SUSTAINABLE DESIGN OPTION STUDIO 2

2026 SPRING TERM

Course lead: Prof. Khoo Peng Beng

Moderators: Prof. Immanuel Koh, Prof. Daniel Whittaker

Studio Instructors:

1. Prof. Khoo Peng Beng
2. Prof. Eva Maria Castro & Nicholas Lim
3. Prof. Lee Tat Haur

1. Introduction

1.1 Course Description
Option Studio 2: Speculative Urban Futures invites students to imagine alternative trajectories for Singapore by engaging deeply with speculative thinking. Grounded in research on contemporary culture, systems, and global paradigms, the studio encourages students to critically interpret the present while scanning the horizon for emerging futures. Through this process, each student develops individual, critically reasoned positions about possible futures.

The studio introduces diverse techniques of projection, storytelling, and narrative-building, guiding students in transforming trans contextual observations into architectural abstractions and future oriented spatial narratives. **Central to this is an understanding of transcontextuality and the interconnectedness between people, place, and planet—recognising that well-being and regenerative action are inseparable foundations for truly critical sustainability.**

This methodology offers a broader vantage point on sustainability and the role architecture plays in shaping resilient global futures. Students also acquire advanced skills in representation, fabrication, and model making to communicate imaginative and radical proposals. These explorations may take the form of absurd, utopic, or dystopic scenarios—each serving as a provocation that challenges assumptions and inspires thoughtful actions toward a regenerative, sustainable urban future.

1.2 Design Projects
The precise operational directives, briefs and specific sites, will be defined by the individual design critics in separate yet interconnected studio options. Each of these individual studio options will be led by ASD faculty and/or visiting professors and culminate in a speculative final project that will articulate architecturally specific positions regarding sustainable design in real world projects. The descriptions of the individual studio options for Spring 2026 are listed in Section 5.

1.3 Learning Objectives
At the end of the course, students will be able to:
- Identify issues of sustainable design in relation to socioeconomic, demographic and cultural trends, through the analysis of literature and review of architectural precedents
- Perform rigorous site analysis and map the site conditions
- Critique a project brief and develop strong, generative sustainable design concepts
- Translate design concepts into meaningful architectural and/or urban propositions at appropriate scales and levels of granularity
- Create convincing arguments for the design propositions and persuasive visual and tangible evidence

1.4 Measurable Outcomes
- Interpret the sustainable parameters and other issues of relevance to the project using drawings and diagrams
- Respond to a specific project brief and a specific context with a meaningful design concept
- Produce coherent architectural representations and models at sufficient levels of detail
- Communicate convincingly sustainable design propositions in the form of renderings, drawings, simulations, models

2. Course Schedule

Studio is based on a 14-week schedule, from 26 January 2026 to 2 May 2026. Lessons held weekly except Week 7, Recess from 8 March 2026 to 15 March 2026. Each project identifies its particular meeting schedule and work requirements. Ordinarily, there will be at least 2 formal reviews that cut across all studio options: an intermediate (mid-term) design review, and a final review.

Weekly lessons
Tuesday 1230pm-630pm, Architecture Studio 6
Thursday 4pm-6pm, Architecture Studio 6

Mid-term review
Tuesday, 3 March 2026, 1230pm – 630pm, Architecture Studio 6

Final review
Thursday, 23 April 2026, 9am – 6pm, Chinese House

3. Assessment

Components	Percentage	Remarks
Class Participation	10%	Assessed on lesson attendance, quality of peer review feedback, and completion of course survey
Mid-term review submission	30%	Assessed on timely submission and project assessment criteria. Refer to notes below
Final term review submission	60%	Assessed on timely submission and project assessment criteria. Refer to notes below

Projects will be reviewed and assessed based on 4 criteria:
- their conceptual strength,
- the coherence of their architectural translation,
- their representative clarity and expressive power,
- and the persuasiveness of their communication, both orally, and through the physical and digital artefacts

Moderation will be held to ensure parity in grading across studios.

Letter grading is used for assessment.

Letter Grade	Grade Point	Explanation
A+	5.3	Exceptional performance
A	5.0	Excellent performance
A-	4.5	Excellent performance in most aspects
B+	4.0	Very good performance
B	3.5	Very good performance in most aspects
B-	3.0	Good performance
C+	2.5	Fairly good performance
C	2.0	Satisfactory Performance
D+	1.5	Improvement Needed
D	1.0	Minimally acceptable performance with much improvement needed
F	0.0	Fail

4. Submission Requirements

Digital submission is expected as well as a physical presentation. Instructors to provide students with an online link to collect online submissions.

4.1 Online submission specifications
- Original plans and boards in *.pdf file format; settings printing quality, but not larger than 50MB per file
- Slides in *.pdf file format where applicable
- Other files such as movies, animations where applicable

4.2 Physical model submission
- Details on model submission will be shared nearer review dates. Ordinarily, students are expected to make a submission the day before actual review. Submissions will be tagged for assessment purpose.
- Where applicable, selected models will be kept by pillar after review for accreditation purpose. Students will be informed if their models are selected.

4.3 InDesign file submission
- Using the InDesign template to document your Option Studio 2 works for the ASD Annual Publication.

5. Option Studios

There are 3 studio options for Spring 2026.

Instructor	Studio Title
Prof. Khoo Peng Beng	Quantum City: A Singapore-Bali Studio
Prof. Eva Maria Castro & Nicholas Lim	coastal assemblages: 2050 SINGAPORE
Prof. Lee Tat Haur	Infrastructures of Care Hybrid, Multiplicitous, and Socio-Collaborative Urban Futures

Refer to Annexes for studio briefs and instructors' profiles.

6. Important Notices

6.1 Plagiarism
Students are reminded that plagiarism is not acceptable at SUTD, all works should be original with proper credits given where applicable.

6.2 Originality of work
The work must represent the student's own effort. Work cannot be substantively done by another including outsourcing.

6.3 Submissions and presentations
All submissions and presentations are compulsory for all students; unless prior excuse with valid reason has been sought and approved by studio lead. Failure to meet any required items will result in grade penalty.

6.4 Warning Letters
In the case where someone is underperforming, students will be issued with a formal warning letter. These are taken seriously with the intent not to be overly punitive but to give students timely warning, so they may seek support and resolve the issues and graduate successfully.

6.5 Studio Attendance
Attendance for studio sessions are vital for the successful completion of the course as discussion and desk critiques are an essential part of the studio experience. In the event that a student is absent for more than 4 studio sessions without valid reasons, the studio instructor reserves the right to award a grade F or Incomplete at the end of term. A warning letter will be issued to students when he/she missed 2 studio sessions. Students are reminded to inform faculty in advance of any absences and to submit any valid reasons of absence thereafter.

6.6 Extension
Under exceptional circumstances, as assessed by individual studio instructor and course lead, a student may be granted an extension for the completion of the course. Three conditions for granting an extension are noted:

1. Request by student due to reasons (non-medical). Up to maximum 3 weeks. Final grade is capped at B maximum.
2. Request by student due to medical reason with supporting documentation. If the medical certificate states the period of rest, the same period of extension shall be granted without cap of grade.
3. If documented medical condition is chronic, 3 weeks extension can be given without a cap on grade. Further extension shall be subject to case-by-case evaluation.

