



ELECTRICAL

Electrical Network Design, Engineering & Construction

www.uea.com.au

UEA know how. Because we know the network.



UEA Electrical is an “A” Grade Accredited Service Provider specialising in the design, engineering and construction of both electricity transmission and distribution networks in NSW. UEA can provide turnkey solutions to developers, civil contractors, utilities and high voltage customers for underground and overhead works in the industrial, commercial and mining sectors across Australia. UEA combines practical and technical know how to get the job done – on time, every time.

UEA Electrical is a leading electrical contractor specialising in transmission and distribution network design, engineering and construction projects including:

- » Substation Design and Construction
- » Asset Relocation
- » Customer Connections of Load (Network Connections)
- » Mining Applications
- » Industrial and Commercial Subdivisions

Our wealth of experience in the Australian power industry, combined with a strong

focus on project management and HSEQ ensures UEA is often chosen to tackle some of the most technically and physically challenging projects. Through a combination of the best personnel in the business, and working closely with our clients, UEA prides itself on a track record of solving the toughest of challenges.

Working on and around voltages up to 132,000 volts, the ongoing health, safety and wellbeing of our staff, subcontractors, clients, consultants, visitors along with the general public is paramount in our target of zero harm.

‘UEA takes health, safety, environmental and quality management to the next level often superseding industry standards.’

UEA Electrical is recognised as an industry leader in project design and delivery as we strive to obtain the most efficient project outcomes for our clients, without compromising on safety or quality.

UEA is internationally certified and accredited:



Your Turnkey Solution – Design, Engineering and Construction

UEA Electrical is a provider of electrical infrastructure design, engineering and construction services for both the electricity distribution and transmission networks. Our skilled and highly experienced team is capable of performing a specific package of works or tailoring a complete turnkey solution to meet your requirements.

As a Level 1, Level 2 and Level 3 Accredited Service Provider UEA Electrical is a specialist in both design and construction. By drawing on our construction expertise during the design process – and vice versa – UEA is able to achieve the most

efficient and cost effective project outcomes whether it is a design project, a construction project or both.

Accredited Service Provider

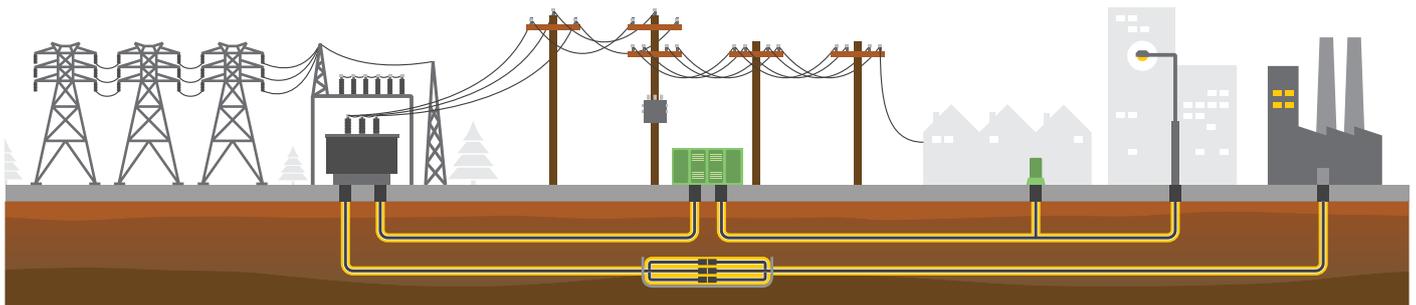
UEA Electrical has achieved the following accreditation with the NSW Department of Trade and Investment:

- » Grade “A” Level 1 ASP (Construction)
- » Level 2 ASP (Services)
- » Level 3 ASP (Design Services)

Transmission

Distribution

Utilisation



Transmission

From 33kV to 330kV, UEA Electrical can offer the following design and construction services:

- » Underground transmission feeders
- » Overhead transmission lines
- » Transmission substations
- » Underground and overhead feeder relocations and extensions
- » Cable jointing including various manufacturers joints and sealing end terminations
- » Fully data logged cable install within conduits and culverts/tunnels
- » Earthing solutions including sheath bonding systems
- » Pole loading calculations and limit state analysis

Distribution

From 415V to 22kV, UEA Electrical can offer the following design and construction services:

- » Chamber/indoor substations
- » Electrical asset relocations for major infrastructure upgrades i.e. road widening
- » Padmount/kiosk substations
- » Earth grid/networks
- » Pole mounted substations
- » Transformer and switchgear upgrades
- » ABC, CCT and open wire overhead systems
- » Industrial/commercial subdivisions
- » All types of cable jointing
- » Network investigation and consultation
- » Pole loading calculations and limit state analysis

Utilisation

UEA Electrical can provide a turnkey approach to providing electrical infrastructure assets, including the design and construction of:

