

Sustainability and infrastructure development: finding commonality to ensure collective success

Africa's ambitious development goals require the construction of infrastructure and related mega-projects as a priority. With the IMF forecasting that 11 of the world's 20 fastest growing economies will be in Africa by 2017, and cities across the continent needing to collectively accommodate an additional 900 million new urban dwellers in the next 35 years, how can African governments and private sector investors meet such high demand for growth in a way that is both realistic and sustainable? Can rapid infrastructure development in itself be sustainable given the type of materials used and the approach usually adopted in these projects? And, if so, what is the likelihood of project custodians insisting on sustainability as a starting point for urban development and expansion?

If the predictions of various leading world bodies and associations including the Mo Ibrahim Foundation are anything to go by, our continent will witness urban development of the scale and intensity seen collectively in the USA, Europe and Japan over the past 265 years *before* 2056. "As Africa starts gearing to become the home of nearly a quarter of the world's urban population by the middle of this century, governments, investors and players in the greater construction value chain are beginning to recognise the significant role each of them will have to play in making this a sustainable reality," notes Kevin Odendaal, PPC Executive: Business Development. "For cities to accommodate growth of this scale, partners will need to take a different approach to infrastructure development from planning right through to design, construction and building management. As such, a lot of this sustainable innovation will centre around the use of concrete as a building material."

This is especially the case given that cement, a key constituent of concrete (approximately 10 – 15% by volume) has a significant environmental cost due to the energy required to achieve the high kiln temperature involved in its production. "This has to be viewed in context however," explains Odendaal. "In order to maximise the sustainability of concrete structures – including infrastructure

megaprojects – we have to understand the interdependencies from ‘cradle to grave’ in the design phase, during construction and at end-of-life. We additionally need to unpack how these impact the levels of energy savings achievable during a structure’s life cycle and use.”

While the industry has worked to quantify “embodied” impact of materials used in infrastructure development, effectively measuring the “whole-life” impact and full effects of the infrastructure’s existence during its usage phase continue to challenge the industry. “This type of measurement is however critical if we’re to meet future targets of ‘zero net-energy’ buildings and infrastructure for Africa. Understanding the full impact versus benefit of concrete is therefore central to this equation.”

With the recent Concrete Manufacturers Association (CMA) Awards – of which PPC was a sponsor – showcasing effective and inspired use of concrete as a medium, Odendaal emphasises the importance of user groups working together to leverage efficiencies in order to ensure collective sustainable use. “This year’s CMA Award winners once again demonstrated the benefits of concrete per user group and how greater interdependence between these can facilitate meaningful sustainability.

“In the case of architects as a group for example, concrete offers a dramatic range of colours, finishes and unlimited design possibilities, difficult to match in other materials. At the same time, it allows structures to be created that provide superior environmental and energy performance,” he notes.

Developers are similarly able to benefit from their use of concrete based on its first cost, long term economic benefits, energy efficiency, lower maintenance, and overall operating costs, as well as opportunities for future reuse should the occupancy of the building change. “Again here, if various players in the collective value chain work together from planning through design and into development, it’s relatively easy to ensure that the strength, durability and natural thermal mass of concrete can be harnessed to create structures that require little maintenance, offer high durability and have high operating energy efficiency.”

Odendaal argues that value-adding partnerships will prove critical in order for this level of sustainability – and sustainable infrastructure development – to be realised however. “For Africa to meet her collective development goals and needs, players will need to work as a *collective*. They will need to take a long-term view of projects in order to unlock economies of scale and sustainability at all levels – ensuring that the infrastructure they create puts society on the road to a sustainable future,” he concludes.