6.7 Selected Works
Selected models and other materials may be retained by the school for use in accreditation and moderation, and also for display as representations of option studio's work.

6.8 Studio Use
Students are responsible for the orderly and tidy use of the studio spaces. This includes dedicated times at the end for cleaning up which must be attended by all. Any infringement or disturbance to the space of others may be subjected to punitive action.

7. Other Matters

For curriculum matters, please approach your respective studio instructors or studio TA, Hannah Lee at 8210 4122 or Telegram at @chinajelly.

For administrative assistance, please approach ASD office:
Ng Wee Yi weeyi_ng@sutd.edu.sg
Kathy Sim aileng_sim@sutd.edu.sg
Lee Kah Wee kahwee_lee@sutd.edu.sg (Studios and Materials)

Annex A: Studio Instructors' Profiles

Prof. Khoo Peng Beng
Studio Title: Quantum City: A Singapore-Bali Studio

Professor Khoo Peng Beng founded his architectural practice, ARC Studio Architecture + Urbanism, with his wife, Belinda Huang in 1998 and now have projects in Singapore, Malaysia, China, India, Cambodia, Timor Leste and Rwanda. In 2020, he and his wife were conferred the prestigious President's Design Award Designer of the Year award in recognition of their design excellence, contribution to the community and their passion in sharing with the younger generation.

Peng Beng is the current Head of pillar at SUTD's ASD Pillar. Prior to this appointment, he has been teaching in the National University of Singapore (NUS) for more than 20 years, skilfully inspiring his Master's students to develop a creative mindset with thought provoking projects. His research interest is in quantum consciousness, holarchy, trans-contextuality, deep sustainability and integral ecology in architecture. He led an international design studio representing the NUS at the Seoul Biennale of architecture and Urbanism 2017.

Peng Beng's transformational work, the Pinnacle@Duxton redefines high rise high density public housing and shows that living closer together can be sustainable, green and even fun. His interest in the design environment has been exhibited at the Venice Biennale, Sao Paulo Biennale and other international exhibitions.

His studio will cover challenges affecting our world today and how design thinking offers different solutions and ways of looking at these issues that will transform them into opportunities for a more sustainable future for all.

Prof. Eva Maria Castro
Studio Title: coastal assemblages: 2050 SINGAPORE

Eva Castro is a professor of practice at AS+D – SUTD, Singapore, where she currently is the coordinator of Core Studio 2 and co-leads the advanced option studio on landscape urbanism.

She has been the director of the Landscape Urbanism Unit at Tsinghua University in Beijing and a visiting professor at the Architectural Association in London, where she taught – as a diploma unit master and the director of the Landscape Urbanism Master program since 2003. She has also held positions as visiting professor at HKU, Hong Kong and as honorary professor at X'ian University of Architecture and Technology.

Castro is co-founder of form_axioms lab, a territorial agency for academic research purposes operating from within SUTD, Singapore.

As a practitioner, Castro is cofounder of Plasma Studio and GroundLab. She has been recognized with several awards including the Next Generation Architects Award, the Young Architect of the Year Award and the Contract World Award. Her work is published and exhibited worldwide, including Archilab's 'Naturalising Architecture' and various solo exhibitions and art installations -at the DAZ (Deutsches Architectural Museun) in Germany and the Architectural Association in London. Plasma studio and GroundLab were the lead designers for the International Horticultural Fair in Xi'an, China a 37ha landscape with a wide range of buildings opened in 2011.

Prof. Lee Tat Haur
Studio Title: Infrastructures of Care Hybrid, Multiplicitous, and Socio-Collaborative Urban Futures

Lee Tat Haur is an architect and founder of TAt Architects, has worked on a diverse range of projects, including commercial and residential developments, places of worship, and urban design. He is currently pursuing PhD at Singapore University of Technology and Design (SUTD) under the SUTD PhD President's Graduate Fellowship (PGF).

Tat Haur has extensive experience from roles with DP Architects and the Urban Redevelopment Authority (URA) in Singapore, involved in projects of various scales such as: PubliCity: Your Ideas for Public Spaces Competition (Winner), SIA-LES Archifest Pavilion Design Competition (Special Mention), PLAY@Punggol Competition (2023) (First Runner-Up).

Students under his tutorage have also won awards including the RIBA President's Medal (UK 2017) and ACARA Rookie Architect of the Year Award (Thailand 2022).

In addition to his professional practice, Tat Haur is a dedicated advocate of architectural and environmental design education. Engaging in adjunct and part-time teaching at the National University of Singapore, Singapore University of Technology and Design, Temasek Polytechnic, and the Nanyang Academy of Fine Arts, he underscores his commitment to excellence in architecture, education, and the promotion of sustainable urban environments through activities like public talks on architectural and urbanism in Japan and moderating workshops such as the 'Japan-Singapore Smart City EcoSystem Dialogue' in 2019.

Annex B :
Studio Briefs

Instructor	Studio Title
Prof. Khoo Peng Beng	Quantum City: A Singapore-Bali Studio
Prof. Eva Maria Castro & Nicholas Lim	coastal assemblages: 2050 SINGAPORE
Prof. Lee Tat Haur	Infrastructures of Care Hybrid, Multiplicitous, and Socio-Collaborative Urban Futures

20.112 Sustainable Design Option Studio 2

Studio Title: Quantum City: A Singapore-Bali Studio

Khoo Peng Beng

Tuesday, 12.30pm – 6.30pm, Studio 6
Thursday, 4pm – 6pm, Studio 6/Zoom Consultation

