BUILDING THE FUTURE OF EDUCATION

Improving the design of learning facilities to adapt the future needs
FOREWORD
The COVID-19 pandemic has resulted in educational institutions across the world being compelled to suddenly harness and utilize the suite of available technological tools to create content for remote learning for students in all sectors. We are experiencing new possibilities to do things differently and with greater flexibility resulting in potential benefits in accessibility to education for students across the world. While it may seem difficult to predict how the future will unfold during such uncertain times, some of the most pioneering work happening around us can guide us in our thinking.

Educational institutions are the backbone of innovation for regional economies. On-campus activity is what largely facilitates the exchange of knowledge and networking that in turn creates new opportunities. Given this, the impact of digital learning can in fact be woven into new learning styles that redefine the function of campus spaces.

Focusing on people’s needs will be key to providing spaces and experiences where students and staff want to spend time engaging in meaningful and productive activities. To do so within sustainable financial schemes, campus facilities will need to become more flexible and adaptable. Harnessing the potential of technology to improve efficiency through automation will also contribute towards this goal and help to create more inclusive experiences.

This document demonstrates how we are delivering exceptional and sustainable outcomes for our clients natural and built assets. If you would like to have further discussion, please feel free to contact one of the Arcadis team.
UNLOCKING
TECHNOLOGY

To support the changing curriculum and teaching styles the classroom and built environment must evolve. This adaption is a complex mix of changes in the physical space, connection to the wider urban realm and community and an understanding of the digital technologies that play an integral part in the schools of the future.

Digital learning or e-learning provides a quick, cheap and modular solution for learners of any age or background and will continue to play a significant role in the future of education. Today, self-motivated individuals can consult a body of curated knowledge and expertise that was unthinkable just a decade ago, with the explosion of digital learning enabled by MOOCs (massive open online courses) and other online offerings.

In parallel to the diffusion of digital learning, new pedagogies and teaching methods are emerging that foster greater collaboration and encourage student and teacher autonomy. Many of these new approaches promote both networking and peer-to-peer (P2P) exchange. These are being promoted by established institutions, and are also emerging more informally through digital platforms. Blended learning seeks to combine the strengths of both digital and physical approaches to education by leveraging the accessibility, transparency and convenience of digital media, while also creating impactful learning experiences on campus.

While we know that in a digital future, we will combine education and work in new ways, now is the time for all of us to re-imagine the future we want to live in and start building it.
Not only is the world facing a pandemic, but at this moment we are also in the midst of digitizing every industry and aspect of our society.
UNDERSTANDING THE FUTURE EDUCATION

Spacing
The demand for flexible spaces is reinforced by decreasing public expenditure in higher education in regions. The spatial requirements for campus buildings are being redefined by the emergence of new more varied learning methods. Less space is needed for traditional lecture theatres, while there is a growing demand for collaborative or trans-disciplinary workspaces, quiet spaces, labs and innovation hubs as well as other types of functional space. There is also a rising demand for spaces that can be transformed on a regular basis, according to ever-changing curricula and the individual requirements of students, departments and industry partners. For these reasons, there is a greater acknowledgement of the need to design spaces that can be regularly adapted, at different speeds and scales. Design strategies should consider the lifecycle of buildings across the different lifespans.

Resilience
Beyond the pressing need to improve the use of resources and save costs, Educational institutions are increasingly required to comply with ambitious environmental standards. Various organisations — whether public or private funding bodies — expect detailed building and operational strategies before new funding is made available for construction or the adaptation of facilities. As a consequence, there is a growing interest in design strategies that can future-proof the financial performance of the campus, while ensuring quality experiences for its users. This can go beyond established passive design principles that allow for natural ventilation and interior natural lighting. Reducing resource consumption to a minimum, ensuring long-term resilience, and promoting sustainable lifestyles are some successful measures to achieve these goals.

