

# FLOOD RISK MANAGEMENT



Successfully helping to protect communities and homes from flooding.







WHS, Burroughs and TACP have formed a partnership to offer clients a professional and proactive service to meet all their Flood Risk Management (FRM) consultancy needs.

Historic levels of rainfall and increasing frequency of storm events combine with climate change to create unprecedented levels of Flood Risk for our communities.

## Skills and Expertise

Our offering is unique, bringing together some of the most technically advanced specialists in the UK in the critical disciplines required. We work collaboratively with clients and in partnership to create added value. We offer a cradle to grave service for clients, from inception to completion. We are credible and respected by clients, regulators and developers.

- » Solutions are developed sensitively with clients and communities;
- » Clients take confidence in our track record of securing regulatory approvals;
- » Efficient and economic schemes are designed; and
- » Competently and successfully delivered.

## Services

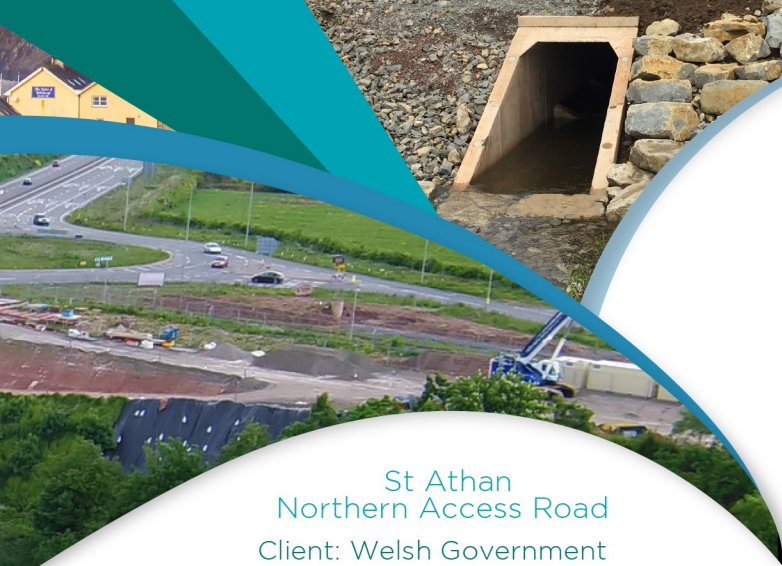
Supporting clients through:

- » Flood Risk Modelling;
- » Options appraisal;
- » Outline and Full business case approval processes;
- » Environmental assessment;
- » Flood regulatory approval;
- » Planning approval and condition discharge;
- » Ecological Mitigation;
- » Licensing and consents;
- » Design of sustainable civil engineering solutions;
- » Procuring competitive and high-quality contractors for implementation;
- » Overseeing the construction of efficient, innovative solutions; and
- » Environmental site supervision.

“ WHS provided friendly and professional expert advice. They have very good working relationships with design team and key stakeholders. By gaining the confidence of the EA, particularly in agreeing mitigation measures, allowed the scheme to progress through a successful planning application on a fast track programme ”

Richard Bruten, Project Director, Alun Griffiths (Contractors) Ltd

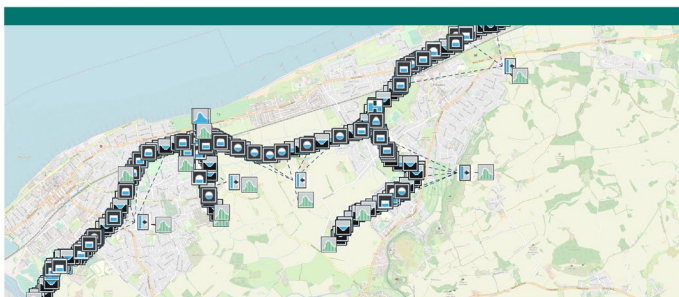




### St Athan Northern Access Road

Client: Welsh Government

The Burroughs, WHS and TACP partnership designed 3.25km of new highway and flood risk improvements, serving the Bro Tathan Business Park at St Athan, South Wales, under a design and construct contract for the contractor and Welsh Government. Flooding and ecological considerations were paramount to the local communities. The innovative design integrates a flood alleviation scheme with the new highway. In collaboration with Natural Resources Wales, pioneering flood risk mitigation included a series of high and low flow culverts and flood storage, and the incorporation of eel and fish passage and ecological connectivity.