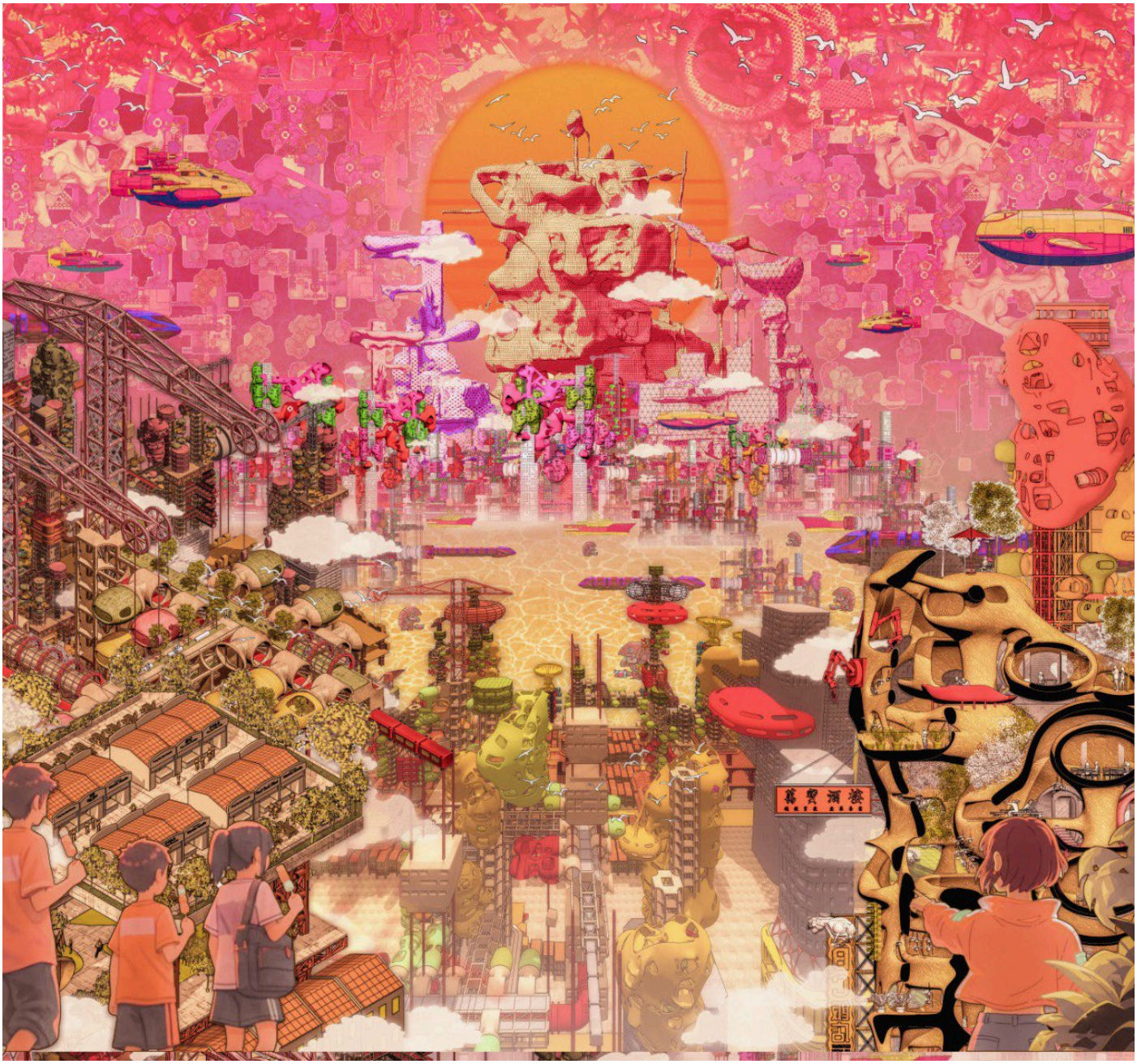

Image source: Ko, Suhun(2025)

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1. PREAMBLE

Our foundational understanding of reality – of what matter is – is totally changed by the quantum paradigm. The ideas of Newton, Darwin, Freud, Marx, Sarte, Foucault - the basic sources of today's world view have been overtaken by new discoveries. In the worldview of the emerging quantum paradigm, the universe is not a lifeless, soulless aggregate of inert chunks of matter, it is instead a living organism. Life is not a random accident, and the basis of the human psyche is more than about survival and self-gratification. We are all a part and simultaneously a whole in our inter-connected universe. How does this new paradigm affect our well-being, our city and architecture?

The studio is interested in exploring consciousness, the quantum paradigm and the dance of relationships and materials that affect our overall perception and being in architecture. We will start by immersing ourselves in a comparative study of Singapore and Bali, discovering the inter-play of our inner worlds and outer worlds that make up the spirit of the place. Studio members are free to explore multiple contexts and inter-subjective enquiries, experimenting with a variety of techniques to present and represent their own subjective and objective response to the city viewed through a broad understanding of the Quantum paradigm. The specific focus will be the interactivity of the observer and the observed universe.

Through a dance of subjective and objective interpretation and reading of place, studio members will speculate on possible future trajectories of Singapore. They will scan the futures horizon to look for signals of possible futures and transforming them into design drivers for these design fictions that are based on existing research and technology.

2. DESIGN RESEARCH PROJECT

Students will conduct a warm data (Bateson) urban experiment from the perspective of Ken Wilber's AQAL framework. They will investigate the following:-

1) their own inner subjective response to the site and what affects how they individually perceive the site
2) the subjective Genius Loci or spirit of the place
3) an objective – the tangible and observable aspects of the individual and how it is expressed on the
4) the objective and tangible aspects of the space and place

Students will translate their research and responses into drawings and models which will be supplemented by their other forms of research. They are free to choose any contexts that interest them or that emerges from their interaction with the site and its people. They will be asked to explore and understand their own feelings and thoughts and the interrelationship between the Physiosphere, the biosphere, the noosphere and theosphere (Wilber).

From the initial responses, students will speculate on a fictional city and create an architectural narrative that explores the field of inquiry and expresses the ideas and concepts derived from the abstract models, drawings and explorations.

3. RESEARCH METHOD AND PROGRAMME DETAILS

The studio will explore various ways where subjective responses and objective responses are expressed as drawings and models. They will study and investigate the relationships between the various context and their own subjective-objective responses and to develop a hypotheses that they will investigate and develop.

Proposed Programme

Week 1 & 2	Discover – Students work together to make a comparative study of Bali and Singapore from the framework of the Doughnut Economy. Students conduct subjective exploration of their inner responses and unconscious expressions. Research and Analysis via drawings, mapping and	Drawings of site, data and areas of inquiry Objective and subjective drawings Conceptual model of 3D or 4D relationship of data A3 maps and A1 site drawings

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	modeling subjective – objective responses. Cartographic mapping and analysis of site and its surroundings and interpretive drawings and models.	Vision statement of field of enquiry
Week 3 & 4	Define – Asking how can we.. and what if… questions. Mapping insights from week 1 & 2 onto programmes and creating experimental models and diagrams with spatial temporal quantities.	Conceptual and interpretive analogue and digital drawings, collages, models and analytics. Programme and design experiments. Mapping of programmes into spatial requirements. Overall strategic concept masterplan and identification of specific site
Week 5 & 6	Develop – Translating analogue models into digital models and diagrams. Developing plans, sections and story boards	Digital models and parametric models. Development of plans, sections and axonometric drawings. Experimental drawings
Week 7 & 8	Rendering drawings, Create enscape file and fly through	Composing storyboards and renderings of composite drawings Review of preliminary enscape models and proposed fly paths
Week 9 & 10	Prepare large drawings, preparing 3D printing files	Prepare 1:500 scale plans, 1:100 scale combined axonometric model, 1:50 axonometric drawing, 1:100 scape sections, one point perspectives and axonometrics
Week 11 & 12	Preparing movie clip, 3D model, book and printing drawings	Compiling entire body of work into a short 3D movie clip, fly through and book. Recording a video presentation.

