

Enhancing the next generation of design standards in the construction sector



A world leading consultancy is strengthening its market leadership through applying systems thinking to the development of international design standards and answering the question: “What is a good standard?”

A standard is formally defined as a “document, established by consensus and approved by a ‘recognised body’, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context” (CEN).

Standards provide a reference text for common understanding between private businesses, public authorities and other organisations complementing national and international regulations. Although generally voluntary, compliance with standards can be required by regulations or incorporated by clients into contracts, making them compulsory (CEN).

What the IDC did

Design standards play a central role in the construction sector. Due to the scale of most building and civil engineering projects it is impossible to prototype, so the adequacy of designs is verified by reference to agreed international design standards, meaning

that required levels of safety, serviceability, durability and robustness are achieved. Design standards enable lessons from the past and new research findings to be embraced and communicated to practitioners through clear requirements and supporting advice.

For decades standards have been developed and defined through a process of sharing knowledge and building consensus among technical experts, via national or international standardisation bodies (e.g. BSI, CEN, ISO). WSP - the UK’s leading consultancy in developing design standards in the construction sector - identified an opportunity to use systems thinking to improve the process by which these standards are developed.

The challenge for the IDC was to investigate how design standards in construction were developed and identify what characteristics and attributes made a “good” standard. This is no mean feat, and the scale of the potential impact is enormous. For example, work on the current revision of the Eurocodes (pan European structural design codes) involves around 1000 people at EU level, under the leadership of WSP’s Head of Civil,

Bridge and Ground Engineering who is also Chairman of CEN/TC 250 - the international committee responsible for these standards. However, these standards then need to be integrated at a national level which involves a further 10-15,000 people across the EU’s Member States. This is just the number of people involved in developing the standards, a 2008 impact assessment estimated that the codes would eventually affect over 500,000 people and a market with a value of €65bn.

After conducting an initial literature review, the team were surprised by the lack of research seeking to characterise and advance ‘good’ design standards. To explore this further the team applied various soft systems methodologies to consider the perspectives and different needs of all the groups involved in, and affected by, the standard development ‘system’; those writing them, those implementing them, and most importantly those using them.

The fresh perspectives that emerged provided important insight into the challenges posed when developing standards, and how they can be successfully overcome.

The Impact

Building from a position of strength, this project has enhanced WSP’s approach to the development of standards, supporting their role as a thought leader in the industry and enhancing their reputation with clients. This project has had significant impact:

- It made a major contribution to the development of the position paper unanimously approved by CEN/TC 250 members to promote ease of use in the development of the 2nd generation of the Eurocodes. This evolution of the Eurocodes is understood to be the largest funded standardisation programme in European Commission history.

- The underlying approaches and methodologies have underpinned the development of a £multi-million programme of work and been used within a number of client projects including the National Grid and Highways England.
- The IDC researcher was recruited by WSP to further implement the findings of the project on behalf of major national client bodies.

The Future

This research will, over the next 5 years, influence and shape the development of the next generation of Eurocodes. By highlighting the issues examined in the project through publications, conferences and other dissemination activities, the team are already seeing heightened academic interest in this field and hope that their work will act as a stimulus for further research activity to support the development of “better” standards. The company is supporting the IDC researcher through a bespoke career development plan to broaden her skills whilst continuing to expand her burgeoning reputation as a national expert.

Related publications

Angelino M., Agarwal J., (2014) ‘Exploring Quality of Design Standards in the Construction Sector: Lessons from Past and Future Needs’. EURAS conference 2014, Serbia, September 2014.

Angelino M., Agarwal J., Shave., Denton, S. (2014) *The development of successful design standards: understanding the challenges*

M. Angelino, M., Taylor, C., Denton, S (2016) ‘What should future design standards in the construction industry look like? The need for new value propositions’. *International Conference on Smart Infrastructure and Construction (ICSIC)*, June 2016, Cambridge, UK

