



Capabilities **Profile**

Benefits of using Morrison Utility Connections

- Specialist dedicated business division with highly experienced individuals with the expertise to deliver all your utility infrastructure requirements

- Backed by M Group Services and its associated businesses with a combined turnover in excess of £1bn

- A flexible and collaborative approach which adapts to our clients' specific requirements

- An end-to-end service from design, through to procurement, construction and test commissioning

- Via our in-house electrical design team, we offer early engagement to ensure we can value engineer the most cost effective solution

- Existing relationships with network operators and councils through our company frameworks business model

- National coverage across our service offering

- Industry leading accident frequency rates (AFR)

- Competitive and flexible commercial terms



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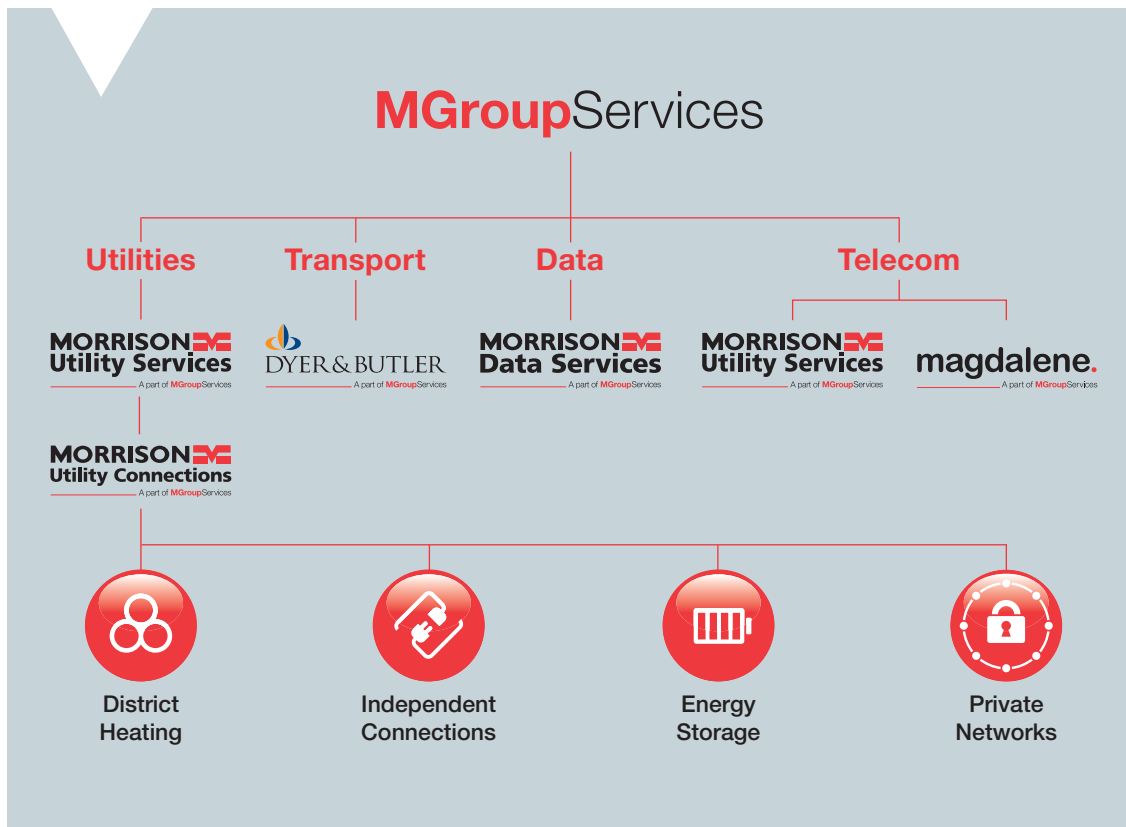
Turncole Wind Farm

Introduction - MGroupServices

M Group Services delivers a range of essential infrastructure services to regulated sectors in the UK & Ireland through its four divisions of;

- **Utilities (electricity, gas & water)**
- **Transport**
- **Telecom**
- **Data**

Operating through established, proven businesses in each division that collectively employ thousands of skilled and experienced specialists, we have long-term relationships with our clients built upon a clear focus on safety, operational delivery, efficiency and customer service.



Our Utility division is focused on a broad range of essential infrastructure services including repair, maintenance, new build and rehabilitation to the electricity, gas and water sectors. These works are delivered by Morrison Utility Services. As part of Morrison Utility Services, Morrison Utility Connections is responsible for works including connections, private networks, electrical design, installation, district heating and energy storage.

Delivering What We Promise

Our customers have chosen Morrison Utility Connections because we are highly experienced in being able to deliver all the design, engineering and technical challenges involved in this specialist utility sector, leaving our customers to concentrate on other aspects of the project, happy in the knowledge that we will deliver the solutions required to meet their project requirements and timescales.

Company Overview

Morrison Utility Connections is one of the largest Independent Connection Providers (ICP's) operating across the UK. We are highly experienced in designing, constructing and commissioning large scale, high voltage connections for our clients, to adoptable Distribution Network Operator (DNO) standards and for Private Wire Networks.

