



An elegant way forward for green design at Greenfield bus depot

“With autumn foliage imminent, my heart is in New England at this time of year. While in rural Massachusetts this summer, I was in search of public transport to New York City. Amtrak trains are sporadic at best, and I was delighted to find a daily bus service to Manhattan from Greenfield (population 17,500) in western Massachusetts’ Pioneer Valley.

Arriving at the Greenfield bus depot, I found a spectacular state-of-the-art green building tucked away on a back road near the town’s main street. It being Sunday morning, the rather grandly christened John W Olver (a recently retired US congressman from the area) Transit Center building was closed, but an informative plaque announced:

Client: Federal Transit Administration
Funding: American Recovery and Reinvestment Act
Architect: Charles Rose Architects
Completion: 2012

A bit of Googling and a phone call to the architects revealed that the £7 million building achieves ‘net-zero’ (operational) energy through the use of 22 geothermal wells, a 680m² ground-mounted photovoltaic array and an on-site wood-pellet boiler. It is billed as the first federal transit building to meet Obama’s executive order that all new federal buildings be net zero energy-rated by 2030. When the project was unveiled to the press last October Charles Rose, of Somerville,

Massachusetts-based Charles Rose Architects, highlighted the need to address building energy use early in the design process. According to Rose, this means using passive design to inform a building's massing and glazing in order to drive down heating and electrical loads. It also means judicious selection of cladding-materials and super-insulating wherever possible, as well as projecting daylight deep into the plan to reduce the need for lighting.

'Zero net energy design has revolutionised the way we work,' Rose says. 'We are creating buildings that are highly integrated. The only way to get to net zero is by integrating mechanical and electrical engineering into the conceptual design phase. It's a fundamentally different way of designing a building. Our mechanical engineers are serious collaborators now.'

It is this 'fundamentally different way of designing' that so many architects are struggling with. The Greenfield transit building's four contrasting elevations respond to different solar orientations as well as pedestrian and vehicular circulation and the other aspects of the brief. Brick and copper are used to screen and filter sun and glare. Daylight and energy modelling by Arup's Cambridge, Massachusetts, office informed the facade design through an iterative process of refinement. Sliding perforated screens can be adjusted to control daylight and glare in the upstairs offices.

Like the infrastructure buildings at the London 2012 Olympic Park, the form and palette of materials of this refreshing building suggest an elegant way forward for green design.

The top-up to the budget made possible by Obama's stimulus package enabled extensive use of renewables to meet the requirement for zero operational carbon, and these are discreetly located on the site and 'designed in'. My only concern is whether there is sufficient demand for transit in this region to give the building a meaningful *raison d'être*."

Hattie Hartman, *Architects' Journal*, September 11, 2013