



PROJECT

A46 Binley Junction

CUSTOMER

Highways England

LOCATION

Binley, Coventry

FRAMEWORK

Regional Delivery Partnership
– Delivery Integration Partner

Need

Highways England are delivering major improvements to the A46 at Binley and Walsgrave junctions in Coventry. The scheme is being completed in two distinct phases with challenging delivery targets linked to the environment, safety and efficiencies which will in turn bring wider benefits for social value and sustainability.

To meet these goals every aspect of the scheme is under scrutiny and one of the first areas has been the compound office and welfare facility. By taking the early decision to build only one facility servicing both phases there have been immediate benefits. Added to this, an innovative design approach has replaced standard modular units with Innovare's off-site manufactured panelised system, ordinarily used for housing and schools.

The result is a low energy, sustainable structure for the offices and welfare which can be dismantled and re-purposed for use in the community following completion.

Solution

In developing this solution, we have committed to an industry first by using a structural insulated panel (SIP) system which is manufactured complete with windows and cladding. Produced within a controlled factory environment the system increases the pre-manufactured value (PMV) for the scheme.

Furthermore, the innovation is a homegrown one. Innovare Systems is our sister company and have been manufacturing their iSIP system for the residential and education sector since 2005.

Their sustainably sourced timber-based product incorporates insulation and reduces cold bridging, for a low thermal U-value achieving energy efficiency equal to a Passive House. To put it in context, normal site accommodation has u-values of 0.35 in the walls, 0.25 in roof/floor and 1.6 for the windows, but at the A46 Binley the values are much lower with 0.18 for the wall, 0.15 for the roof/floor and 1.4 for the windows.

Alongside this, the build has needed just a short three-week installation period.



Figure 1 - Innovare's Factory in Coventry

Outcome

The innovative use of proven off-site SIP's technology has delivered tangible benefits for the wellbeing of the work force, the environment, and the entire scheme through:

- **Increased Productivity** - The SIP system is configurable to allow flexible open plan spaces which fully comply with current building regulations – differing from a typical temporary portacabin solution – while still having the advantages of rapid deployment and commissioning.

Site manager Dave Mantle discusses the benefits: *"The cost of hire over the 3 years*

when compared to the build costs were negligible, and potentially favourable with future re-use. On top of that our environment is now free from noisy generators and warm in winter and cool in summer which improves wellbeing and productivity.”



Figure 2 - Quick erection of structural insulated panels

- **Sustainability** - In both the operation and within the life cycle of this building there are numerous opportunities to reduce the environmental impact.

Caroline Hutson, the environmental lead on the A46 scheme explains: “This helps us meet the carbon aims of these schemes and we must practice what we preach by including how we manage our site. First, as this building can maintain an air change rating of 0.6, which is commensurate with a Passive House, it is very low cost to heat. Thus, improving energy efficiency further. “Second, as the timber used has a whole

life of at least 60 years that is locking in potential carbon until a time when there should be much lower levels of carbon gases in our environment. “

“Innovare uses timber from sustainable forestry, which ensures that the process of CO2 absorption and oxygen emission is maximised. Trees are sustainably harvested at the peak of their cycle, and replaced with younger, more carbon efficient trees, before their ability to absorb and emit declines.”

“Timber’s environmentally friendly credentials also give it a significant advantage in circular economy terms over materials such as PVC-U, which does not harmlessly biodegrade.”



Figure 3 - Sustainably sourced timber

- **Social Value** - On completion, the ambition is to dismantle, relocate and repurpose the building for a school or

youth centre at no capital cost to that organisation. Using the Thrive Social Value calculation tool, this amounts to a £3m investment back into the local community.

Gareth Ellison, director at Innovare Systems, sees enormous potential. “This is an exciting project for us, as well as the diversification within our business, this unique site compound contains some further, latent benefits. It would be extremely satisfying if we could reuse this structure to benefit the local communities through education and social support. “



Figure 4 – Simple transportation and reuse

Looking to the future, long duration projects will gain whole life benefits from selecting this off-site panelised housing system for high quality, sustainable site accommodation.