We are fully accredited by Lloyd's Register (NERS) to provide the design, construction and delivery of contestable electrical connections up to 132kV to the specification and quality required by the DNO and for Private Wire Networks.

Key Contacts Details



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NERS Accreditation

Overview:

All Independent Connection Providers (ICP's) have to be accredited under the National Electricity Registration Scheme (NERS) which is operated by Lloyds Register on behalf of the UK Distribution Network Operators (DNO's). The NERS accreditation lists both the location coverage and the scope of works an ICP can carry out at the different voltages.

Below is the current NERS accreditation for **Morrison Utility Services - National Coverage.**

Cable Laying LV, 11kV, 33kV, 66kV, 132kV

Civil Works Civil Works

Jointing LV Dead, LV Live, 11kV, 33kV

O/Head Line Wooden Pole LV, 11kV, 33kV

Substation Installation 11kV, 33kV, 66kV, 132kV

Network Connections Jointing LV Mains and Services, LV

Electrical Design of Distribution Networks Covering
LV Cable Networks to Domestic Properties, LV Cable Networks to Industrial/Commercial Properties, HV Cable Networks 11kV, HV Cable Networks 33kV, HV Cable Networks 132kV, HV O/Head Networks 11kV, HV O/Head Networks 33kV, HV O/Head Networks 132kV, S/Station 11kV, S/Station 33kV, S/Station 132kV

For the very latest accreditation details please visit www.lr.org



Design Services

Our in-house design engineers are experienced in both the DNO Power Networks Industry in the UK and Private Electrical Networks

Our Services Include:

SPECIALIST ENGINEERING SERVICES

Structural engineering, piling design, design of transformer bunds, plinths and enclosures including oil containment calculations, design of switch rooms and control rooms, structural steelwork design, portal frame buildings, brick built buildings, reinforced concrete, roadways, drainage and fencing.

PRIMARY ELECTRICAL ENGINEERING

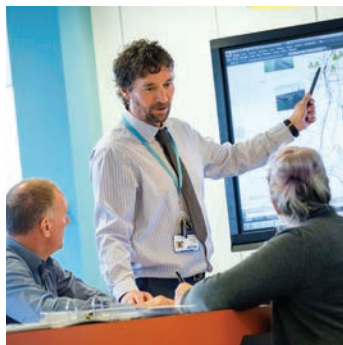
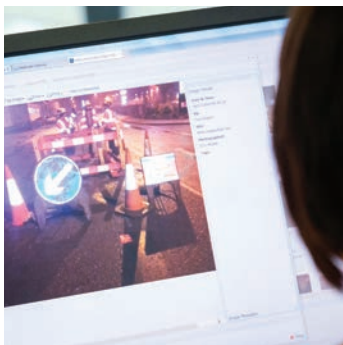
Production of substation and plant layouts, designing to industry and client-specific electrical safety clearances, bespoke design of structures, bus bar design and specification, production of bar and clamp schedules, multicore layouts, cable containment design, trough design, earthing design and layout, heating, lighting and ventilation design, mapping and cable route design and layout.

