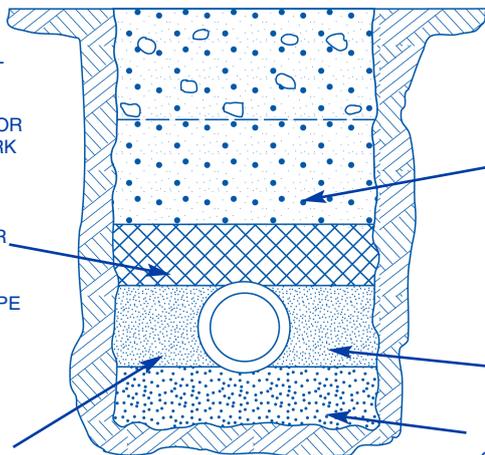
CHART A SHOWS THE DEPTH OF THE CUT RISER

CHART A

| ASSEMBLY including cover in mm | DEPTH |
|--------------------------------|-------|
| Base | 155mm |
| Base + 1 Riser | 355mm |
| Base + 2 Risers | 565mm |

FIG.10

WHERE THE BACKFILL ABOVE THE PIPE CONTAINS STONES LARGER THAN 40mm OR WHERE THE PIPEWORK IS DEEPER THAN 2m IN POOR GROUND, THE SELECTED GRANULAR MATERIAL SHOULD EXTEND TO AT LEAST 100mm ABOVE THE PIPE CROWN.



FIRST 300mm OF BACKFILL SELECTED TO BE FREE FROM STONE EXCEEDING 40mm (UNLESS THE GRANULAR MATERIAL EXTENDS 100mm ABOVE PIPE CROWN - SEE NOTE OPPOSITE).

GRANULAR SIDE FILL

MINIMUM 100mm GRANULAR BEDDING

SIDE FILL MINIMUM 150mm WIDE EACH SIDE OF PIPE REGARDLESS OF DIAMETER

A square top system is also available, making for easy installation of patio & driveway paving blocks and slabs.

NOTE: To allow easy removal of debris from the 250mm-chamber assembly, it must never be deeper than an arms length (600mm).

The 450mm chamberbase unit comprise four swept inlets at 90° and 45° and comes complete with three removable blanking plugs to seal any unused inlets. The assembly comprises a base (435-228); raising pieces (435-229) and plastic cover (435-230).

Pre-formed 450mm diameter chamber bases and risers with 450mm diameter covers can be used up to 1200mm in depth. Up to this depth, they will officially be known as shallow inspection chambers.

DRAIN CONNECTORS

To simplify the modification of your existing drainage system Wickes have two types of drain connector.

If you are connecting to an existing drain, the age of your property may indicate the type of drains you have. However you will need to carefully expose the drain to determine what it is made of i.e. PVCu or clay.

All underground drainage pipes are a golden brown (old clay drains tend to be a darker brown); to distinguish them from other buried services.

For recognition, PVCu drain pipework is easily scored with a pointed object. It's easily cut with a multi purpose saw and is jointed with push-fit fittings.

There are two types of clay drain:

• Vitrified Clay

This is the most modern form of clay drainpipe and is recognised by its smooth matt finish and black polypropylene couplings. The pipes are approximately 1600mm long.

You can dismantle this type of vitrified clay pipe at a coupling, or it may be simpler to cut the pipe with an angle grinder and leave a chamfered pipe end.

NOTE: Vitrified clay pipes are divided into two types: thin walled and thick walled.

Thin walled vitrified clay pipe has been made since about 1984. To adapt to this pipe use the Wickes Flexiseal Connector (430-042). This black rubber flexible connector will allow PVCu drain pipe to be joined to a variety of pipes which have an outside diameter of between 121-136mm, such as the thin walled vitrified clay, glazed vitrified clay, ductile iron or cast iron.

The Flexiseal Connector is fitted with two stainless steel clamping bands which are tightened around the pipe ends with a screwdriver or 8mm nut driver.

Thick walled vitrified clay pipe was made prior to 1984. After chamfering and lubricating, both pipe ends, this pipe can be replaced in PVCu using the push-fit connector (432-046).

• Glazed Vitrified Clay (Salt Glazed Ware)

This oldest form of clay pipe was still being used around the late 1960s and early 1970s. It has a glazed surface and is jointed by sockets filled with a cement mortar mix. Simply cut the pipe with an angle grinder to leave a chamfered end on the pipe. Then you can convert to PVCu by using the Flexiseal Connector. (430-042)

TESTING

All drains must be tested to ensure that they do not leak before being covered over. If your work is subject to Building Regulations, your Local Building Control Officer will want to witness the testing.

NOTE: Make sure your drain will pass the required test before asking the Building Control Officer to visit, this will save you both a lot of time and effort.

Under normal situations the pipe and fittings are fully supported by the weight of the backfill surrounding the pipe. However, as they are unsupported when being tested, the internal pressure may partially push fittings apart causing them to leak during a test. If you feel that this

may happen take precautions against it.