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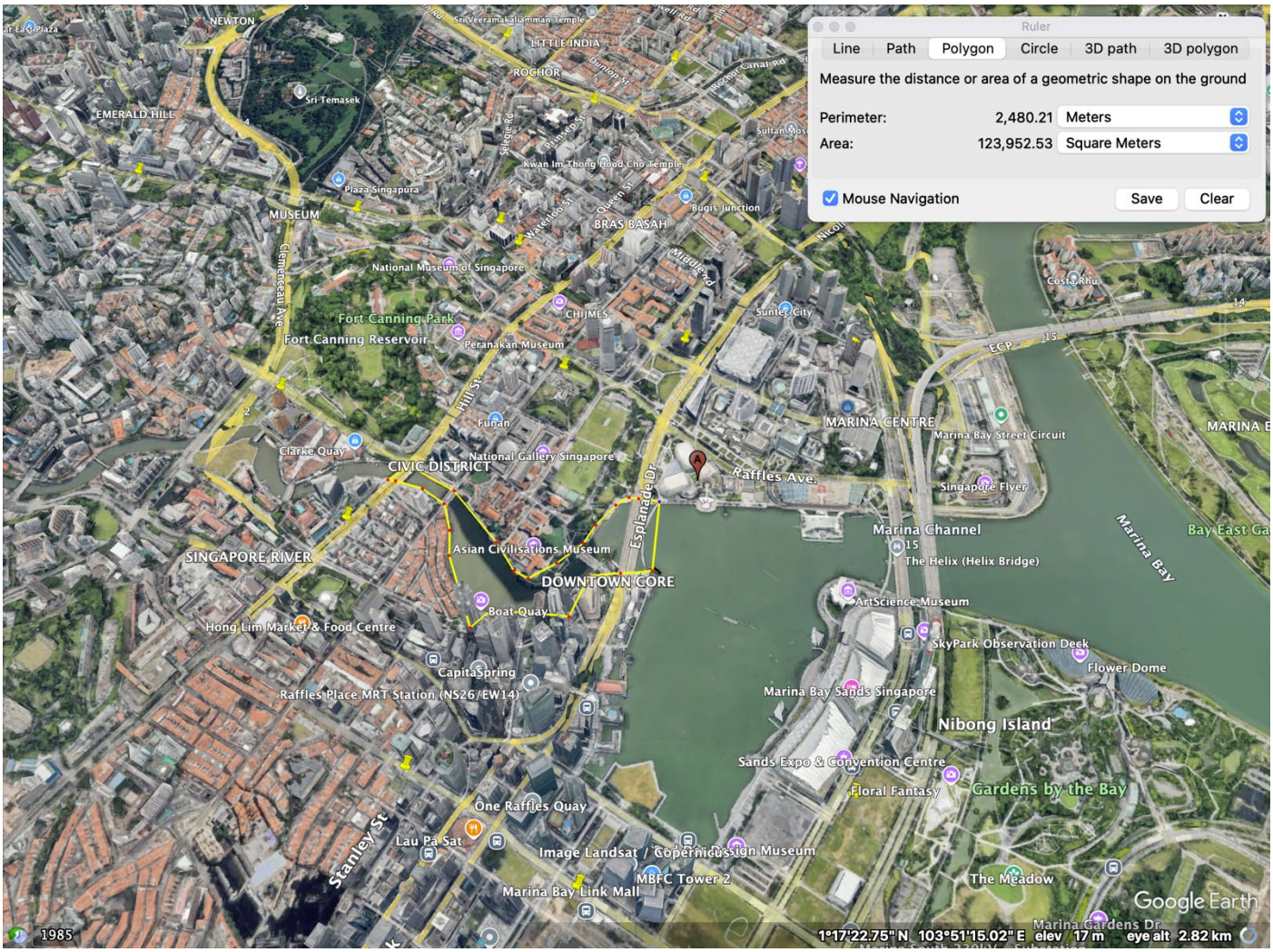
4. RESEARCH SITE

1. A comparative study of Bali and Singapore and its macro context using cartographical techniques
2. Singapore River and interface between land and water



The site is about 12 Ha and a perimeter of approximately 2500m. Students will be asked to propose how the site can be broken up into 7 parts. Each person can choose a part. The site sub-division shall ensure that every student has an edge condition of the site to along the boundaries. Each person gets roughly a 350 length along the site which is a ten-minute walking distance. Students are to study the parts and wholeness from the perspective of understanding the holarchy and how each holon is nested in the next. Students are to negotiate amongst themselves to suit their area of inquiry. Each studenty has about 10Ha of study and it has to include the water edge. Students on their own is a basic holon (a 10Ha precinct).

3. A field trip to Bali

Students will be required to then combine the entire study into a group studio response comprising: -

a) the macro transcontextual study of Bali and Singapore
b) Singapore River Study
c) Bali Field Trip report

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5. COMMUNITY OF PRACTICE, READINGS AND RESOURCES

1. Kate Raworth, "*Doughnut Economics: seven ways to think like a 21st century economist*
2. Christopher Alexander, *"A Pattern Language: Towns, Buildings, Construction"*
3. Nikos A. Salngaros, *"Principles of Urban Structure"*
4. Amerigo Marras, "*ECO-TEC: Architecture of the In-Between"*
5. Paraq Khanna, *"Connectography: Mapping the Future of Global Civilization"*
6. Mitchell Waldrop, "*Complexity: The Emerging Science at the Edge of Order and Chaos"*
7. Jeffrey D. Sachs, "*The Age of Sustainable Development"*
8. Nora Bateson, *"Small Arcs of Larger Circles: Framing Through Other Patterns"*
9. Piero Mella, *"The Holonic Revolution"*
10. Douglas R Hofstadter, *"Godel, Escher, Bach: An Eternal Golden Braid"*
11. Charles Montgomery, *"Happy City"*
12. John Cage & Merce Cunningham, *"Chance Conversations: An interview with Merce Cunningham and John Cage" https://youtu.be/ZNGpjXZovgk*
13. Laurie Anderson, *"O Superman"* https://youtu.be/Vkfpi2H8tOE, *"Born, Never asked"* https://youtu.be/A0ltGjJ7_U8
14. Francis Ford Coppola & Phillip Glass," *Qatsi trilogy trailer"* https://youtu.be/FHMmP5Ayous, *" Koyaanisqatsi"* https://youtu.be/1jM2WA2WbDc, *"Powaqqatsi"* https://youtu.be/BQQAjbXFO5s,
15. Sol Lewitt, *" Sol Lewitt: The Well tempered Grid" https://youtu.be/v-7mM9dK6IU*
16. Michael Murphy, *" Architecture that's built to heal" TED Talk*
17. Mark Anielski, *" The Economics of Well Being"*
18. Ken Wilber, *" A Brief History of Everything"*
19. Don Edward Beck and Christopher C. Cowan, *" Spiral Dynamics"*
20. Italo Calvino, *" Invisible Cities"*
21. *Bernard Tschumi, "The Manhattan Transcripts"*
22. *Jenny Roe and Layla McCay, "Restorative Cities: urban design for mental health and wellbeing"*
23. *Gary Zukav, "The Dancing Wu Li Masters"*
24. *Fritjof Capra, "The Tao of Physics"*
25. *Jeffrey Kluger, "Simplexity: Why Simple Things Become Complex (and How Complex Things Can Be Made Simple)*
26. *CJ Lim and Ed Liu, "Short Stories: London in Two-and-a Half Dimensions"*
27. *Geoffrey West, "Scale: The Universal Laws of Life and Death in Organisms, Cities and Companies"*

6. DESIGN STUDIO SPECIFIC EXPECTATIONS

These are finer-grained extension and elaboration of the Learning Objectives set for Term 8.

i. To understand integral theory and be comfortable with a state of not knowing.
ii. To understand the entire creative process as simultaneous design and research.
iii. To be able to conduct research, to observe and identify the various context affecting any issue or any project.
iv. To be able to translate subjective and objective data into experimental models and representations.
v. To be able to frame fields of enquiry with coherence and clarity.
vi. To be able to formulate appropriate design questions.
vii. To be able to formulate a design brief and abstract experimental responses with appropriate drawings and models.
viii. To be able to translate abstract models and drawings into architecture.
ix. To learn and use new digital tools for fabrication and 3D printing.
x. To create advance abstract representations.
xi. To learn and create an Enscape rendering environment from SketchUp, Grasshopper and Rhino.
xii. To be able to compose a presentation storyboard.
xiii. To be able to understand how to organize and design with holons and in a holoarchy.
xiv. To be able to present complex ideas with clarity and confidence.
xv. To be able to gain an insight into how architecture affects complex systems and multiple contexts.

