



CASE STUDY

MIALGAE SURFACE WATER DRAINAGE NETWORK

CLIENT: EARLS GATE UTILITIES LTD

LOCATION: CALACHEM, GRANGEMOUTH

HIGHLIGHTS:

- 'Infodrainage' modelling and design
- Site Drainage layout
- SuDS
- Brownfield redevelopment
- Industrial inspection and investigations
- Drainage system Inspection



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THE CHALLENGE

Arthian Ltd supported Earls Gate Utilities (EGU) with the assessment and design of a proposed drainage tie-in for the MiAlgae development plot within the east car park at the CalaChem site, Grangemouth.

The work involved reviewing the existing drainage network, carrying out a site-based drainage investigation, and developing a practical solution to accommodate additional surface water runoff. This included identifying a suitable connection point and proposing upgrades to ensure the system could accommodate the flows from the site post-development.



THE CHALLENGE (cont.)

EGU required a clear and workable solution for connecting the proposed MiAlgae plot into the existing drainage system within the east car park.

The site presented a few key constraints. The existing drainage network is split between two systems, the North Car Park drainage (pre-1988) and the South Car Park drainage (1988 extension), both ultimately discharging to the site's Effluent Treatment Plant (ETP).

While the network was generally understood to be operational, there was limited certainty around its original design and available capacity. A key concern was whether the existing infrastructure could accommodate the surface water runoff following development of the brownfield site.

In particular:

- The existing 150mm drainage connection did not have sufficient capacity for the proposed catchment area.
- The drainage layout shown on record drawings needed to be confirmed through site walkover and dye testing.
- Any solution had to work within an active industrial site, avoiding disruption to existing operations.
- The design needed to align with SuDS principles, including limiting discharge in line with greenfield runoff rates.

THE SOLUTION

Arthian carried out a site-based drainage investigation by lifting manholes and using dye testing to confirm flow routes and identify interconnectivity of existing systems. This allowed the team to verify the layout shown in historical drawings and develop an accurate understanding of the network.



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THE SOLUTION (cont.)

Using InfoDrainage modelling, the team assessed both the existing and proposed scenarios. The analysis showed that while the northern drainage system would see a reduction in catchment and flow, the southern system would experience a significant increase in runoff due to the development.

To address this, Arthian proposed a practical upgrade:

- Installation of a new 300mm diameter pipe connecting existing manholes to divert future flows.
- Removal and isolation of redundant drainage runs within the development area.
- Retention of key elements of the existing drainage network where appropriate to minimise disruption.

This approach provided a betterment to the existing system, replacing the current 150mm outfall with a higher-capacity connection and improving overall flow performance.

The design also considered greenfield runoff rates using the IH124 method, establishing a benchmark discharge rate and confirming that attenuation was not required due to the site's connection to the wider ETP-controlled network.

To support delivery on site, Arthian prepared a detailed Scope of Works, outlining contractor responsibilities, including:

- Excavation and installation of the new drainage connection.
- Manhole modifications and pipe installation.
- Testing in accordance with BS EN 1610.
- Backfilling and reinstatement of the hardstanding.
- Sealing of redundant drainage within excavations and manholes.



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THE SOLUTION (cont.)

Outcome

- A clear drainage tie-in solution for the MiAlgae development.
- Increased capacity within the drainage network through upgraded pipework.
- Verified understanding of existing drainage through site investigation and testing.
- A practical solution that works within the constraints of an operational industrial site.
- Compliance with SuDS principles and industry standards.



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