

Module: Architectural Structure

115Z66B

Week 1

This first week is an introductory session of this module. We will be informed on how this semester's schedule looks like, some grounding rules of the module (for facilitator and students), and a brief introduction of this area of study.



Today session's aims and objectives

- To provide a clear outline of the Architectural Structure module (schedule, assessments, etc)
- To communicate ground rules
- To expand what to expect from this module
- To jumpstart the discussion with a hands-on activity related to tectonic thinking

Outline

Of today's session

1 ABOUT THE MODULE

AIM AND OBJECTIVES

LEARNING OUTCOMES

(TENTATIVE) SCHEDULE

ASSESSMENTS AND FEEDBACKS

STUDENT ENGAGEMENT AND REGISTRATION

GROUND RULES OF THE MODULE

WHAT TO EXPECT

2 TECTONIC THINKING

BRIEF LECTURE ON TECTONIC THINKING

PRACTITIONERS: ARCHITECT AND STRUCTURAL ENGINEER

APPLYING TO A NEW SITE



ABOUT THE MODULE

Building on previous tectonics, architectural mechanics and structures modules in year two and first semester of year three; this **17 week module** provides an opportunity to exercise tectonics as an integral process of design.

Active learning is encouraged through scaffolding pedagogical strategies. The format is: lectures, workshops (~~in-class~~ ~~and on-site~~), seminars with student led discussions, practitioners' talk(s) and potentially a site visit.

Aims and objectives of module



#1

To introduce tectonic thinking as part of an integral design process.



#2

To analyse history of construction methods to improve understanding of current available methods.



#3

To apply what students learned in previous related modules collaboratively.



#4

To gain understanding of the importance of technical drawings and their use.



#5

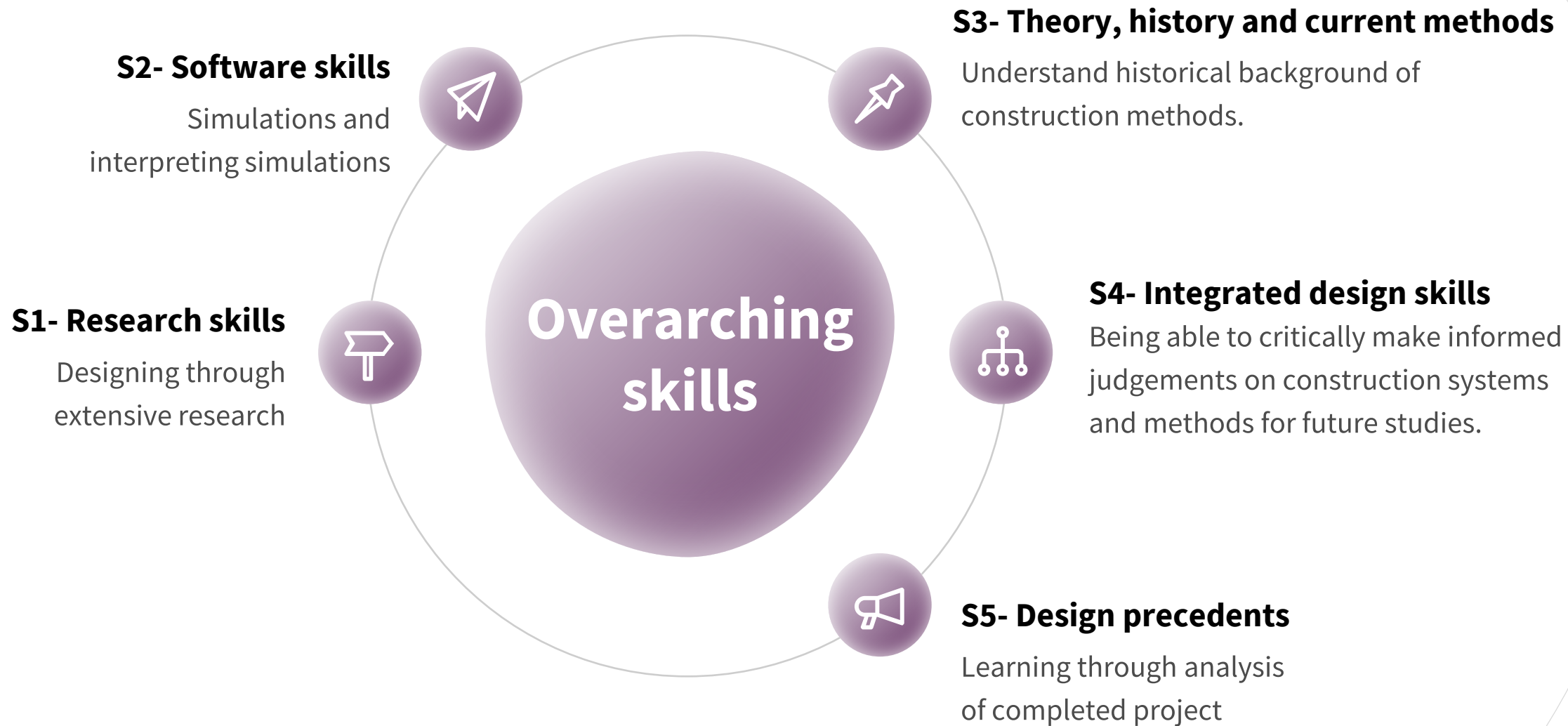
To identify structural systems, building elements, components, connections, construction methods and detailing.

