

Drainage

Workplace transport site safety information sheet WPT26

This information will be useful to anyone who uses workplace transport or who works where it is used. It will help employers, managers and supervisors to assess their workplace and make improvements. The checklists will help you to prepare your risk assessment.

Roadways, footpaths and hardstandings on site should be properly drained to make sure that puddles of water don't build up. If drainage is poor, water will build up on the road surface and affect movement around the site. This is called ponding, or standing water. Ponding can damage the road surface, and in cold weather can result in ice. This is a particular problem where the road is not surfaced or if the road surface is already in a poor condition.

Common problems

Poor road surface: Water will tend to pond if the road surface doesn't have enough slope across it or if the surface is uneven or potholed.

Blocked drains: Drainage systems can become blocked if they aren't properly maintained and regularly cleaned. Leaves and litter will block drainage grids. Roots can grow into broken drains and cause blockages.

No drains: If your site has no formal drainage you will be relying on water to run off into soft ground and soak away naturally. This may not be enough, especially in wet periods or if you have areas where the water can't easily run off onto soft ground.

Drains in the wrong place: The drains on your site may not be in the right places to collect water. Changes to the site layout can lead to changes in the path that water will take.

Flood water: Is your site in an area which is subject to flooding from nearby rivers and streams? Dry stream beds can become torrents in wet weather. Check that flood prevention mounds are intact (contact the Environment Agency or use local knowledge).



Checklist – what to look out for

- Standing water that will penetrate the road surface and lead to damage.
- Uneven, potholed road surface.
- Puddles, which can ice over in cold weather, leading to loss of control, slips and falls.
- Vehicles can aquaplane leading to loss-of-control accidents.
- Water can obscure road markings.
- Constant splashing of buildings can result in damage.
- Pedestrians avoid the puddles, leading to accidents.

How can you deal with common problems?

Improve the road surface: A new road surface can be laid to allow water to drain off more easily. Simply repairing potholes or damaged areas can help reduce the amount of damage which might occur in the future. For more information about drainage problems see the information sheet *Road surfaces* WPT28.

A surface gradient (or camber) of 1 in 40 should be enough to allow water to run off. Roads should also be sloped along their length with a minimum gradient of 1 in 125, although it should be no steeper than 1 in 12.



Cleaning and maintenance: Drainage systems need regular maintenance to make sure that they work properly. Clean gullies regularly to remove the debris that collects in them. Cracked and broken pipes should be repaired and roots removed. You could use specialist drainage contractors to do this, or your local council may provide this service.

Temporary roads: Temporary roads should follow the natural contours of the ground, as far as possible, so that natural drainage is working for you, not against you. Water running away to the side of a road is likely to cause less damage than if it is allowed to run along the road.

Installing or upgrading drainage

If the existing drainage system is inadequate, or if your site doesn't have any existing drainage, there are several methods you can use to improve your drainage:

Gullies and pipes: If the area to be drained has a hard surface and is kerbed then the traditional method of drainage is to direct the flow of water into gullies and into a piped system. The pipes then take the water into the local drainage system. All gratings and channel units should be of appropriate load-bearing capacity for the location.

Kerb drains: These look like normal kerbs but have holes in the face of the kerb to collect the water which is then carried along inside the kerb to an outfall and into a piped system as described above. They are useful where installing gullies is not practical, or is expensive, and can also be used in flat areas as they can include an in-built slope.

Channel drains: These are particularly useful for large areas such as car parks to reduce the amount of water flowing across the surface. They are installed to be flush with the surface and have a grate to allow water into the channel below which then runs off into a piped system.

Filter drains: A filter drain is usually installed where surface water drains onto soft ground at the side of the hard area. It consists of a trench, which is often lined with a geotextile. The trench is filled with stone which allows the water to drain away, either into the ground, if it is suitable, or into a

perforated pipe in the bottom of the trench which may then connect into a piped system.

Permeable surfacing: Several surfacing products are available which allow water to pass through the surface, removing the need for traditional drainage systems. The water is then either allowed to soak into the ground or is collected below the surface and carried into a piped system.