### Rhyl Cut and Prestatyn Gutter Flood Risk Study

Client: Natural Resources Wales

Rhyl and Prestatyn are connected with a series of manmade drainage channels built in the 1960s and 70s, which present a risk of flooding to residential and commercial properties.

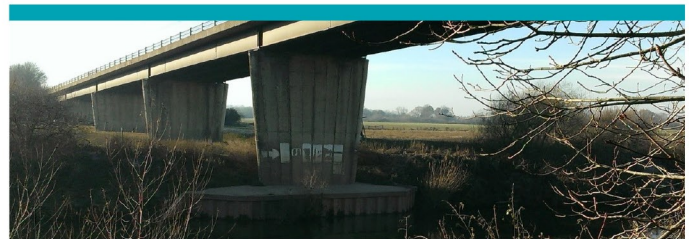


WHS developed a detailed hydraulic model and undertook 300 modelling runs for different scenarios to provide NRW with a prioritised list of "at risk" locations, including blockage, breach, siltation, failure of pumping stations, reduced channel maintenance and tidal locking.

WHS worked closely with Dwr Cymru Welsh Water to agree the modelling approach, ensuring a robust assessment of flood risk. Study outputs included recommendations for targeted management of the watercourses and pumping stations, and specific flood risk improvements.

"In terms of the interactive PDF's, we (NRW) have found them very useful and led to better stakeholder engagement within the project"

David Tarrant - Natural Resources Wales

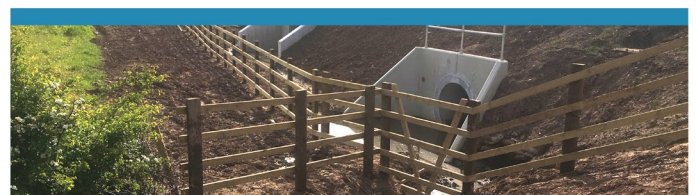


### Worcestershire Southern Link Road - Phase 4

Client: Worcestershire County Council

The Burroughs/COWI Joint Venture, including WHS and TACP, formed part of the Contractors team to design and construct this exciting strategic highway scheme which formed the final part of a multi-project to improve congestion around Worcester.

The Scheme crosses the floodplain of the River Teme and the River Severn, which is also a Registered English Civil War Battlefield. It includes 2km of dualled carriageway, two road bridges including a 300m viaduct over the River Severn. WHS undertook detailed flood modelling and developed the Flood Risk Assessment for the final scheme that the team successfully took through the planning process. Essential to the Scheme's success was their approach to liaison with the Environment Agency and other key stakeholders. Essential mitigation included a flood compensation area which was designed to benefit biodiversity and flood defence schemes to reduce the flood potential on specific properties within the River Severn floodplain.



### Upton-Upon-Severn Flood Resilience Scheme

Client: Worcestershire County Council

Burroughs were the Contractor's Designer for a highways and drainage scheme on the A4104 road to provide flood resilience to Upton-upon-Severn in Worcestershire. This important scheme required the replacement of culverts and raising of road levels for improved access to the town during flood events. Collaboration with all stakeholders was essential in achieving a "Best Value" solution. The remodelling of the River Severn Flooding Catchment was vital for the design of effective and appropriate flood conveyance structures based on a 120 year design life and securing the necessary regulatory approvals for the scheme.

WCC Councillor Tony Miller said:

"To know that the likelihood of this road flooding in the future is dramatically reduced, is fantastic. I would like to personally thank the project team for their hard work and dedication in delivering this complex scheme."



## In Partnership

WHS, Burroughs and TACP have a long standing effective working relationship in the development of options, flood risk assessments, design and construction of flood protection measures.



WHS is well known as the developer of the flood flow assessment methods and tools used throughout the UK. We build upon this national credibility to work closely with flood regulators during scheme development.

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Burroughs are an award-winning independent engineering and project management consultancy, proud to have been instrumental in shaping an exciting and diverse mix of infrastructure and civil engineering projects.

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TACP is an interdisciplinary environmental consultancy widely recognised for their innovative yet pragmatic solutions. Established in 1906 we bring considerable experience of working in sensitive ecological and historic landscapes throughout the UK.

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Together we are adept at combining leading specialist sector knowledge and site specific data analytics, identifying innovative options, developing inspiring yet pragmatic solutions and effectively engaging with regulators.

## Frameworks

- » Welsh Government NPS Framework - Flood Risk Modelling and Mapping
- » Welsh Government NPS Framework - Civil Engineering
- » Transport for Wales Consultancy Panel
- » Coastal Partnerships East Framework

## Awards and Accreditations