- » High voltage customer installations (HVC's)
- » Dedicated high voltage feeders
- » Dedicated substations and equipment for large load application e.g. data centres and manufacturing
- » Public/street lighting
- » Low voltage reticulation
- » Maintenance of high voltage customer installations
- » Protection grading studies
- » Earth grid/networks
- » High voltage metering and equipment

Distribution Network Construction

UEA Electrical provides a highly skilled team with unrivalled experience in the construction of electricity distribution assets from 415V up to 22kV. Our industry experienced project management team works closely with clients to deliver tailored solutions across a range of asset construction projects:

- » Connections of load for the supply of new buildings and developments
- » Installation of overhead and underground assets in commercial and industrial subdivisions
- » Augmentation of existing poles and wires for capacity increases
- » Uprating of existing substations (e.g. transformer and switchgear replacements)
- » Construction of kiosk and padmount substations
- » XLPE and paper lead cable jointing and terminating

UEA provides professional, cost effective solutions complimented by safety, quality and environmental accreditations. We take pride in our capability to deliver distribution assets that are built to meet if not exceed the relevant network authority and/or Australian standards and are fully tested by our highly qualified staff prior to commissioning.



Case Study

Wilson Drive 11kV Line Augmentation



Due to aging assets and increased demand requirements, UEA Electrical was contracted to carry out a major upgrade to the electricity distribution network in the Southern Highlands 110km south-west of Sydney.



The upgrade covered a geographical route of over 13 kilometres in length and presented a number of obstacles including linework over railway crossings; and through commercial, industrial and residential areas supplying electricity to over 1200 customers.

In order to upgrade and augment the existing overhead assets the complete scope of works included the installation of:

- » 24,615 metres of 7/4.50 AAC conductor
- » 13,930 metres of 6/4.75 and 7/1.60 ACSR conductor
- » 1535 metres of HV Aerial Bundled Conductor (ABC)
- » 65 poles (timber and concrete)
- » 3 x Air Break Switches
- » 3 x Load Break Switches (Type 1 and Type 3 Auto)
- » 2 sets HV Underslung Links

Due to the radial nature of the overhead feeders in the Southern Highlands area, the works were required to be co-ordinated across more than thirty network isolations, over an eighteen week period from commencement to completion.

Due to the complicated nature of the works, intense stakeholder management was required in order to coordinate the staging of outages to ensure that local customer's needs were met.

In spite of the challenges this project presented, UEA was able to deliver the project ahead of schedule, with zero lost time injuries – a great achievement.

Case Study

Transmission Substation 33kV Feeder Upgrade



Due to the ever growing electricity demands of South Western Sydney, the local supply authority initiated the installation of a brand new transmission substation to service the expanding region. In order to distribute this increase in network capacity to its customers, the requirement to install seven new 33kV feeders was identified and a contract for the works was let.

UEA Electrical carried out all facets of the electrical work in this complicated project, including:

- » 33kV Pfisterer GIS terminations
- » 33kV Tyco straight through joints (STJ)
- » 33kV cross bonding joints

- » Installation and termination of earth link boxes
- » 33kV pole installation and associated linework
- » 33kV underground to overhead terminations (UGOH)
- » 33kV Pfisterer outdoor sealing end terminations
- » High Voltage testing and pre commissioning of installed infrastructure

Through an in-depth knowledge of the local supply authority's transmission network, UEA Electrical successfully delivered a program of works with a minimum of fuss, whilst exceeding client expectations.



Transmission Network Construction



UEA Electrical provides construction services for the installation of transmission mains assets ranging from 33kV up to 330kV. Our team is experienced in both overhead transmission lines and underground feeder installations, including all civil works, linework, cable jointing and sheath bonding systems.

During construction of transmission feeders our experienced electrical engineers and cable jointers are on hand throughout to provide quality control, including cable installation with full route tension calculation and real time monitoring. Projects are supervised by experienced and electrically qualified personnel, guaranteeing the integrity of the installed assets is fully maintained.

UEA Electrical also has experience in transmission switchyard and substation

construction including the installation of power transformers, capacitor banks, overhead bus bar, cable sealing ends and associated protection, control wiring and commissioning.

All transmission network assets are built to the relevant supply authority and/or Australian standards and fully tested by our highly qualified staff. UEA offers a range of testing services to ensure the integrity of the installation is ready for service.

With its highly skilled and experienced workforce UEA Electrical is in a unique position to deliver the most technically challenging projects within the marketplace, including substations, heavy industry and mining. Project work is carefully planned to deliver key milestones such as outage dates on time, every time.

Substation Design & Construction



UEA Electrical specialises in design, engineering and construction solutions for clients with large load requirements. By analysing client requirements and liaising directly with local supply authorities, UEA is able to determine the best substation solution for any application.

