# Mace and LSE - Paul Marshall Building Construction

EMSOL Enabled Mace and LSE to Reduce NO2 by 78% and CO2e by 67%

This project was a collaboration between a range of stakeholders to better understand ways to address air quality during the build phase of a construction project in a high-density urban site.

## Multiple stakeholders & a difficult site

As part of its 2030 vision LSE is committed to creating a #SustainableLSE. LSE's Estates Division is responsible for providing a world-class built environment for its students and staff.

Their current project, the Marshall Building at 44 Lincoln's Inn Fields, is an urban redevelopment involving demolition of an existing building and construction of a new, mixed use building with 12-levels.

The site is located in a dense and busy part of Holborn, London, closely flanked by neighbours such as the 16th century tourist attraction The Old Curiosity Shop, LSE teaching facilities and LSE Student Union. The site is in the heart of the university campus, so LSE was keen to understand more about air quality challenges potentially caused by construction vehicle traffic.

This makes the site a major focus for the LSE Sustainable Futures Society, which proposed the EMSOL project.

LSE Sustainable Futures are part of LSE's student sustainability movement, responsible for driving engagement and actively promoting sustainability action on campus. The society administers the Sustainable Projects Fund, which is financed by a tax on single-use water bottles on campus. The fund part-financed the project, alongside a contribution from LSE Estates.

**Emission reductions enabled:**

| NO2 | CO2e |
|---|---|
| 78% | 67% |

The next partner in the collaboration is the principal contractor handling the Marshall Building site, Mace Group. Mace are construction industry leaders and pioneers for sustainability in construction, including an ambitious net zero carbon pledge for 2020. They're committed to reducing outdoor workers' exposure to ambient air pollution (to within WHO guidelines by 2025 for the majority of time at work).

Finally, there's Hanson, the UK's largest supplier of ready-mixed concrete. Hanson are a crucial part of the supply chain, running a fleet of 100 ready-mix vehicles across sites in London. 50-odd deliver concrete to the Marshall Building site on their routes.

The local authority - Westminster City Council - are also a crucial part of the equation, as their Air Quality Action Plan impacts decision-making around construction projects in the borough.

*"Air quality is the number one concern for people in Westminster. [We are committed to] placing emissions and pollution at the forefront of decision making on public spaces and buildings."*

- Westminster City Council, Statement on Air Quality

City of Westminster

## Why taking steps to improve air quality has been challenging

LSE is committed to protecting its students, staff and visitors from air pollution as far as possible (see the LSE Air Quality Position Statement). Previous initiatives have included promoting cleaner air commuting routes – but LSE is keen to do more, particularly exploring the air quality impact of its construction projects.

Working in collaboration with EMSOL has allowed LSE Estates to gather evidence to enhance future action on reducing pollution. EMSOL has given LSE a better understanding of the specific impact of their construction activities on air quality, to learn where and how they can make a difference

*"Taking action to improve air quality is challenging as it involves multiple factors and data can be hard to make sense of. A collaborative approach with different partners has proven an effective way to make progress."*

- Dan Reeves, Residences Sustainability Officer, LSE

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For Mace, previous site monitoring equipment has provided valuable data on emissions levels but the missing link has always been actionable insight into the causes of breaches.

Without this insight, it hasn't previously been possible to take targeted action to achieve longer-term air quality improvement.

From Hanson's perspective, environmental sustainability is an increasingly important conversation as government pressure ramps up and low emissions zones are extended. They care about doing the right thing and want to stay ahead of regulatory change – but in a tight-margin industry, action has to be cost-effective to work for the business.

Their decision to invest in upgrading their London fleet to Euro 6 reflects this stance, but it's had little tangible commercial impact for them as there's no evidence to justify their investment.

*"Solutions are luxuries unless they make business sense."*

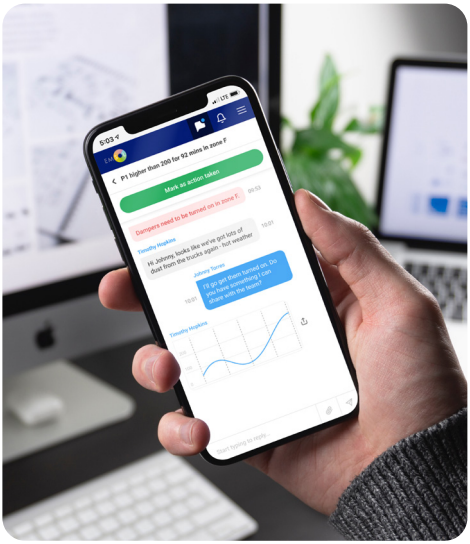
- Andrew Dixon, Regional Transport Manager, Hanson

Hanson HEIDELBERGCEMENT Group

## EMSOL was selected to make a practical difference

By installing close-range vehicle trackers on Hanson's fleet and pollution monitors at the main site access point, EMSOL was able to track emissions breaches as they happened (dbA; $NO_2$, CO, $O_3$, PM10, PM2.5, PM1) for five months through the EMSOL SaaS platform. The EMSOL Air Quality Action Platform collated emissions data into a multi-view dashboard configured to each stakeholder.