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7. PRESENTATION AND DELIVERABLES

Deliverables at Interim Reviews to be determined by each Studio Tutor.
At the Final Review, each project shall be described **at minimum** by this baseline set of deliverables:

i. Orthographic architectural drawings (site plan, plans, sections, elevations)
ii. Three-dimensional orthographic drawing (i.e. a 1:100 /1:50 sectional oblique) demonstrating the design research intent and its comprehensive embodiment in the design
iii. Composite Drawing
iv. Physical Models – abstract experiments, study models and final model
v. Descriptive, analytical, or illustrative images chosen to best describe the design research idea
vi. Process drawings to show relevant aspects of the design process, method, and research approach
vii. Enscape rendered model
viii. Fly through and mini movie
ix. Individual Design Journal documenting entire research programme over the semester on Miro and as appropriate in hard copy
x. 7-minute verbal performative presentation at Final review.
xi. A powerpoint presentation and E-book compilation.

The student's design of the overall layout, drawing types, drawing styles, models, digital vs analog, stills vs moving images, graphics, fonts etc. are all part of the design module's assignment.

Together with the verbal description of the project, the visuals argue for each student's architectural research, process, and final proposed design research outcomes.

<u>Other Deliverables</u>

Combined Studio Report (A4 portrait): digital copy and hard copy for department record. A $50 reimbursable expense per studio is granted to each studio.

8. DATES TO TAKE NOTE

- Week 1, 27 January 2026: Pre-Lottery Presentation
- Week 1, 29 January 2026: First studio lesson
- Week 6, 3 March 2026: Mid-Term Review at Studio 6 during studio time
- Week 7 (Recess Week), 8-15 March 2026: Bali Studio Trip
- Week 13, 23 April 2026: Final Review at Chinese House

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coastal assemblages : 2050 SINGAPORE

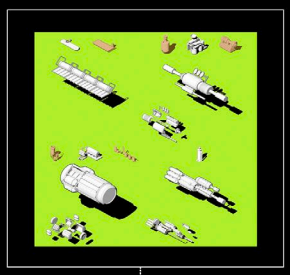
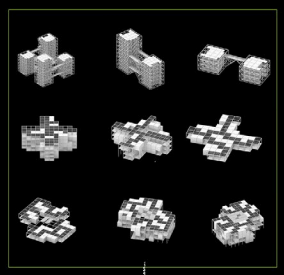
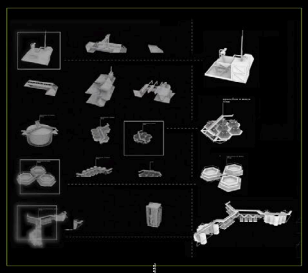
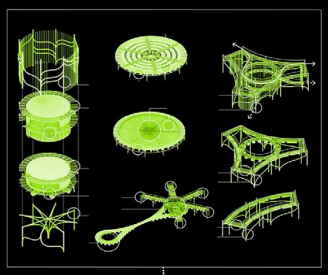
teaching team: eva castro I nicholas lim

I.

PROTOtypes ~~[hybrids & other beasts]~~

_The prefix prot-, or proto-, comes from Greek and has the basic meaning "first in time"or "first formed."

*_"first, source, parent, preceding, earliest form, original, basic," (from PIE *pre-, from root *per- (1) "forward," hence "before, first").*

To define a prototype in this studio will be to critically observe a given type and to capture its essential performativity, to then move away from its pre-assigned, often monofunctional character and set of effects and transit toward projecting new *other behaviors* able to produce *new re-combined effects and* affiliations within the territory where it is to be positioned.

Prototypes in this studio are understood as the nodal articulation of a territory, capable of generating local *intensities* within the [land-sea]scape. By creating these nodes, we are simultaneously designing desired (and specific) performances (1:10/1:100) and attributing hierarchies within the landscape (1:1000/1:10000), designing its nuances and inflections as well as re-defining its *meaning*.

To design a prototype -for us in this studio, will be to allow at times the temptation of the irrational to dance with the generic, to challenge all what we think *it is* and to allow the *unfamiliar* to break through. To foster the unfamiliar is not to be seen as a capricious attitude, rather a decisive intention to question the norm and the status quo. The unfamiliar -as the presence of the not-known, the less-known, will be pursued as a means to decode the traditional and re-code the construction of future relationships.

As the prototype serves as a model for further iterations, it is by default in a continual process of becoming that cannot be abstracted from its spatio-temporal circumstances,

hence in constant connection to ‘its’ context; forming it, affecting it. To capitalise and elongate that transformative quality, the studio will operate procedurally, gradually moving from global observation to operating within a laboratory condition for engendering (families of) prototypes. Within this stage we will maintain the generic as an embedded potential for flexibility; we will work with gradients of variability informed by given parameters and build a comprehensive catalogue.

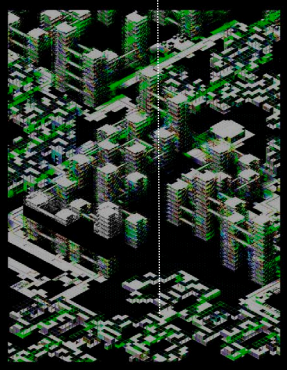
The shift from the type to the prototype is a conceptual shift to redefine the infrastructures that have traditionally served the city -beneath its surface, to alter their monofunctional character and reposition them as active components to materially shape the new city. To visualize infrastructures and infrastructural systems will mean to re-think their traditional continuities and to move toward aggregative logics of discrete components.

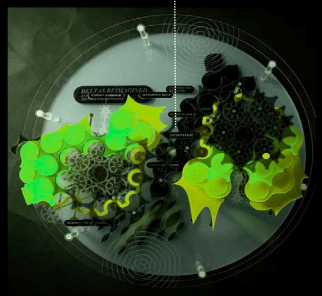
II.

and ***ASSEMBLAGES***

_a collection or gathering of things or people.
_a machine or object made of pieces fitted together.

_Deleuze and Parnet 1987, 69 [1977]) At their most basic, assemblages could thus be thought of as a collection of relations between heterogeneous entities to work together for some time.



To define an assemblage in this studio will be both, to (de)sign_ate combinatory logics; adjacencies and desired inter-relationships among the prototypes through aggregative logics, and to articulate the territory by addressing the prototype(s) specific insertion within an environmental, socio-economic and cultural context. We will ground the said assemblage(s) within the particular condition of the sea and its interface with the land, and will fine-tune it to simultaneously adapt and react, forming a new fabric within the

urban context. The aim will be to build a dialogue of sorts that we will characterize as a coastal artificial ecology.

We will treat infrastructures as a direct agent to engage with the territory. We will pursue the formal and material articulation of the infrastructural prototype, coordinating its operations with the territorial processes, forms and parameters identified in the site, developing its relation to the field, and elaborating its architectural composition.

The studio will first define what are the necessities within the East Coast in Singapore, to then approach the issue from the infrastructural point of view, analyzing existing typologies, working at the edge of their functional capabilities to develop hybrid and highly designed infr*architectures* for new modes of coastal living, that is co-existing with our environment, geography and ocean.

