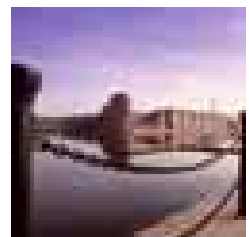
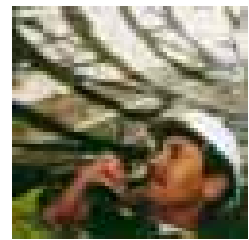


## *Construction services*

*Too often in the past the construction industry has delivered late, in excess of budget, with defects, or with safety and operational issues, all of which led to customer dissatisfaction. The process of developing and delivering a project was fragmented with numerous interfaces between the various stages and the parties involved.*

The missing ingredient: an integrated professional team harnessing its development planning, environmental, engineering, construction, operational and management skills throughout the project life cycle. Customers are increasingly seeking this total solution to derive best value and reliability of delivery, enabling them to concentrate on their core business in the knowledge that a team is working alongside them with the necessary breadth of skills to deliver the project requirements. Entec is fully committed to this approach.



*Capability statement*

# Entec

*Entec is one of the UK's largest environmental and engineering consultancies. Our technical and business skills are dedicated to delivering strategic, technical and engineering solutions which bring commercial benefit to customers at home and overseas. This know-how is based on over 60 years' consulting experience in the public and private sectors.*



Certificate No. EMS 69090

Certificate No. FS13881

Entec operates a Quality Management System in accordance with the latest requirements of the international standard BS EN ISO 9001 and an Environmental Management System compliant with BS EN ISO 14001. Both are audited by BSI Management Systems.



## *Construction services*

Entec has long recognised the importance relationships play when working in fully integrated multi-disciplinary construction teams. We have invested in a development team and business unit dedicated to the construction sector. By this means we are able to develop and share working practices to benefit the delivery team, and the end user alike. We apply strong project management protocols, focusing on delivery into the multi-disciplinary arena. Entec is equally at home in either taking a lead role in bringing together technical services or as a supply chain partner. Through this approach we have developed well-established relationships with a number of contractors and consultants.



### *Entec working in partnership*

Entec works in partnership with its customers to ensure:

- Clear objectives;
- Mutual benefits to all partners including the client;
- Cultural alignment;
- Encouragement of innovation and willingness to challenge;
- Recognition and reward for achievement;
  - at a corporate level increased profitability and long-term client relationships;
  - at a personal level through an individual's performance development process;
- Structured customer feedback;
- Shared learning to seek continuous improvement;
- Trust;
- Utilisation of the best skills for the job;
- Clear team organisation, allocated responsibility and defined accountability.



## The service

As customers place increasing emphasis on the construction team to add value by early involvement in the project life cycle, a wider range of risks must be managed. Entec is able to provide specific support in the following areas, and when appropriate lead the provision of technical services:

### Feasibility and Optioneering (to preferred option)

- environmental scoping studies and high level assessments
- master planning
- stakeholder consultation
- sustainability appraisals
- conceptual engineering designs
- contaminated land desk studies, risk and liability assessments

### Planning (preferred option to planning consent)

- environmental impact assessments
- environmental statements
- surveys (geotechnical, contamination, environmental, statutory undertakers, engineering)
- preliminary engineering and environmental design
- remediation plans and design
- stakeholder consultation
- planning applications and preparation
- public inquiry (expert witnesses, proofs of evidence, statements of case, rebuttals)

### Design and Construction (planning consent to scheme opening)

- detailed engineering design
- detailed environmental design
- planning supervisor
- environmental training, monitoring and management plans (EMP's)
- site supervision and audits
- HAZOP and HAZCON studies
- commissioning plans

### Maintenance and Operation (post scheme opening)

- O&M manuals
- safety appraisals
- operator training
- post-construction environmental monitoring

### Specialist skill areas include:

#### Environmental:

archaeology, air quality, built heritage, community, ecology, land contamination, landscape and visual, land use, noise and vibration, socio-economics, sustainability, waste management, water resources/hydrology

#### Engineering:

civil, mechanical, electrical, process, instrument control and automation (ICA)

## Case studies

The following pages demonstrate Entec's capabilities in the area of construction management, using case study examples. ►



## Construction of the Newport Southern Distributor Road Morgan Est



Location of proposed bridge crossing over the River Usk candidate Special Area of Conservation

Following preliminary design work and environmental impacts assessments, a contract to design, build, finance and operate a 9.3 km long distributor road along the southern edge of Newport in South Wales was put out to tender in the Official Journal of the European Community. Morgan Est, one of the largest civil engineering contractors in the UK, together with Vinci, an international contracting company, formed a partnership to bid for the £55 million contract.

Amongst the technical issues that Morgan Est's/Vinci's tender needed to address were various requirements that had been defined by the client (Newport County Borough Council) relating to ecology and landscape. Demonstrating that these requirements would be fully met was essential if the tender was to be successful. At the same time, however, the success of the tender depended on these aspects of the work being addressed in a cost-effective way.

