BAUER TECHNOLOGIES

# Company Profile


**BAUER Technologies Limited** is a specialist foundation contractor, providing innovative techniques and optimised designs for large retaining structures, piled foundations, cut-off walls and ground improvement installations, throughout the UK & Ireland and to date is the only geotechnical contractor in the world to be accredited with BRE BES 6001 sustainability certification (November 2021).

**Bauer Technologies in the UK specialises in the design and installation of:**

- Large diameter rotary bored piles
- Large diameter CFA piles
- Diaphragm walls
- Secant and contiguous piled retaining walls
- Under-reamed piles
- Plunged column piles
- Near-silent pile removal
- Deep soil mixing (MIP)
- Ground improvement

A wholly owned subsidiary of the BAUER Group, Bauer Technologies is fully supported by the technical departments of its parent company, based in Germany. This gives access to worldwide, industry leading deep foundation equipment and personnel. Close links with our worldwide network, as well as our large R&D department, allows us to draw upon the full depth of the BAUER Group's experience and full product range to develop the most time/cost-effective solutions for our clients.

By using this full product range, Bauer Technologies innovate and optimise to find solutions which give our clients' an edge. We encourage clients to engage with the Bauer team at the earliest possible opportunity, to maximise the value that Bauer can bring to geotechnical projects. The Bauer name is synonymous the world over with the highest standards in foundation engineering.

All our piling and diaphragm walling equipment is manufactured by Bauer. This equipment is particularly suited to dealing with hard strata, including removal of reinforced concrete sub surface obstructions.

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# CASE STUDIES

## A533 Chester Road Bridge Replacement, Cheshire

**Amey/Sir Robert McAlpine JV appointed Bauer Technologies, on behalf of National Highways, to undertake piling work on both sides of the motorway and the central reservation, as part of the National Highways improvement scheme for motorways in the northwest.**

Specifically, Bauer's scope of works was the installation of rotary bored piles for the A533 bridge replacement, which was awarded late 2021. All works were planned using the Bauer VSI software to visualise the optimum set up for each platform, detailing space requirements for the piling rig, crane and ancillary equipment. This was transferred into Bauer's works execution plan, task briefings and induction, to ensure all site personnel had the correct information for working in an extremely high-risk environment.

All permanent piles in the new structure were 1180mm dia, with drilled rock sockets into the underlying mudstone of varying lengths, to function as bearing piles for the new bridge structure. Piles were designed by Bauer Technologies and were detailed to enable safe installation while working in close proximity to this busy stretch of motorway, which remained open throughout project works.

The first section of works, using a BG26 rig, was to install a 900mm retaining wall, allowing construction of the east abutment at a lower level from the upper A533 road. All equipment was then fully demobilised, the diameter changed and was moved to the west abutment. This was followed by remobilisation and installation of all piles. When

this scope of works was complete, there was further demobilisation and movement to the central pier, where piles were installed between the two 50mph running lanes of the M56. The final demobilisation and remobilisation was into the east abutment, to complete Bauer's scope of works.

Bauer's scope of works commencing during March 2022 and, following the installation of the working platform, progressed with a quick programme duration of 5 weeks, on time and to budget.

## Delta Junction - Metro Extension, West Midlands


**The Midland Metro Alliance is building a number of Metro extensions on behalf of Transport for West Midlands (TfWM). The Wednesbury to Brierley Hill Metro Extension project is an 11km extension will branch off the current West Midlands Metro line, just east of the Wednesbury Great Western Street Metro stop.**

Specifically, Bauer Technologies' scope of works was to stabilise historic granular and cohesive embankment fill material, to minimise settlements under the planned Delta Junction approach ramp. This project will see the new tram line elevated by six meters to join the existing track level.

This project saw the first Deep Soil Mixing (DSM) project for Bauer Technologies; knowledge and experience was successful transferred from other Bauer subsidiaries and Bauer's head office specialists, to the UK project delivery team, allowing Bauer Technologies to provide an optimised ground improvement design tailored to client requirements.

