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The campus continuum:

Design of UK's national satellite test facility makes space for collision and curiosity

Learning environments have a direct impact on student outcomes. Higher education facilities are becoming increasingly flexible to serve a multitude of purposes and adapt to rapidly advancing technologies. To stay ahead of the curve, traditional higher education facilities and lab environments across the UK are opening their doors to tech incubators, commercial research, primary students and the community-at-large.

Architects at IBI Group, a global technology-driven design firm, keep this top-of-mind in the education facilities they design all over the world. As Lead Architect of the National Satellite Test Facility (NSTF) at Harwell Science and Innovation Campus, IBI has designed the largest satellite testing facility and a first-of-its-kind in the UK for the Science and Technology Facilities Council and Rutherford Appleton Laboratory (RAL) Space.

Due for completion in 2021, the NSTF is a 5,250 sq. m./56,500 sq. ft. facility that will bring research groups, students and the local and international space community together to help propel the UK into the commercial space age. To support and facilitate the 3,500



experts in higher education, to create a culture where public engagement is regarded as an important and essential activity by the research community.

“The government is aware there is an incredible return on investment by supporting research and education,” said Andrew Fursdon, Project Director and IBI’s London Higher Education & Science Lead. “Even if it takes years to fully realise, a similar initiative brought a return of £23 to the UK economy for every £1 of public sector capital funding.” It pays to inspire young minds at an early age, and increasingly student interests and future career aspirations are trending towards the STEM industries.

To exemplify this, RAL Space recently held an art competition to solicit “imaginative, out-of-this-world” artwork from students aged 5-11 years old. As part of the experience, winning artists will have their artwork displayed on the NSTF project site during construction, and the chance to visit the facility and meet the engineers who test satellites for future space missions. The Science and Technology Facilities Council (STFC) also has an active outreach programme with local schools around Oxfordshire and across the country. “Earlier in our work with the STFC, we designed a visitor’s centre where student groups and the local community can engage with the campus

and its research,” said Fursdon. “They even have an inflatable planetarium they use to explain the heavens.”

In decades past, scientists used to lock themselves away in private labs for years to study phenomena and discover scientific breakthroughs in secret, with little to no contact with the outside world. That is simply not the case anymore. “Increasingly in recent years, we’ve discovered that the best outcomes result in spaces where research is taken out of the lab and diagnosed with multidisciplinary teams in common areas, and as a result those spaces are designed into research buildings.” Providing space to meet, innovate and create is key. These collisions are important in any learning environment.

There is a clear and distinct trend connecting science and technology-focused incubators with higher education. “We’re finding more and more,” continued Fursdon “there is an intention to provide the opportunity for a collaborative exchange between academia and industry—whether in the commercialisation of science or in influencing the vocational training of future apprentices.”

Private organizations help fund these vocational and research hubs, like UTC@MediaCityUK in Manchester, in part because they gain access to bright, young minds with similar interests or areas of research. The



Andrew Fursdon, Project Director

to 10,000 satellites due to be launched by 2025, the UK government was motivated to create a centralised facility to test satellites, replicating the conditions they must be able to endure through launch and space travel, so that research groups did not have to search elsewhere for similar resources.

The facility is being made possible with the support of over 10 British universities (including Oxford) and the UK Government, underpinning industries worth more than £250B. Though it will serve civic, scientific and commercial interests, RAL Space is working with other stakeholders, including



National Satellite Test Facility will include a high precision workshop on the ground floor, laser labs, and robotic engineering; facilities that encourage interaction and collaboration between different disciplines and stakeholders, allowing groups to stretch their boundaries.

Andrew has also seen campus facilities “double-up” and use their research spaces for afterschool programs to encourage curious, young minds to maximise their use. At Imperial College London, a renowned research and engineering-focused institution, its Stadium House building hosts local community, primary and high school students and allows them to ‘make things’ as part of an induction course. “Science is opening its doors to spark curiosity in young minds and encourage them to get creative.”

Stadium House was a tired 1980’s office building which now has a new lease on life. It is promoted by the school as a “Hackspace”; a place for a unique community of inventors and entrepreneurs across the university. The facility is a creative container and a vibrant environment offering its ‘makers’ access to cutting-edge prototyping equipment and professional experts. Some of the creations by Hackspace Fellows (as they are known) include an improved incubator for premature babies, low cost weather stations to help coffee farmers in the tropics, and a pulsing, LED-lit dress for Lady Gaga.

This brings up another trend that is impacting education environments earlier and earlier: making things is no longer an unpopular part of learning. “Making things with your hands isn’t a dirty concept in

academia anymore,” continued Fursdon. “We’re seeing a push towards vocational training earlier and earlier in the educational continuum. At the Rosalind Franklin Institute, Harwell, there is space for a workshop facility to serve the laboratories, and more collaboration space outside of the controlled environment to encourage interaction between researchers and students.”

In education architecture, it is difficult to future-proof a building. In a highly-specialized research facility, with lab equipment and technology that is rapidly changing, doubly so. The impact of new technologies cannot be understated in lab and learning environments. Technology is changing how learners engage with the built environment, and what they expect from their education.

“We take care to design out risk and make sure that adaptability objectives are accommodated in order to achieve maximum benefit over the full life span of the facility.” An approach that makes this possible is the inclusion of modular, adaptable space planning. “Often K-12 school boards and universities need a secure investment in terms of future-proofing their facilities for new instruction techniques, new technologies and program changes, by adding generic space that can be versatile or updated in the future.”

Higher education institutions need to remain competitive, as their student customers can be harsh critics. As education models change, competition for funding and financial support is increasingly felt and internalized by students. Students also need

to know that if they work hard, there will be opportunities for them on the other end.

IBI Group (TSX:IBG) is a globally integrated architecture, planning, engineering, and technology firm with over 2,700 professionals around the world. For more than 40 years, its dedicated professionals have helped clients create livable, sustainable, and advanced urban environments. IBI Group believes that cities must be designed with intelligent systems, sustainable buildings, efficient infrastructure, and a human touch.

IBI Group’s Learning+ practice has a rich history designing education institutions across the globe, from early learning through to higher education. Our professionals connect pedagogy to design, creating dynamic environments that cultivate transformational teaching and learning. Notable educational research facilities include CUBRIC, a state of the art brain imaging facility for Cardiff University on its Innovation Campus; several research facilities for leading Institutes at Oxford University; Sensor City and Liverpool Life Science Accelerator, which form part of Liverpool’s Knowledge Quarter; and UTC@MediaCityUK, a landmark learning centre catering to 14-19 year olds from Greater Manchester interested in emerging creative, media and digital industries.

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