Studio Structure

Week 01 - week 03 : prototype design and experimentation
_formal geometric studies beginning with INHABITATION
_understanding aggregative logics with designed INHABITATION unit types

research and analysis : coastal RESILIENCE, PROTECTION, APPROPRIATION, EXPLOITATION

Week 03 - week 06 HYBRID prototyping (1:10 – 1:100)
_generating hybrids (geometric analysis, performative analysis, global catalogue, phisycal models) that integrate performative infrastructures with housing
_generating family of HYBRIDS

Week 06 - week 07 production mid term review (defining modes of representation akin to the forms and arguments generated)

Week 07 - week 10 phase 02 tile assemblage (1 :100 - 1:1000)
_Aggregation of hybrid : creation of the TILE to understand and demonstrate relationship between hybrids, how the family works together, under what conditions (quantities, limits, site)
_development through production : describing machines, prescriptive drawings, designing mechanisms, physical models (1:10 / 1:1000)

Week 10 - week 13 phase 03 assemblages

_research on environmental logics, territorial emplacement and feedback, iterations
-assemblage strategies of hybrid family onto the site

Week 13 – week 14 production final review
_defining modes of graphical and textual representation akin to the forms and arguments generated

Notes
_The studio will take advantage of the CCA ongoing research and plugin within the East Coast as the testing local bed for the projects.
_Likewise, the CCA network of local and international collaborators, from industry to academic institutes to public agencies will lend its support to the work carried out.
_The best work produced during this studio will be included within the one year programme the CCA organises and will be incorporated in exhibitions, presentations and events in Singapore, NYC, Helsinki and Santiago de Chile.

https://cca-sg.com/

20.112 Sustainable Design Option Studio 2

INFRASTRUCTURES OF CARE
HYBRID, MULTIPLICITOUS, AND SOCIO-COLLABORATIVE URBAN FUTURES

Instructor
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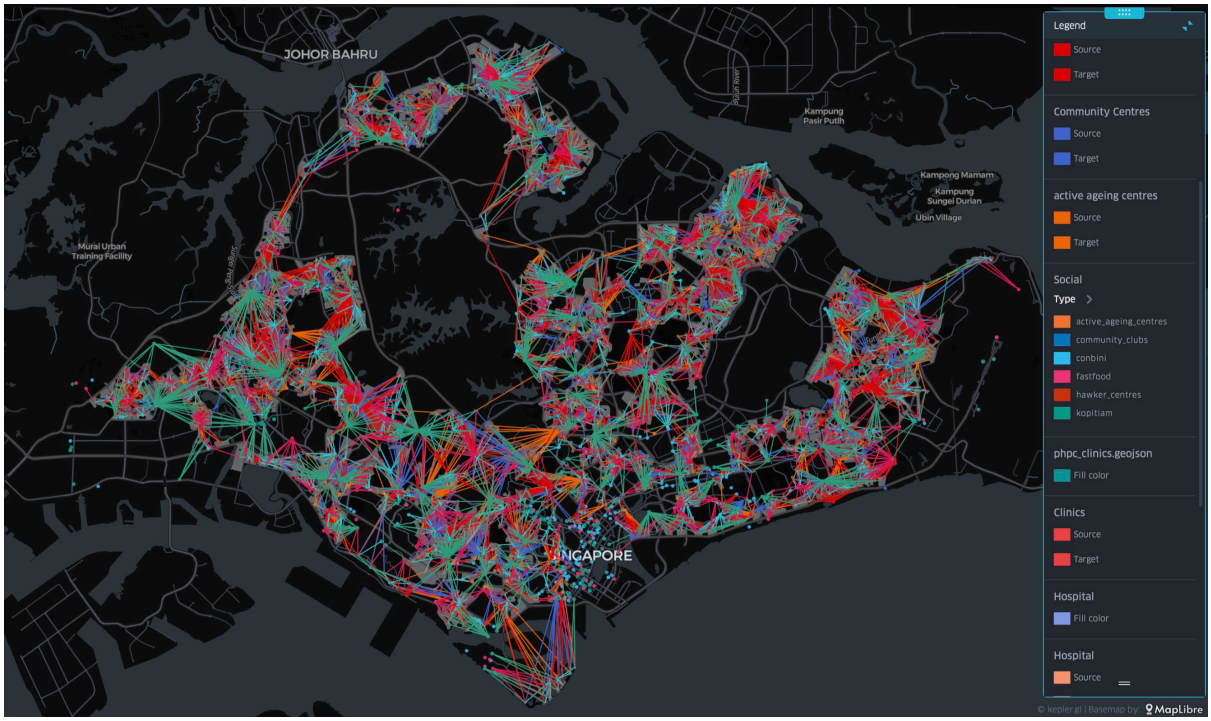
Architecture and Sustainable Design
Singapore University of Technology and Design



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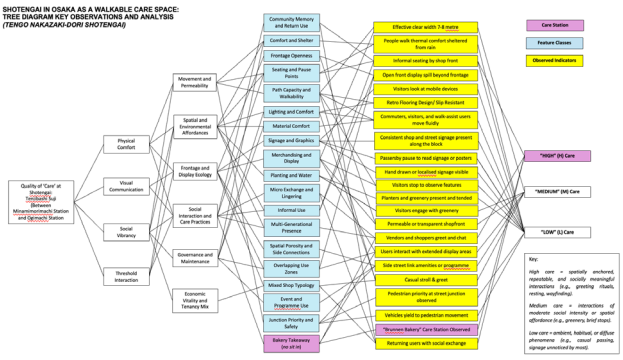
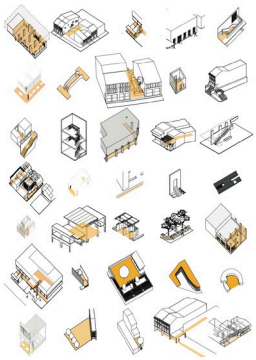
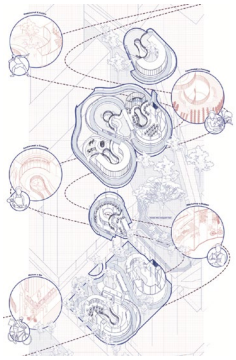




Left (One Image): Lee, T. H. (2025). Spatial research and design for everyday care spaces in our built environment: Walk and Osaka shotengai. Singapore University of Technology and Design, Singapore.
Centre: Student work from LTH Studio, NUS, Design 5 (2024).
Right: Student work from LTH Studio, NUS, Design 5 by Adrian Soh (2022)

PREAMBLE

Third Places, Care, and the Future of Ordinary Urban Life

Cities are sustained not only by formal infrastructures such as transport systems, utilities, and healthcare institutions, but also by subtle yet essential layers of everyday space that support social life, well-being, and informal care. These spaces are rarely recognised as care environments, yet they play a critical role in sustaining daily routines, social familiarity, and intergenerational life.

Ray Oldenburg's concept of the **Third Place** provides a useful lens for understanding such environments. Third Places are informal, accessible, and socially inclusive spaces that exist outside the domains of home and work. They support routine encounters, social levelling, and a sense of belonging through repeated everyday use. In dense urban contexts such as Singapore, many Third Places are embedded within ordinary residential environments rather than formally designated civic spaces.

