



Thames Tideway Tunnel

Capabilities

What we can do

Hanson UK, a capable business

Hanson UK is part of the HeidelbergCement Group, employing 53,000 people across five continents. HeidelbergCement is the global leader in aggregates and a leader in cement, concrete and heavy building products (brick, block and precast concrete).

Hanson UK is split into business lines offering the broadest range of products and services in the heavy building products market.

Hanson Aggregates produces sand, gravel and crushed rock from over 54 quarries in England and Wales and includes Hanson Aggregates Marine, Europe's largest producer of marine-dredged sand and gravel.

Hanson Concrete is the UK's largest supplier of ready-mixed concrete from a national network of 178 fixed and site-based plants.

Hanson Asphalt and Contracting supplies and lays asphalt for road surfacing and provides a range of infrastructure services. Its civil engineering division specialises in the construction of wind farms and waste-to-energy plants.

Hanson Cement is a leading manufacturer of Portland cement, both in bulk and in bags, and produces ground granulated blastfurnace slag (GGBS) under the brand name Regen – a cement replacement in ready-mixed and precast concrete – and a range of bagged cementitious and aggregate products.



Aggregate dredger Arco Dart



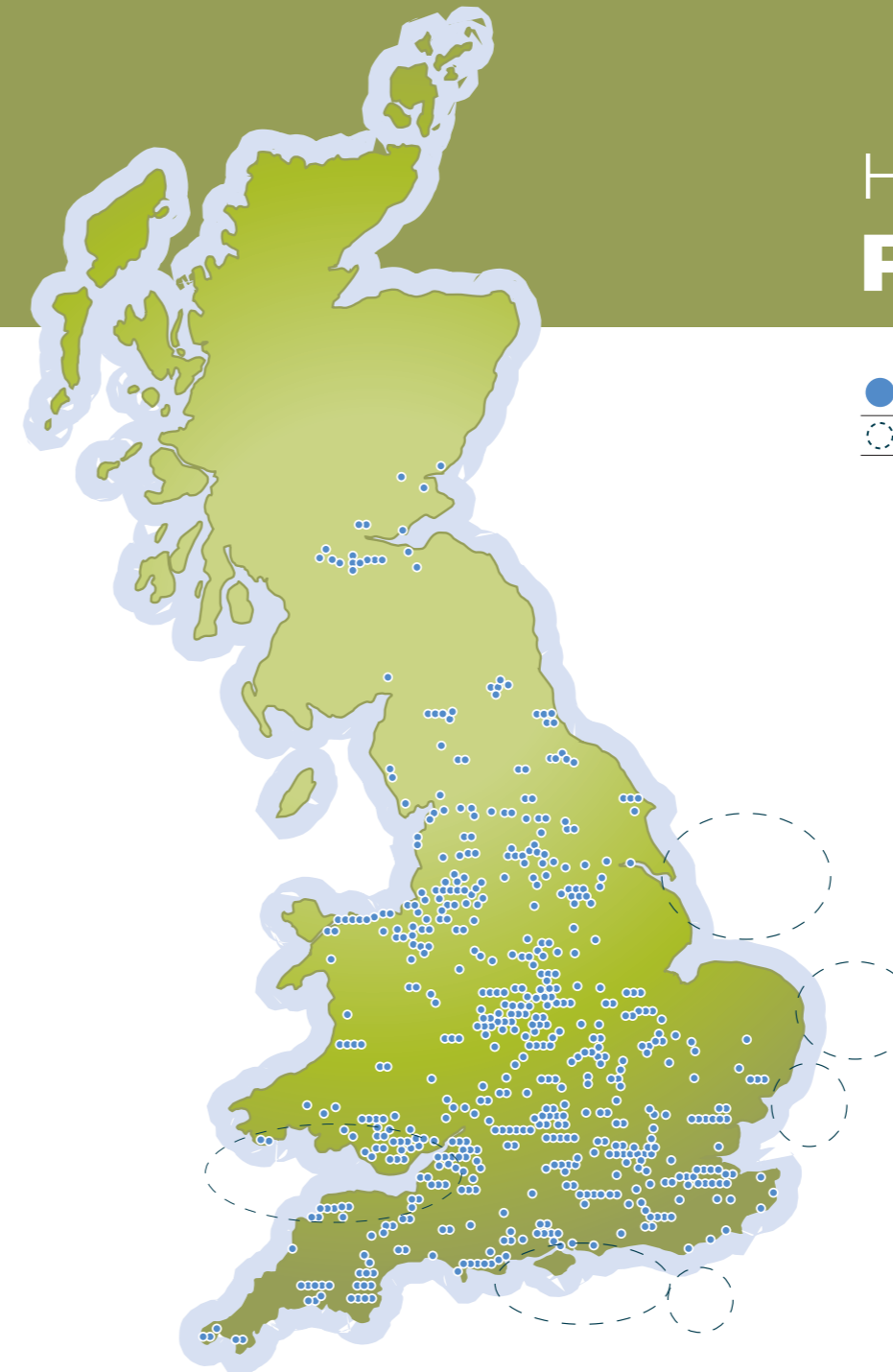
Ketton cement works in Rutland



Ready-mixed concrete delivery

Hanson UK

Production sites



- Operations
- Marine licences

Our UK operations	
Aggregates depots and wharves	16
Asphalt plants	29
Bagged product plants	12
Block paving plants	1
Brick works	7
Cement depots and wharves	6
Cement plants	3
Concrete/aircrete block plants	7
Regen plants	3
Marine dredgers	7
Precast concrete and flooring plants	2
Quarries – sand and gravel	29
Quarries – crushed rock	25
Ready-mixed concrete plants	178
Recycling/landfill sites	17
TOTAL	342

All our production sites are certified to ISO 14001 and ISO 9001

Our responsibility

Health and safety

Committed to health and safety

- Committed to achieving the highest standards of health and safety for all our employees, customers and third parties