With the diverse and potentially complementary activities that take place on campus sites, Educational institutions are ideal environments to turn waste into a resource. Emerging practices of resource use, underpinned by the circular economy, aim to enhance and preserve the natural environment. By breaking linear cycles of resource consumption, and instead keeping materials and energy in use for as long as possible, value and usability are extended, such as the sharing and reuse of materials, or remanufacturing of objects and components could allow the campus to retain value and minimize waste, reducing costs and environmental impact. In the context of a campus, for example, the by-products of some laboratories, such as heat, can contribute to the operation of other services, or be used by other laboratories or facilities.
**User-experience**

Design practices that put human needs and desires at the core of decision-making have strongly influenced product and service design in the past few decades. Similar expectations are now changing the way spaces are designed. The human-centred approach acknowledges the diverse nature of human desires and focuses on understanding user profiles to deliver context-specific solutions. These aim to enhance the quality of experiences and extend productive time by facilitating ancillary aspects of daily lives.

Personal development, leisure and physical health can be nurtured by including dedicated campus facilities as part of learning and common spaces. Placed close to transition spaces, these facilities provide an opportunity to meet new people and exchange experiences. To cut operational costs, some of these facilities such as canteens and gyms can be run by students themselves as part of their curricular or extracurricular activities. Boundaries between learning and social spaces should be minimal to encourage accessibility and visibility of activities.

Lighting also has a significant influence on wellbeing. Building designs that maximise the use of daylight not only reduce energy consumption but also provide more comfortable learning conditions. Where artificial lighting is used, diversity of conditions and personal control can enhance perceived comfort and productivity. Like lighting, the right sound levels can also influence wellbeing. Specific areas of ‘acoustic refuge’ for example can enable creative thinking and concentration away from the noise of an open-plan environment.

**Better Construction Planning**

Successful strategies are underpinned by pervasive wireless connectivity and a high degree of integration between diverse data sources. These are sustained by resilient infrastructure that makes it easy to assimilate data flows from multiple sources — from real-time building usage data to social media and other urban data, such as transport schedules.

Combined, these technologies could contribute to the creation of an accurate and detailed model of physical structures would act as a platform to allow every stakeholder to access all information from a single perspective. Today, the more pervasive and consolidated use of Building Information Modelling (BIM), Introduction Efficient facilities and personalised services is improving the ability to share data relating to all phases of an asset’s lifecycle across stakeholders, whilst ensuring data inputs remain consistent over time.
The building was required to respond to a multiplicity of varying uses throughout the building height, resulting in different grids throughout the building. The High Block and the Low Block are connected at 4 levels to provide direct access between these two blocks.

**OUR SOLUTION**

- Careful planning of column locations was required to achieve this economically.
- We updated ourselves on the rationale, procedures and requirements in seeking support for UGC funding application which will facilitate other UGC-funded institutions in their future campus development.
ABOUT PROJECT

- Manage the design of a contemporary 7,000m² center to function in harmony with a leafy natural environment and to enhance the on-site existing heritage building
- Deliver an economic design in a historical, sloping and elevated site
- Ensure BIM is utilized at the appropriate time to develop a coordinated design on a complex site to ensure a no-surprises delivery

OUR SOLUTION

- Regular and exhaustive Value Engineering workshops
- Bespoke form of procurement, adhering to the University’s standard way of practice to suit the Hong Kong market
- Early contractor engagement with proven BIM experience

KEY HIGHLIGHTS

- Stakeholder engagement from the earliest opportunity provides long term benefits in terms of “buy in” on decision making
- Design review can deliver significant value in terms of reduction of cost

UNIVERSITY OF CHICAGO CENTER

Project & Programme Management Consultancy
Hong Kong | 2017 - 2018
KEY HIGHLIGHTS

- The buildings are on top of three courtyards that form the focus for the learning commons and associated amenities

- There is a concourse named University Street at approximately the mid-elevation of the campus.

ABOUT PROJECT

The Centennial Campus is compatible and seamlessly linked with the Main Campus and introduce a new architectural language that could be adopted in elements throughout the whole campus to create a coherent image for the University. Energy efficient building systems also incorporated into the design.

OUR SOLUTION

The advantages of the application of such system in construction projects are two folds. One of them is to alleviate the threat to environmental protection (BEAM accreditation) while another one is to minimize the running cost of the construction buildings in long term.
ABOUT PROJECT
Phase 7 Campus Expansion in Ngee Ann Polytechnic comprises of:
• A&A and Extension to existing Block 51 Canteen with new teaching facilities and classrooms;
• New construction of Teaching Block 58;
• New construction of SIT@NP Campus
• New construction of Integrated Indoor Sports Hall and Canteen at Block 22.

