

TOOLEY STREET is an office development that combines the renovation of street-facing Victorian warehouses with a new six-storey office building. The exposed concrete structure at Tooley Street is a high quality example of fair faced concrete used in an internal environment and as external cladding.

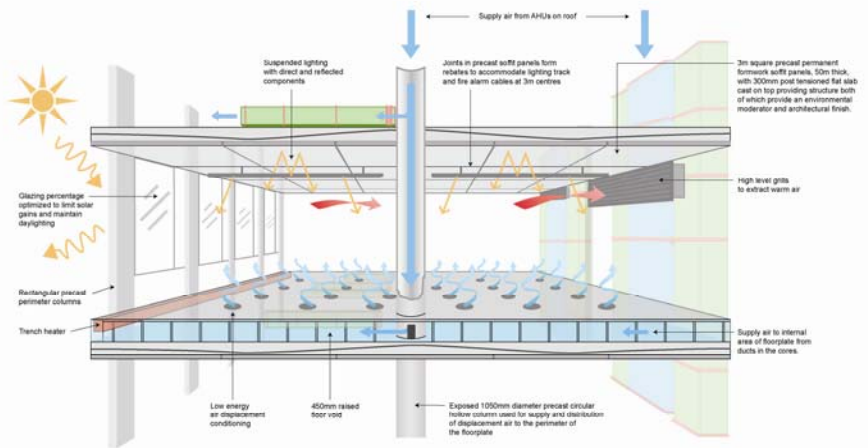
Location	154-172, Tooley street, London
Year of completion	2008
Use of structure	Commercial
Owner	Great Portland Estates
Architect	Allford Hall Monaghan Morris

Consultants	Ove ARUP & Partners
Main Contractor	Laing O'Rourke
Frame Contractor	Expanded Structures
Project Cost	£42 million
Project Size	18,500 sq. m

Tooley Street demonstrates how a post-tensioned slab can be used efficiently as thermal mass to moderate internal temperature changes. No additional finishing materials were introduced which would insulate the concrete structure from the internal environment helping project achieve a "Very Good" BREEAM rating. Structures and services are integrated throughout the project as shown in sketch below (right).



Tooley Street - The 'Lean' Office



PT Designer	STRONGFORCE
PT System supplier & installer	StrongForce Bonded Flat Duct 3-4-5 MonoStrand system (15.7mm)
PT tonnage	131 Metric Tonnes
Project Duration for PT works	25weeks (for 24pours)
Awards	
Highly commended at 2008 Post-Tensioning Association awards	
British Precast Concrete Awards winner 2008	
BREAM Rating - "Very Good"	



DESIGN aspirations for the project were to construct a premium quality, low-energy, cost-effective building, with minimal use of following trades, and reduced waste. The use of post-tensioned slabs provides efficient span-depth ratios, allowing the generous floor slabs and floor to ceiling heights to be achieved within planning constraints. Additionally it gave further benefits through material and cost savings by thinner slabs & also faster slab cycle.

The Post-Tensioned floor slabs were mostly 300mm thick & were cast onto 3m square, 50mm thick pre-cast panels, used as permanent formwork. These panels were affectionately known by the team as 'biscuits'. The slab is designed as class 2, limiting concrete soffit stress and so preventing visible cracks developing in the architectural finish biscuits.

The integration of high quality precast concrete panels with an insitu post tensioned slab was an innovative solution for the Tooley Street project. However this solution resulted in more challenging tasks for the post-tensioning design and installation team. Each of the six post tensioned slabs at first floor to roof was divided into four pours separated by pour strips to isolate the stability cores. Minimising the restraint to shrinkage was essential to minimise the risk of cracking the precast panels.