PROTECTION & CONTROL SYSTEMS

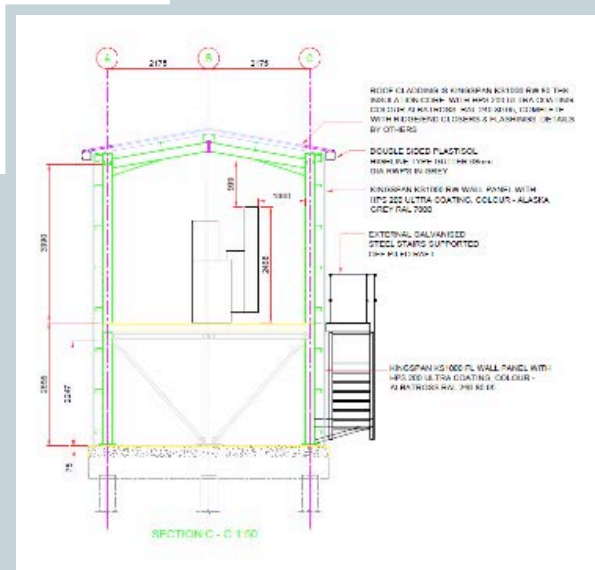
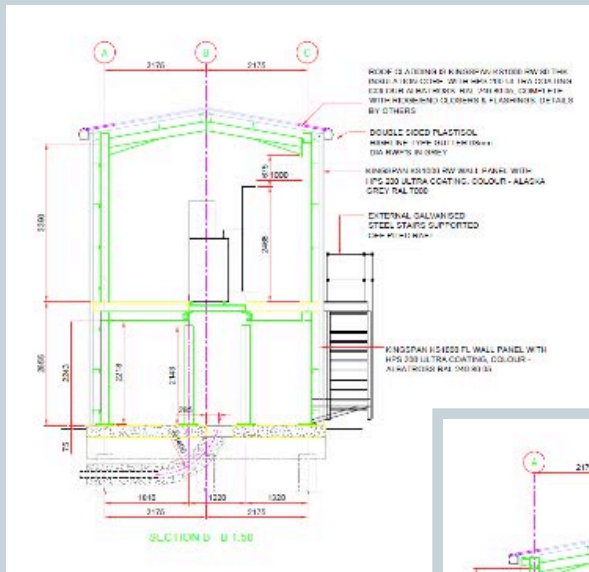
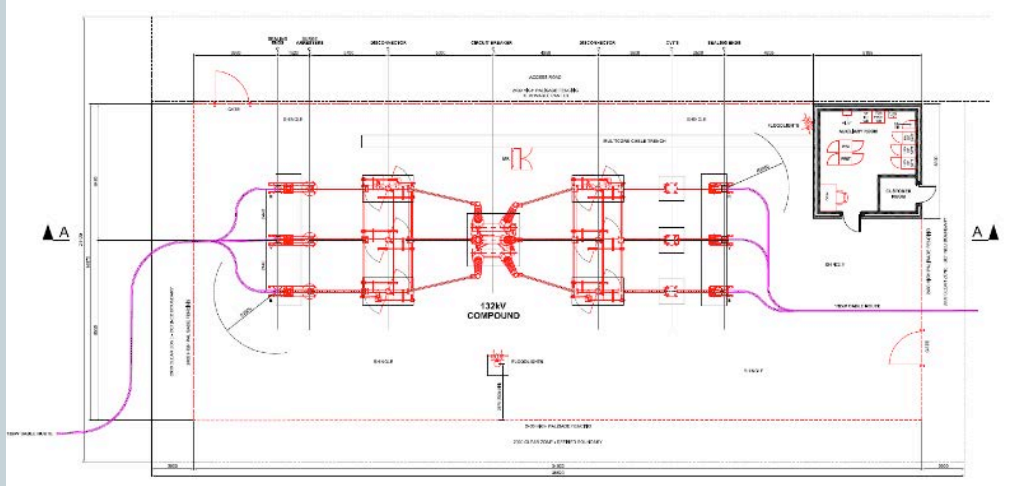
Applications engineering, SCADA I/O schedules, production of multicore schedules/termination diagrams, design and specification of electrical and mechanical interlocking, relay specification, relay panel design, protection coordination/settings reports, production of main connections & protection diagrams, design and development of AC & DC schemes, specification of DC battery/charger systems and DC distribution, approval and integration of manufacturers' drawings.

SPECIALIST DESIGN SERVICES

Cable rating, Earthing, Harmonics, Power quality P28 (flicker, transformer energisation and voltage step change) and all other generation compliance studies.



Typical Design Drawings



Electrical Infrastructure Capabilities

Our expertise in the design and delivery of contestable electrical infrastructure projects ranges from 11kV right the way through to 132kV for both DNO adoptable and Private Wire Network projects.

Our capabilities include;

Cable laying

Cable pulling

Cable jointing

Utility diversions

Ring Main Units

Primary substations

Distribution substations

Protection and control equipment

Bay extensions

Switching compounds

OHL services

Transformers

Circuit breakers

Disconnectors

Earth switches

Surge arrestors

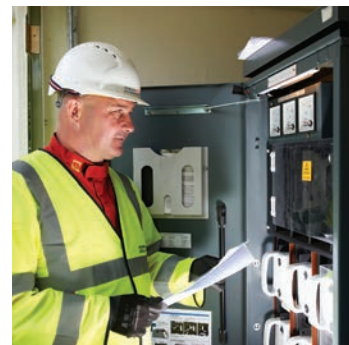
Ancillary equipment

Switching stations

Plant rooms

Small power works (heating, lighting and ventilation)

Testing & Commissioning



Civils Capabilities

The development and build phase of our projects will always involve a variety of engineering competencies which will be specific to the project.

Our capabilities include;

Fencing

Preparatory Groundwork's

Trenching

Temporary works

Joint bay construction

Duct installations

Toughing

Drainage

Substation bases

Transformer bunds

Switchroom foundations

Substation buildings

Steel frame buildings

Ring beams & slabs

Brick buildings

Cladding

Roofing

Relay room construction

Plant room construction

Reinforced concrete works

Directional drilling

Micro tunnelling

Auger boring

Piling mats

Sheet piling

Gabion baskets

Retainer construction

Temporary access roads

Kerbing

Hard & soft landscaping



Multi-Utility Capabilities

Where a project with a significant electrical aspect also requires either a gas or water connection, we can also provide these design and installation services.

Within M Group Services, we have a wealth of utility industry experience across all sectors including a large number of framework contracts that are in place with gas and water network operators, where we construct and commission on their behalf.

Our portfolio includes large, industrial multi-utility installations including alterations or diversions to existing equipment, for both network connections and private networks.



Electricity



Gas



Water



Traffic Management Capabilities

Our specialist internal traffic management team design and deliver traffic management solutions to meet each individual project's requirements utilising the latest traffic management software.

