

THE MASTER OF SCIENCE, INTEGRATED SUSTAINABLE DESIGN (MSc ISD)

IS A ONE-YEAR,
POST-PROFESSIONAL PROGRAMME THAT ADDRESSES THE GLOBAL
SUSTAINABILITY CHALLENGE BY TACKLING BOTH THE BUILDING
AND URBAN SCALES, AND INTEGRATING KNOWLEDGE FROM THE
DISCIPLINES OF ARCHITECTURE, ENGINEERING, LANDSCAPE DESIGN,
PLANNING, URBAN DESIGN AND BIOLOGICAL SCIENCE.

THE CURRICULUM delves
into material, technical, spatial and social
systems, linking them directly to the
urbanisation of Asian cities. Students
come from varied disciplinary and cultural
backgrounds: most are from Asian countries,
a few from Australia, Europe, North and
Central America.

AFTER GRADUATION,
many MSc ISD alumni return to their
core disciplines as sustainability-trained
professionals. A degree from NUS enhances
their standing and marketability; the MSc ISD
experience gives them a newfound capability
to frame problems from an Asian perspective.
With these, they are well placed to carve
out unique positions in the building and
planning sectors in the region. Some
graduates segue into research, education
or specialist consulting. Others have gone
on to pursue PhDs.

POST- PROFESSIONAL PROGRAMME THAT ADDRESSES THE GLOBAL SUSTAINABILITY CHALLENGE



FOCUS

Human actions are responsible for global warming and ecosystem losses. The solution to the crisis we face depends to a large degree on what we build, and how this shapes the way we live. The challenge here is not only technological, it is also cultural, economic and ecological. And the solution is predicated on our understanding of how these forces interact and how they might be integrated in positive, life-sustaining ways.

Four areas of focus differentiate the MSc ISD approach:

SINGAPORE AND THE ASIAN CONDITION

Singapore is on the frontlines of environmental policy and action in Asia. With the city-state as a springboard, students are led to explore issues specific to tropical/subtropical climates and high-density urbanism. The curriculum includes visits to completed projects as well as guest lectures by policy-makers and consultants, shedding light on the Singapore model.

MULTISCALAR APPROACH

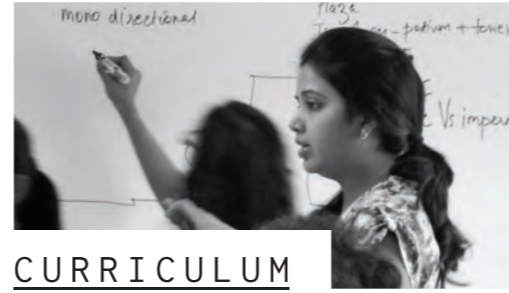
The programme examines different scales of the built environment. The first semester is devoted to the building scale; the second probes the urban. Students discover why scale matters to a discussion on sustainability; they are taught to visualise the interdependency of engineered, spatial and landscape elements, and to frame buildings within neighbourhoods, and neighbourhoods within cities.

SYSTEMS-THINKING

Systems-thinking aids the visualisation of connectivity and exchange. It facilitates life-sustaining flows of resources and people in a manner that unifies and fortifies, and reverses fragmentation. The programme, for instance, investigates the interface between natural and human-made systems; it probes the links between social and economic networks. It emphasises *integration*, how to bind elements into new *wholes*, and goes beyond improving the performance of parts.

PROJECT-BASED, CROSS-DISCIPLINARY LEARNING

The programme is taught by highly qualified professors who offer cross-disciplinary viewpoints and undertake cutting-edge research. In-house teaching is augmented with masterclasses run by internationally renowned scholars and practitioners. Past masterclasses have included architects, WOHA, and climate engineers, Transsolar KlimaEngineering. The two *integrated studio projects* channel theory into problem-solving. Here, emphasis is placed on strategic, critical and collaborative thinking, past textbook learning.



CURRICULUM

The four focus areas of the MSc ISD programme are integrated into a curriculum structure that fleshes out the challenges of Asia and offers an approach to tackling them. The centrepiece of the programme are two project-based courses in which students are tasked with a complex real-world problem. These two courses are backed by four lecture courses in which sustainability-related paradigms, principles, and strategies are critically examined.