Learning Outcomes



At the end of Semester 2, students should be able to do the following:

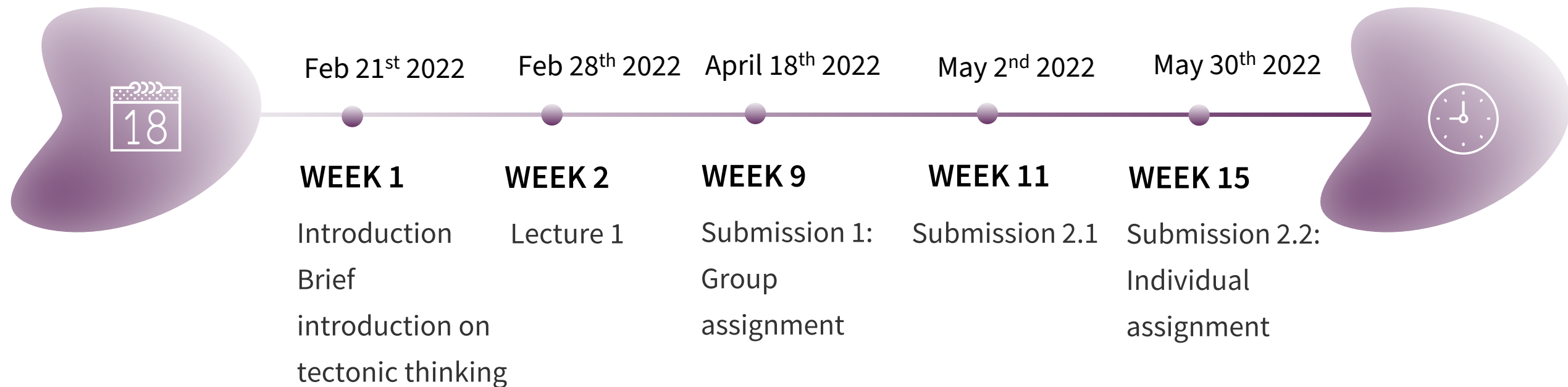
1. Be able to practice **tectonic thinking** by illustrating ability to design with a range of materials and consider their suitability with regards to sustainability, performance, production, application and context.
2. Have improved understanding of **integrated design approach** in relation to the currently available methods of construction.
3. Have exercised **construction skills** including collaboration with other stakeholders.
4. Have exercised the importance of **good communication** through architectural drawings and models.



