

Building blocks of life

October 1 2007

The £140 million construction of the ISIS Second Target Station at the Rutherford Appleton Laboratory in Oxfordshire is nearing completion. The largest science construction project in the UK, it is on time and on budget.

The Second Target Station is an addition to the existing ISIS facility which supports an international community of around 1600 scientists who use neutrons for research in physics, chemistry, materials science, geology, engineering and biology.

The specifications of the project are extraordinary and the construction challenges quite different from a normal building. The final steel blocks are now being erected in a structure known as ‘the monolith’. It is 7.5m high and 12m in diameter and its walls are 4m thick and encased in a further metre of concrete. 6,500 tonnes of steel are needed as radiation shielding for a tungsten ‘target’ no bigger than a packet of digestive biscuits.

The target will be struck by an 800 MeV proton beam – this creates neutrons for use in one of seven scientific instruments. The beam travels in a stainless steel vacuum vessel in an area called ‘the tunnel’. It is encased in 23,000 tonnes of steel shielding along its 143m journey from the ISIS synchrotron to the target. With elements such as a floor loading of 50 tonnes per square metre, ISIS TS-2 has been described as the only project of its kind by Jonathan Carkeet, the construction project manager.

“The influence of science is the major difference between this project and any other. The specifications of the job are almost incredible. Very few people in the industry will have the experience of building a neutron spallation source. It’s not just another office block.’

Before the first brick was laid – a 750,000 tonne chalk hill was moved 100m to allow space for the construction and 18,000 trees were planted to satisfy planning requirements. Building began in 2003 with Costain as main contractor and Severfield Reeve erecting the 2,000 tonne steel frame. The unique installation has been carried out by an ISIS team headed up by Carkeet of the Edwards Partnership and using a raft of subcontractors including Corus who helped to build the monolith.

Source: National Physical Laboratory

Citation: Building blocks of life (2007, October 1) retrieved 19 April 2024 from <https://phys.org/news/2007-10-blocks-life.html>

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