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| Project name, location | New Romford Hospital |
| Year of completion | 2005 |
| Client | Bovis Lend Lease |
| Contractor | P C Harrington Contractors Ltd |
| Consultant | BDP |



Podium slabs at North West level 1



South East level 0

Project description

When tendering for this job, Structural Systems were challenged to demonstrate that post-tensioning was versatile enough to cope with the future needs of the Hospital Trust. The major concern was forming penetrations through the slab for services, both pre-construction and after completion.

SSL have developed a twin approach to this requirement. Firstly, because of the large spaces (1.5 to 2m) between the tendons, holes can easily be cored or cut without detriment to the slab. SSL's Induced Current Tendon Detector can verify the location of tendons prior to cutting. Should it be necessary to cut through a tendon this is relatively easy as, with bonded tendons, the tendon remains fully bonded after a short transmission length, subject to design verification, naturally.

The second facet is the coring of future penetrations at columns. Column zones are highly stressed and usually heavily reinforced for punching shear. SSL have developed an innovative steel shear head that allows up to four 200mm diameter holes to be cored at each internal column. Thus, over the life of the hospital, the Trust are confident that the needs of future equipment and medical services can be met.

The structure comprises two podium levels measuring 150 by 160m overall. Four circular towers rise from the podium for a further three storeys, bringing the total area of post-tensioned slab to 84,230m². The basic grid is 8.1m square but there are longer spans where the grid meets the irregular perimeter. Slab depths vary to suit the spans and the loading (between 5 and 15kN/m²) but 275 and 300mm thicknesses are typical.

The tendon layout in the circular towers is complicated by a 33m long light-well at 45° to the grid. Consequently, tendons run on the orthogonal grid, at 45° and around the circumference. Never-the-less, this complex building has been tamed by post-tensioning to give a robust and versatile structure that should serve the community's needs for many years to come.

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| PT tonnage | 530t |
| PT system(s) and size(s) | Bonded flat duct, 5no 15.7mm strands |

Principal benefits of using PT on this project

Speed of construction, economy, flexibility for future hole cutting.