Project name, location	**Whitestown Way, Tallaght, Dublin**
Year of completion	2007
Contractor	P Elliott & Co Ltd
Consultant	Arup

Project description

Our fourth and largest job with Arup concerns two floor plates at the Whitestown Way Shopping Centre in Tallaght, Dublin. This L-shaped building measures 170 by 152 and is divided by movement joints into three sections.

Originally conceived as RC, the decision to switch to post-tensioned concrete has saved in excess of €1M, principally in reduced reinforced tonnage, decreased concrete volumes and simplified formwork.

The suspended ground floor slab supports retail loading totalling 10kN/m^2 and is generally 350mm thick spanning the 10 by 7.5m grid. One corner drops to 260mm thick where the grid reduces to 7.5 by 7.5m and this form is repeated on the Mezzanine slab above this area.

A 430mm thick slab is needed to support the weight of a 1.5m deep swimming pool, part of the hotel complex at the prime corner of the site. Basement car parking occupies the space beneath the ground floor.

The level 1 podium slab is a significant structure. It carries two 4-storey office blocks, one 5-storey hotel and six apartment blocks ranging from 3 to 5 storeys. As these blocks have entirely different structural grids to the retail level, a series of post-tensioned beams carries the loading to the columns.

To maximise the flexibility of the retail space, alternate rows of columns have been omitted to give 15 x 10m grid for these beams. The largest beams are 2400 by 1350mm deep and contain four 3105 tendons (31 strands). More typically, beams are 2400 by 800mm and contain four 1905 tendons. The 275 mm deep slabs between the beams are also stressed.

PT tonnage	450t
PT system(s) and size(s)	Bonded flat duct, 5no 12.9mm dia strands and Bonded multistrand,

	31no 12.9mm dia strands.
Principal benefits of using PT on this project	Economy (€1M saved) and speed of construction