- Seek to reduce the number of accidents and incidents year on year, with the goal of eliminating lost time accidents
- Managers involved daily in behaviour and health and safety observations
- Ensure plants and equipment are maintained to a high standard
- Openly report our performance and constantly review
- Commitment expected from employees to constantly strive to eliminate hazards and risk of potential injury.

Upgrading our fleet network

Not only have we increased our fleet numbers of late, but we have also upgraded them to increase efficiency and to help sustain our excellent health and safety record, which is of paramount importance.

- Our concrete truck mixers have been fitted with sensors to detect cyclists
- They have been fitted with left turning awareness systems
- Side under bars have been fitted to our tippers to avoid cyclists or pedestrians being pushed under the wheels
- Extra signage on vehicles to help make them more visible
- High percentage of our concrete mixer trucks have a four-way recordable camera system fitted.

Fleet tracking

- Our vehicles have been fitted with tracking devices to help with delivery planning and further increase efficiency
- Vehicles running out of our London King's Cross plant have GPS navigation systems fitted, enabling us to find out the exact location of the vehicle
- All of our other vehicles have Hanson WAP phones fitted. These help provide various updates, including helping determine at what stage of the route the vehicle is
- Our fleet tracking capability enables us to provide you with more accurate delivery times in the event of a delay.

Hanson UK

Performance and sustainability

Highlights 2012

- ✓ **OHSAS 18001** certification achieved across main business lines
- ✓ Employee lost time injuries **fall by a third**
- ✓ Waste to landfill **target exceeded**
- ✓ Mains water use **falls**
- ✓ More than **100** biodiversity and geodiversity action plans now in place
- ✓ Energy use per tonne down **11.5 per cent** since 2005
- ✓ **Stakeholder** engagement programme broadened
- ✓ New **sustainability department** provides increased focus

