

CAPITA

Delivering the UK's Utility Infrastructure





Market challenges

The utilities market is experiencing unprecedented change and disruption; from a customer based focus, government and regulation, increased competition, production service models and changes in distribution channels are rapidly delivering new ways of working.

In the UK alone, there is an ever-increasing demand for utilities to drive growth in housing, and industry. In terms of domestic demand alone over 181,000 new homes were built in 2017, this coupled with expanding trade and commercial demand has increased the need for :

- Water supply and treatment of effluent from each house
- Power supplies to each property although this can be offset by photovoltaic cells on new properties
- Gas supplies for space heating and cooking
- Telecommunications for occupants

This demand is not only seen in new houses but also has a much wider effect on the Infrastructure that supplies these utilities. This has resulted in additional infrastructure works;

- Additional water mains and augmentation of existing mains is often required to supply Increased demand
- Sewers, pumping stations and water treatment work often require upgrades to Increase capacity
- The power grid must be enlarged to carry Increased load and power generation capacity upgraded
- New gas supplies and network upgrades often required.

Our expertise

We specialise in the utilities market across gas, electricity, operations and maintenance, power, water, energy, telecoms and nuclear. Our experts work across the whole life cycle of utility assets to reduce risk, increase certainty of costs and transfer innovative knowledge and skills from other sectors we operate in.

Capita is regarded as a trusted and reliable partner to companies in the utilities sector, with a deep understanding of the sector and a track record of assisting our clients to achieve their strategic goals.

Our service capability reduces the number of supplier interfaces for our clients and greatly simplifies the management and costs of your project. Our flexible approach allows us to also provide specific 'stand-alone' services to our clients if required.

We act as National Grid's property services provider, managing its £400million portfolio of surplus sites and responsible for managing all lettings, asset management, site sales and town planning work on approximately 500 brownfield sites across the UK.



Our services

Capita can provide a whole range of services to clients in the utilities market. We have a network of 16 offices within the UK each with individual skills, covering most client requirements for utility procurement, design and installation management.

Our service includes;

- Feasibility and Assessment studies
- Planning applications and impact assessment surveys
- Stakeholder consultation
- M&E Design and Specification
- Cost estimates and programming
- Design review and acceptance
- Procurement strategy and Contractor selection
- Contract administration
- Quality auditing and monitoring
- Programme management
- Cost management and reporting
- Risk management and value engineering
- Construction management

Case Study: Dalmuir WwTW

Capita were employed to provide feasibility and outline design services in the delivery of a new large sludge treatment centre capable of handling more than 135m³ of liquid sludge per hour and a tertiary ammonia reduction plant that reduces ammonia levels from a peak inflow of 4000m³/hr to below a value of 20 mg/l in all environmental and process conditions. Capita successfully delivered the outline design and assisted the client during tender adjudication.

The ammonia treatment is achieved by pumping a percentage of the final effluent through two new, 33-meter diameter nitrifying filters. The nitrifying filters are fed via a new feed pumping station with alkalinity control dosed into both supply mains. The nitrifying filters use an innovative long stranded plastic media that has not been used in the UK until now.

The flow from each filter is then re-combined with the remaining outflow, and the ammonia level in the blended flow is sampled and monitored before discharge into the Clyde River.

The sludge handling incorporates an additional, 23-meter diameter by 6-meter-high, picket fence thickener to augment the three existing thickeners. A new sludge handling building will house three dewatering centrifuges, polymer storage and dosing, odour control plant, centrate storage, electrical equipment and sludge skip loading bays.

Technical management will be undertaken by Capita's M&E team, based in East Grinstead. The team will review all technical issues and will manage the Contractor led 730-day performance testing of the new plant.



Case Study: Castor Bay to Belfast Strategic Trunk Main

Capita delivered a scheme consisting of 29.2km of 700mm and 600mm diameter trunk mains together with two new water pumping stations capable of pumping 31.36 ML/day and 32.55 ML/day respectively. Capita have also designed the control system that allows the Operator to select 7 operational modes depending on the water demand profiles at any of the four service reservoirs on the system, as well as two emergency recovery scenarios used in the event of major disruption within the existing supply network. Capita also provided operation mode optioneering, an outline tender design and WLC for the scheme.



