UNIVERSITY TRENDS

CONTEMPORARY CAMPUS DESIGN

JONATHAN COULSON
PAUL ROBERTS
ISABELLE TAYLOR

SECOND EDITION

Routledge
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LONDON AND NEW YORK

INTERDISCIPLINARY RESEARCH BUILDINGS

SHERMAN AND JOYCE BOWIE SCOTT HALL CARNEGIE MELLON UNIVERSITY

Pittsburgh, USA 2016 $82m 10,125m² (109,000ft²)
Architect: OFFICE 52

PEDESTRIAN CONNECTIONS Sited between three engineering buildings, Scott Hall has improved physical links within the College.

THE COLLEGE OF ENGINEERING IS ONE OF CARNEGIE MELLON UNIVERSITY'S (CMU) MAIN ACADEMIC BASTIONS, DELIVERING ONE OF THE MOST HIGHLY RANKED ENGINEERING PROGRAMMES IN THE COUNTRY. IN SUCH A COMPETITIVE FIELD, THOUGH, NO INSTITUTION CAN REST ON ITS LAURELS.

In 2006, planning began for a nano-bio-energy technologies building to provide the College with new facilities and bring together previously scattered researchers to create a consolidated engineering hub at the heart of the campus. The campus master plan pointed to the last remaining unbuilt plot within the Engineering precinct. But it was unbuilt on for a reason. Firstly, the site's topography drops some 25 metres (80 feet) into a ravine, Junction Hollow. Secondly, the steep hillside of the lower portion is bisected by an existing service road and major utilities, with a railway line running alongside it. Not only would any new structure have to contend with these physical and infrastructure challenges, but the site was tightly sandwiched between three existing engineering buildings, Wean Hall (1971), Roberts Engineering Hall (1997) and, most notably, Hamerschlag Hall (1914), one of CMU's most symbolic properties. These logistical complications were, nonetheless, overridden by the strategic desire to tie the College together, driving the decision to opt for this site rather than a more straightforward location elsewhere on campus.[26]

The University launched a national design competition, which, in 2011, was won by OFFICE 52. The original brief specified a seven-level structure that descended into Junction Hollow, to house the Department of Biomedical Engineering, the new Scott Institute for Energy Innovation, the Disruptive Health Technologies Institute, the Engineering Research Accelerator and a nanotechnology facility. A seven-storey tower would, though, have disturbed (at high cost) the existing utilities in the ravine, whilst a hillside location next to a road and railway line is less than ideal for the sensitive equipment, especially the clean room facility, that the building was intended to hold. Recognizing these difficulties, OFFICE 52's winning design proposal completely reimagined the brief.

Instead of a single tower, OFFICE 52 split the scheme into three separate components: a nanotechnology clean room, a four-storey laboratory block and a public atrium. The clean room, called the Bertucci Laboratory, was inserted into a sunken service yard between Hamerschlag and Wean Halls, thus situating it on a flat surface away from the vibration of trains and cars. The laboratory block, known as the North Wing, was set on the original site but raised on structural steel legs, thereby obviating the need to build on the hillside and disrupt the utilities below. The two units were then linked by the four-storey atrium.

