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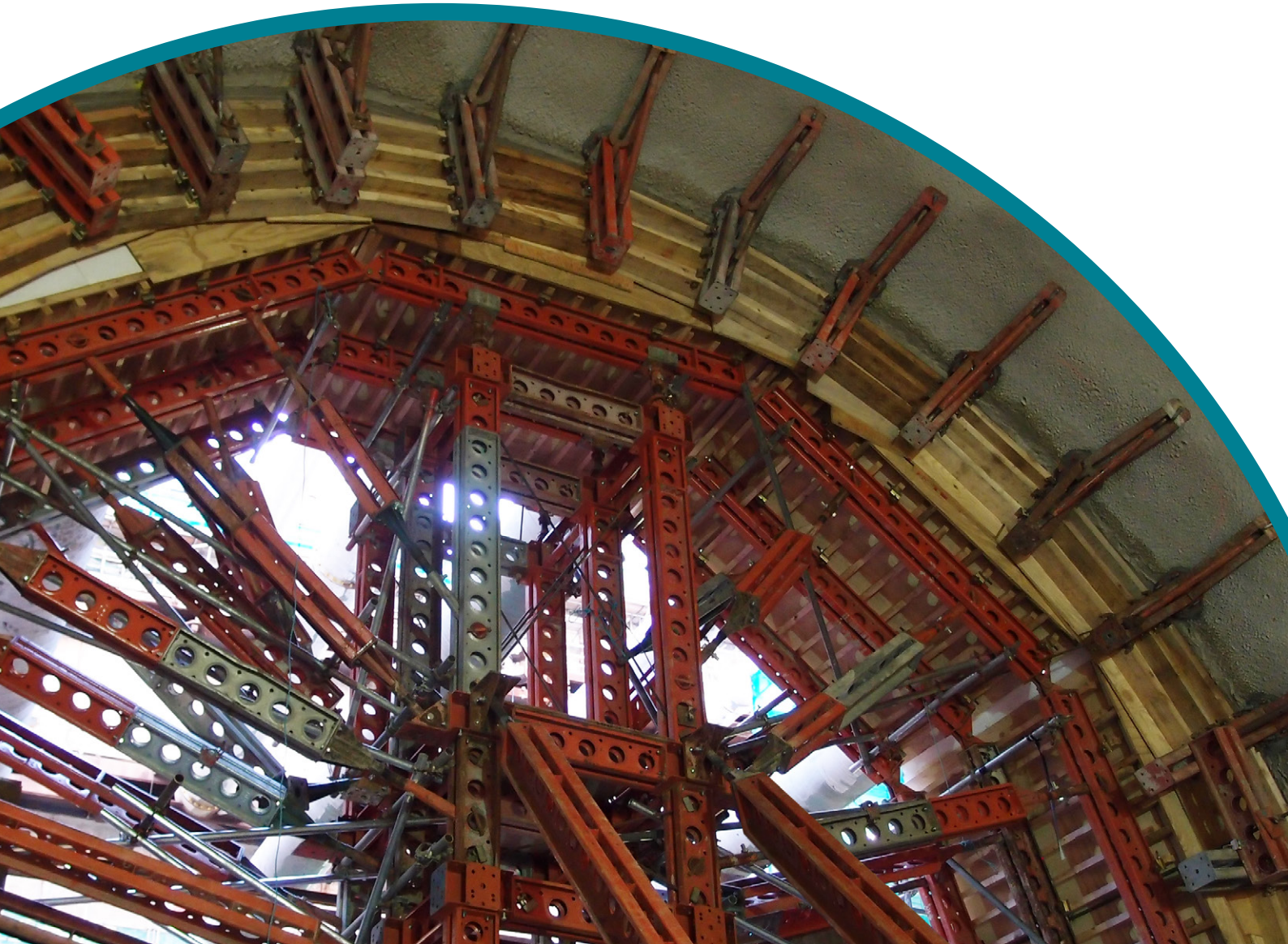
How BSI helped **HS2** use Standards to manage costs

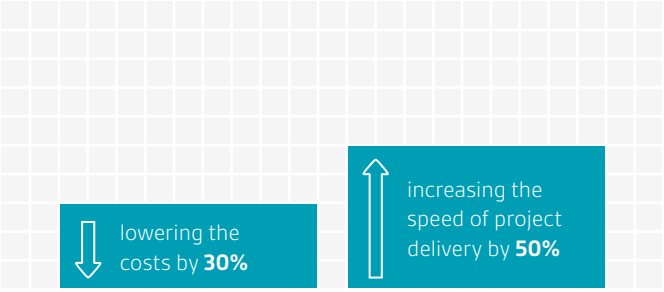


Challenge

The UK Government's Construction 2025 strategy tasks the sector with lowering its costs by 30 per cent, and increasing the speed of project delivery by 50 per cent. In response, work has been done by the industry to find where such time and cost savings could be made.

Infrastructure UK reviewed costs in the sector and identified that there was 'over specification on infrastructure projects'. The Institution of Civil Engineers (ICE) subsequently published its *Specifying successful standards* report which concluded that while standards are not a cause of wastefulness, their misinterpretation and misapplication can increase inefficiencies and costs.

Meanwhile HS2 Ltd – which is developing and promoting the UK's new high speed rail network – established a number of work streams to identify where it could make cost savings. As a result of the ICE report, one of these work streams focussed on the efficient application of standards. HS2 commissioned BSI to lead this work stream, and with industry input, research the standards landscape, addressing the efficiency of their application, and to make recommendations that would lead to significant cost savings.