In Singapore's public housing estates, care often emerges through spatial conditions rather than formal programmes. Void decks become communal living rooms. Sheltered walkways function not only as connective infrastructure, but also as places of pause and chance encounter. **Kopitiams** become sites of routine, recognition, and informal support, where daily habits and familiar faces sustain social ties. Through everyday use, these spaces operate as **urban-spatial infrastructures of care**, supporting emotional comfort, social connection, and mental well-being across generations.

This studio examines how such everyday care spaces might evolve under **future conditions of demographic change, increasing density, and shifting social practices**, and how **architecture and urban design** can support continuity rather than rupture as the city transforms.

STUDIO AGENDA

From Everyday Care to Urban Future Systems

The studio adopts an **urban research-driven architectural design approach**, in which demographic analysis, spatial observation, and the mapping of infrastructures of care are pursued simultaneously. Students move iteratively between urban-scale conditions and everyday neighbourhood spaces within a mature public housing estate in Singapore, allowing insights across scales to inform architectural propositions over the course of the studio.

The studio frames care as a **distributed urban system**, rather than as the sole responsibility of clinical institutions, emerging from networks of everyday spaces, routines, and social relationships. It deliberately focuses on ordinary environments such as neighbourhood kopitiams, markets, void decks, and walkways, on the premise that the greatest urban impact often lies in normal, repeated spaces rather than singular architectural gestures.

Students are encouraged to move from observing individual situations as part of mapping broader **systems of care**, by examining how everyday activities such as eating, exercising, shopping, resting, reading, gaming, and spiritual practices are distributed across space and time. Taken together, these activities form patterns of social connection, emotional comfort, and everyday well-being at the neighbourhood scale.

The studio asks students to consider how these everyday care networks might evolve into **future urban village systems** under conditions of increased density. Futures thinking is embedded by engaging questions of time, ageing, and generational change, and by exploring how today's users and practices may adapt and persist over the coming decades through layered and volumetric arrangements of living, social life, learning, and care.

The studio agenda is organised around four core aims:

i. To identify and map existing infrastructures of care and Third Places, both formal and informal
ii. To analyse how everyday spatial qualities support care, sociability, and well-being
iii. To develop a collective Master Plan that synthesises research and articulates spatial strategies related to density, urbanism, and publicness
iv. To develop individual architectural interventions that respond directly to this shared framework and the observed conditions of everyday life

The studio asks students to work across multiple, interconnected scales:

- Everyday spaces and routines
- Neighbourhood networks and relationships
- Architectural interventions as part of broader urban systems
- The Master Plan as a collective spatial framework

SITE CONTEXT AND SELECTION

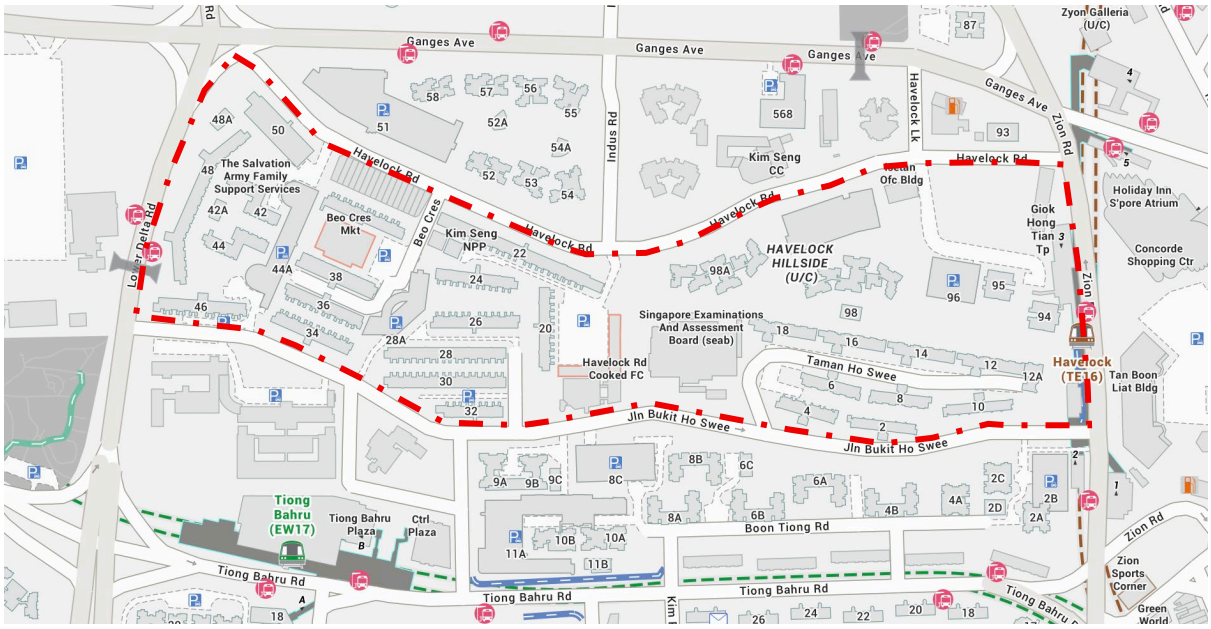
Beo Crescent (former Bukit Ho Swee Area)

The site is located in **Beo Crescent (former Bukit Ho Swee Area)**, which was redeveloped as public housing following the 1961 Bukit Ho Swee fire. Today, Beo Crescent is a mature public housing precinct within the Bukit Merah Planning Area, and characterised by a dense layering of everyday social spaces, care-related amenities, and long-established neighbourhood routines.

The area comprises residential blocks, kopitiams, wet markets, community facilities, healthcare services, and public transport connections, all located within walkable distances. Void decks, covered walkways, and pocket of public spaces form a continuous network of everyday spaces that support informal social interaction and daily care practices, particularly among elderly residents.

Key neighbourhood anchors such as **Beo Crescent Market and Food Centre**, surrounding kopitiams, and adjacent residential blocks function not only as service points, but as **everyday Third Places** where routine encounters, recognition, and informal support take place. The proximity of transport nodes and community services intensifies daily use and reinforces the area as a lived urban environment rather than a purely residential enclave.

This site is selected not as a blank slate for intervention, but as a **working landscape of care**, where spatial qualities, social routines, and informal support networks already exist. The studio approaches the site as an environment to be carefully read, mapped, and understood before architectural propositions are developed. Design interventions are expected to respond sensitively to existing everyday practices and strengthen the spatial conditions that support care and social life.



One Map: Beo Crescent, Tiong Bahru

THEORETICAL FRAMEWORK

The studio draws from a set of interrelated theoretical perspectives that inform both research and design decisions. These perspectives operate as analytical lenses, guiding how students read existing environments and develop architectural responses.

- **Third Place Theory** (Oldenburg, 1989; Putnam, 2000): Informal social spaces that support everyday sociability, social levelling, and community life beyond home and work.
- **Human Scale Urbanism** (Gehl, 2010; Whyte, 1980; Alexander et al., 1977): The relationship between spatial configuration, comfort, visibility, and everyday social activity.
- **Lived Space and Urban Rhythms** (Lefebvre, 1991; Lefebvre, 2004; de Certeau, 1984): How daily routines, repetition, and movement shape the experience of space over time.
- **Urban Well Being and Restorative Environments** (Jacobs, 1961; Cooper Marcus & Sachs, 2013): How ordinary spatial conditions contribute to mental comfort, familiarity, and low intensity restoration

RESEARCH QUESTIONS

The studio will be guided by the following questions:

- Where do Third Places and infrastructures of care already exist within everyday neighbourhood spaces?
- How do spatial qualities such as shade, seating, thresholds, proximity, and visibility support or limit care and social interaction?
- How are care infrastructures distributed across the neighbourhood, and where are gaps, overlaps, or pressures evident?
- How can architectural and urban interventions enhance care while remaining sensitive to everyday use and neighbourhood identity?