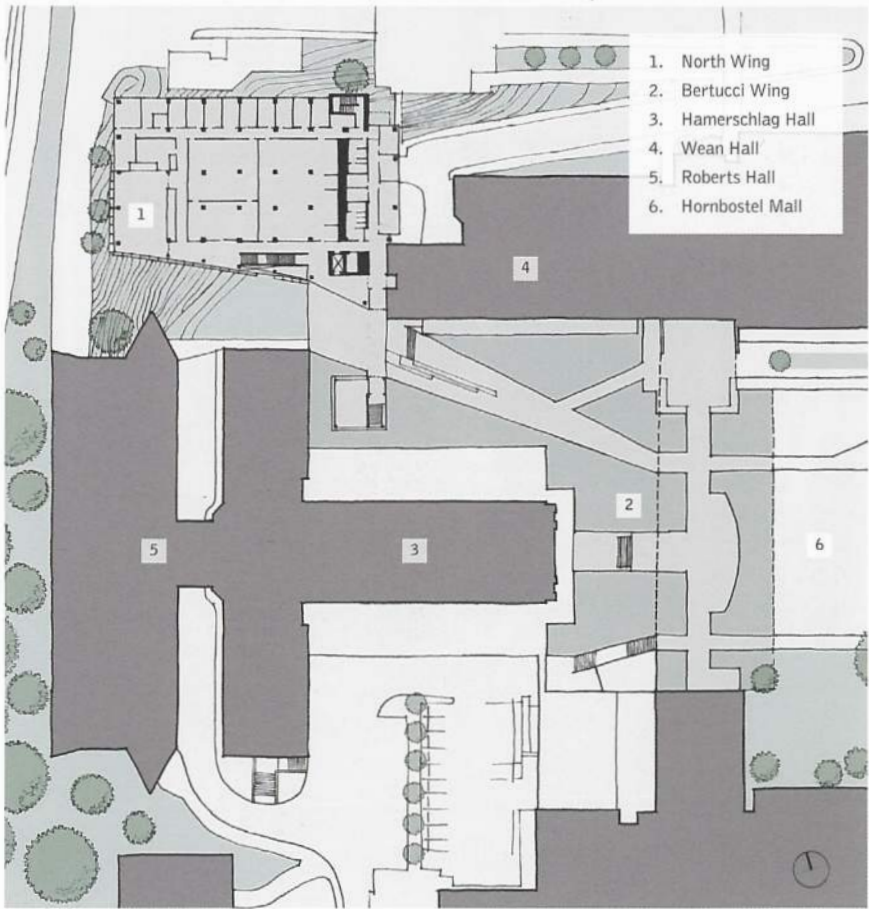
Externally, the prominent form of the building gave the College a distinctive contemporary symbol. The North Wing juts conspicuously out over the ravine. Its glazed curtain wall is animated by a geometric pattern based upon phototonic quasicrystaline structures common in nanoparticle research. The density of the coverage of the pattern changes across the surface, providing additional privacy and shading as required within the building. The south and west elevations are screened by vertical dichroic glass fins. This type of glass, itself related to the science of nanoscale processes, changes colour in line with the time of day, light intensity and peoples' movements, meaning that Scott Hall is constantly moving from a palette of blue to lavender to teal.

The Bertucci Laboratory is largely hidden from above ground in the old sunken courtyard. The wing was covered by a green roof, which extended the grassy landscape of the Hornbostel Mall, one of the campus's major open spaces, to the North Wing. Topping a clean room with a green roof was a bold move; it will almost certainly leak in time. Yet the opportunity to improve the physical link between the College's buildings through the new public realm outweighed the risks.[27]

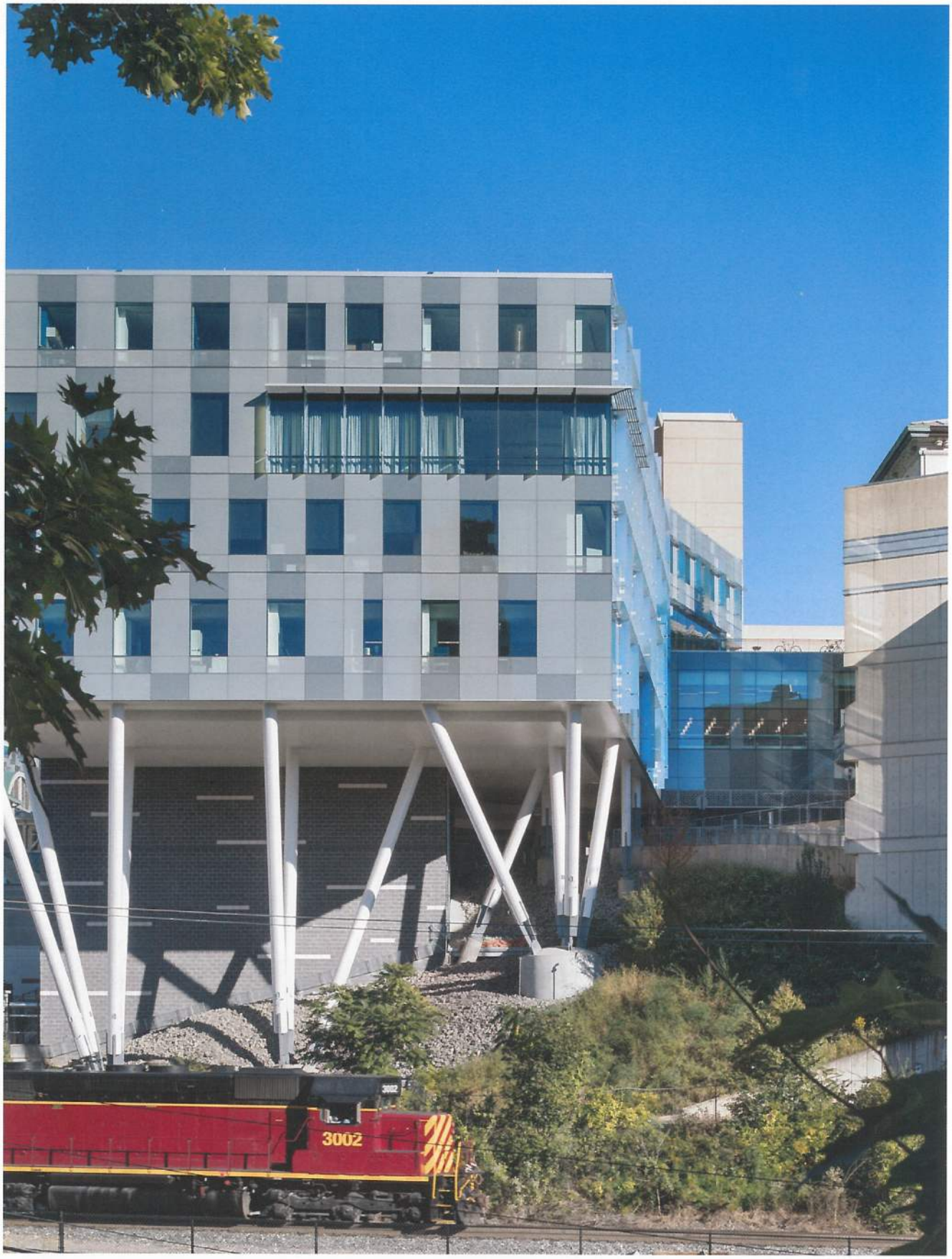
Scott Hall has also provided internal physical connections between the College's structures, fostering porosity between the departments and, accordingly, a collaborative culture. The North Wing has