To be awarded the degree, a candidate must attain 40 units made up of the following:

2 INTEGRATED PROJECT STUDIO COURSES

ISD5101 AND ISD5102 INTEGRATED STUDIO PROJECTS

This course relies on project-based learning to develop skills for systems-thinking. Students are grouped into teams to work on problems at the building scale (ISD5101) or the neighbourhood/precinct scales (ISD5102). The project presents a problem of spatial, technological, and material systems, and specific economic, social and ecological imperatives. Singapore-based experts are invited to guide students along the way in areas requiring specialist knowledge, with industry partners often called in to participate in discussions. Visits to local projects are scheduled in this and other courses. The proposals that emerge from this exercise are varied and reflect, in part, cohort mix and individual backgrounds. Most students investigate a deeper integration of architecture, urban design and planning with energy, water and food systems. Some generate new typologies, morphologies and infrastructure to accommodate these systems; others formulate new policies to drive cities towards self-sufficiency and resilience. All are taught to frame the impact of their decisions in both quantitative and qualitative ways, and appraise problems from multiple vantage points.

8 UNITS EACH = 16 UNITS

4 LECTURE COURSES

ISD5103 GREEN BUILDINGS IN THE TROPICS

This course takes a critical look at the rise of the Green building movement in tropical Asia, asking if it has, in recent decades, addressed the challenges of climate change and urbanisation. Tracing the environmental trend from the 20th century to present day, students are exposed to various principles and positions. A deep dive into the Green movement reveals its underlying worldview. Alternate perspectives are reviewed. Multiple examples of built projects in Asia are presented and debated.

ISD5104 ENERGY & ECOLOGY

This course explores energy demand at the scales of the building and neighbourhood, and its relationship to spatial form and choice of mechanical-electrical systems. It probes how power is generated, transmitted, utilised, and reclaimed. It questions reliance on fossil fuels which is a primary cause of global warming. It paints a broad picture of energy in its various forms, how demand is shaped by decisions at the drawing-board. Several high-performing buildings are visited and discussed.

ISD5105 PRINCIPLES OF SUSTAINABLE URBANISM

This course examines the challenge of urbanisation in Asia. The Singapore model of urbanism is introduced and reviewed, as a launch pad for discussion. It is coupled with an overview of historical and economic forces that have shaped the growth of Asian cities, by way of decisions that have had a direct and indirect social and environment impact.

The imperative of density is deliberated; questions are raised on how new forms of high-density urbanism might lead to solutions for Asia.

ISD5106 SUSTAINABILITY MODELS AND BIO-CENTRIC DESIGN FOR THE BUILT ENVIRONMENT

The course looks at past, present and future paradigms of the global sustainability movement with emphasis on the regenerative approach to design and development. Here, the purposeful union of social and ecological systems is investigated as an approach. The role of nature, in particular, is summarised and expanded to include biomimicry and ecosystem services as drivers of design-thinking.

4 UNITS EACH = 16 UNITS

2 ELECTIVES

PROGRAMME ELECTIVES

Electives are courses students select to augment core learning. Most MSc ISD students opt for courses from postgraduate courses in the College of Design and Engineering, related to environmental design and sustainable development. At the start of each semester, the Programme Director releases a list of preapproved electives.

4 UNITS EACH = 8 UNITS

ADMISSIONS

The programme can be completed in one year, full time, or two years, part time.

Candidates are selected on the basis of their academic qualifications and relevant industry experience. An applicant is required to submit the following:

- Evidence of a Bachelor's degree with honours in Architecture, Engineering, Landscape Architecture, Planning/Urban Design, Project and Facility Management, or any built environment-related programmes or qualifications as may be approved by the National University of Singapore.

- A detailed curriculum vitae and, if the candidate is from a design background, a project portfolio.

- Letters of reference from at least two persons.

- An essay of no more than 1,000 words explaining why sustainability is important to the applicant.

- TOEFL score of 580 or equivalent for applicants whose first degree was not taught in English.

Shortlisted candidates may be invited to appear for an interview. Where an applicant is not based in Singapore, the interview will take place via video call.