Our capabilities include;

Traffic Management Plans

Local authority applications

Stakeholder meetings

Bus stop closures

Bus stop relocations

Temporary switch off of permanent signals

Temporary switch off of beacon heads

Stop and go works

Two way traffic lights

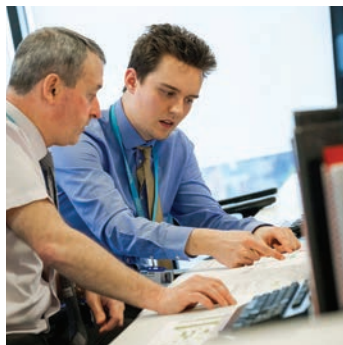
Multi-phase traffic lights

Lane closures

Road closures

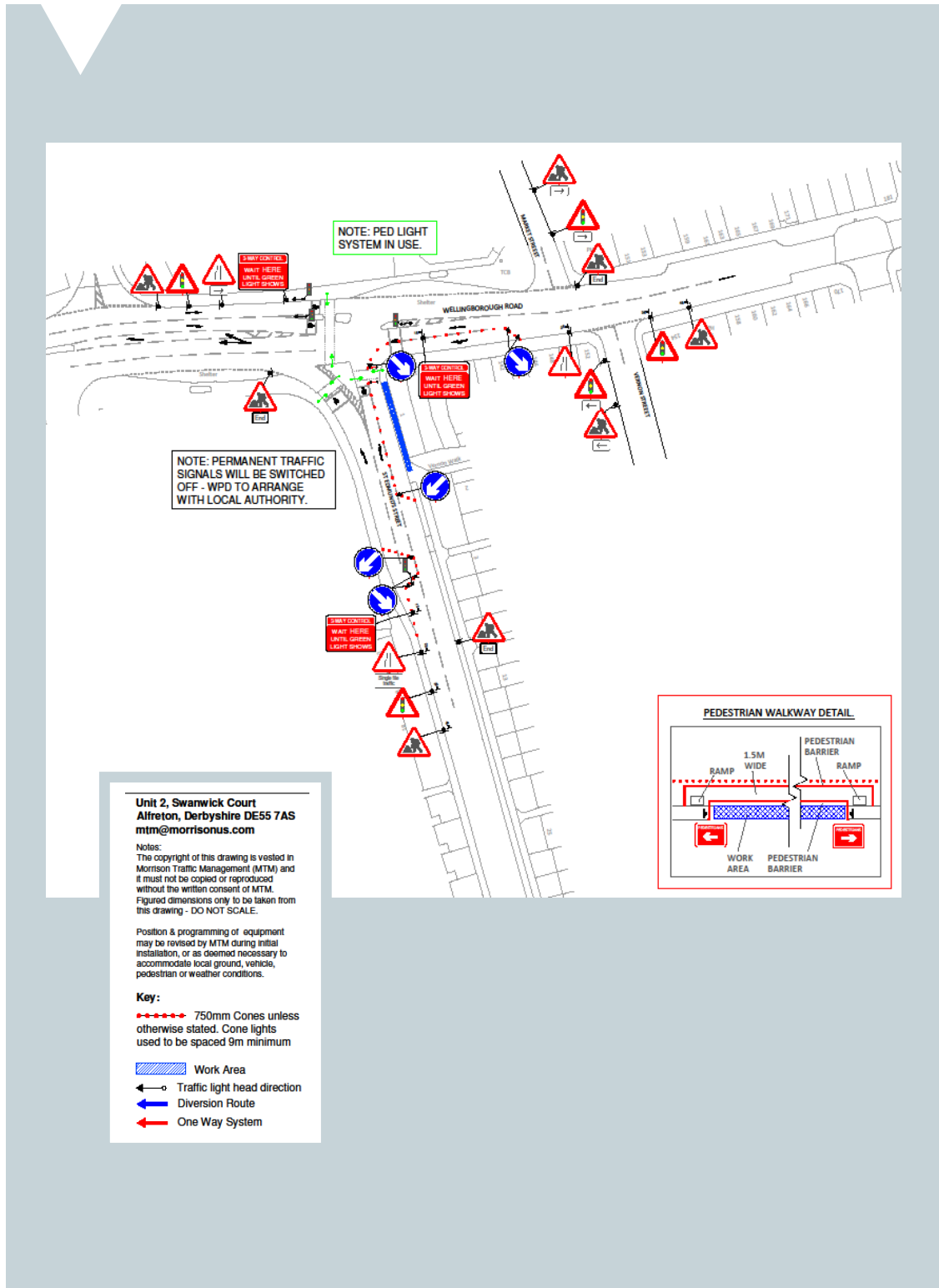
Diversions

Signage



Traffic Management Capabilities

Here is a typical example of one of our traffic management schemes.



District Heating Capabilities

We can provide the complete District Heating solution from feasibility through to delivery and beyond for full or part projects.