ENTRY PAVILION rises from the green roof of the extended grass mall to give access to the Bertucci Laboratory.

GROUND-LEVEL PLAN The scheme comprises the four-storey North Wing, the below-grade Bertucci Laboratory, which sits beneath a new green lawn (indicated), and an interconnecting atrium.



access points to Wean Hall at two levels; there are two entrances to Hamerschlag Hall; and a short bridge joins to Roberts Hall, leading directly from the North Wing's café. The focus placed upon nurturing connections between the members of the various departments is best encapsulated by the Ruge Atrium and Collaboratory, at the intersection of the two wings. Joining all floors of Scott Hall, this light-filled space was designed as the building's social hub. With a café and meeting areas, it is here that all users of Scott Hall and its neighbours overlap and come together. Time will tell whether it will spark the collaborative science that its designers and CMU anticipate, but its teeming, interactive ambience makes for a positive indicator.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SOUTH FAÇADE Dichroic glass fins create an ever-changing pattern of colours and reflections.

Opposite:
NORTH WING Jutting prominently into a ravine atop slender steel legs, the wing is fixed to the hillside by a masonry core.

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ROUTLEDGE

SECOND EDITION

The campus has a deep-rooted prestige as a place of teaching, learning and nurturing. Conjuring images of cloistered quadrangles, of sunny lawns, of wood-panelled libraries, it is a word viscerally charged with centuries of scholarly tradition. And yet it is also a place of cutting-edge science, vibrancy and energy. It is this dual nature, this concurrent adherence to tradition and innovation, which renders the physical environment of the university such a redolent, enduring and dynamic realm. However, it also means that the twenty-first-century campus is a highly challenging and exacting landscape to design and manage successfully.

Today, the scale of the pressures and the rate of change facing higher education institutions are greater than ever. Squeezed public spending, growing societal expectations and the broadening education ambitions of developing nations are set against a backdrop of rapid technological progress and changing pedagogies. What are the repercussions for the physical realities of university planning and architecture? And how are university campuses adapting to contend with these pressures?

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'The authors' unparalleled knowledge of the international higher education campus context is clearly discernible and the selected case studies are both informative and inspirational.' **Professor Veronica Campbell**, Bursar and Director of Strategic Innovation, Trinity College Dublin

'This book is a must-read for all university boards, executives and vice-chancellors contemplating their position in a globally competitive knowledge economy.' **Andy Sharp**, Director Facilities and Services, Australian National University

'The authors challenge us to think through the relevance and rationale of current building and master planning typologies and to clarify our thoughts about the future.' **Paul Williams**, Founding Partner, Stanton Williams

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