



CASE STUDY NUMBER 91: Thames Water/eight20 – eight20 achieving sustainable construction from site operations to tea time treats

WINNER OF THE NJUG SUSTAINABLE METHODS AND MATERIALS 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

eight20 is engaged in delivering £1.76bn of Thames Water's capital delivery programme until 2020. This includes a large mains replacement programme, whose required outcome is to reduce leakage, bursts, flooding, and increase capacity for growth.

Case Study

Across this project various sustainable methods were design and construction including:

Hydraulic Modelling and BIM were extensively used, including on mains replacement in Hatton Gardens, the famous jewellery diamond district. These methods were innovatively combined with engineering judgement to reduce the scope of works, including 8000m reduced to 1080m, with 40 cut and caps, (this involved isolating the main, cutting through the main to abandon, then draining and capping it), reducing carbon by over 930 tonnes (85%).

These design techniques were also utilised when replacing a trunk main in Swiss Cottage, reducing its scope from 3315m to 1615m, with 1300m of abandonment, reducing carbon by over 5600 tonnes (94%).

Non-intrusive surveying techniques facilitates less invasive, more sustainable no-dig construction methods. For instance, high resolution GPR (Ground Penetration Radar) was used to locate services including plastic mains which are commonly used in the water industry, but cannot be identified through traditional "cat & genny" surveys. GPR reduces the need to undertake physical trial holes and facilitates a "**right first time**" ethos. Identifying underground services clearly prior to the start of works enables design

modifications to be completed more efficiently, reducing last minute changes, which can increase time on-site and cause additional disruption.

Such surveys were undertaken on a very busy Motcomb Street, Belgravia, which negated the need to undertake trial holes, which would have required a road closure over several days and the undertaking of costly excavation and reinstatement works. This would have caused heavier traffic congestion on an already congested road, with annual average daily flows of 17,433 vehicles. Furthermore, GPR provides greater location accuracy meaning more precise and smaller excavations. Similarly, it was used on the A10 Great Cambridge Road and provided 100% accuracy and resulted in no incidents of unexpected services when works commenced. Such methods have ensured that eight₂O consistently achieve high rates of reuse of surplus construction/demolition materials.



Non-intrusive GPR undertaken on Mottcombe Street without the need for complex road closures on congested routes

Trench Sharing at Swiss Cottage was used following extensive collaboration between eight₂O, tRIIO (National Grid joint venture between Skanska and Murphy's) and various councils. tRIIO used the same

Reuse of surplus construction/demolition materials 2016/17 (% of total)



Consistent beneficial reuse of surplus construction and demolition materials

trenches to implement the necessary gas main replacements for 130m of main, reducing excavations by 140m³. Process driven efficiencies including reduced programme time (less 3 weeks), reduced cost (including traffic management and lane rentals) for both parties, improvement of safety, minimised disruption to the public, and a reduction in utility strikes.

Vacuum Excavation was used on Blyth Road, Hammersmith, a region heavily congested with buried utilities to reduce the chance of damaging these assets by 50%

and reducing excavated volumes by at least 20%, leading to reduced vehicle journeys by around 30%.