Entec was brought in at an early stage of the tender preparation process to write those parts of the tender dealing with landscape and ecology, and to cost the inputs that had been defined. This required Entec to review two environmental statements (each dealing with different sections of the road) in order to identify the mitigation measures that should be included in the tender. It also required Entec to work closely with other members of the project team, a relationship that continued during the tender negotiation stage.

The key ecological issue that needed to be addressed in the tender was the development of mitigation measures relating to migratory fish and otters in the River Usk candidate Special Area of Conservation.

For landscape, there was a need to work up an outline landscape scheme for the road corridor, and develop a strategy for the management of both new and retained landscape features and habitats. This was used as a basis for obtaining prices from landscape contractors, which were then built into the costs for the project.

During the summer of 2001, it was announced that the Morgan Est/Vinci tender had been successful. Entec is now working alongside other project team members to ensure that Newport County Borough Council's requirements relating to the construction and operation of the road will be met on time and within budget.

*Addressing ecological and landscape requirements during road design and construction*



## Coastal Sewage Treatment - UV Disinfection Programme Byzak / Northumbrian Water

Under the UK Water Industry's Asset Management Plan 3, Northumbrian Water Limited (NWL) was required by OFWAT to provide ultra-violet (UV) disinfection to six coastal/estuarial continuous effluent discharges by 31 March 2002, including NWL's three largest sewage treatment works (STWs), serving Newcastle, Teesside and Sunderland.

Tenders were sought from UV process contractors and framework civil contractors with sub-contracted framework consultants for a prototype installation at Seaton Carew STW to be commissioned one year early.

Entec was approached by two civil contractors, but opted to bid with Byzak, who were subsequently awarded the target cost civil contract for both the initial prototype and the five continuation sites.

Entec provided civil, structural and hydraulic design services to Byzak, tailored to suit their construction needs. However, a strong partnership ethos developed with NWL, Entec and the two main contractors where Entec was able to contribute technical advice well beyond a strict civil sub-contract design role.

Consequently, Entec's brief soon expanded to include value engineering to suit NWL operations, support for NWL planning submissions, HV power supply design and procurement and systems control and data acquisition (SCADA) liaison on the two largest sites. This extended to all sites, including Howdon STW, which will become Europe's largest wastewater UV disinfection plant, serving a population of one million.

Byzak have benefitted from a flexible design service from Entec, constantly reviewed to fit construction sequences and needs. As the scope of work has expanded on what has been a fast-track procurement, even by the world-leading UV process contractor's standards, NWL have also benefited from the broad range of Entec skills that have been called on at short notice. Following the success of the project, the team won highly commended status in the prestigious, annual Construction News 'Quality in Construction' Awards.



### *Designing Europe's largest UV disinfection plant*



#### Facts and Figures

**Project**  
Coastal STW - UV Disinfection Programme

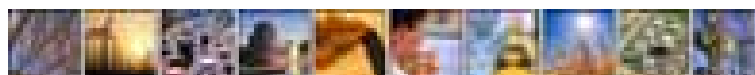
**Client**  
Byzak / Northumbrian Water

**Location**  
Six coastal STWs, NE England, UK

**Capital Project Value**  
£11.4m

#### Entec Services

- Detailed structural, hydraulic and civil design (to Byzak)
- HV design and procurement project management (to Byzak)
- SCADA design and procurement project management (to Wedeco)
- Value engineering / operability reviews (to NWL)



## **Newcastle Schools PFI Project** Focus Education (Bovis Lend Lease and HBOS)

FocusEducation Limited, a joint venture company incorporating Bovis Lend Lease and HBOS (Halifax and Bank of Scotland) were chosen as preferred bidder by Newcastle City Council to develop six new schools on the site of existing schools in Newcastle. The redevelopment of each school through private finance initiative (PFI) was necessary because each existing school accommodation is not appropriate for the standards required by a modern school.

Entec was part of the project team from an early stage. We provided a range of planning and transportation advice to add weight to the bid and inform the designs of each school as well as setting out the strategy for disposing of surplus school land for residential development. Entec successfully steered FocusEducation through a challenging planning process, working on an extremely tight timescale.

We submitted detailed planning applications for each of the school sites. This involved co-ordinating the team of architects, transportation engineers and landscape architects, pulling together the submission to a very tight timescale set out by the need to achieve financial close by a

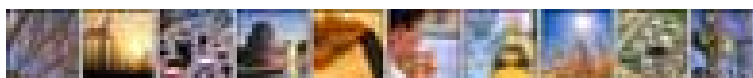
specified deadline. Work on the planning applications also involved a great deal of negotiation with Sport England on a range of playing field issues. A number of the schools were in sensitive locations and a series of negotiations were necessary with the local planning authority to ensure that planning permission for each school could be delivered and that potential objections were kept to a minimum.