Our capabilities include;

Feasibility

Route assessment and development

Design

Mechanical & electrical Installation (both primary and secondary)

Engineering services

Value-engineering

Cost/value management

Multi Utility works including connections

NRSWA Compliant Traffic Management

BS5975/PAS88 Compliant temporary works design

Micro tunnelling & directional drilling

Press brake jointing for PE systems

Fusion welded band jointing

Class 1 Welded joints

Temporary works design

Utility tracing & mapping

Live connections

Fault finding

Thermal surveys

Repair & maintenance

SCADA

Alarm continuity

Flushing and filling of network

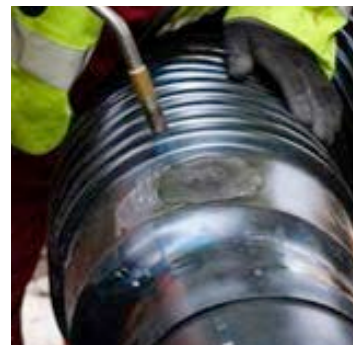
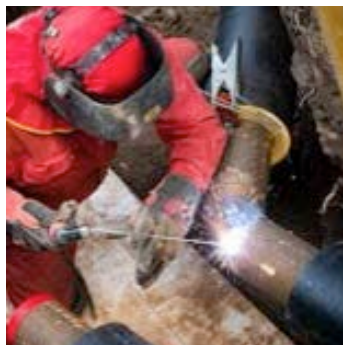
As built records

Pressure testing

NDT weld testing

HAUC compliant reinstatement

Testing & commissioning



Energy Storage Capabilities

Whether your energy storage project is containerised, purpose built, stand alone or co-located with a generation facility (such as solar PV, wind or CHP) we have the experience to get you connected.

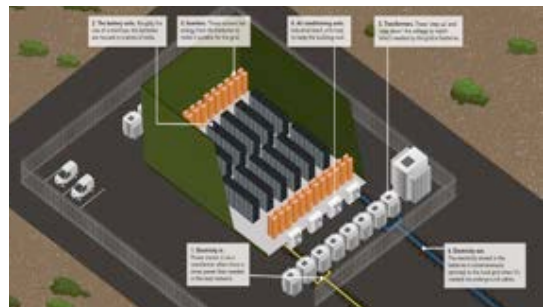
We can provide all requirements for your energy storage project from the design through to the delivery. We can either construct the buildings or prepare the site to accept containers, create the grid connection required, source the batteries and inverters and all you have to do is decide on a specialist software provider of your choice. We can even help with that if required.

To date we have delivered or are in the process of delivering;

6MW SMS Facility at Leighton Buzzard for UKPN

49MW Purpose built “Big Battery” at Roosecote for Centrica

35MW Containerised facility at Port of Tyne for RES



Governance & Network Operator Adoption Process

Our in-house Governance team ensure that at every stage of the project we have secured the correct licenses and agreements to complete the adoption process within the agreed timescales and to the satisfaction of both the Network Operator and our customer.

Typical services provided by our Governance Team are:

Legals and Consents - Negotiate and agree contracts to work on private land including - Head of Terms and Construction Licence.

SI work Including - UXO, Ecology, Ground conditions, Archaeology.

Water crossing consents - License to cross waterways including - Canals and Rivers, EA, MMO, Local Authorities.

Highways - Licences to cross roads other than single carriageway.

Utility Crossing Consents - Negotiate to cross existing utilities in private land – Easements.

Section 50's - Section 50 to work in public highway.

DNO Contact

Private Land Access - Access, wayleaves and Easements.

Design approval – Our team are an integral part of this process and they facilitate all of the following stages.

- Initial contact
- Prepare design
- Submit design
- Gain approval

Adoption for DNO Works - Adoption process including Adoption Framework Agreements and associated site specific agreements.

Sign off for private works.

Specifications

DNO G81 specifications.

Framework agreements.

Morrison Utility Connections can manage the entire adoption process for you from design through to delivery.

Network Rail Crossings – Experience

In addition to crossing motorways and rivers we have completed numerous under-track rail crossings utilising specialist contractors for directional drills, micro-tunnelling and auger bores.

Our work spans from assisting clients in starting negotiations with Network Rail and preparing detailed estimates;

Geological surveys, bore holes and settlement calculations

Preparation and submission of F1, F2 and F3 documentation including associated RAMS

Track monitoring including arranging track access

Preparation of track contingency plans

Specialist contractor management and coordination

Full CDM management



Case Study

Shotwick Solar Farm

Private Wire 132kV Grid Connection to 49MW PV Farm



OVERVIEW

Morrison Utility Connections were contracted to deliver a 132kV private wire connection from a PV farm direct to an adjacent local paper mill. These works were successfully completed within a three month period from commencement of construction to energisation.