Bauer's scope of works included a preliminary Zone Load Test, as well as regular wet grab sampling and verification coring of completed DSM columns. The ground improvement was installed by means of Ø2000mm Deep Soil Mixing (DSM) columns, to maximum design depth of 11.50m, using a BG45 piling rig and associated grout mixing plant.

There were a number of challenges to the successful completion of this project. The working area was exceptionally long and narrow, which made Bauer's careful planning of site logistics and column construction sequence essential. After 200 years of works, obstructions such as brick culvert and coarse foundry waste required close cooperation with the main client and contractor, to overcome and deal with these issues. The general industry shortage of Ground Granulated Blast Furnace Slag (GGBS) and Ordinary Portland Cement (OPC) constituted a major risk to project delivery. Intensive negotiations with the supply chain during the project mobilisation phase meant Bauer was able to secure the required resources and delivered the project ahead of programme.

Bauer Technologies commenced works on site during December 2021 and completed the works ahead of schedule, early March 2022.

# CASE STUDIES

## Audley Square Redevelopment, London

**The project was undertaken by principle contractor Careys Civil Engineering, who awarded the piling and foundation works to Bauer Technologies in 2021.**

Specifically, Bauer was contracted to construct a secant wall around the perimeter of the development. This saw the company install 245 liner metres of guidewall and 432nr 780/880mm piles, with design depths up to 54m. In addition, some 18nr kingposts were installed in selected primary piles to facilitate propping of adjacent structures during the excavation of the basement.

The bearing piles, necessary to support the super structure, were constructed within the perimeter wall and comprised 95nr 1200mm, 1350mm and 1800mm, with depths up to 57m. To facilitate a top-down construction approach, 24nr plunge columns were installed in selected piles. Both the secant wall and bearing piles were constructed using the Rotary Bored Cast-in-Situ technique.

There were multiple plunge column section sizes and levels, which prevented standardisation of installation technique and equipment. Specifically, the plunge columns required the use of a hydraulic frame to install the columns in the larger diameter piles and plunge column templates to install the columns in the smaller diameter piles. Multiple templates were also required to fit each column section size and 5nr different 'follower sections' were required to fit the various column section sizes and finish levels.

Prior to commencing piling works, some advanced works were also undertaken by Bauer. These included the installation of 2nr 1200mm preliminary test piles, using the bi-directional O-Cell method. Obstruction coring and old pile removal was also performed, as some pile locations were obstructed with in-ground features, including existing slabs, old piles, and concrete thrust blocks. A period of pre-coring was factored into the project schedule to clear these obstructions in readiness for new piles.

The nature and complexity of the project meant it was not without significant challenges. Site congestion was the biggest issue that had to be addressed. There were often three piling rigs, three handling cranes and piling attendant equipment, such as cranes and dumpers working within the relatively small site (approx. 2800m$^2$ area). In addition, there were other subcontractors on site, with a full complement of equipment also working within the limited site area. Other challenges included a large number of unforeseen obstructions which were encountered during the construction phase. These included old piles not identified in drawings, existing contiguous piles, old steel props/plates that all required coring out using heavy duty rotary equipment. This impacted on programme and resulted in heavy wear/tear and damage of rotary tools too.

Despite the many challenges, seen and unforeseen, works were completed successfully and to the complete satisfaction of the client.

## NESS Energy Project, Aberdeen

**The project was undertaken by ACCONIA, on behalf of Aberdeen City, Moray and Aberdeenshire Councils, who awarded the piling and foundations contract to Bauer Technologies in 2020.**

Specifically, Bauer Technologies was required to install a hard/hard secant wall comprising of 172no. 1060/1180mm diameter piles to depths of 30m, which will create the waste reception bunker.