For more information on the programme, please visit bit.ly/nusdoa_mscisd




CONTACT

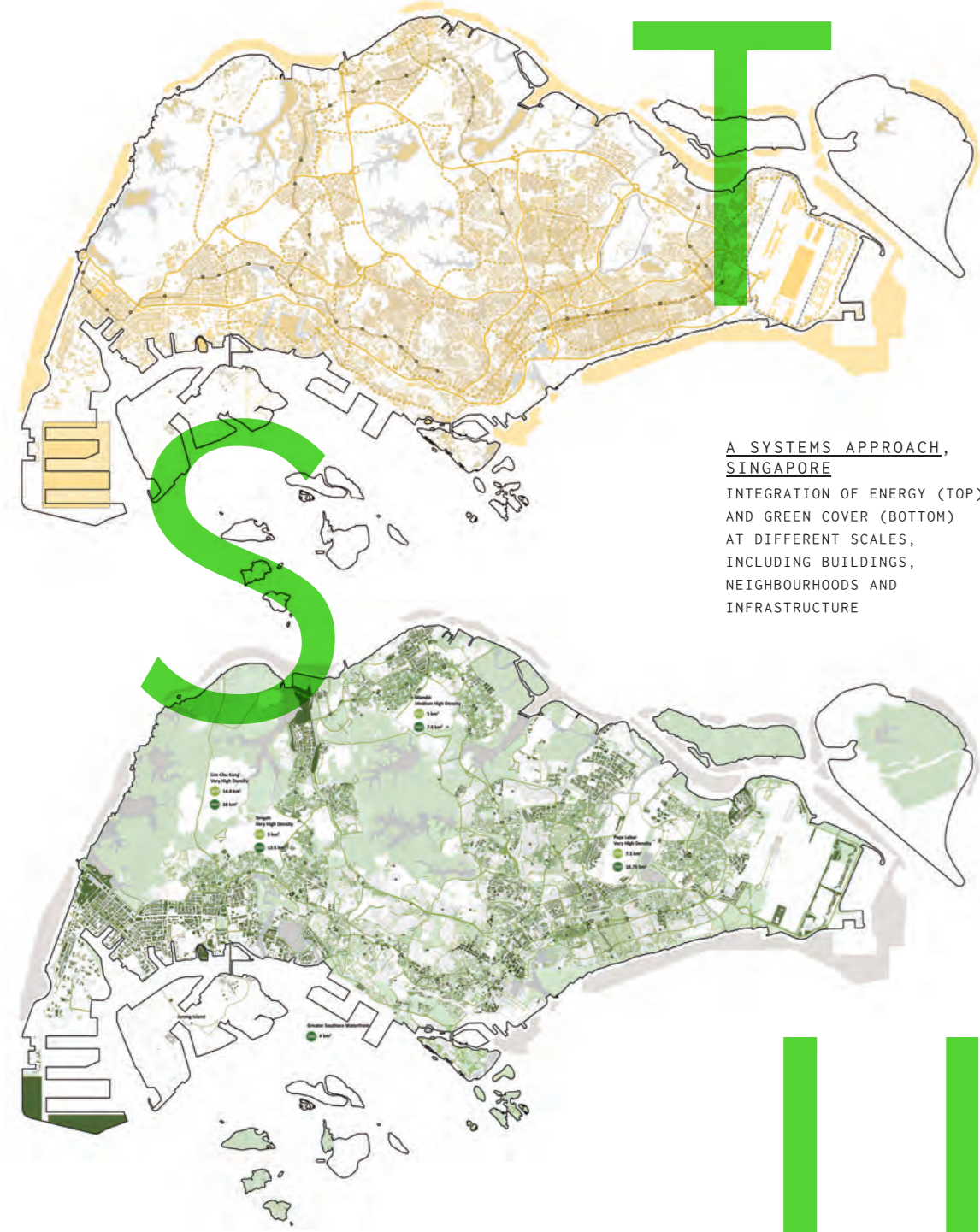
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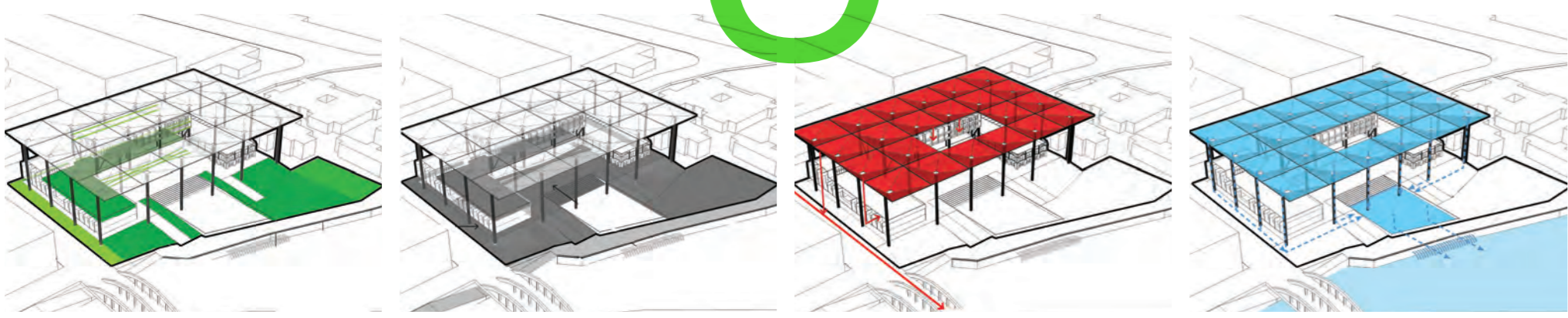
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 NUS
National University of Singapore
Department of Architecture
College of Design and Engineering



