home safe and well

CASE STUDY
AtkinsRéalis | Super Gully Drainage – 17/07/2025

Introduction

AtkinsRéalis were appointed to the East of England Region Design Service Consultancy (ERDSC) by National Highways (NH) to provide essential services designed to enhance the efficiency, sustainability, and effectiveness of drainage systems across the East of England region. AtkinsRéalis operates at the forefront of highway drainage renewal and management.

Highway flooding on the A1 in Wyboston, from the overbridge north of the Apple Green services on Great North Road to The Lane posed severe difficulties for motorists and local pedestrians impacting road safety, traffic flow and local properties. Heavy rainfall often led to water accumulation and ponding in the area creating hazardous driving conditions that resulted in disruptions to traffic, inconvenience to the local community, and increased maintenance costs.

The team undertook a challenging yet crucial project involving the detailed design of storm drainage along the A1 to provide a long-term solution to the problem.

Overview

The network had been experiencing substantial flooding on a part of the highway for some time which required some innovative thinking to get around site constraints without encroaching on private land and costly amendments to the existing footbridge.

The flooding was noted to be the result of bridge foundations above the drainage settling and affecting the discharge capacity of the drainage.

An innovative design was implemented on National Highways schemes using Super Gully as part of the drainage design, to remove the surface water efficiently and provide some additional capacity in the drainage system.

A departure from standards was submitted to National Highways Safety, Engineering & Standards (SES) Team to approve construction using a new proprietary system within the Strategic Road Network (SRN).

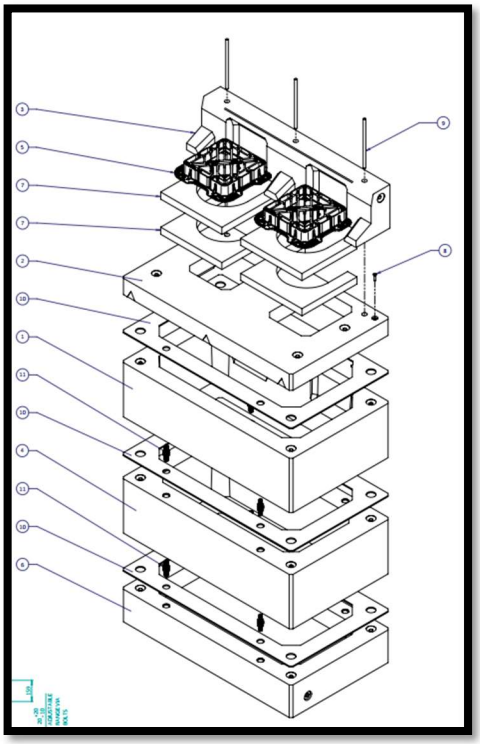
Super Gully was created to help overcome common issues with highway flooding:

- Flooding hot spots e.g. low-lying areas
- Carrier pipe failure to cope with extreme rainfall
- Maintenance issues with existing drainage solutions

The result being a low-maintenance, high-capacity kerbside surface water management solution with increased storage capacity that has the ability to cope with severe conditions in comparison to traditional drainage systems, leading to safer road conditions due to reduced likelihood of the presence of surface water.

Challenges

- Water accumulation and flooding, creating hazardous conditions
- Dealing with the effects of climate change
- Settlement of the footbridge footings above the existing drainage run
- Surcharge within in the central reserve connecting chamber during peak flow
- Costly alternatives e.g. diversions and clashes with existing utilities
- Additional departures from standards for the same design leading to delayed use on future schemes



Action Taken

Addressing this issue required a comprehensive approach to drainage system design, ensuring that stormwater could be effectively managed along with the other existing utilities.

These specialised Gullys have the capacity equivalent to seven standard Gullys – this is highly beneficial when dealing with the effects we are seeing from climate change, due to their enhanced capacity. The product combines ductile iron gully gratings with an offsite manufactured precast concrete system. Supplied in modular form this solution is also simple to handle on site using existing plant.

