

CASE STUDY NUMBER 89: Skanska Construction UK Ltd/ Transport for London – Working together to minimise disruption of multi-utility diversion works in Romford

WINNER OF THE NJUG MINIMISE DISRUPTION AWARD 2016

The National Joint Utilities Group (NJUG) is the UK industry association representing utilities solely on street works issues. NJUG represents some 56 utility companies and contractors engaged in the street works sector, and 18 specialist sub-contractors who provide equipment, materials and services supporting street works activities. Our members represent major contributors to economic growth and work to deliver gas, electricity, water and telecommunications to both individual consumers and UK plc. In order to continue this drive for further improvements within the industry - we have developed the NJUG Vision for Street Works, which revolves around seven main principles:

- Safety
- High Quality
- Minimise Disruption
- Keep the Public Fully Informed
- Sustainable Methods and Materials
- Avoid Damage to Underground Assets
- Innovation

This case study is an example of the street works sector delivering on these principles and turning the vision into reality.

Overview



Skanska Construction UK has recently completed a highly complex multi utility diversion works for Transport for London, (TfL) at Ardleigh Green Bridge, Romford, part of TfL's wider Structures and Tunnels Investment Portfolio, (STIP) which includes demolition and construction of four bridges in London. The scope of works was to divert and connect a 900mm Essex and Suffolk Water Main, a 500mm National Grid Gas Main, UK Power Networks' (UKPN) low voltage (LV) and high voltage (HV) cables, Virgin media and Vodafone telecommunications works. Ardleigh Green Bridge carries the busy A127 over a live railway, however the bridge requires replacement. Skanska was employed by TfL to undertake the multi utility diversions, over a newly installed Service Bridge, which was designed solely to carry the services and allow for the demolition and rebuild of Ardleigh Green Bridge.

SKANSKA

Collaborative working, scheduling and planning between Skanska, Transport for London, local authority and utility owners delivered a highly complex multi-utility diversion project ahead of schedule whilst minimising disruption to road users, residents and businesses.



Working together

Traditionally, to undertake such vast multi utility diversions each asset owner would divert and reconnect their own service – resulting in multiple excavations, extensive traffic management, numerous lane closures and road closures causing huge disruption to the surrounding community, including businesses, residents and road users. The A127 carries extensive amount of traffic from London to Romford, therefore it was imperative to limit lane closures on this stretch of road. By working closely with TfL, Skanska planned the works to minimise disruption, by undertaking multi utility excavations, working on multiple assets at a time. This allowed for one multi-utility trench, as opposed to five, with works on each utility occurring simultaneously, or closely following another. This required efficient planning and a high level of coordination by the project team. By working closely with the asset owners, TfL and the London



Borough Havering, the works were completed two months ahead of schedule, as well as a lane closure of the A127 during the middle phase of the project coming off a week early.

Skanska worked alongside TfL and their designers in the Early Contractor Involvement period, where the works were meticulously planned to reduce nuisance and disruption. Once the project began there was extensive liaison with Essex and Suffolk Water, National Grid, UKPN, Virgin Media and Vodafone, where Skanska used its utilities expertise in this area to build strong collaborative relationships and reduce risk to the works. It was imperative to manage these works closely, as it was not as simple as one utility owner following the other. Some works had to be completed before others could be diverted, to avoid clashes. Scheduling and on site coordination was paramount, to allow all to work on site safely and effectively. The works were near a live railway. Skanska and TfL worked very closely with Network Rail to allow the railway to remain operational throughout the works and not disrupt their users.



Other considerations to minimise disruption was planning deliveries to site. Access to the site for large machinery was challenging, with some requiring lane closures to enable delivery. This was undertaken out of hours, to prevent congestion during busy periods. Non-noisy works were scheduled for weekends, to allow the project to progress but minimise nuisance.

Community

Limiting disruption to the surrounding community was a priority for TfL and Skanska. Constant liaison occurred with the London Borough of Havering highway and environmental health departments, as well as a dedicated resource to communicate with the local stakeholders. Due to planning the noisy works to non-sensitive times of the day and limiting breaking out by digging multi-utility trenches, there was no noise or vibration related complaints during the entirety of the works.



A few initiatives that Skanska did was to work with local businesses, such as the laundrettes for PPE washing. Over 90% of the inert excavated materials was sent to a local restoration project. This was a disused landfill site that is being restored into a Country Park for public use. Skanska aim to not just limit disruption but explore ways to enhance the area in which we work.

Innovation

Ardleigh Green Bridge was the first of four bridges to be completed for Skanska Utilities as part of TfL's STIP programme. Numerous alternative building information modelling techniques were employed, including augmented reality, photospheres and photogrammetry. Photogrammetry converts photography into 3D models, by overlapping a series of photos to create the 3D model, within a 2-3% accuracy of a total station. This can help limit disruption in the future, by reducing trial holes and having an accurate image of what is in the ground. Augmented reality can be used to virtually mark out utilities, therefore limiting the requirement for multiple trial holes. Photospheres are a great tool for pre-site survey, getting a 360° image, which can help with effective planning as utility owners can get an accurate image of the site, without the need for multiple visits. These techniques are now being deployed on other multi-utility diversions as part of the STIP programme.

