

Sustainable Track Drainage, Amersham, Buckinghamshire



SuDS used

- *Infiltration systems*
- *Hydrodynamic vortex separator*

Benefits

- *Solved existing flooding problems*
- *Enhanced health & safety for maintenance operatives*

1. Location

Amersham, HP6 5BB

2. Description

A forward-thinking approach to sustainable track drainage and maintenance, pioneered by London Underground, has set new standards for personnel safety, whilst successfully managing flooding and pollution risk.

Flooding had become an increasingly frequent problem for homes and businesses that back onto the track at the north-western end of the Metropolitan line at Amersham in Buckinghamshire.

Investigation work found the existing track drainage to be in relatively poor condition, with poor ballast, deteriorating pipes and, most of all, existing deep bore soakaways that had completely silted up and which were in a poor state of repair.

The existing deep bore soakaways were 6-7m deep and posed a health & safety risk for a maintenance operative to attempt to rehabilitate. Disturbing them could have increased the risk of groundwater pollution. They were therefore left unmaintained to reach the end of their service life. New deep bore soakaways were constructed, which, although expensive, are necessary solutions in space-constrained sites. Other options, including above ground SuDS and connecting to the sewer network were considered, but rejected on technical grounds.

3. Main SuDS components used

Each soakaway is protected by an advanced hydrodynamic vortex separator – the first time the units have ever been used for trackside drainage and pollution control.

4. How it works

The hydrodynamic vortex separator captures sediment and other associated pollutants arising from the rolling stock and the break down over time of track ballast. Capturing these pollutants ahead of the deep bore soakaways ensures the long-term viability of the soakaways.

5. Specific project details

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6. Maintenance & operation

A collaborative approach between London Underground, Track Partnership and the manufacturer at the off-track locations minimised the project duration through a combination of low risk works during traffic hours and higher risk works during engineering (night-time) hours. Lightweight, HDPE (high-density polythene) chambers, instead of the more common concrete manholes, could be installed quickly, easily and safely by overhead winch during the short window when the line is closed.

Instead of having to arrange safe access for an operative to enter and manually clean numerous catchpits, the hydrodynamic vortex separator can be periodically emptied using a vacuum pump system.

7. Monitoring and evaluation

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8. Benefits and achievements

The efficiency of the hydrodynamic vortex separators meant that just 7 assets were required as opposed to around 50 – 60 assets had conventional catchpits been used. The solution provides improved drainage to combat the flooding and complied with the Environment Agency stipulations that the underlying chalk aquifer would not be vulnerable to pollution.

9. Lessons learnt

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10. Interaction with local authority

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11. Project details

Construction completed: June 2016

Cost: -

Extent: -

12. Project team

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|--------------|------------------------|
| Funders | London Underground Ltd |
| Clients | London Underground Ltd |
| Designers | Track Partnership |
| Contractors | Onsite |
| Manufacturer | Hydro International |

13. Project Images and illustrations

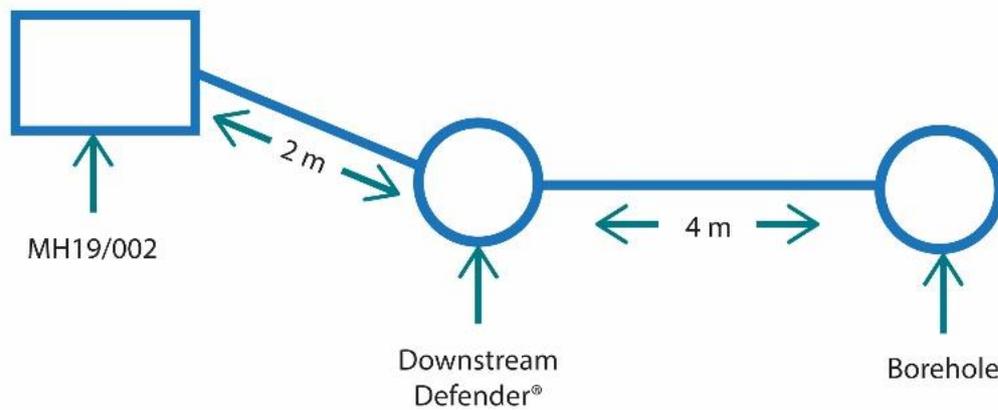


Fig 1: Schematic of solution



Fig 2: Setting out works



Fig 3: Hydrodynamic vortex separator unit prior to installation



Fig 4: Amersham Station