UEA Electrical is fully capable of providing both design and construction services for all types of substations including:

- » Kiosk Substation
- » Padmount Substation
- » Chamber Substation
- » Indoor Substation
- » High Voltage Customer Substation
- » Transmission Substation

Case Study

Western Sydney Data Centre



UEA Electrical successfully delivered a design and construction contract for a Western Sydney Data Centre worth \$3 million. The project spanned 13 months and culminated in the design and construction of a High Voltage Customer Substation installation for one of the largest data centres in Australia. This electrical design and construction project is one that sets UEA Electrical apart from its competitors and builds on its capacity in the High Voltage Customer market.

The scope of works included the design of a master plan to allow for an ultimate site power consumption of 60MVA. To achieve this, UEA designed the substation to eventually operate at 33kV, however due to local network constraints and in order to meet the first stage maximum demand; the substation is currently energised at 11kV.

As part of the first stage of the works, UEA was contracted to design and construct two new 11kV underground

feeders from an Endeavour Energy Zone Substation. The data centre substation was engineered using 33kV switchgear to minimise disruptions to the site as the future power demand increases which has ensured the sustainability of the design. Initial design aspects also include high voltage metering and protection with integration to the Building Management System. The initial stage of the project comprises four 11kV / 433V, 2.5MVA transformers.

The electrical design and construction for Stage 1 of the data centre was an overall success, and was completed by UEA Electrical on budget and ahead of schedule. Future stages will require the installation of two 33kV feeders from the Endeavour Energy network with tri-generation to supplement the supply. It is anticipated that thirty three 2.5MVA transformers will be required to meet the final site maximum demand. UEA looks forward to the challenge and meeting all future requirements for this project.



Asset Relocation

UEA Electrical works closely with its clients through road widening and other major construction projects where electrical assets are required to be relocated.

It is these types of projects where UEA Electrical excels as we are able to provide design and construction services to facilitate the efficient relocation of existing electrical assets. We pride ourselves on working side by side with our clients to ensure that their construction programs are met and key milestones delivered. This is only possible when you have a team of highly skilled and experienced people helping you to deliver your project.



Case Study

Schofields Road Asset Relocation



UEA Electrical was contracted to undertake asset relocation works as part of a 2km road widening project along one of the main arterials within Sydney's rapidly growing North West. This project required significant project management expertise in order to deliver the asset relocation program due to the transient nature of a road widening schedule.

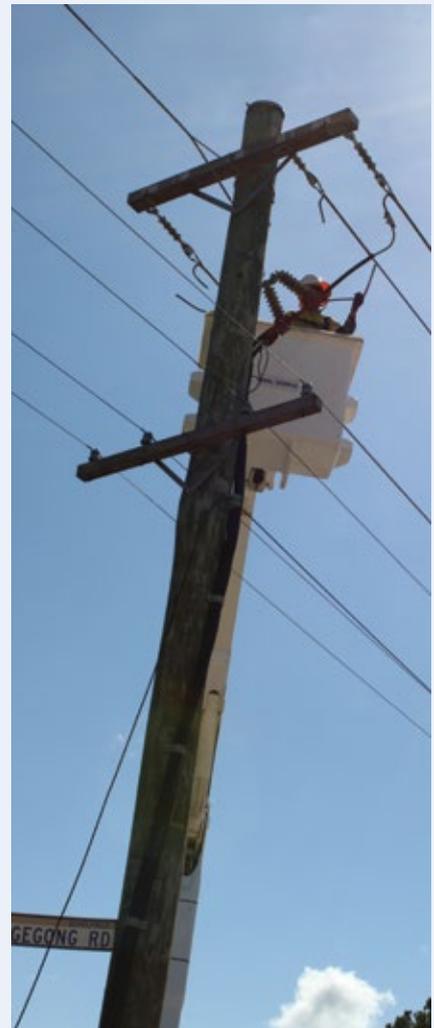
UEA Electrical was responsible for relocating all electrical infrastructure along the 2km route which encompassed:

- » Non-destructive service location
- » Civil works for conduit (duct) installation
- » 150m underbore for creek
- » Conduit (duct) installation
- » HV, LV and SL cable hauling
- » Overhead linework construction, deviation and augmentation
- » Level 2 service extensions
- » Installation of 85 street lights including footings, columns and lanterns
- » Padmount / kiosk substation installation
- » Padmount switching station installation

- » All HV and LV cable jointing including:
 - » Straight through joints (STJ)
 - » Substation terminations
 - » Underground to overhead connections (UGOH)
 - » Street lights
 - » Pillars / Turrets

The most critical concern whilst relocating electrical assets for a road widening is how the widening program interacts with the electrical design. Quite often temporary works are required before the final iteration of the design can be implemented. Careful planning and exceptional project management are required to juggle the necessary program of works and it is in this area that UEA excels setting it apart from the competition.

UEA worked through many different options at the estimating stage to ensure the client had allowed sufficient time and budget for the temporary works; and to ensure that the final program of works was achievable and as efficient as possible. Working alongside our clients to achieve best for project outcomes is a service UEA is very proud to offer – going above and beyond for our clients helps us to deliver on time, every time.





Complex
made simple.

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