



SPX Gives Museum Project a Lift

Situation:

Considered a landmark building, a museum in the United Kingdom was undergoing a £46m renovation to transform the magnificent Victorian building and its facilities into a world-class, 21st century visitor experience for Scotland — and a showcase for international visitors.

The project included the creation of 14 new galleries, two hands-on discovery centers, a larger gallery for international touring exhibitions, new facilities for education and a state-of-the-art learning center.

A new floor was also to be created beneath the main hall, forming a new street level entrance, restaurant, shop, cloakroom and visitor reception area.

During the renovation project, more than half of the museum property was to stay open to the public.

Challenge:

Among the challenges faced by the contractors and engineers on the project was to lower the basement floor by 1.4 meters, removing the basement walls to open up space for the new facilities and street-level entrance. This area runs the length of the main hall which is situated directly above it. One of the specific tasks involved was to prestress the beams that would hold up the new entrance and inner walls.

Steel beams have various stress values, which determine shear, bending and other behaviors, along their length. Pre-stressing the steelwork, which creates permanent stresses in the beams, is critical for improving their behavior and strength under various load conditions.

A limited budget ruled out use of a computer-controlled synchronized lift system, requiring the team to seek out alternative methods to safely and successfully pre-stress the beams.

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Solution:

When asked to supply equipment to help in creating the new entrance, a distributor of SPX Hydraulic Technologies products called in their Power Team® Sales Manager, Ian Harris, for assistance.

Mr. Harris, along with the subcontractor, met with the architect and main contractor to discuss how various Power Team tools could be used in conjunction with each other to efficiently achieve the same results as a synchronized lift system but in a much more cost-effective way.

The solution devised involved using several Power Team hand pumps and sets of cylinders that would be spread out along each beam. Cylinders were selected that could fit in the very tight gaps available to accommodate the lifting equipment.

Hand pumps were operated a few strokes, and measurements taken at the stress points along the length of the beam. As each point reached its required stress, the cylinders were locked off.

The process was repeated until all points had achieved the required stress. Each lift took one to two days.

The PowerTeam lifting equipment specified for the task included:

- 5 P300 hand pumps
- 15 RLS200 cylinders
- 5 9765E hoses
- 5 9635 manifolds
- 5 9682 fittings
- 15 f9682 fittings
- 15 9575 shut off valves
- 25 9798 couplers
- 15 gauges

Result:

Installation of the beams to support the inner walls and new street-level entrances is complete. The museum reports that the renovation project is running on time and on budget, with an anticipated grand opening in 2011.

To learn more about Power Team equipment and other solutions available from SPX Hydraulic Technologies, go to www.spxhydraulictech.com