227no. bearing piles measuring 900mm diameter and 222no. bearing piles 600mm diameter were installed across the 7 buildings - Bunker, Tipping Hall, Admin, Boiler, Air Cooler Condenser, Bottom Ash and Flue Gas, together with bearing piles for the temporary tower crane. In addition, a significant pile test programme was undertaken, consisting of 3no. preliminary piles tests, 5no. working pile tests, 10% of piles cross hole sonic logging with the remaining 90% integrity tested.

The project was complex from a geotechnical perspective with challenging ground conditions typical of that found in the North East of Scotland comprising made ground overlying heavily obstructed boulder clay. This ground with its natural obstructions did cause significant wear and tear to the equipment, in order to maintain continuity of operations two welders were permanently based on-site repairing the tools. Several man-made obstructions were also encountered which were overcome using Bauer-designed coring tools.

The project, which Bauer began working in late February 2020, was unexpectedly shut down for 10 weeks due to the COVID-19 global pandemic. Bauer's optimisation of resources upon restart resulted in the completion of the Secant Wall box only 2 weeks beyond the original pre-COVID shut down programme date, which gave the client the opportunity to accelerate the capping beam works.

Notwithstanding the shutdown period due to COVID-19, Bauer completed works in September 2020, which was in line with programme, to budget and most importantly, with an excellent safety record.

# CASE STUDIES

## M6 Cheshire

**The project to redevelop the motorway section was undertaken by joint venture, Amey Sir Robert McAlpine, who awarded the piling and foundation works to Bauer Technologies, a subsidiary of the BAUER Group.**

Specifically, Bauer was required to install 124no. abutment CFA piles (62 per abutment), each measuring 900mm x 13m, and 60no. pier rotary bored piles, each measuring 900mm x 16m. 2no. preliminary test piles and 2no. working test piles were also required.

The importance of the transport link meant work had to be undertaken with the motorway live. Narrow lanes and 50mph speed restrictions were applied to the 1.5km section of the M6 carriageway in both directions between the exit and entry slip roads. Safety throughout this project was paramount.

Ensuring the safety of workers was critical and of particularly importance where work required rigs to pile in the central reservation. In addition, Bauer's scope of works commenced during the COVID-19 lockdown restrictions, which meant all work undertaken on-site had to adhere to the Government's strict working guidance, to ensure that all those working on the project took steps to keep everyone safe.

Bauer mobilised to site early June 2020, with works completed successfully and safely in just 4 weeks, on time, to budget and to the satisfaction of the client.


## Werrington Grade Separation, Peterborough

**Network Rail's Werrington Grade Separation project when complete, and coupled with upgrades elsewhere along the route, will see increased capacity in journeys between London and Edinburgh on the East Coast Main Line (ECML).**

The Site was split generally into North (Phase I) and South (Phase II); Morgan Sindall Infrastructure PLC awarded both phases of the works to Bauer Technologies upon successful completion of the Phase I works.

Phase I of the project saw Bauer install 183No piles, required for the TBM Launch Pit, which was an increase on an original scope of 120No piles; the TBM Launch Pit was increased in length to aid later construction of a syphon for the Werrington Brook that passed through the site.

Phase II of the project commenced in June 2019, with work on the Stamford Under Bridge (UB). The Under bridge consisted of 120No Piles to allow the top down construction; this bridge ultimately takes the new Stamford Line around the dive- under structure.

The Cock Lane Footbridge (CLFB) was completed as part of the Stamford UB package, and whilst the Cock Lane Footbridge needed only 4No piles, it required some of the most intensive planning on the project, due to the tight working area and the 400kV overhead lines that ran through the site.

The South Wall was split into two sections, to allow for the Stamford Line to be slewed over the Stamford UB during Christmas 2019. The initial West Wall consisting of 281No Piles followed on from the Stamford UB and CLFB in July 2019. The line of the wall along the Stamford line dictated that the rig and the crane were required to work under strict conditions, which was up to 3m from the running line and between live overhead line masts and bases.