PROJECT DETAILS

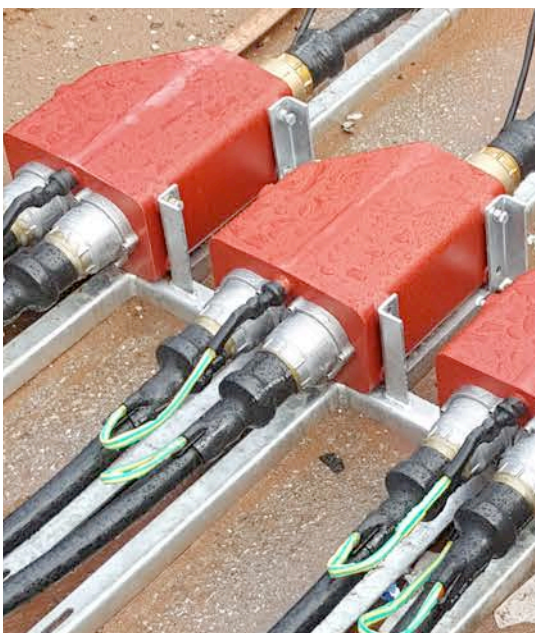
The scheme for the 49MW solar park involved connecting the customer 33kV substation at the solar farm via a 1.5km 33kV cable route which crossed a main railway line and constructing a complete new 132kV bay extension to an existing substation owned by the local paper mill, which fed onto the Scottish Power Network. The bay extension included the installation of a 132/33kV transformer, 132kV circuit breaker, dis-connectors, earth switches, surge arrestors and ancillary equipment.

DESIGN

Via the Morrison Utility Connections in-house design team, the business was responsible for completing and coordinating all aspects of design including specialist engineering studies, civil engineering works, application engineering, protection and control settings, primary electrical design and cable route design.

BENEFITS

The design and delivery works involved liaison with the paper mill owners, Scottish Power and the Solar Park Developer to ensure upfront design was in-line with all interested parties' requirements and that the delivery aspects were completed as efficiently and as quickly as possible. Due to the dedication of both the design and delivery teams, this project was delivered successfully to the client's extremely tight deadlines which in turn enabled them to claim for their Renewable Obligation Certificates.



Case Study

Santander Data Centre 132kV Grid Substation



OVERVIEW

When retail banking giant Santander decided to establish a new data centre in Leicestershire, it chose Western Power Distribution to manage the connection to the electricity distribution network, who in turn awarded Morrison Utility Connections the contract to design and build the new 132kV Grid Substation.



PROJECT DETAILS

The new substation would ensure the continuous power supply needed to maintain access to millions of customers' records and had to be completed by the fixed deadline. With a tight programme, every detail had to be meticulously programmed to prevent slippage.

When the site was ready to begin receiving equipment, the transformers were manoeuvred into place at the new Grid Substation. This followed months of planning and preparation work at both the Carlton Park and Enderby Grid substations.

Enabling works involved clearing the Carlton Park site and diverting gas, electricity and telecoms equipment away from the substation's future home. This procedure needed to be undertaken accurately and carefully to prevent any loss of supply to other customers. 132kV double circuit cables were also installed to link the Enderby and Carlton Park sites. With the route between the two crossing a patchwork of land owned by National Grid, Western Power Distribution, the local authority, private landowners and Santander itself, detailed planning and execution was required.



As Designer and Principal Contractor, Morrison Utility Connections undertook a design, project management and coordination role on the project, managing both the Carlton Park and Enderby sites, as well as four service partners who performed key roles within the project. We were also the central liaison point, ensuring successful communication with Western Power Distribution, Santander and other organisations involved in the data centre project

BENEFITS

- Efficient delivery on time and within budget further enhancing the client's reputation.
- Designer role providing complete control over the design process and enabling more efficient programme management.
- Project management role ensuring accurate management of all aspects of the work.
- Extensive turnkey substation construction experience enabling the design and build of a new Grid substation in just 10 months.
- Stakeholder management expertise ensuring smooth project delivery whilst meeting all parties' expectations.
- Meticulous safety management resulting in no accidents or incidents during the course of the project

Case Study

Ridham Dock Biomass

132kV Biomass Generation Connection



OVERVIEW

MVW Umwelt GmbH has recently constructed a Biomass power generation plant at Ridham Dock in Kent. The plant uses about 172,000 tonnes of waste wood per year to generate almost 188 million kilowatt-hours of electrical energy and has a net generating capacity of 23 megawatts. Morrison Utility Connections successfully designed, constructed and commissioned all of the contestable connection work for the project, installing UKPN adoptable assets.

PROJECT DETAILS

The scope of works included the supply, installation, connection and commissioning of the 132kV power cables together with all protection and control equipment from the point of connection on UKPN's existing 132kV overhead tower network at Ridham Dock, to a newly installed 132/11kV step-up transformer on site. In addition, we constructed a 132kV open bus bar switching compound together with the supply, installation and commissioning of all plant and equipment. Our activity on site required us to work together with the joint venture partnership of CNIM/Clugston being MVW's plant construction partners who completed ground stabilising activities and construction of the plant.