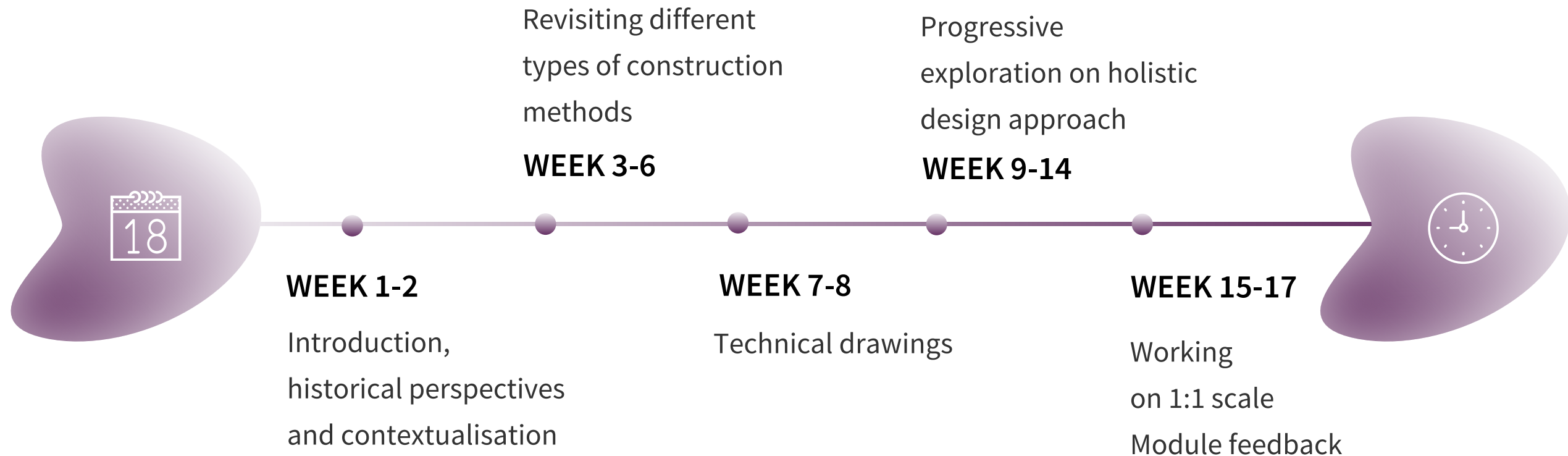
Before you start..

1. Please check that you have access my **website** (<https://miatedjosaputro.com/category/nbu/archi-structure/>). Materials will be uploaded in this site only.
2. Password to access weekly page: **nbu-as**
3. Make a **Disqus** account to leave comments on dedicated weekly page. Link how to upload images, click [here](#). *Note that for submissions, you cannot upload Word/PDF file through Disqus.*
4. Make sure you have joined the **WeChat** and **DingTalk** group chats.

Module timeline



Module's topic summary



List of topics

Week 1-5

Derived from overarching skills

Note: tentative schedule. Please pay attention to announcements via Wechat group chat. To be confirmed in weekly basis due to the current pandemic situation.



Week 1

Introduction of module
Workshop 1: Tectonic thinking



Week 2

Lecture 1: Historical points of view
Assessment 1: Brief



Week 3

Lecture 2: Timber structure



Week 4

Lecture 3: Steel structure



Week 5

Lecture 4: Concrete structure

List of topics

Week 6-10

Derived from overarching skills

Note: tentative schedule. Please pay attention to announcements via Wechat group chat. To be confirmed in weekly basis due to the current pandemic situation.



Week 6

Lecture 5: Masonry structure



Week 7

Workshop 2: Technical drawings



Week 8

Reading week



Week 9

Submission 1



Week 10

Assessment 2: Brief

Lecture 6: Tectonic thinking as holistic approach

List of topics

Week 11-17

Derived from overarching skills

Note: tentative schedule. Please pay attention to announcements via Wechat group chat. To be confirmed in weekly basis due to the current pandemic situation.



Week 11

Lecture 7: Structural analysis for architects
Submission 2.1



Week 12

Lecture 8: Low rise and high rise building



Week 13

Individual tutorial



Week 14

Lecture 9: Urban landscape
Individual tutorial



Week 15

Submission 2.2 (final submission)