Bauer's works commenced March 2019 and completed August 2020, deploying a BG45 PL, BG30 PL, BG30 VL and Klemm 709-1 to undertake the works.

# CASE STUDIES

## Basement, Central London

**A basement project in Central London required Bauer Technologies to construct 574no. of Ø880/780mm secant wall piles, at depths varying from 11m to 28.5m, as well as 51no. of Ø1300/1200mm bearing piles with plunge columns, at depths varying from 26.85m to 44.6m.**

The scope of works included the geotechnical pile design, as well as construction of 336 linear meters of guide wall. Eleven out of the 51 plunge column piles were installed through an existing basement using permanent liners. For the secant pile wall design Bauer cooperated closely with the client's design team to develop a secant pile wall configuration in compliance with the project specification. The depth of the secant pile wall primary piles was 11m, whilst the secondary piles reached to 28.5m, allowing for excavation of a 22m deep basement.

Work was being undertaken in a residential area, which meant Bauer's site team had to work in strict compliance with noise limits and working hours specified in the applicable Section 61 consent. Bauer employed a number of noise mitigation measures, notably the mobilisation of an innovative "silent drilling bucket", allowing the operator


to excavate the London Clay with minimal drilling noise when clearing spoil off the tool.

Despite the logistical complexities of the site, all piling works were completed to the full satisfaction of the main contractor and without lost time or accident, within budget and two weeks ahead of schedule.

## Woodsmith Mine, North Yorkshire Moors

**Woodsmith Mine, located in Whitby, North Yorkshire, is a deep potash and polyhalite mine. The project involved Sirius Minerals constructing the UK's deepest mine, will allow the extraction of large quantities of Polyhalite for global distribution.**

Bauer Technologies was appointed to install three up to 120m deep diaphragm wall shafts, with diameters between 8m and 35m. To guarantee the specified vertical tolerance of 200mm, the site team had to combine various survey methods, which were documented in a 3D BIM model. In addition, as part of the works, a large quantity of bentonite slurry had to be reconditioned in a complex de-sanding plant and by use of specially designed polymer-based additives. Specifically, the service shaft headgear chamber was 60m deep, 35m dia; the production shaft headgear chamber was 60m deep, 32m dia; and the production shaft main shaft was 120m deep, 8m dia. The shafts were formed by 2.8m wide and 1.2m thick panels – 48 for the service shaft, 44 for the production shaft headgear chamber and 14 for the deep main shaft.

Notwithstanding the often-extreme weather conditions, the ground conditions at the Woodsmith site were challenging. Variable lamination through which Bauer had to cut the diaphragm wall panels for the shafts was classed as weak to medium-strong. The intermittent nature of the geological lamination made the cutting process technically challenging, and required Bauer to deploy several combinations of cutter wheel configurations to optimise performance.

Work on the first panel beginning December 2017. The extremely challenging ground conditions demanded three cutters on the project: two MC96 machines and an MC128 carrying HDS120 hose drum systems and BC40 cutter units. Two BE500 and one BE550 de-sanding units fitted with BDS125 de-silters and a BD90 decanter were used. Bauer Technologies completed its scope of works successfully in December 2018, with all works completed to the agreed programme.

# CASE STUDIES

## A19 / A1058, Newcastle


**Bauer Technologies was awarded the piling contract for the A19/A1058 Junction Improvement project in Newcastle, by Sisk Lagan JV, the Main Contractor responsible, on behalf of Highways England.**

The £75m scheme involves upgrading the existing roundabout to a 3-level interchange. Bauer's scope of works was to install 583no contiguous rotary bored piles with diameters ranging from 600mm to 1500mm. The piles, which were up to 31m long, were founded in sandstone bedrock to form contiguous pile walls, creating the trough for the A19 'dive under'. A number of the retaining wall piles also act as hybrid design elements by carrying the load of three major single span bridges across the underpass.