Connect into the local drainage system: The most common method of disposing of surface water is into an existing sewerage system – this may be a private system or one which is controlled by the local water authority. Alternatively, the water may go into:

- a local watercourse such as a ditch, stream or river;
- a pond;
- the sea; or
- a soakaway, which will hold the water while it soaks into the ground.

These outfall methods will all require consultation with the local water authority or drainage board, and also the Environment Agency. The drainage outfall from your site may have to include equipment to prevent the local drainage system from being contaminated with petrol, oil or other chemicals which may be spilled on your site. Surface run-off will include firefighting water. Specialist design services will be required to make sure that the system is appropriate for your site.

On larger sites, where large quantities of water are drained, a retention or balancing pond (or similar) may be required as part of your system to regulate the flow of water from the site and help with water quality.

Checklist

- Even road surface. Remove potholes and make sure the gradient (slope) of the surface of your site is not too flat or too steep.
- Drainage – check whether your site has any drainage and, if so, check it is appropriate.
- Check to see if your drains are in the right place.
- Has the site layout changed? Changes in the layout of your site can affect where water will stand.
- Check that your drains are clean and well maintained with no blockages.
- Check that it is adequate for the site, ie that no ponding is created after heavy rain or the use of water on the site.
- Look at pedestrian and vehicle routes in particular to check that they are free of standing water, especially after heavy rain or the use of water on site, eg when washing down vehicles.

Checking your site

Carry out a visual inspection of your site to look for problems with drainage. Walk around the premises, make notes and

take photographs of any problems such as areas of standing water. Mark the problem areas on a site plan (you may be able to get a plan showing the drainage on your site).

Does your site use potential pollutants? The Environment Agency recommends that all industrial sites using potentially polluting liquids have an accurate and up-to-date drainage plan. This should identify both surface and foul water systems. You may need to arrange for a site drainage survey.

In a site drainage survey, drains are inspected by a specialist company. They lift manholes and use dye tracing, flow meters, pH and ammonia meters to establish how the system operates. CCTV might be used to detect lost or blocked drains.

Checklist

- Carry out a visual inspection of drainage on your site.
- Pay for a professional drainage inspection or survey if you feel you cannot do this properly yourself.
- Check for channels and gullies, the type of road surface and any kerbs, areas where there is standing water and areas where there may be flooding from rivers or streams.
- Check for blocked drains.
- Check for risk of contamination.
- Ask staff whether they know of any problems with drainage.

Where to get help

If you have a problem with drainage, you might be able to fix it yourself, eg cleaning a blocked drain. If you are unsure, speak to your health and safety workplace representative or contact HSE for advice. It may be more cost effective to have a professional assess your site and carry out the work, eg a specialist drainage engineer. New drainage systems will need formal consent from the relevant authorities.

You can also get advice by speaking to other similar local businesses – look for examples of good practice. Contact your local trade association or Chamber of Commerce for recommended local suppliers or look in the *Yellow Pages* for listings of drainage contractors.

Checklist

- Can you fix the problem yourself or do you need professional help?
- Speak to your health and safety representative and talk to your staff.

What might it cost?

- Creation of a soakaway with a new pipe and gravel drainage system costs approximately £200.
- A new gully costs approximately £1000.
- A day's work from a drain-cleaning gang costs approximately £500.

(These costs are a guide and may vary significantly for individual sites and circumstances.)

Find out more

Management of health and safety at work. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice and guidance L21 (Second edition) HSE Books 2000 ISBN 978 0 7176 2488 1

Workplace transport safety: An overview Leaflet INDG199(rev1) HSE Books 2005 (single copy free or priced packs of 5 ISBN 978 0 7176 2821 6) www.hse.gov.uk/pubns/indg199.pdf

Workplace transport safety: An employers' guide HSG136 (Second edition) HSE Books 2005 ISBN 978 0 7176 6154 1

Sewers for Adoption (Sixth edition) WRC 2006 ISBN 1 898920 57 3

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This document contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

This document is available at: www.hse.gov.uk/pubns/wpt26.pdf.

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