A SYSTEMS APPROACH, SINGAPORE
 INTEGRATION OF ENERGY (TOP) AND GREEN COVER (BOTTOM) AT DIFFERENT SCALES, INCLUDING BUILDINGS, NEIGHBOURHOODS AND INFRASTRUCTURE

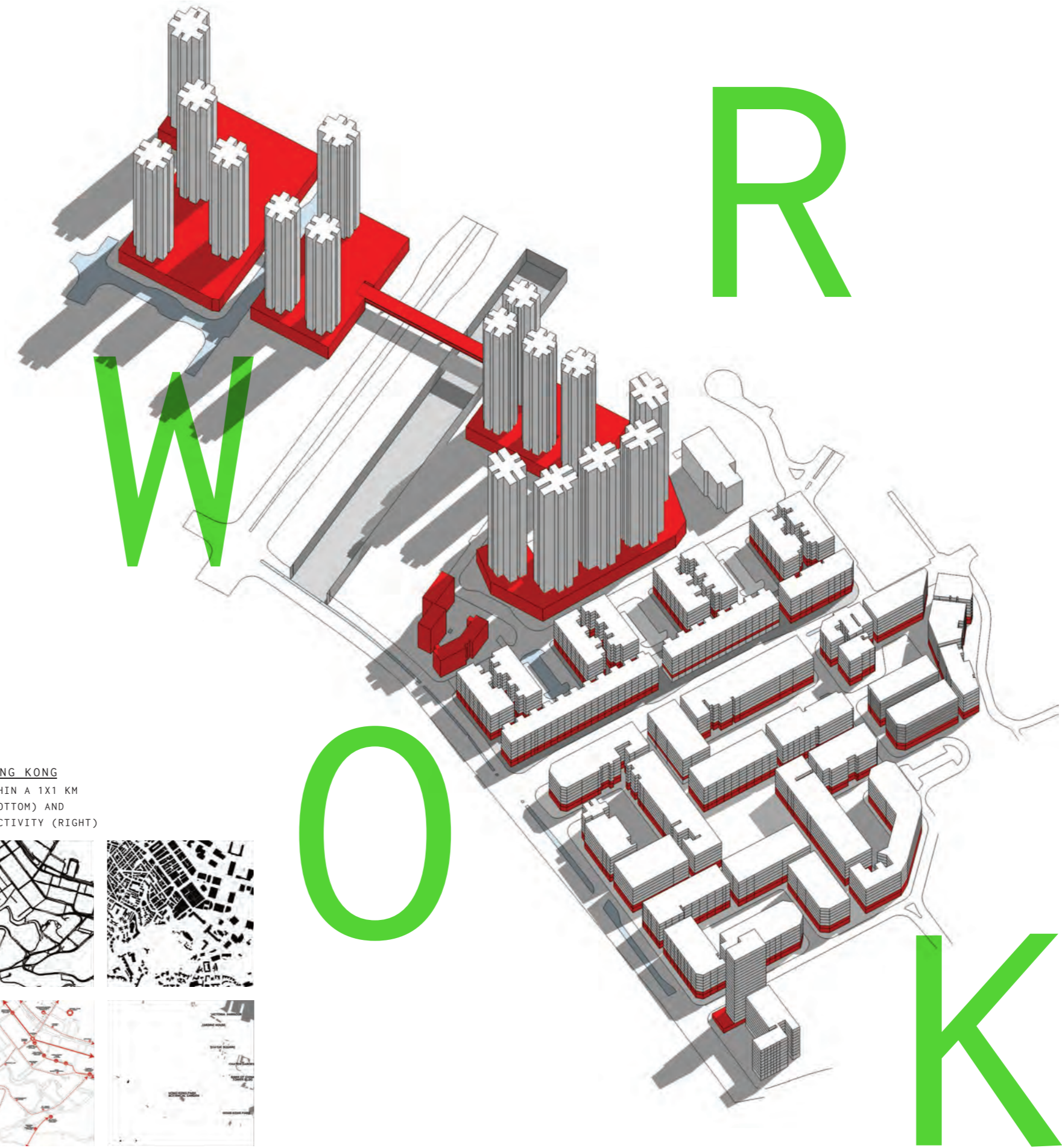
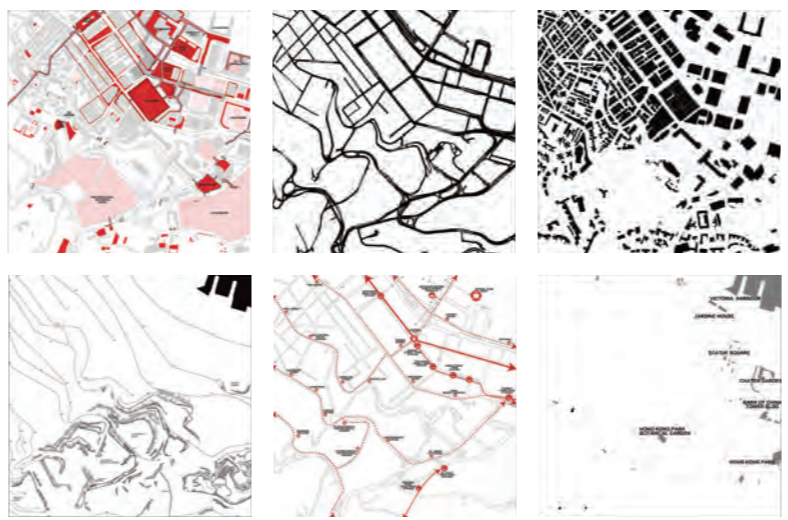