The project was incredibly challenging and involved Bauer working within a live, major roundabout with a heavy volume of traffic. In order to manage the associated risks efficiently, Bauer worked closely with SLJV and Highways England in order to implement stringent health and safety processes. In addition, Bauer participated in Highways England's "Raising the Bar" scheme which is designed to raise standards in Efficiency, Quality and Health & Safety.

Piling works started in December 2016, with mobilisation of a Bauer BG30 rig, which was followed by a second machine in early 2017. Piling works were carried out in two phases, both phases being completed on time and on budget.

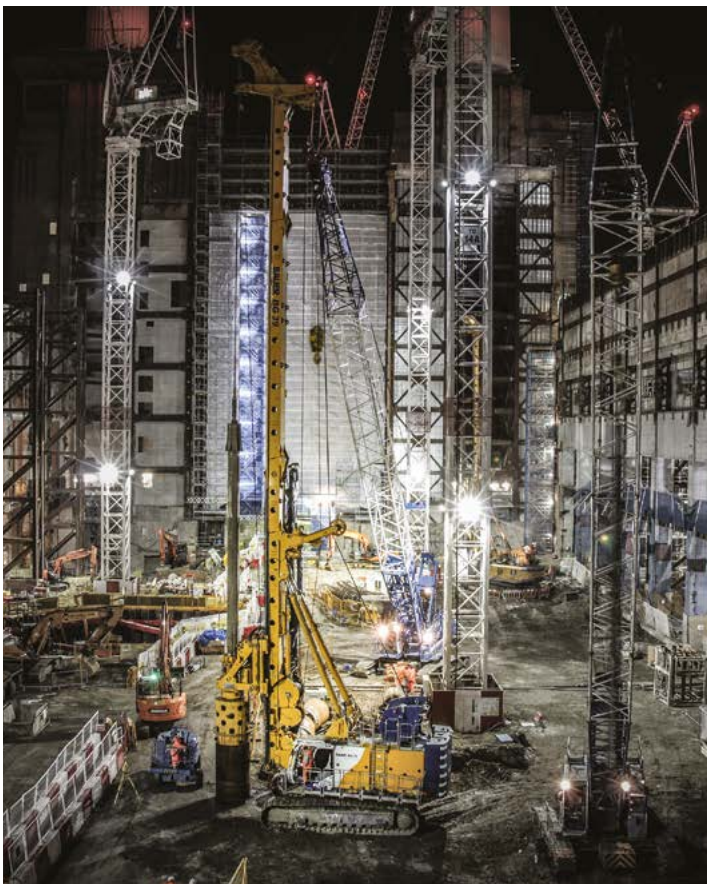
## Battersea Power Station, London

**Bauer Technologies was awarded the £30m piling contractor for Phase 2, working directly for the Battersea Power Station Development Corporation (BPSDC) to design and construct the rotary bored piling within the envelope of the existing 1930's Power Station building.**

Bauer's scope of works included the design of permanent and temporary works piled foundations; 500no 880 and 1180mm diameter secant piles in two secant walls; 125no contiguous wall piles; 400no bearing piles (750mm to 2400mm diameter between 35m and 65m deep) and 80no temporary piles for temporary works structures and tower cranes.

Prior to constructing the main works piles, substantial existing traditional concrete foundations and piles were removed at new pile locations using specialist piling equipment.

The successful delivery of the piling works overcame challenges that included the presence of existing foundations (including piles), headroom and space constraints, strict building movement tolerances, asbestos contamination, scour features in the London Clay, logistics management and coordinating work with both enabling and follow on contractors.



# CASE STUDIES

## Principal Place, London

**Bauer Technologies was awarded the £4.86m foundations contract for Principal Tower, a 50-storey luxury residential establishment in Central London, by Multiplex Construction Europe on behalf of its Client, a joint venture between Brookfield Office Properties and Concord Pacific.**

Specifically, Bauer was appointed to install the piled foundations and secant walls for the Principal Tower, which was particularly challenging, as Bauer was required to work under restricted space conditions, next to a live railway, around strict load restriction zones and in amongst other trades on site.