The 132 kV switching compound included:

- Design, including layout, arrangements and construction requirements for the relay room
- Circuit breaker, disconnectors and earthing switches, surge arrestors, cable sealing ends and busbars
- Relay room containing RTU, protection relay panel, battery charger, lighting and small power as well as the distribution board, downstream lighting and small power equipment
- Compound installation included equipment, control/protection cabling trenches and security
- Earthing system for the switching compound



BENEFITS

- Liaison with UKPN to ensure upfront design was in line with DNO expectation and adoption agreement allowing greater efficiency in the overall programme management and procurement.
- Collaboration with JV Partnership to ensure civils work was carried out to adoptable specifications.
- Full project management to deliver to the client's requirements.

Case Study

Leighton Buzzard

UK's Largest Battery Storage Facility



OVERVIEW

Morrison Utility Connections were appointed to manage the design, build and installation of the state-of-the-art electricity storage facility that provided a leading test bed for exploring the capabilities and costs of high-voltage energy storage for UK Power Networks (UKPN).

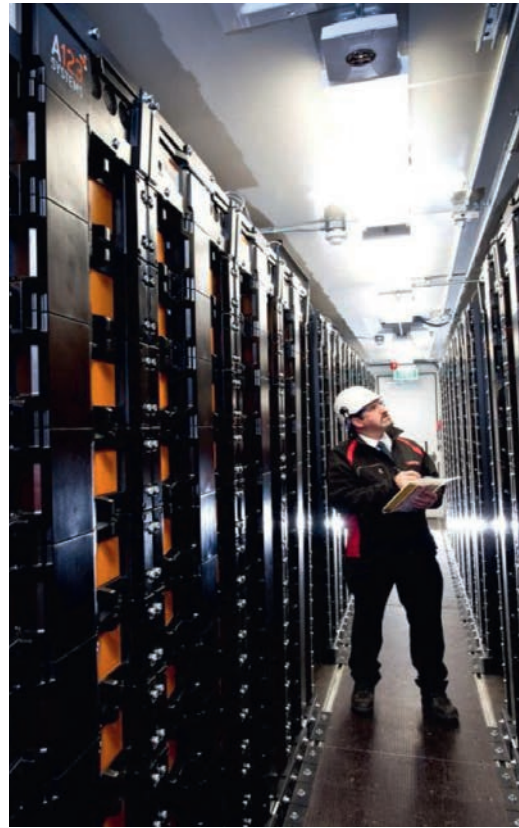
PROJECT DETAILS

The project centred on the installation of a 6MW/10MWh battery at one of UKPN's main 33/11kV primary substation sites in Leighton Buzzard. The connection phase of the project was completed on programme, on budget and without incident or injury.

At the time of commissioning, UK Power Networks described the device as the largest of its kind to be located on any distribution network in the UK. The development of the storage facility represented an important milestone for UKPN's Smarter Network Storage project, enabling the company to delay or avoid any significant rebuild of the electricity network which would have otherwise have been needed for Leighton Buzzard.

The design plans had to address a number of challenges including the fact that the storage facility itself, was to be built on a flood plain. Morrison Utility Connections overcame this challenge with an open basement design that enables any flood water to flow through beneath the building.

The overall project team was a collaboration between a variety of organisations that included Newcastle University, Imperial College London, Kiwi Power, Younicos, S&C Electric, Swanbarton Limited, AMTSybox, Poyry Management Consulting, National Grid, Smartest Energy, UKPN and Morrison Utility Connections.



“ We are delighted that the design and construction phase of the Smarter Network Storage project has reached successful completion. A huge “well done” to the Morrison Utility Connections project team that oversaw this important element of the project, particularly with no lost time injuries during the construction. ”

Nick Heyward,
Project Director at UK Power Networks

Case Study

London Gateway Private Utility Network Infrastructure



OVERVIEW

London Gateway is a state-of-the-art, highly automated deep-sea container port that will house a new 9 million square foot logistics park – the largest of its kind in Europe.

Modelled on DP World's flagship Jebel Ali facility, in Dubai. London Gateway will provide 2,700 metres of quay, six deep-water berths with depth alongside of 17 metres, 24 giant quay cranes and an annual capacity of 3.5 million TEU (twenty-foot equivalent units).

PROJECT DETAILS

DP World contracted Morrison Utility Connections to design, procure, install and commission the electrical infrastructure to facilitate the electrification of the new London Gateway logistics park.

Beginning in October 2014, the 46-week high-profile private network project centred on the development of electrical infrastructure, including the construction of two new 33/11kV primary substations, the installation of over 35km of site wide 11kV cabling, 8km of 33kV cabling and numerous secondary substations to provide power and lighting to the logistics park.

DESIGN

Civil and electrical design was completed in house, including the 11kV and 33kV and 33kV cable and cable route, 33/11kV compound, 11kV switch room and all associated protection and control design requirements. Prevailing and significant on site ground condition risk also required a redesign from the original client substation specification to a more suitable engineered solution – an elevated switch house with piled foundation, minimising works below ground and removing associated ground risk.

The protection and control system design included interfaces with both existing private (port owned) 33kV networks and DNO networks. A large portion of the project covered complex SCADA and network monitoring and automation, enabling the client to view everything down to power flow on its low voltage distribution network.