Old drains must never be tested with water as they cannot withstand the internal pressure but new drains may be tested this way.

For further details contact your local reference library which may hold a copy of Approved Document H of the Building Regulations.

A simpler alternative is to carry out an air test using a 'U' gauge. The equipment can be hired from a hire shop.

TEST PROCEDURE

This test is in accordance with Approved Document H of the Building Regulations. All gullies should be filled with water and test plugs or bags put into the ends of the pipework to be tested. One test plug should be fitted with a tee piece. A branch of the tee goes via a flexible hose to the 'U' gauge. The other, also via a flexible hose, to a small hand pump.

If there are gullies on the system air is pumped into the pipe until a pressure of 50mm is obtained on the gauge. Then the maximum acceptable loss of pressure shown on the gauge is 12.5mm in a five minute period.

If there are no gullies on the system a reading of 100mm is required on the gauge with a 25mm drop being the maximum allowed in a five minute period.

If a system does not meet these requirements, pump in more air whilst someone applies soapy water to the joints. Bubbles will form when a badly assembled joint is detected. Once detected check that the fittings have not been partially pushed apart causing them to leak air.

If this is not the case, the leaking joint should be taken apart and the ring seal should be removed. Thoroughly clean the ring seal and the seal housing, to remove any dirt or grit, then reassemble the fitting and re-test, as above.

SHOPPING LIST

Underground drainage products stocked by Wickes are listed on the back page. You should be able to install, replace or add to almost any drainage system using some of these items. (Please note that stocked items may change depending upon requirements).

Use the 'I NEED' column to make up your own In-Store shopping list.

| Code | Drainage Products | 'I NEED' |
|---------|---|----------|
| 432-001 | 3m Underground Pipe | |
| 158-830 | 4m Underground Pipe (selected stores only) | |
| 432-050 | Slip Coupling | |
| 432-012 | Double Coupling Socket | |
| 432-007 | 100° Socketed bend | |
| 432-006 | 20° Single Socket Bend | |
| 432-016 | 45° Single Socket Bend | |
| 432-008 | 87.5° Single Rest Bend | |
| 432-015 | 45° Double Socket Bend | |
| 432-018 | 87.5° Double Socket Bend | |
| 430-082 | 110mm Adjustable Twistlock Bend | |
| 432-005 | Equal Socketed Junction | |
| 432-014 | Blanking Off Plug | |
| 432-002 | Bottle Gully Rod Eye | |
| 432-053 | 110mm Tick Gully | |
| 432-026 | Square Hopper | |
| 432-027 | 150mm Square grating | |
| 432-009 | Downpipe Adaptor to 68mm (Black) | |
| 430-042 | Clay to PVC Adaptor | |
| 435-194 | 110mm x 87.5° Drain Branch | |
| 435-196 | Inlet Hopper Grating (Brown & Black) | |
| 240-631 | 3" Weatherproofing Tape | |
| 435-225 | 110 x 40 / 32mm Drain Adaptor | |
| 435-226 | Drain Rodding Point (selected stores only) | |
| 158-827 | 30° Drain Bend Single Socket | |
| 158-837 | 87.5° Drain Bend Single Socket (selected stores only) | |
| 158-831 | 110mm Single equal Branch (selected stores only) | |
| 158-828 | Rainwater Gully | |
| 158-834 | 110mm x 87.5° Triple Socket Branch (selected stores only) | |
| | Manhole Chamber Fittings | |
| 432-028 | 250mm Shallow Access Chamber Access Base | |
| 432-029 | 250mm Shallow Access Chamber Riser | |
| 432-004 | Aluminium Access Cover & Frame (250mm) | |
| 435-227 | Square Top for Shallow Access Chamber (250mm) | |
| 435-228 | 450mm Access Chamber Base | |
| 435-229 | 450mm Access Chamber Riser | |
| 435-230 | 450mm Access Chamber Cover & Frame | |
| | Channel Drainage | |
| 240-733 | 1m Drive Channel (Polymer) | |
| 240-734 | Drive Channel End Cap (Polymer) END CAP | |
| 158-821 | 1m Drive Channel (Polymer) | |
| 158-825 | Drive Channel End cap (Polymer) | |
| | Manhole Covers | |
| 430-007 | 305 x 305mm Drain Tidy (12 x 12") | |
| 240-730 | 5 Ton Steel Manhole Cover 450 x 600mm | |
| 240-731 | Internal Manhole Cover 450 x 600mm | |
| 240-732 | Block Paving Cover 450 x 600mm | |
| 240-041 | Keys for internal Manhole Cover – Pack of 2 | |
| 432-013 | Silicone Lubricant 250ml | |

Whilst every care has been taken to ensure that the product design, descriptions, specifications and techniques of constructing the products are accurate at the date of printing. Wickes products will inevitably change from time to time and the customer is advised to check that the design, descriptions, specifications and techniques of constructing any of the products described in this leaflet are still valid at the time of purchase or placing an order.

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