

## Natural Capital Workshop – Challenges, opportunities and ideas

Having collaborated with Sir Robert M<sup>c</sup>Alpine on a project to review the Natural Capital (NC) impacts of different technologies at two of our developments, we held a joint workshop in September to debate and discuss the findings. Bringing a good mix of expertise into the room including architects, cost consultants, contractors, other landlords, investors and finance people, we were able to set out the NC impacts of three different technologies alongside and in similar language to the financial impacts.

The workshop we held addressed three specific questions:

- What are the most important elements of a building to focus on from a NC point of view?
- What are the barriers to getting a NC approach adopted?
- Who should be responsible for driving the concept of NC analysis within a project?

The debate generated some really interesting ideas and suggestions.

### What are the most important elements of a building to focus on from a NC point of view?

The key elements of the buildings were clearly identified as: the major structural elements of foundations, walls and frame but also the finishes, and particularly the mechanical and electrical (M&E) systems. This implies that design is key as this tends to drive the M&E requirement.

The wide variation in the NC impacts of major materials including concrete, steel, aluminium and timber were discussed alongside the ways in which their impacts can be minimised. Materials often have essential characteristics such as strength, durability and versatility but their impacts and availability need always to be respected. The environmental impacts of concrete can be improved with the addition of recycled material and similarly steel increasingly incorporates recycled content. The use of laminated timber was raised as this seems to be an increasingly popular construction material and has much lower NC costs than steel and concrete.

Glass was discussed as a popular material but one that can create significant operational efficiency issues through solar gain and glare. Aluminium was identified as a material with many desirable properties, particularly its versatility and weight, but one with extremely high NC costs. Its routine use for decorative purposes or for light weight cladding may be extremely expensive in terms of NC.



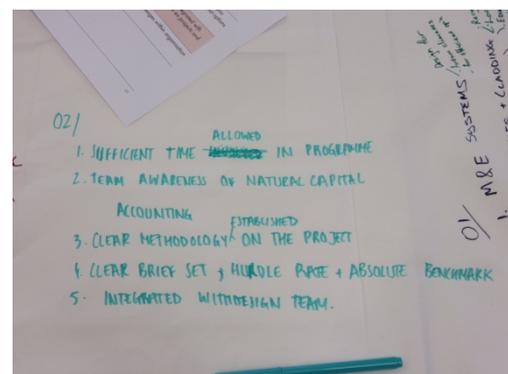
Building flexibility into the design was a key topic raised during the workshop. Weighing up the benefits of future-proofing the building versus the costs of increased concrete was an interesting question. The best choice always seems to be to build in flexibility rather than risk shortening building life. However this can require over-sizing of a frame relative to its immediate use. This is costly in terms of carbon and NCs so perhaps we should challenge the likelihood of future flexibility actually being utilised. Where increased natural resources are required to accommodate flexibility, careful consideration must be given to the likelihood of it actually being required over the lifetime of the asset.

The importance of incorporating NC thinking within the design process was a recurring theme. Designing for future climates was raised as was designing for operational efficiency. The challenge of the performance gap – that often substantial difference between the modelled performance and performance in use – was very much on the table. The NC (and financial) costs of operationally inefficient plant and machinery over the life cycle of a building can dwarf some of the benefits of even the best materials selection. It really is critical that we get this bit right.

### What are the barriers to getting the approach adopted?

Many barriers to getting a NC analysis approach adopted were identified. Limited awareness of the concept and how to apply it is clearly a major hurdle and we hope workshops of this nature will help in resolving this. But other major barriers exist. Timing and time; at what point in the process should the concept be introduced and is there enough time in the programme to allow for this type of analysis to be done? If each time a change to the design is made a new NC analysis has to be done, this could add substantially to the programme. The concept has to be introduced early (i.e. RIBA Stage 1) and the whole team must be clear on what it is, what it means for their role and be included in their scope of services and appointments. This is a departure from business as usual which we know is always a challenge.

Another major challenge is confidence in a clear and robust methodology. Significant work is being done by the NC Coalition to develop NC protocols and embed robustness to the modelling. But there is no sector supplement for construction yet. This of course presents an opportunity as well as a challenge – we still have the chance to help form one. But until there is one, we have to select our approach with care.



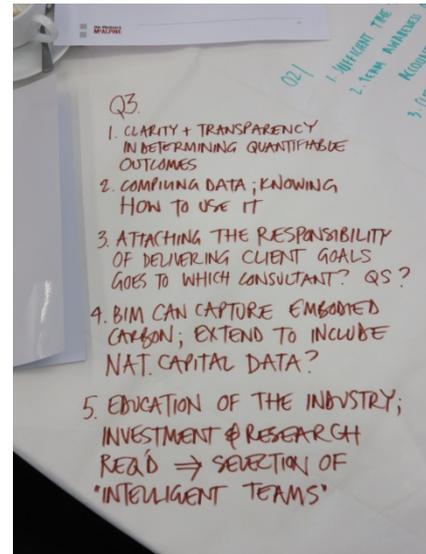
And of course there will always be the major challenge of how NC measures up against financial capital. Any project will have to stand up financially so what role do we expect NC analysis to play? At such an early stage in the evolution of NC for our sector we are currently using it as a means of making more informed decisions, but they may not be different decisions. Having greater insight into the wider implications of our decisions is nonetheless valuable. The client not only needs to set a clear brief but should also recognise the significant impact on NC that decisions taken to define the brief potentially have.

## Who should be responsible for driving the concept of NC analysis within a project?

Given the importance of the design in terms of outcomes it seemed logical that a large part of this responsibility sits with the architect and is supported by the structural engineer. However, support is also required in the form of rapid modelling, most probably best done by the Quantity Surveyor on the project. It has long been recognised that the QS has the skills set to manage embodied carbon performance on a project so NC analysis is a logical evolution of this.

It was suggested that BIM could potentially be extended to include NC as a concept which would of course speed up the process. The client clearly needs to lead by setting that clear brief and guidance regarding trade-offs and this can be difficult when our own thinking on the subject is evolving.

Looping back to our initial discussion, the M&E team need to be able to demonstrate how the building will perform and respond to different design decisions – materials, orientation, scale and mass are just some of the features that will determine resource consumption for the operational life of the asset. And of course the contractor needs to be involved too. NC is sensitive to purchasing decisions so, under a design and build model where the contractor procures materials, they have to contribute to and understand the analysis. This may mean bringing them in earlier in the process than is usual.



A number of suggestions were made for easing some of the barriers and challenges, in particular the development of regulation and policy to require NC analysis. There was understandable nervousness around imposing the concept until it is more developed for the sector. It is being discussed however in policy circles so the agenda is moving forward. More research is needed and more sharing of our experiences and learning. Leadership from informed clients is key but we also need to be pushed by informed consultants bringing ideas to help drive change. What emerged from the discussion is that a whole team approach is required and with that a whole team understanding of NC and NC analysis as a concept. The industry really is not at this point yet but sharing information on projects like this and starting to use the concept within smaller decisions as we trial the concept are what we need to move us forward.

We found this a really interesting and informative discussion and are grateful to all our guests and of course to Trucost for their contributions. The project was ultimately made possible through our close working relationship with Sir Robert M<sup>c</sup>Alpine's Sustainability Team and the co-operation of their construction teams in providing data, so our thanks to them once again.

**The full report and exec summary can be downloaded from the partner websites:**

[Hammerson](#)

[Sir Robert M<sup>c</sup>Alpine](#)