METHODS AND APPROACH

The studio adopts a **hybrid mixed-methods framework**, combining spatial analysis, qualitative observation, and architectural design.

1. Shared Group Mapping and Master Plan Study

Urban and Neighbourhood Scale

Students will collaboratively map:

- Formal care infrastructure, including healthcare facilities, community centres, transport nodes, and public amenities
- Informal Third Places and everyday care spaces, including void decks, sheltered walkways, kopitiams, markets, and connectors

Mapping will be supported by **QGIS-based spatial analysis**, conducted at a group level. The emphasis is on spatial understanding and interpretation rather than technical software proficiency.

2. Observation Studies: Visualising Everyday Use, Care, and Spatial Social Identity

A central methodological focus of this studio is how everyday use of space can be **observed, recorded, and visualised**in ways that meaningfully inform architectural and urban design. Many infrastructures of care operate through informal routines, repeated practices, and shared familiarity. These forms of care are often overlooked by conventional architectural drawings or programme-based diagrams.

In dense urban environments, care is not only delivered through formal institutions, but is embedded within **everyday spatial arrangements**, proximity, and repeated encounters. The studio therefore approaches **density and urbanism as lived conditions**, rather than abstract metrics. Density is understood through overlapping uses, negotiated distances, shared thresholds, and accumulated routines that shape how care, sociability, and support are spatially produced over time.

Observation Methodologies

The studio's observational approach is grounded in established methodologies from urban studies and architectural research.

William H. Whyte's study of everyday public life foregrounds **direct observation, filming, and behavioural mapping** as tools to understand how people actually use urban space, rather than how designers assume space is used (Whyte, 1980). His work demonstrates how informal patterns of sitting, lingering, movement, and social interaction reveal the social life embedded within ordinary urban environments.

Building on this, Jan Gehl and Birgitte Svarre provide systematic methods for **studying public life**, emphasising time-based observation, counting, mapping, and recording everyday activities as a basis for human-scale urban design (Gehl & Svarre, 2013). Their work reinforces observation as a design-generative practice rather than a purely analytical exercise.

Edward T. Hall's research on spatial behaviour further informs the studio's attention to **proximity, distance, and embodied spatial relationships**, highlighting how spatial arrangements shape social interaction and perception in everyday settings (Hall, 1966). His work supports a reading of space as socially and culturally produced through repeated encounters and spatial cues.

Together, these frameworks position observation not as preliminary data collection, but as a **foundational architectural methodology** for reading everyday life, care practices, and spatial social identity.

Students will employ a set of visual and spatial documentation techniques, including:

- **Density and Urbanism**
  Examining how everyday activities, movements, and social interactions accumulate and overlap within limited spatial environments, and how architectural elements such as corridors, void decks, ground floors, and thresholds mediate dense patterns of use.
- **Behaviour Mapping and Spatial Social Identity**
  Recording where people sit, stand, move, linger, wait, and interact over time, and how these behaviours relate to specific spatial qualities (Whyte, 1980; Gehl & Svarre, 2013).

- **Time-Based Observation**
  Documenting how spatial use changes across different times of day and week, revealing rhythms of routine, care, and social presence (Gehl & Svarre, 2013).
- **Perceptual Walkthroughs**
  Recording spatial experience through movement, noting visibility, comfort, enclosure, thresholds, and sensory conditions, informed by studies of spatial perception and proximity (Hall, 1966).
- **Annotated Drawings and Diagrams**
  Translating observations into plans, sections, axonometric drawings, and layered diagrams that visualise everyday practices rather than abstract functions.

These methods will be applied to everyday neighbourhood spaces such as void decks, sheltered walkways, elevated public spaces, and kopitiams, allowing students to visualise how routine, familiarity, and informal care are spatially produced within public housing estates.

3. Matrices and Pattern Analysis

Students will construct **analytical matrices**, such as:

- Generations × Activities
- Spaces × Routines
- Social Practices × Time of Day

These matrices help identify overlaps, gaps, and spatial tensions, and allow students to select a focused design trajectory early in the studio.

4. AI Assisted Analysis and Projection

AI based tools may be used to assist in:

- Identifying spatial and social patterns
- Synthesising qualitative observations
- Generating speculative scenarios based on existing conditions

AI is treated as an **analytical and exploratory tool**, not as a replacement for design thinking or observation.

5. Care Typologies and Spatial Prototypes

From the research findings, students will develop:

- A **taxonomy of care-related and Third Place spatial conditions**
- Selected **care infrastructure prototypes** derived from observed everyday practices

These typologies function as analytical tools that inform architectural strategies.

6. Architectural Intervention

Individual Project

Each student will propose an a **reimagined architectural intervention and prototype** within Beo Crescent:

- Responds directly to research findings
- Strengthens existing Third Places and infrastructures of care
- Operates at an appropriate architectural scale
- Remains sensitive to everyday routines and neighbourhood identity

Interventions may include new architecture, adaptive reuse, or combination of both.

STUDIO STRUCTURE AND TIMELINE

Weeks 1 to 3
Urban research, mapping, and introduction to theoretical frameworks

Weeks 4 to 6
Qualitative analysis, care typologies, and identification of design opportunities

Mid Term Review
Research findings, mappings, typologies, and initial design direction

Weeks 7 to 10
Architectural design development

Weeks 11 to 13
Design resolution, representation, and final review

DELIVERABLES

Research and Analysis

- Reading of theories (literature to be given)
- Group care infrastructure and Third Place maps
- Group and individual site analysis and qualitative studies
- Care infrastructure typologies and prototype studies

Master Plan (Group)

- Master Plan
- 3D Modelling

Architectural Design (Individual)

- Site plan
- Plans, sections, and elevations
- One comprehensive sectional or axonometric drawing
- Design narrative linking research to architectural intervention
- 3D Model

Representation

- Process diagrams and drawings
- Physical and or digital models

LEARNING OBJECTIVES

By the end of the studio, students will be able to:

- Density, urbanism, publicness … relationship with architectural intervention
- Identify and analyse Third Places and infrastructures of care in everyday urban environments
- Apply mixed research methods to architectural inquiry
- Translate spatial and qualitative analysis into architectural strategies
- Develop architectural proposals grounded in lived urban conditions
- Communicate research driven design clearly and rigorously

NOTES

This studio values clarity, sensitivity, and spatial reasoning over spectacle. Architecture is approached as part of an evolving everyday urban ecology of care, where design responds to lived routines, social continuity, and informal support systems rather than isolated formal gestures.

This studio aligns with the instructor's ongoing PhD research on everyday urban space and Third Places. The studio builds on broader research conversations and collaborations, including ongoing research with Sam Conrad Joyce (SUTD ASD) and Orlando Woods (Singapore Management University) on infrastructures of care in Singapore.

Insights and selected student work from the studio may inform subsequent academic research and publications, subject to student consent and further development.

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