OUR SOLUTION
When constructing cost model, we had to take into account the compound cost rate for the different functional areas of teaching facilities, indoor sports facilities, F&B canteen and all respective cost rates to be used and benchmarked with existing relevant facilities in Higher Learning Institutions such as other Polytechnics and Universities; yet showing the different cost relationships on the cost differences.

We assisted in budgeting without proper designs at the early stages of project implementation and also help put up approval papers on the capital cost, cost norms, benchmark and critical cost drivers.

KEY HIGHLIGHTS
• Establish the most efficient method of construction based on cost and functional value.
• Successful implementation on the integration of different facilities in one single block for all 3 different projects.
ABOUT PROJECT
The building was required to respond to a multiplicity of varying uses throughout the building height, resulting in different grids throughout the building. The High Block and the Low Block are connected at 4 levels to provide direct access between these two blocks.

OUR SOLUTION
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KEY HIGHLIGHTS
Early engagement with the contractor for buildability and programme input

Assist client to lead the Consultant team to deal with design and statutory submission, ensure school is compliance to use.

STAMFORD AMERICAN SCHOOL
Project & Program Management Consultancy / Health and Safety Advisory
Hong Kong | 2016 - 2019
KEY HIGHLIGHTS

• Designed by Renzo Piano, one of the most famous international architects.

• One of the first Whittle Schools in the world to be built in Shenzhen and Washington, D.C. at the same time.

Whittle School & Studios Shenzhen
Project Management and Cost Consultant Shenzhen 2016-2019

ABOUT PROJECT
Whittle School & Studios, a modern global PreK-12 school with campuses in Washington, DC and Shenzhen. Whittle Shenzhen is designed by Renzo Piano and successfully opened in 2019.

OUR SOLUTION
Arcadis provide Project Management and Cost Consultant to WSS from 2016 to 2019, also we used to play a fundamental role in helping WSS finalizing built-to-suit Lease Agreement and Design & Construction Agreement with China Merchant. With in-depth client focus and the understanding of the G30 needs and challenges in their 1st Global School, we demonstrated the strong local delivery capabilities in Shenzhen.
KEY EDUCATIONAL PROJECTS

ASIA

China
COFCO Vanke Changyang Middle School, Beijing
EtonHouse International School, Dalian
Shanghai Wellington College International
Shanghai
Whittle School & Studios, Shenzhen
Avenues School, Shenzhen
The American International School of Guangzhou,
Guangzhou

Hong Kong / Macau
Kellett School , Hong Kong
HKUST – Animal Care Expansion and Remodel
University of Wollongong College – Hong Kong
Campus
Li Po Chun United World College Dormitory
Renovation , Hong Kong
Community College of City University at Tai Wai,
Hong Kong
HKU Medical Complex Extension
The Chinese University of Hong Kong
The University of Hong Kong (HKU) SPACE
Community College, Kowloon Bay
The Hong Kong Polytechnic University, The Hong
Kong Community College, Hung Hom
PolyU Campus Expansion at Ho Man Tin Slope,
Hong Kong
New Campus of Vocational Training Council (VTC)
at Kowloon East , Hong Kong
HKIS Upper Primary School Redevelopment
Canadian International School, Hong Kong
ESF Kowloon Junior School Redevelopment, Hong
Kong
Redevelopment of Our Lady of Fatima Girl’s School,
Macau
Redevelopment of Block “O” at Sacred Heart
Canossian College, Macau

Thailand
Shrewbury International School

ASIA

Singapore
New Primary School along Punggol Way
Rejuvenating of Ngee Ann Polytechnic Campus
Expansion (Stage 2 & 3)
NAFA 4th Building
Proposed A&A Works to Senior Schools Science
and D&T Labs
Tanglin Trust School
MDIS Campus at Iskandar Development Area
Feasibility Study for A&A to Former ITE Clementi
Overseas Family School New Campus
ESSEC Biz School @ Nepal Hill
Ngee Ann Polytechnic Campus Expansion (Phase
7), (Phase 7-2) & (Phase 7B)
Redevelopment of BCA Academy,
Singapore (Phase 1 & 2)
A&A Works at NAFA (Campus 1 and 3)

