Drainage Design: Best Practice with MicroDrainage
For our designs to be valid, we need to fully understand the inflows our networks need to be able to deal with.

In the UK, this means an understanding of which rainfall methodology we need to use.

Get this wrong and it could spell disaster!
Which Rainfall to use;
FSR - Flood Studies Report ?
or
FEH - Flood Estimation Handbook?
- Built into MicroDrainage
- Oldest methodology
- Simple description, based on two key variables:
  - M5-60
  - Ratio ‘r’
- Released in 1999 – FEH CD-ROM
  - Catchment-scale data
- Re-released in 2013
  - Catchment-scale data
  - Point-scale data
- Web-based, ‘Pay-per-use’ service: https://fehweb.ceh.ac.uk/
[Comparison demonstration]
### Ave. Rainfall Intensity Results for Newbury

<table>
<thead>
<tr>
<th>Return period (years) Method</th>
<th>2</th>
<th>30</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSR</td>
<td>16.200</td>
<td>30.811</td>
<td>40.510</td>
</tr>
<tr>
<td>FEH 1999 Catchment</td>
<td>14.708</td>
<td>33.422</td>
<td>48.426</td>
</tr>
<tr>
<td>FEH 2013 Catchment</td>
<td>13.902</td>
<td>33.338</td>
<td>43.200</td>
</tr>
<tr>
<td>FEH 2013 Point Based</td>
<td>14.041</td>
<td>34.380</td>
<td>44.690</td>
</tr>
</tbody>
</table>

FSR 16.5 % > FEH'13 Catchment  
FEH'13 Point 11.6 % > FSR  
FEH'99 Catchment 19.5 % > FSR
[Source Control & CASDeF demonstration]
The CASDeF Controller provides the engineer with complete control over the design and analysis processes.

CASDeF can be used to upsize any structures in Source Control to prevent water levels from exceeding a given (known) level.

We can also use CASDeF in Simulation when working with entire networks to resolve flooding through a 3-step solution:

• Step 1 to size flow controls that will utilise the existing upstream storage.

• Step 2 to upgrade pipe sizes where there is insufficient flow capacity.

• Step 3 to provide the optimum online storage.
An appreciation of the differences in UK Rainfall methodologies is essential to best practice design.

MicroDrainage has the ability to work with all types of synthetic rainfall data.

MicroDrainage has tools, such as CASDeF, to enable you to automatically upsize and optimise your designs.