Some 81no, 1500mm bored piles, up to 55m deep were installed, including 8no permanent casings with bitumen slip coating, 14no. large section plunge columns, and 10no king posts. 32no 880mm bearing piles, up to 33m deep, were also installed as well as 214no 880mm secant wall piles (150 linear metres), up to 33m deep including 24no king posts. Bauer was able to draw on its specialist foundations contractor knowledge to carry out project-specific plant modifications, which allowed a BG40 piling rig to install heavy duty pile casings of up to 2000mm diameter, whilst standing on sensitive temporary works structures with strict load restrictions.

In the second phase of the works, Bauer used a 350-tonne mobile crane to safely lift its BG30 piling rig into the partially excavated secant wall box. This allowed the remaining bearing piles to be installed after successful completion of archaeological excavation works by the Museum of London.

## Eastern Bay Link Flyover, Cardiff

**The £57.3m Eastern Bay Flyover is a critical component of the Cardiff Eastern Bay Link (EBL), funded and managed by the Welsh Government, with Dawnus Ferrovial Agroman Joint Venture (DFAJV), the Main Contractor, awarding the piling contract to Bauer Technologies Ltd.**

Bauer Technologies commenced piling works in March 2016, installing 252no, 1200mm rotary bored piles with depths up to 32m, using Bauer's own BG30 and BG39 piling rigs. Casing vibrators were used to place and extract single wall casings up to 17m long. Notably, Bauer also successfully carried out three pile maintained load tests using Osterberg cells.

The £2m project presented many challenges; work had to be undertaken adjacent to a live railway line and without striking any of the numerous live services in the piling area. The risk assessments Bauer implemented, and the associated mitigation measures allowed the piling team to install all piles without interruption to rail traffic, which was an incredibly important aspect of the project. Bauer's performance resulted in the early handover of completed pile groups.

# CASE STUDIES

## M8/M73/M74 Improvements - Structure 105 - Braehead Railway Bridge, Scotland

**Bauer Technologies was awarded a £3.5m sub-contract by Ferrovial Lagan JV (FLJV) to install the foundation piles for a number of structures along the new motorway, including the 8no. 2.0m diameter foundation piles for the Braehead Railway Bridge.**

A challenging project, as it had to be planned in great detail and in close cooperation with main contractor Ferrovial Lagan JV and Network Rail to ensure minimum disruption to rail services. As a result the 2.0m piles had to be constructed within 4 x 54-hour railway possessions (closures) in April 2015. A key element in assuring reliable delivery was to verify the design assumptions and the construction method.

This was demonstrated by construction of a sacrificial test pile of the same diameter as the works piles, fitted with a 660mm diameter Osterberg Cell.

The design test load for the pile was 28.7 MN but it was finally tested to failure, achieving a maximum sustained gross bi-directional applied load of 39.5 MN. Directly after the successful test piling the 8no. 2m diameter rotary bored piles up to 18.7m deep were installed. The first 54hr possession was scheduled for the Easter weekend. At their closest the piles were within 2m of the nearest rail and 1m away from an OHLE stanchion.

The piles were drilled by BG40 drilling rigs resourced from Bauer resources in UK and Europe. The piles were temporarily cased with Bauer segmental casing through the upper over-burden and made ground strata, which consisted of silty/ sandy firm to very stiff clay (glacial till). The segmental casing was then sealed into the underlying sandstone and siltstone rock. Using Bauer rock augers and drilling buckets, the pile bore was drilled through sandstone, siltstone and mudstone with rock strengths of up to 50Mpa.

Piles were heavily reinforced full length with a double layer of B50 reinforcement (a steel density of nearly 800kg/linear m). The line of piles constructed in closest proximity to the railway tracks had a permanent steel liner installed over the upper section, in the zone above the concrete cut-off level, to allow safe access for follow on contractors to trim the piles.