UK Government's Construction 2025 strategy.

Solution

Research and consultation of the role of standards

The aim of the project was to establish how the application of standards could be improved to **maximize project efficiency** and to identify critical gaps in the standards landscape. To this end, BSI engaged technical experts and ran exploratory workshops to look at cost saving opportunities across civil engineering, power and systems. BSI also carried out a review of the portfolio of formal and informal standards in the sector to confirm the standards needs of HS2 and assess how standards were being applied.

Gap analysis and assessment of needs

The expert groups quickly focussed on the areas where the greatest efficiency gains could be made. They identified that attention to compliance, approvals and procurement processes would yield the highest potential impacts primarily by reducing delays. In addition, over design was found to be common practice and the timing of procurement strategies could be greatly improved.

Some significant gaps in the existing standards portfolio were also identified which, if addressed, would likely provide significant cost savings.

"High Speed Two Ltd's (HS2) Efficiency Challenge Programme was set up and specifically tasked with generating savings for the HS2 project through updating standards. BSI was appointed by HS2 to undertake research into standardization in the areas of civil engineering, buildings and railway systems. Industry experts were involved from designers, contractors and professional organizations, including the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Royal Institute of British Architects and the Railway Industry Association."

Colin Rawlings, HS2

Project outputs

Delivering a programme of standards development

We were able to act immediately on some gaps in the standards portfolio. **BS 8002:1994** on earth retaining structures and **BS 8004:1986** on foundations had been withdrawn when Eurocodes were introduced from 2010. However valuable information to support the application of Eurocodes had been lost and republishing this would provide valuable guidance on the design of more efficient structures.

BS 8081:1989 on grouted anchors had not been withdrawn but needed updating to comply with Eurocode amendments. The industry still clearly needed the good practice outlined in these standards.

> We worked with the expert stakeholder committees to revise all three standards and bring them up to date. These are of value not only to HS2, but to the engineering sector as a whole and to geotechnical engineering in particular.

New PASs

In addition, scoping workshops were held to define specific needs for new areas of standardization, which led to the development of four new BSI PAS documents which will plug important gaps. These documents are: **PAS 8810:2016**, **PAS 8811:2017**, **PAS 8812:2016** and **PAS 8820:2016**.

A new approach to standards implementation

Finally, the project confirmed ICE's assertion that, in some cases inconsistent approaches to the application of standards do lead to inefficient solutions that add to whole life costs and hinder the delivery of optimized solutions and performance improvements.

The clear remedy is that the efficient application of standards and any critical gaps needs to be addressed at the planning stage of an infrastructure project. The right standards must be identified and qualified as suitable for the intended purpose. The correct versions of each standard must be specified in procurement documentation, and a consistent interpretation and application of those standards communicated throughout the supply chain. This can drive down costs and save time.

The Benefits of Designing and Building with BSI Standards

The BSI project has given **HS2** the potential for project capital cost savings, in four key areas:

1. The identification of standards gaps and the lack of clarity which leads to inconsistent interpretation
2. Improving the consistency in application and interpretation of standards along the supply chain
3. The resulting streamlining of third-party compliance and approval processes
4. Addressing the conservative design culture which aims for 'worst case plus' solutions, and results in over-specification

Working with BSI, HS2 has been able to drive forward these improvements through engagement with industry stakeholder groups and the consensus building process. HS2 Ltd expects to reap significant rewards from engaging with BSI on this project. In addition, the improved standards landscape for HS2 projects will impact on other infrastructure clients and the industry as a whole.

Outcome

Our work with HS2 has demonstrated the potential value that can be gained by consultation with BSI at an early stage of any major project. We have the knowledge and means to identify the right standards, revise older standards that are still of value and create new ones. Moreover, the project led us to develop a methodology for interrogating the role and application of standards in large infrastructure schemes. This approach can now be reapplied to future projects that are in pursuit of cost and time savings, and Construction 2025 targets.

Newly published research shows standards boost productivity and improve performance, kick-start innovation, and support UK domestic and international trade.

The latest research from CEBR (Centre for Economics and Business Research), commissioned by BSI, indicates that the application of standards boosted the UK economy by £8.2 billion in 2014, up from £2.5bn in 2005. It also shows that 37.4 percent of UK productivity growth can be attributed to the use of standards.

Additional benefits to businesses through the adoption of standards include enhanced reputation, compliance with regulations and greater control of environmental problems. The research also identified that investing in standards pays dividends for organizations that use them.

To find out more and read the full report: **bsigroup.com/EconomicBenefits**

To know more on how a PAS can be developed go to: **bsigroup.com/PAS**

Titles

BS 8002:2015. Code of practice for earth retaining structures.

BS 8004:2015. Code of practice for foundations.

BS 8081:2015. Code of practice for grouted anchors.

PAS 8810:2016. Tunnel design. Design of concrete segmental tunnel linings. Code of practice.

PAS 8811:2017. Temporary works. Major infrastructure client procedures. Code of practice.

PAS 8812:2016. Temporary works. Application of European Standards in design. Guide.

PAS 8820:2016. Construction materials. Alkali-activated cementitious material and concrete. Specification.

References

ICE - Specifying successful standards **https://www.ice.org.uk/disciplines-and-resources**

New research – June 2015: The Economic Contribution of Standards to the UK Economy **https://www.bsigroup.com/en-GB/standards/benefits-of-using-standards/research-reports**

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