Industry firsts

- 1998** Began creation of Europe's biggest man-made reed bed at Needingworth in partnership with the RSPB
- 2000** Built floating concrete platform for Canary Wharf
Signed memorandum of understanding with English Nature (Nature England) and Countryside Council of Wales
Became UK Habitat Champion for reed bed and fen
- 2001** Castle Cement gained ISO 14001 and ISO 18001
- 2005** Joint BAP and GAP action plan for all quarries
- 2006** Purchase of Civil & Marine, sole UK manufacturer of GGBS
- 2007** Carbon Trust Certification awarded to building products division for energy management and planning
All Hanson production sites gained ISO 14001
- 2009-11** Achieved responsible sourcing of materials certification for ready-mixed concrete and aggregates, asphalt, brick, block, precast concrete and cement
- 2010** Largest heavy building materials company to receive the Carbon Trust Standard
Launched the first low energy asphalt – Hanson era
Gained first Site of Special Scientific Interest (SSSI) status for a translocation site from Nature England



Hanson UK

Products and services

Delivering product and technical innovation

Construction

- Hanson Ecohouse® – first Code 4 masonry house
- Stewartby commercial building – BREEAM excellent

Concrete

- High rise – leading concrete technologies and construction techniques in high rise construction
- Hanson EasyPile® – innovation in concrete piling mixes
- Concrete solutions – post tensioned, high strength, low permeability, self-compacting and lightweight concretes
- Sustainable concretes – high Regen® (GGBS) mixes with recycled aggregates
- Power range – specific mix designs for the energy sector

Asphalt

- Hanson era® – low energy, high recycled content asphalt for all surface courses
- Hanson Tuffgrip® – low noise, reduced course thickness

Cement

- Regen® – the cement substitute GGBS
- Low CO₂ cement – introduction of aggressive alternative fuel and material programmes
- TioCem® – absorbs and reduces NO_x in the atmosphere



Mobile plant capabilities

Mobile concrete plants

We have invested in a fleet of mobile batch-plants, available for projects both large and small. We have a wealth of experience in all aspects of concrete production and have successfully managed a large number of site batching operations throughout the UK. Our on-site batching delivers the material right where you need it, keeping trucks off the roads and transport costs to a minimum.

- Our site plant provides continuity of supply throughout the project's lifecycle
- Our modern plants provide highly accurate mixing for quality concrete, batch after batch
- We can formulate bespoke mixes for every type of job including high flow/high strength concrete for pumping
- All our plants are certified by the Quality Scheme for Ready-Mixed Concrete (QSRMC)
- We will provide operational and technical advice through the early site planning process and continuous support through the whole of your project's lifecycle
- Quick plant set-up.

Our locations

Hanson, our south-eastern capability

Our people

- Worldwide expertise gained on projects ranging from the US federal road building programme to the Sydney Olympics
- Our solid asset base and experienced management team makes us an ideal partner for supplying a range of construction materials in London
- We meet the key sustainability criteria of responsible sourcing, appropriate use of secondary materials, minimised embodied impact and healthy materials with minimum exposure to pollution
- Our successful projects in the capital include:
 - Canary Wharf
 - Terminal 5 building, Heathrow Airport
 - Channel Tunnel Rail Link into St Pancras.

Our assets

- A strong market position in London and South East England
- Supported by a comprehensive network of production sites and depots for:
 - ready-mixed concrete
 - asphalt
 - concrete block
- Sites principally supplied by marine sand and gravel dredged from the English Channel and the North Sea and by rail hauled limestone from Somerset
- The largest high quality sand and gravel reserves in the South East
- Rail-linked aggregates depots at West Drayton and Dagenham
- Six marine wharves on the Thames and Medway rivers including a deep water terminal near Greenwich
- Rail-linked aggregates storage and concrete production facility in the heart of London at King's Cross
- Large scale use of rail and water transportation for raw materials ensures we optimise logistics and maintain the lowest cost and highest sustainability balance
- Close links with major builders' merchants to offer multi-product drops
- Experience of installing and running site-based concrete production plants
- Mobile concrete plants for specific projects and portable silos for dry mortar
- Supported by a distribution network of nearly 500 aggregate tipper vehicles and around 250 concrete truck mixers in the South East alone.