Malaysia
Graduate School at Sunway College Campus,
Selangor
International Student Office at Sunway College
Campus, Selangor
Department of Art and Design at Sunway College
Campus, Selangor
Sekolah Kebangsaan Putrajaya
Berjaya International Boarding School at Berjaya
Hills, Bentong, Pahang
Sunway Monash University
University Teknologi Petronas, Academic And
Student Facilites, Tronoh, Perak
Lim Kok Wing University College Of Creative
Technology, Cyberjaya
New Teaching Centre of The British Council at
Wisma Selangor Dredging, KL
Alice Smith School Extension, Kuala Lumpur

Philippines
Ateneo Leong Hall Social Science Building
Ateneo School of Medicine
University of Dormitory
De La Salle University
AMV College of Accountancy, Manila
Far easter University, Silang
Tan Yan Kee Student Center
INTERNATIONAL

**Australia**
La Trobe University—ESD Design Brief for all new buildings
Leongatha Secondary College
Ludwig Institute—Royal Melbourne Hospital
Methodist Ladies College
Monash Special School, Brandon Park
Monash University
Building B, Caulfield Campus
Drug Discovery Biology Unit, International Centre
Monseac’s Fitout Caulfield Campus
Morwell College of TAFE
Mt Scopus College
Oakleigh Greek Orthodox College
Over Newton College
College of Advanced Education, Newcastle
Grays Lane Public Primary School, Sydney
Mount Druitt Technical and Further Education College
National Institute of Dramatic Arts, Sydney
University of New South Wales—Pool
Gymnasium Cogeneration System
University of Sydney—Faculty of Law
University of Technology, Sydney
Griffith University—G52 Building
University, Gold Coast
New Primary Classrooms for Autism
Queensland Southport Special School, Gold Coast
St Paul (Primary / Secondary) School—Library Extension, Bald Hills
University of Queensland—Gehrmann Laboratories, Brisbane
Wynnum Primary State School
Bruce College of TAFE, Canberra
St Aloysius College—ESD / Green Star Strategies, Hobart

**INTERNATIONAL**

**Europe**
Aston University—Aston Business School, UK
Bannerman Road School, UK
Colfox College, UK
Dumfries and Galloway Schools, Scotland, UK
Gladesmore College, UK
Highgate Woods School, UK
Imperial College—Biochemistry Building, UK
Parkview Academy, UK
Peninsula Medical School, UK
Penry College—BSF Pathfinder, Cornwall, UK
Rhonda PFI Welsh Language School, UK
Roehampton University, UK
South Devon College, Plymouth, UK
Stockwell Park High School—BSF Pathfinder, London, UK
Tanaka Business School, UK
University of Bristol, UK
Westlands School, UK
Böhlen Professional Training Centre, Germany
Dortmund Centre for Production, Germany
Geesthacht Primary and Secondary School, Germany
Koblenzer Straße School, Bremen, Germany
Potsdam University—School of Natural Sciences, Germany
Torgau New Special Education Centre

**Middle East**
Dar Al Zikr Al Hakeem School, Saudi Arabia
King Fahd University for Petroleum and Minerals, Saudi Arabia
Science & Technology College, Taif, Saudi Arabia
Education City, Qatar
MARKET LEADERS

At Arcadis, our people have the opportunity to work on the most iconic and innovative projects in Asia. They have the chance to shape environments and improve quality of life for its people. They are encouraged to grow the business and position themselves as thought leaders sharing their knowledge to shape the industry in which we work.

AS LEADERS WE SHARE OUR POINT OF VIEW

We aim to attract, engage and inspire the best professionals in the natural and built environments – people who think big and want to go far. Our collaborative culture encourages colleagues to build and expand their network, enabling them to contribute to the development of new ideas and realize their potential. This sparks a culture of high-performance and being the best. That’s why we look to position our skilled employees at the heart of our industry’s hot topics, sharing their best-practice, shaping the discussions and being thought leaders.
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