Capita client, Northern Ireland Water, is focused on delivering their schemes to a minimum WLC and we are committed to provide best value in line with NIW cost requirements.

Capita Symonds methodology was to appraise the specific costs involved and initially examine the Capex and Opex NPV costs independently using numerous operational modes and demand profiles.

Detailed mechanical, electrical, ICA and civil capex costs were developed for the pumping stations, surface reservoirs and transmission mains. This included security provisions, trunk main pipe and laying options (including three river crossings), reservoir connections, new NIE (Northern Ireland Electric) power supplies as well as new HV feeders to each of the sites. The Opex NPV costs were built from capital cost of the plant, electricity cost of pumping, planned, reactive and asset replacement maintenance costs including staff and material costs.

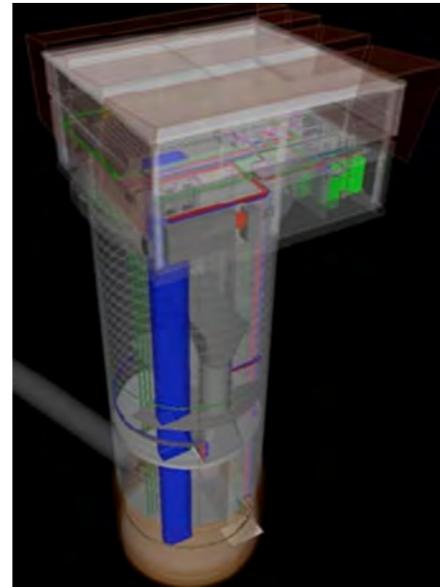
Case Study: National Grid Power Cable Tunnels

Capita carried out the design of the mechanical and electrical systems for the cable tunnels, shafts and head houses to enable 400kV circuits to be installed across central London. Capita undertook independent Category III checking of the critical structural elements and predicted ground deformations.

The project entailed the construction of 32km of 3m and 4m diameter bored tunnel under central London to carry 400kV cables between new and existing substations. These tunnels run from Hackney to Willesden and from Wimbledon to Kensal Green. The appointment came as a direct result of Capita's established working relationship with the lead contractor Costain and the specialist M&E subcontractor VVB.

The works included the detailed design of the following systems:

- Tunnel ventilation
- Electrical distribution
- Building services
- Pumped drainage
- Fire fighting
- Fire detection & alarm
- Gas detection & alarm
- Radio communications
- Tunnel vehicle
- Distributed heat detection
- Electric wire rope hoist
- SCADA
- Lighting staircase pressurisation
- Earthing & lightning protection



Case Study: HS2 Utility Diversions

Capita worked with all the utility companies in the Birmingham area to identify the major utilities along the route of the proposed Hs2 high speed rail link. This included all sewers and water mains above 1200mm, medium and high-pressure gas mains, MV and HV power cables and pylon routes and any pipeline containing oil, fuel or mixed-use pipelines.

HV power line diversions were routed in consultation with UKPN and alternative routing and pylon locations determined. This resulted in the demolition of existing buildings at locations where space was at a premium.



Medium and high-pressure gas mains were located and diversions identified in conjunction with National Grid Gas. Diversions were planned for times of low gas demand, mainly in the summer, and when mains could be emptied or supplies routed via other mains, or when this was not possible stopple pits and hot tapping methods were used.

Capita worked with Severn Trent water on diversions to major sewers and designed new works to take temporary flow while breaking into and diverting the existing mains. The new route took the sewer under the train line with suitable protection provided to the sewer.

Capita also work with many telecoms companies to move and relocate phone masts and existing BT plant including trunk, junction and fibre cables, manholes and duct routes.

CAPITA

Our team

Michael Anderson

Regional Director

t: 07887837630

e: michael.anderson@capita.co.uk

Lee Brock

Director Water and M&E

t: 01342 327161

e: lee.brock@capita.co.uk



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