The existing gully connections intended to manage runoff had unfortunately been failing to adequately collect the water due to settlement of the footbridge footings above the existing drainage run reducing the capacity to discharge.

- To address this pressing issue, the team has proposed the installation of super gullies as attenuation and the rerouting of the outfall via the central reserve drainage system.
- To prevent additional surcharge within in the central reserve connecting Chamber during peak flow a non-return valve was also installed thus releasing surcharge at a later stage after peak flow had subsided.
- By integrating super gullies into the drainage system, the team not only enhanced water collection capabilities but also eliminated the need for a costly diversion of services and works which could undermine the existing footbridge.
- To effectively address clashes with existing utilities, the team devised realignment of the kerb and gully locations to integrate existing services. Collaboration between the contractor, our design team and National Highways allowed us to quickly resolve technical issues as they came up resulting in a quick turnaround reducing extensive delays on site.

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Results

A1 Wyboston, Before

The consultancy framework has resolved flood hotspots across major routes (M11, A1M, A10, A11, A12, A14, A47) through comprehensive services from preliminary design to construction support. By optimising the placement of Super Gullies and collaborating closely with National Highways, the team retained the existing pipe network, enabling a cost-effective and efficient solution. The use of alternative designs and a highly collaborative approach helped avoid significant delays and cost overruns during construction.

Additional Schemes

Since ERDSC another example of where AtkinsRéalis has been involved in Super Gully work for National Highways is on the A14 Junction 16 – 17 through a collaboration between AtkinsRéalis, Carnell's, and Core Highways for National Highways.

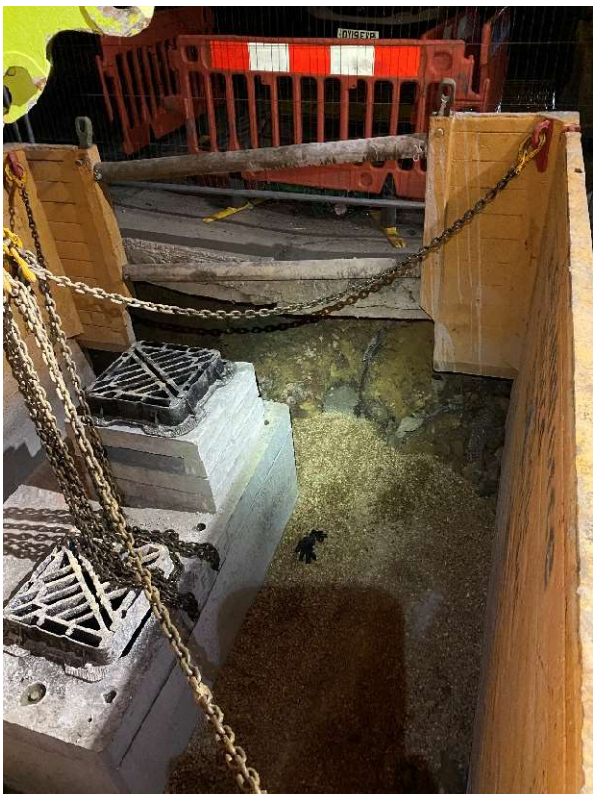
This intervention addressed safety concerns raised by police due to standing water in the central reserve, which had caused near-miss incidents. The flooding was attributed to previously installed substandard gullies as part of an earlier M1 to A1 link Thrampton to Brampton scheme and ponding had also been noted within the V channel drainage at Spaldwick on the A14. By integrating Super Gullies and retaining the existing pipe network, the team enhanced water attenuation without needing a full system replacement.

A1 Wyboston, After

Although AtkinsRéalis designed the scheme, construction was handed over to another team due to road space booking challenges and as the ERDSC framework had now ended.

The drainage professionals at AtkinsRéalis have now used Super Gully's in multiple designs that have since been completed.

The success of this approach has led to further applications of Super Gullies, including an upcoming scheme near Lydney, Gloucester, which has been positively received by the local council.



Installation at A14 Central Reservation

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