The permanent liner was attached to the reinforcement cage using a bespoke fabricated bracket-splice connection developed by the project engineering team.

Bauer Technologies added value to the project by using its experience of previous work on similar technically demanding projects carried out in a rail environment. This experience was fundamental in Bauer Technologies installing the 8no. piles for Structure S105 in less than 50% of the allowed construction time: only 2 of the 4, 54-hour possessions were required to complete the work.

## Manufacturing Facility, Bradford

**Bauer Technologies tendered and successfully negotiated a subcontract to deliver the foundation work for the project, working for JN Bentley, on behalf of the main client, BASF. Bauer Technologies mobilised to carry out the work in February 2015.**


As the work was to be undertaken while the chemical plant was in operation, the project was not without its challenges. Specifically Bauer Technologies had to install a number of rotary bored piles in close proximity to BASF's existing chemical storage tanks, which carried inherent risk as well as influencing construction sequence.

On-site, Bauer Technologies had to react quickly and professionally to changed ground conditions by modifying the envisaged construction method and then optimising performance under the revised constraints. For example, mine workings within the bedrock were encountered, requiring temporary casings to be lengthened from 6m to 15m. By working closely and co-operatively with JN Bentley the disruption and delay to the programme was minimised. Work was completed in early March 2015.

Bauer used its BG30 and BG40 rigs to drill 880mm dia piles, with rock sockets up to 25m long in Coal Measure Sandstones, Siltstones and Mudstones.

# CASE STUDIES

## Acton Dive Under, London

**Bauer Technologies secured the contract for the piling works for the £30m Network Rail (on behalf of Crossrail) Acton Dive Under project in West London.**

The £4m project awarded by main contractor BAM Nuttall, involved Bauer Technologies installing 950lnm of secant and contiguous pile walls, consisting of 1400no CFA piles in diameters of 600mm, 750mm and 900mm. The piles up to 16m deep, were installed between live railway lines using a CFA adapted Bauer BG28 drilling rig.

## US Embassy, London

**Bauer Technologies won the contract to undertake the piling and diaphragm walling works for the new US Embassy in London.**

The US Dept of State Bureau of Overseas Buildings Operations (OBO) Construction Contractor, BL Harbert, and Prime Sub-Contractor, Sir Robert McAlpine, selected Bauer for the early site work. The project commenced in June 2013, ahead of the main works in August 2013.

Bauer's work consisted of the construction of a diaphragm wall and deep base-grouted piles and despite the complex and large-scale nature of the project, the work was completed within an extremely tight 3-month schedule. Bauer mobilised several rigs, including 2no. BG40s; 2no. BG28s and 2no. diaphragm wall grabs.

## Whitechapel Station - Cambridge Heath and Durward Street Shafts - Crossrail Advanced Station Works

**Bauer Technologies completed Crossrail Advance Works Contract C511 at Whitechapel Station, London, May 2013.**

The scope of works included the construction of a circular diaphragm wall shaft at Cambridge Heath and a more regular shaped diaphragm wall box at Durwood Street. The main contractor for the project was the BAM Nuttall Kier Joint Venture. Both sites had challenging working constraints. Other works included pile probing and pile removal.

## Liverpool Street Station - Moorgate Shaft - Crossrail Advanced Station Works

**Bauer Technologies completed the Crossrail Advance Works Contract C501 at Moorgate, London in August 2013. The contract, for main contractor BAM Nuttall Kier Joint Venture, included extensive pile probing and removal, using the Bauer Technologies developed Annulus Cutter.**

The main scope of the project consisted of the construction of 3No 2.4m diameter future over site development piles and the construction of a diaphragm wall box. Geothermal loops were also installed within the diaphragm wall panels. Working space within this extremely constrained site was a significant challenge to the project team for the duration of the works.