Our other role was to provide advice to FocusEducation on the disposal of surplus school land for residential development. This involved working closely with the Property Division of Bovis Lend Lease and a commercial agent in order to gain the return required as part of the financial model for the PFI. Entec advised which land was most likely to realistically gain planning permission.

Our background work on the surplus land disposal strategy led to Entec being appointed by Bett Homes (North East) Ltd who, following a competitive bidding process, were named as the housebuilder to develop the sites.



*Detailed planning submissions for six new schools and surplus land assets strategy*



## **New E-Business Centre, Consett Business Park** Derwentside District Council



Entec has provided project management services to Derwentside District Council for the design, procurement and construction of a new E-Business Centre at Consett Business Park. The facility provides a suitable base for small enterprises and start-up businesses.

Entec managed the procurement process from the development of the employer's requirements to the preparation of tender documents, tender appraisal and contract administration in the construction stage.

Cost management services and site inspection services were provided throughout the construction stage, with Entec undertaking single-point responsibility between Derwentside District Council and the contractor.

Entec also designed, procured and managed the site investigation services and managed the provision of a topographical survey.

The total contract value was £1.63m.

*Providing project  
management  
services to  
local government*



### **Facts and Figures**

**Project**

New E-Business Centre,  
Consett Business Park

**Client**

Derwentside District Council

**Location**

Consett, County Durham, UK

**Entec Fee Value**

£60,000

**Entec Services**

- Project management
- Programme management
- Cost management



## Design and Construction of Ripon Leisure Centre Allenbuild Turner

*Geotechnical  
and structural  
engineering services  
for multiple-use  
leisure complex*

Entec acted as Allenbuild Turner's structural engineers, supporting their successful presentation to Harrogate Borough Council for the building of a leisure centre near the town centre.

The brief was to design and construct a building to incorporate a number of leisure facilities including a main sports hall, an arts hall for special functions, a weight-training room, a crèche, a bar and lounge area with viewing galleries and dedicated changing facilities for the public. Included in the overall requirements were a boiler house and plantroom, a main reception area and all necessary car parking facilities and landscaping.

Entec was responsible for the structural and civil design as well as the building services design for the complex. We scoped and supervised the site investigation, which revealed that the ground conditions were difficult, with peat overlying rock strata incorporating gypsum cavities. Entec's geotechnical engineers designed a piled foundation solution to overcome potentially large settlements.

The poor ground conditions led our engineers to design a drainage system, which would accommodate possible movements in the soft ground around the site.

The main building superstructure incorporates steel portal frames in the main hall, with roof bracing across the arts hall.



This wind-girder construction transfers the wind forces into bracing hidden within the cavity. The roof consists of purlins on steel beams and incorporates eaves overhangs as architectural features.

All internal walls are blockwork with exposed external masonry at low level only and both timber and metal sheet cladding above.

With an overall value of £1.4 million, the project was completed on programme and within budget.

### Facts and Figures

#### Project

Design and Construction of Ripon Leisure Centre

#### Client

Allenbuild Turner  
(formerly Turner Design & Build)

#### Location

Ripon, North Yorkshire, UK

#### Entec Services

- Piled foundation design
- Drainage design
- Superstructure design (steelwork, load bearing masonry)



## **Watchgate WTW - Water Quality Improvements** Morgan Biwater Joint Venture

Watchgate Water Treatment Works near Kendal in Cumbria, is an automated plant which treats up to 700 million litres (140 million gallons) of water a day from Windermere and Haweswater for United Utilities in the North West of England. The plant is extensively landscaped and virtually unseen from the surrounding countryside. In compliance with new water regulations, United Utilities introduced improvements to the original plant which have required major construction work on the site.

Entec supported Morgan Biwater Joint Venture (MBJV ) during the tender period for the project providing conceptual design information and value engineering to enable a competitive tender submission. Following Morgan Biwater's appointment as principal contractor by United Utilities, Entec was subsequently appointed as civil and structural designer. Entec has been responsible for the design of all underground structures, pipework and plant infrastructure, working closely with

MBJV's in house mechanical and site teams. Complex concrete structures and large diameter pipelines have had to be shoe-horned into the existing site without compromising the subtle landscaping and allowing the plant to continue to operate as normal.

Construction and design started simultaneously in July 2001 and was completed in mid 2003. Entec has been able to demonstrate a flexible, proactive approach to the design of complex structures set against a very tight design and construction timetable.

*Water infrastructure  
improvements on a  
constrained site*



## *Construction services*

### *Sample client list*

Alfred McAlpine  
Amec Capital Projects  
Balfour Beatty  
Birse  
Bovis Lend Lease  
Byzak  
Harbour & General  
Henry Boot (Scotland)  
Kier  
KMI Water  
Meica  
Morgan Est  
Morrison Construction  
Nuttall



*Construction services*

# **Entec**

*For further details on  
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