FORM FOLLOWS SYSTEMS
 INTEGRATION OF GREENERY (LEFT), PUBLIC SPACE (2ND FROM LEFT), ENERGY (3RD FROM LEFT), AND WATER (4TH FROM LEFT) IN A REIMAGINED INSTITUTIONAL BUILDING IN SINGAPORE

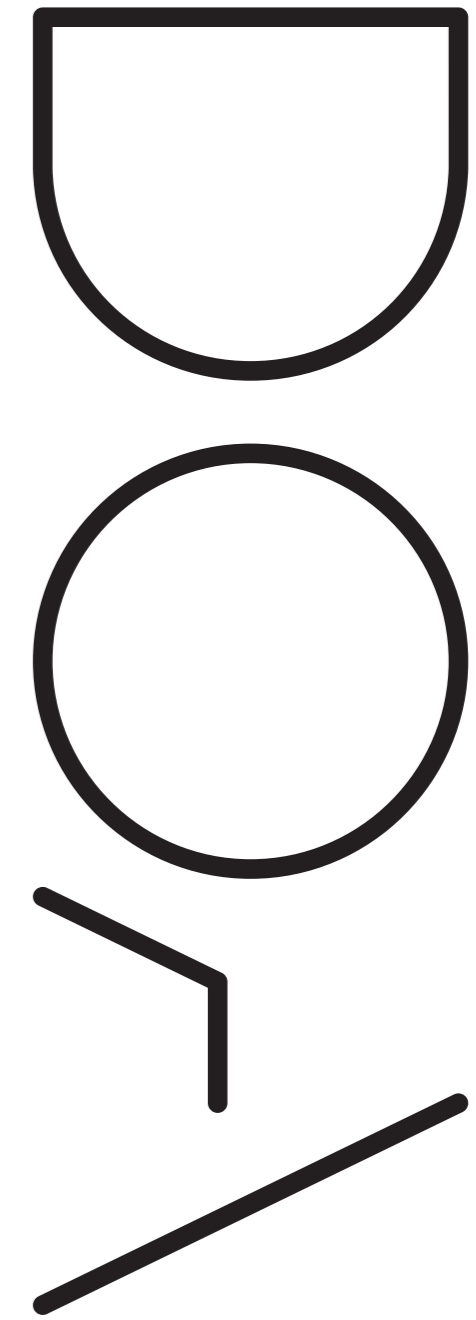


MAPPING ENERGY
 DISTRIBUTION OF ENERGY DEMAND IN A PRECINCT IN EAST SINGAPORE

DENSITY AND LIVABILITY, HONG KONG
 DECONSTRUCTING URBAN LAYERS WITHIN A 1X1 KM PRECINCT ON HONG KONG ISLAND (BOTTOM) AND A PROPOSAL FOR PEDESTRIAN CONNECTIVITY (RIGHT)



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INTEGRATED SUSTAINABLE DESIGN

MASTER OF SCIENCE, INTEGRATED SUSTAINABLE DESIGN