# CASE STUDIES

## Tottenham Court Road Station Upgrade, London

Bauer Technologies performed large diameter (2m+) piling to below 65m depth; diaphragm walling 1m thick x 41m deep; 11nr plunged columns installed into large diameter 48.5m deep piles; piles of diameter 2.4m and various secant pile walls for main contractor Vinci BAM Nuttall Joint Venture. (Client was London Underground).

*The project presented a number of challenges, including:*

• Construction of 2m diameter bearing pile with permanent liner in a 'D Shape

• Design and installation of a new bespoke plunged column frame 23m long, equipped with laser guides which for the first time in the UK bears on "naked soil", rather than a steel casing clamping the frame in place. The plunge columns are by far the heaviest and longest that the industry has seen for some time, with a mixture of 600 x 600 and 700 x 700 columns up to 33m long installed

• Installation of a diaphragm wall within a working area of 25m x 30m surrounded by London traffic

## Pembroke Jetty, Pembroke

**Bauer Technologies completed these extremely complex works on a 50 year old jetty on the Severn Estuary at the site of the new 2000MW, Combined Cycle Gas Turbine Power Station, to support the Leibherr LGD 1750 crane and its 387.5 tonne superlift required for the safe off-loading of five 400-tonne gas turbines as part of the stations' construction.**

Bauer chose its rotary system for the job, using thick walled casing with tungsten carbide cutting teeth rotated to pile toe level using Bauer's powerful BG28 rig. For the marine piles, 1220mm diameter casing was fitted with Bauer cutting teeth to ensure penetration through boulders. The works were undertaken 24hrs a day, 7 days a week to complete the piling and ensure the deadline was met; this was driven by the departure schedule of the ships delivering the gas turbines from Rotterdam.

## Pembroke Power Station, Pembroke

**Bauer Technologies completed the £5 million contract for the installation of the piled foundations at Pembroke CCGT. Each unit consisted of a variety of sub-structures covering a total area of 40,000sqm.**

The scope of the piling contract comprised the construction of the piling platform; preliminary trial bores to verify ground conditions and rock head level in the piling area; a preliminary pile testing regime including a fully instrumented test pile; construction of 2,307no. 600mm reinforced CFA piles; 421nr 900mm unreinforced CFA piles and installation of 10nr 1200mm dia steel liners to 10m depth at the condensate pit, including all associated piling attendances (setting out, provision of attendant plant, spoil disposal, platform maintenance).

# CASE STUDIES

## Waste to Energy Facility, Newhaven

**Bauer Technologies executed a circular shaped diaphragm wall and foundation barrettes for the facility in Newhaven for Hochtief UK.**

Different options and alternative technical solutions were proposed and offered during the tendering phase, before Hochtief, in joint venture with vonRoll (Switzerland), awarded the project to Bauer Technologies Ltd.

## Palm Paper Project, Kings Lynn

**Bauer Technologies was successful in winning the contract for the piled foundations of Europe's largest paper machine.**

The scope of the project was to install a secant pile wall (hard/hard) and foundation piles to support the machine hall area to a design developed by BHM INGENIEURE Engineering & Consulting GmbH. The final value of the works performed by Bauer was £4.4 million.

## Severn Power CCGT, Newport

**Bauer Technologies was awarded the £15 million contract for the piled foundations of the new Power Station, which consisted of two power generating units, each a variety of structures covering an area of 60,000sqm.**

The scope of the piling contract involved the construction of the piling platform; a preliminary pile testing regime; the erection of an on-site concrete batching plant; the installation of the piled foundations, comprising 439nr 620mm diameter bored piles; 426nr 880mm diameter bored piles and 711nr driven cast iron ductile piles.

To view these projects in more detail please visit our website: **bauertech.co.uk/en/projects**

## Bauer Technologies Mission Statement - 2022

To be the UK's leading geotechnical contractor, bringing competitive solutions to our clients through innovation and sustainability.

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