Why do drainage systems stop performing?

How can I ensure future ease of maintenance?

How are open drains maintained?

What methods unblock drains?

- Jetting (above) – is an efficient way of cleaning piped drains. A hose, fed through the pipe, washes and flushes sediment, iron ochre and debris from its internal walls, perforations and adjacent stone fill. Some models can extend to 300 m up the pipe.

- Rodding – is a more labour intensive and less effective alternative.

What time of year should in-field and open drains (ditches) be maintained?

- To protect fish eggs and small salmonids, maintenance of open drains likely to contain these species should be carried out between mid-May and mid-September.

- Hedgerows adjacent to drains should not be cut between 1st of March and 31st of August.

Useful Publications

Land Drainage Booklet
A freely downloadable practical guidebook to land drainage is available via the Teagasc website, www.teagasc.ie/publications Search “Land Drainage”.

Land Drainage Manual
The Teagasc Manual on Drainage and Soil Management is available from Teagasc offices or can be ordered via the Teagasc website, www.teagasc.ie/publications Search “Teagasc Manual on Drainage and Soil Management”.

Land Drainage: MAINTENANCE Q&A

- Why do drainage systems stop performing?
- How can I ensure future ease of maintenance?
- What methods unblock drains?
- What time of year should field and open drains be maintained?
Introduction

• A maintenance plan should be adopted following the installation of any drainage system.
• Maintenance vastly improves the capacity and the lifespan of the drainage system.
• A regular maintenance programme should include assessment of the whole network, focusing in particular on likely areas for blockages (Figure 1) and adequate upkeep.

What causes drains to block?

• Fine soil particles: silt and clay particles are many times smaller than aggregate or pipe slits, they can enter pipes and settle in low flow conditions.
• Iron ochre deposits: these are predominantly ‘rust’ and occur naturally in certain soil types.
• Plants and their roots: can thrive in open channels, at the pipe outlet and deep within the system.
• Collapse/sedimentation of open drains, due to flow conditions, undercutting of banks or livestock damage.

How can I ensure future ease of maintenance?

• Clean and upgrade open drains before field drain installation to ensure good outfalls and consistent flows.
• Use simple layouts with few junctions, use manholes as access points. The upstream end of field drain pipes can be brought to the field surface and capped to allow access.
• Mark the locations of field drain outlets and manholes in the field and on maps to help locating them afterwards.
• Always use pipes to allow for maximum water flow and maintenance by jetting/rodding.
• Ensure the aggregate used above the pipe is washed and 10-40 mm in size. At present there is no evidence to suggest membranes on top of aggregate or around pipes help.

Why do drains stop performing?

• The performance of drainage systems will deteriorate over time, due to a variety of blockages.

How are open drains maintained?

• Open drains should conduct surface water during rainfall, be deeper than in-field drains and also where possible drain groundwater all year round.
• Open drains should be clean and as deep as possible with a graded profile (Figure 2).
• The bank slopes of open drains need to be appropriately graded to prevent collapse (See Table).
• If such grades cannot be achieved then piping of new open drains may be necessary.
• When cleaning open drains, care must be taken to protect field drain outlets from damage.
• Spoil from such works can be spread on adjoining land but must not impede water.

<table>
<thead>
<tr>
<th>Soil</th>
<th>Channel &lt;1.3m deep</th>
<th>Channel &gt;1.3m deep</th>
<th>Max water velocity m/sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Clay</td>
<td>0.5:1</td>
<td>1:1</td>
<td>1.5</td>
</tr>
<tr>
<td>Clay or Silt Loam</td>
<td>1:1</td>
<td>1.5:1</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Figure 1: Examples of where blockages may arise.

Figure 2: Maintenance of open drains changes the shape of the drain and makes them more efficient for water transport.