Using EMSOL gave LSE specific, real time breach evidence and the ability to report on breaches by source, which will enhance future developments in minimising air pollution impact on its community and tackling climate change.



*"Identifying specific pollution sources means you can take immediate action to shut down the problem. Small improvements in air quality have a big impact on students' health right now."*

- Ethan Stratford, President, LSE Sustainable Futures Society

## Creating a connected curriculum

Crucially from LSE's perspective, the data collected was used in the LSE curriculum, linking academia to real-world LSE operations to support student learning.

This 'connected curriculum' furthers LSE's mission to provide world-leading education and fulfils LSE Sustainable Future's engagement mandate. These efforts were recognised by exceptional student feedback, and LSE's placement as finalists in the Student Engagement category of the Green Gown awards 2019.

For Mace, using EMSOL meant they could track the impact of their supply chain on site pollution – and with continuous monitoring, get an early warning before potential breaches happened, so they could pre-empt them.

EMSOL enabled pollution reductions of 15421 NO2 (µg/m3) during the 5-month project, amounting to 103 NO2 (µg/m3) per day. This is significant for enabling the site to take action to protect workforce exposure. In terms of COe, 452,600 (µg/m3) across the project were identified, amounting to 90,520 COe per day. This enables Mace to deliver significant GHG reductions which mitigates long-term climatic change potential.

With this insight, Mace are now exploring options (including submitting an IUK project in partnership with EMSOL) to secure data on the rest of the supply chain to drive targeted intervention.

*"Using EMSOL meant getting data we can take action on, to bring us closer to our net zero goal – like changing delivery patterns, informing traffic planning and evaluating equipment and supplier sources."*

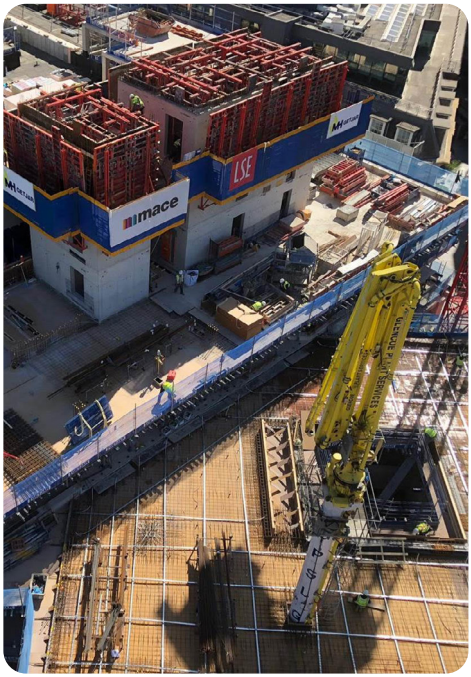
- Ali Ashpitel, Sustainability Manager, Mace Group

The data showed the majority of breach events weren't associated with Hanson's fleet. Other suppliers, NRMM, construction activity or wider London issues were likely causing the NO2 and PM10 issues discovered.

From Hanson's side, EMSOL proves their value as environmentally forward-thinking suppliers with a modern fleet that doesn't have a significant detrimental impact on site air quality.

EMSOL would also give Hanson evidence to pinpoint vehicles that may need maintenance if they repeatedly correlate with breaches, providing an alternative to expensive, time-consuming exhaust pipe monitoring systems.

Most crucially for Hanson, this project was possible without costly vehicle downtime or disruption (vehicle tags take minutes to install) or reputation-risking cross-site data confidentiality issues (data is anonymised and tags are close-range, so they can't track vehicles beyond the Marshall Building site).




*"Proving the conversion of our fleet to Euro 6 has had a beneficial impact on the site has been great. If we can see breaches happening when other contractors' fleets are on-site, it proves our case."*

- Andrew Dixon, Regional Transport Manager, Hanson

## EMSOL empowers organisations to take steps every day to make a lasting difference in reducing transport pollution

### Do you want to learn more?

Our air quality experts are ready to help you achieve your emissions targets!
Check out our website at www.emsol.io or email us at sales@emsol.io