“ We optimise logistics to ensure the lowest cost and highest sustainability balance. ”

Luke Smith
Hanson regional concrete manager – South East

Sprayed concrete and grout capability



Hanson UK sprayed concrete with cement from Ketton

Hanson UK has 20 years of experience in producing sprayed concrete through its Hanson Cement and Hanson Quarry Products divisions. From its Ketton plant Hanson Cement manufactures a unique quality of cement that is used in sprayed concrete mixes. Hanson UK with HeidelbergCement has a technical product capability that has been proven in tunnelling projects worldwide. Hanson Cement and Hanson Concrete, together with our admixture partners, can ensure the final mixes for the primary and secondary coats deliver:

- Reduced rebound
- Reduced wastage
- Time saving
- Rapid and successful adhesion
- Consistent best quality
- Specific mix designs

Over the last 15 years HeidelbergCement has developed in excess of 50 different grout variants for tunnel applications across Europe. Through the HeidelbergCement Technical Centre (HTC), a specialist department was created to develop grout formulations and work with engineers and contractors to deliver tailored solutions for individual projects where geological, logistical and formulation issues needed to be considered. These are:

- Pumpability of grout from batching plant to work location
- Setting time control
- Resistance to bleeding and segregation
- Reduced heat of hydration/low heat
- Durability
- Easy application through segment annuluses
- Shrinkage compensation

Hanson UK with HeidelbergCement can supply formulations, material and expertise for grout used in concrete segment tunnel lining. This technical knowledge can be translated in the UK market through Hanson UK's:

- Asset base – three cement plants and depots
- Material supply – Cement, PFA, Regen (GGBS) micro silica, limestone and admixtures
- Knowledge – Hanson UK Concrete technologists
- UK based technical support and quality control
- Pumping expertise

Hanson capabilities for Thames Tideway Tunnel

- The most sustainable transport solutions for ready-mixed concrete and aggregates available in London
- £20 million investment in concrete plants over the last 5 years
- Supported by around 250 concrete trucks and 500 tippers in the South East
- Mobile plant capability
- Use of Hanson's unique floating platform:
 - bulk of raw material river-fed
 - sizeable reduction in lorry movements
 - further reductions in carbon footprint

KEY

Tunnel

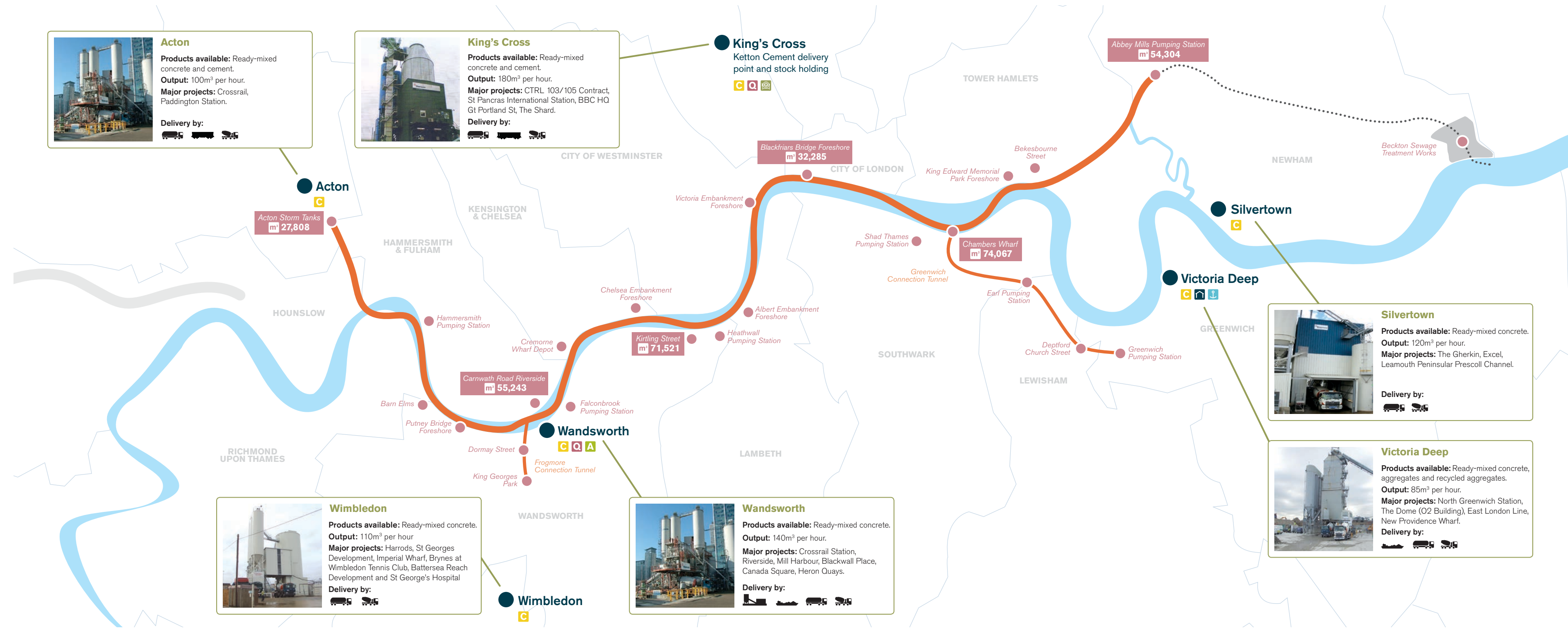
- Tunnel Site
- Main Tunnel
- Connection Tunnels
- Lee Tunnel (Under Construction)