The works will energise the first plots on site, including a 316,000 square foot distribution centre and the 386,00 square foot Common User Facility (CUF) that will enable occupiers to share warehousing and transportation, materials handling equipment and labour.

Case Study

Turncole Wind Farm

OVERVIEW

The connection of a 17.5MW, 7 turbine wind farm close to Burnham-on-Crouch in Essex. Construction of the wind farm began in November 2015 and was completed in December 2016. Now operational, Turncole Wind Farm is capable of generating sufficient renewable electricity to meet the needs of more than 14,000 homes.



PROJECT DETAILS

- 16.45km of 33kV underground electrical cable and associated protection circuits, one third in highway and two thirds in agricultural land
- Directional drills under River Crouch (690m) and River Roach (570m)
- 33kV UKPN adoptable substation
- 33kV Windfarm substation
- All associated enabling works and full in-house traffic management

Cable installation works commenced April 2016, the project duration was 37 weeks and the site was handed over to the client on time ready for commissioning. The final cable route was 16.45km in length and included 14 separate Horizontal Directional Drills under rivers, ditches, and areas where there were significant engineering difficulties.

During this period 19,500 metres of duct, 48,750 metres of 33kV cable and 16,450 metres of fibre optic circuit have been installed with 102 High Voltage cable joints being completed. The project also included the laying and removal of over 16,000 tonnes of temporary stone access roads, approximately 4.4km in length, and the installation and removal of 7km of temporary Bog Mat road. The whole route has been mapped using drone and GPS technology.

During the construction phase of this project a typical working week averaged 2,900 man hours with zero accidents or incidents.

PREPARATION WORKS

Assisting the client with all licence and legal requirements.

Detailed Civil Design

33kV switch/control room, drainage, roadways and fencing, structural engineering, production of planning drawings, geotechnical site investigation and soils analysis

Detailed Electrical Design

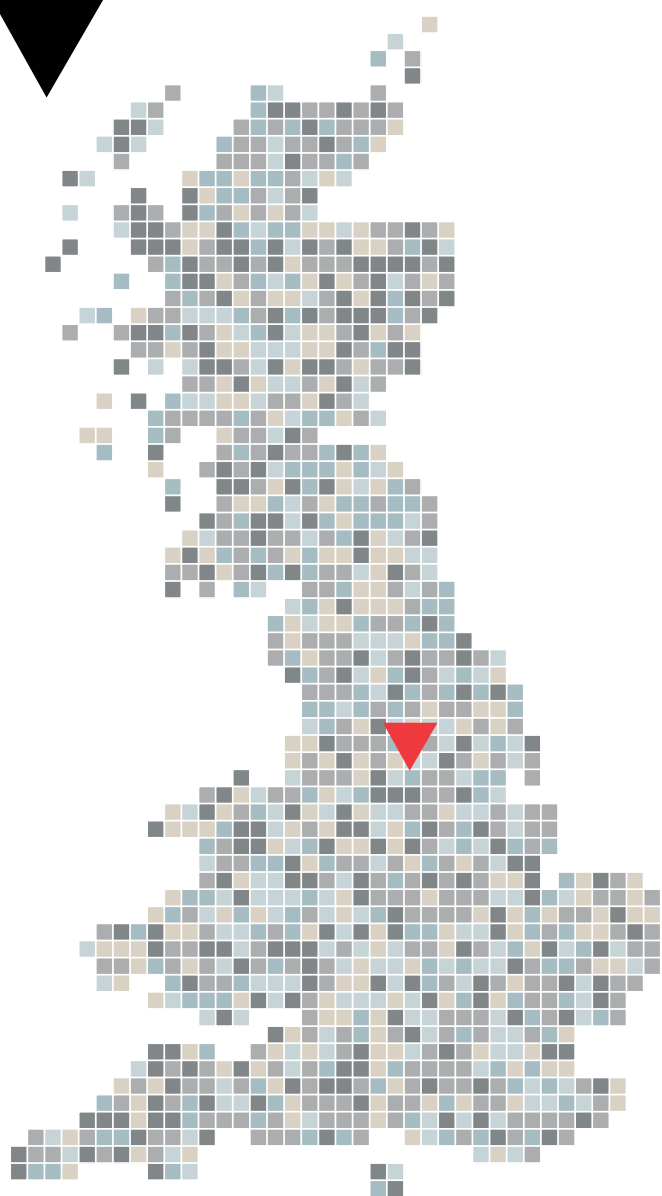
Soil resistivity surveying, earthing layout, plant/equipment layout, 33kV cable route design and HDD design, plant and equipment specification

Detailed Protection & Control Design

Production of main connections and protection diagram, production of AC & DC schemes, specification of relays to AVC and HV/LV protection panel, approval and integration of manufacturer's drawings into the overall scheme.

BENEFITS

Undertaking the complete package of design both for the host DNO and end client in-house minimised the number of project interfaces and allowed the design to develop smoothly.



Morrison Utility Connections

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