Hanson production sites

- Q Aggregates
- m³ High Volume Aggregate Site
- A Aggregate Depot
- C Asphalt
- C Concrete
- C Cement
- GGBS
- Wharf

Delivery method

- Barge
- Floating Plant
- Lorry
- Ship
- Train
- Ready-mix Lorry



- Other Aggregate supply sites**
- Allington
 - Ardingly
 - Beaconsfield
 - Gallagher
 - Lenham
 - Mortimer
 - Newhaven
 - Reigate
 - Shoreham
 - Theale
 - Wrotham

East London


West London

West Drayton

Products available: Ready-mixed concrete, Primary and Secondary aggregates.

Output: 48m³ per hour.

Major projects: RAF Northolt, RAF Ruislip, M1 Central reservation, Windsor Castle, Earls Court Ideal Home Exhibition and Heathrow Airport.

Delivery by:  

Dagenham

Products available: Ready-mixed concrete, aggregates and recycled aggregates.

Output: 100m³ per hour.

Major projects: CTRL 250/240JV, Romford Hospital, Pioneer Point Ilford.



Delivery by:    

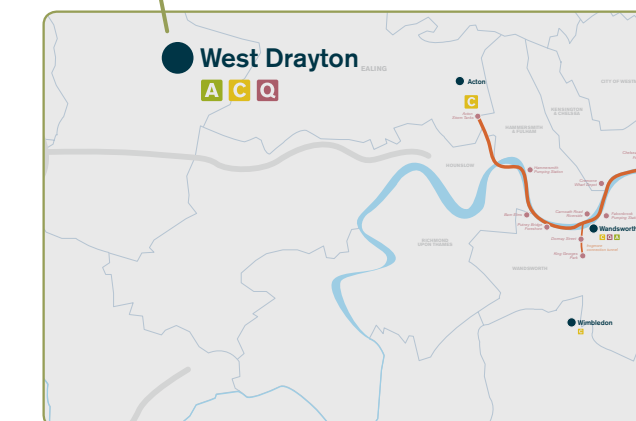
Purfleet

GGBS manufacturing plant (grinding plant with first vertical mill in the UK).

Storage: 12,000 tonne capacity.

Major projects: Olympics, CTRL, OE2 bridge, Canary Wharf, Stratford City, The Dome (O2 Building).

Delivery by:  



Erith

Products available: Ready-mixed concrete, Primary and Secondary aggregates.

Output: 48m³ per hour.



Major projects: Costain Construction Waste & Recovery station in Erith, Highertest - Bell Marsh Prison, Lancsville - Woolwich Arsenal, Bexley Heath Town Centre and Farnborough Hospital.

Delivery by:  

Frindsbury

Products available: Ready-mixed concrete and aggregates.

Output: 48m³ per hour.

Delivery by:  

Hanson UK Case studies

Connecting the City, Canary Wharf, the West End and Heathrow Airport to commuter areas east and west of London, Crossrail is a major new rail link project designed to provide a world-class, affordable railway with high frequency, convenient and accessible services across the capital.

Case study 1: C510

Crossrail contract C510 – Early Access Shafts and Sprayed Concrete Lining Works for Whitechapel and Liverpool Street station tunnels

BBMV, the joint venture encompassing Balfour Beatty, ALPINE BeMo Tunnelling, Morgan Sindall and VINCI Construction, is constructing early access shafts and Sprayed Concrete Lining (SCL) works for both Whitechapel and Liverpool station tunnels.

The major construction works for C510 began in April 2011 and includes the construction of the Crossrail Whitechapel and Liverpool Street Station SCL tunnels. Associated works will include the shafts and adits, platform tunnels, Tunnel Boring Machine (TBM) reception chambers and launch chambers, cross passages, access passages, escalator barrels, ventilation ducts and a link passage from Crossrail Liverpool Street Station to the London Underground Northern Line Moorgate.

Station platforms – the works also include the construction of four compensation grouting sites in the vicinity of Liverpool Street Station and one compensation grouting shaft in the vicinity of Whitechapel Station.

Material for sprayed concrete

Hanson UK is supplying BBMV with key components for the sprayed concrete mix. Ketton works is the approved cement source; the material is railed into our central London cement distribution depot at Kings Cross, and road delivered direct to site. The marine sand is supplied via Hanson marine and processed at Dagenham wharf and road delivered to site.

With limited site storage at both Finsbury and Whitechapel sites, and the demanding daily sprayed concrete program, weekly and daily logistics planning between the BBMV site team and Hanson orders at Kings Cross and Allington has significantly contributed to the overall success to date. Communication and just in time delivery has reduced vehicle congestion at the vehicle holding areas awaiting discharge to the concrete plants Hanson operates one of the largest Crossrail approved delivery fleets in London, with over 150 vehicles and operatives now approved to deliver to these sites.

Volumes

- Cement 48,000 tonnes
- Marine sand 40,000 tonnes



Hanson UK Case studies

Case study 2: C305

Eastern Running Tunnels (Limmo Peninsula to Farringdon; Limmo Peninsula to Victoria Dock; Stepney Green to Pudding Mill Lane)

Contract C305 is the biggest design-bid-build construction contract of the CRL project. The contract includes the eastern running tunnels of CRL's central section with launch shafts and SCL launch adits for TBMs at Limmo Peninsula, SCL caverns and launch adits for TBMs at Stepney Green and 10 SCL cross passages between the running tunnels with lengths up to 30 metres.

According to Crossrail project managers, the Stepney Green caverns are one of the largest mined caverns ever constructed in Europe using a spray concrete lining. The eastbound cavern is where Crossrail trains will branch towards Stratford or Woolwich and so is scaled to accommodate the two tunnel boring machines (TBMs) – Victoria and Elizabeth.

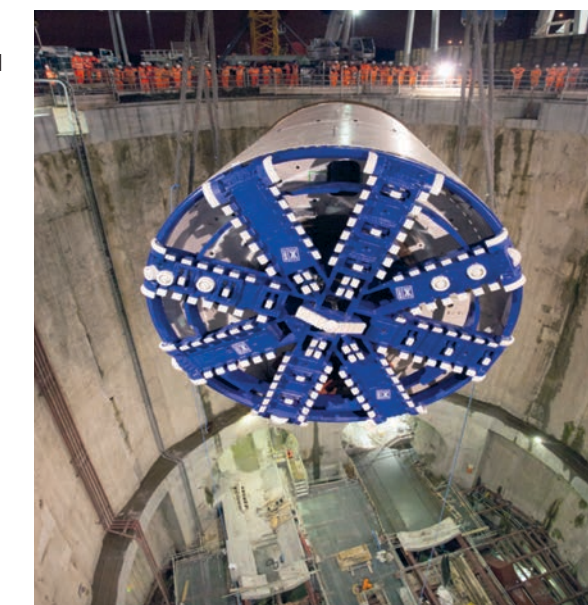
The cavern is 50m long, 13.4m wide and 16.6m high at its widest point. To construct the cavern, the team had to excavate 7500m³ of material and apply 2500m³ shotcrete to the walls.

Due to the site's urban location, alongside a school and a technical college, a concrete batching plant was built on site to manufacture the concrete for the cavern.

At the Limmo Peninsula site, two 40m deep and 30m diameter shafts were first built. One shaft was sunk using diaphragm walls, the second so called Auxiliary shaft was built utilising the SCL construction method. At the bottom of each shaft two 15m long and 8m wide SCL launch adits were excavated and two 55m long and 8m wide SCL tunnels constructed in order to connect both shafts. All SCL works at Limmo Peninsula followed a Top Heading, Bench and Invert excavation sequence and were carried out in London Clay.

This project has seen Hanson UK supply to date:

- Stepney Green – 11km³ spray concrete lining supplied 24/7 over 9 months
- Limmo Peninsula – 7.5km³ spray concrete lining supplied 24/7 over 8 months
- Primary lining mix contains retarder, super-plasticiser, microsilica and steel fibres
- Secondary lining contains poly fibres (for fire retardation) instead of steel fibres.



Hanson UK

Case studies

Case study 3: C300

Western Running Tunnels (Royal Oak to Farringdon)

Crossrail's Western Tunnels Contract is one of the largest of the Crossrail contracts. At peak production the TBMs can each advance up to 40 metres in a day excavating in excess of 3,000 tonnes and installing 575 tonnes of concrete tunnel lining rings.

The western tunnels (C300/410) work comprises two 6.2m internal diameter bored tunnels, each 6.5km long between the Royal Oak portal, which is west of Paddington Station, and Farringdon Station, and the sprayed concrete lining (SCL) station tunnels at Bond Street (BOS) and Tottenham Court Road (TCR) and the Fisher Street (FS) cross over tunnel, including ticket hall shaft construction at TCR. The western tunnel drive, between Royal Oak and Farringdon is one of five drives and will be the point at which the existing Network Rail services on the western section of the route enter the tunnels under central London.

Hanson establishes precast facility for tunnel segments

The tunnels are being lined with precast concrete fibre reinforced concrete segments manufactured in a tunnel segment manufacturing facility at Old Oak Common. The purpose built facility has an on-site QSRMC accredited, computer controlled concrete batch plant. The purpose built factory employs about 60 people and began producing segments in February 2012. The factory produces up to 200 segments per day and includes a laboratory to test the quality of the concrete to ensure that the segments have a 120 year life. The factory has been built specifically for the production of Crossrail's tunnel segments on a site that will become home to a major Crossrail train depot once segment production is completed. BFK will manufacture more than 75,000 tunnel segments at the Old Oak Common site.

The concrete segments are transported by tunnel locomotives into the tunnels and loaded onto the 1,000 tonne mobile underground tunnel factory (the TBM). As the 140 metre long TBM advances forward, the precast concrete segments are built into 23 tonne rings to line the tunnels behind the TBM cutter head.



Project description

- Establishment of precast facility to produce segments for Crossrail C300 Western Running tunnels
- On-site QSRMC accredited computer controlled concrete batch plant with fully automated steel and polypropylene fibre dispenser equipment
- Heater systems and enclosed aggregate storage to achieve specified concrete temperature
- Planetary type mixer for speed to achieve total homogeneity and mixing of product
- Full traceability of all batch weights to include fibres, admixtures, powders and aggregates
- Integrated Hydronix system to record m/c of raw materials and concrete
- Dedicated trucks for concrete supply into segment moulds
- Specialist concrete mix design to achieve both tensile and compressive strengths
- Volume 80,000m³
- Traceability – each segment is specifically coded enabling each segment of each ring to be traced as to its location in the tunnel lining and that code can be referred back to an individual batch of concrete.



Our companies and products

Hanson UK is the leading supplier of heavy building materials to the UK construction industry. We are split into three business lines – Hanson Cement and Hanson Quarry Products. Hanson UK is owned by the HeidelbergCement Group, which employs over 53,000 people and operates worldwide. Hanson UK employs around 3,500 people across over 300 sites.

For detailed information on all areas of Hanson and our products visit: hanson.co.uk

Hanson UK

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