Week 16

Peer sharing



Week 17

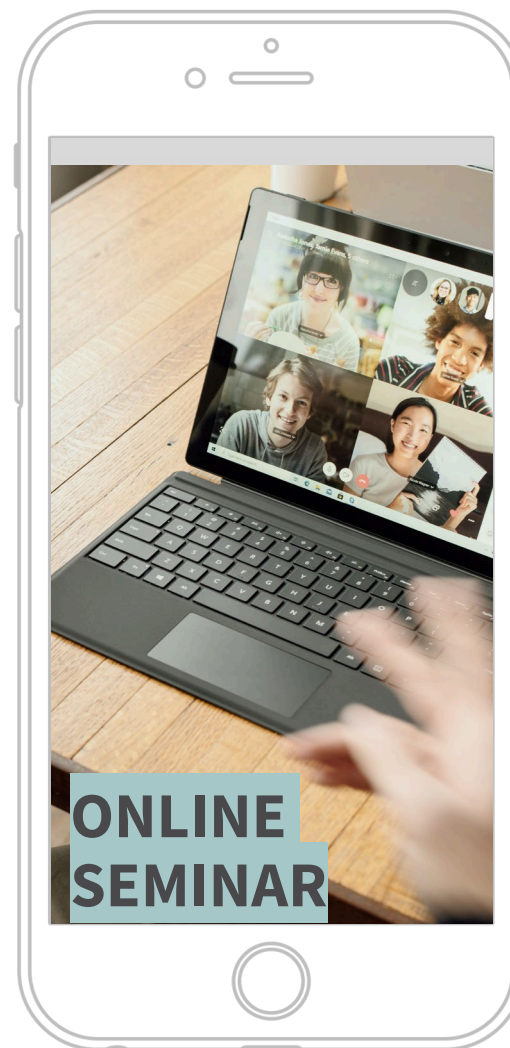
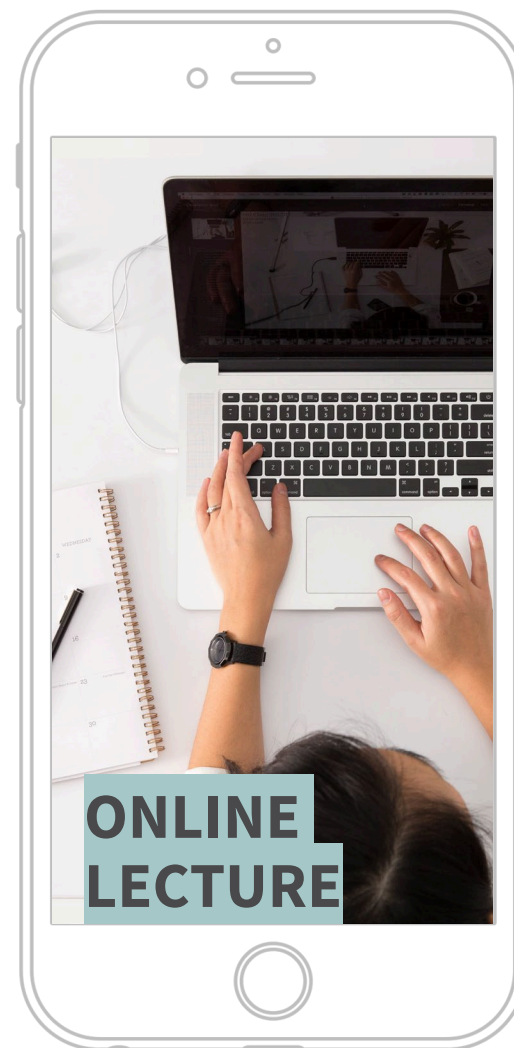
Teacher and students feedback, reflections.

Formats of active learning

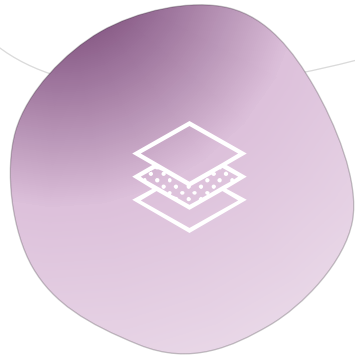
**FLIPPED CLASSROOM
APPROACH**

(REMOTE) SITE VISIT

**ONLINE PRACTITIONER
SHARING SESSION (tbc)**



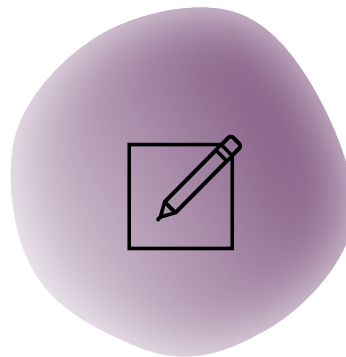
Assessment and feedback



Submission 1: Project submission

Week 9

30%



Submission 2: Essay

Week 15

50%



Attendance and online forum post counts

Week 1-17

20%

Student engagement and registration

1- DingTalk presence.

2- Forum post counts.

You have to be involved in every single discussion post.

Active learning by producing.

Deadline: every Saturday 11:45pm (China time)

Alternative: send me an email with the format 'week no + name + student ID'.

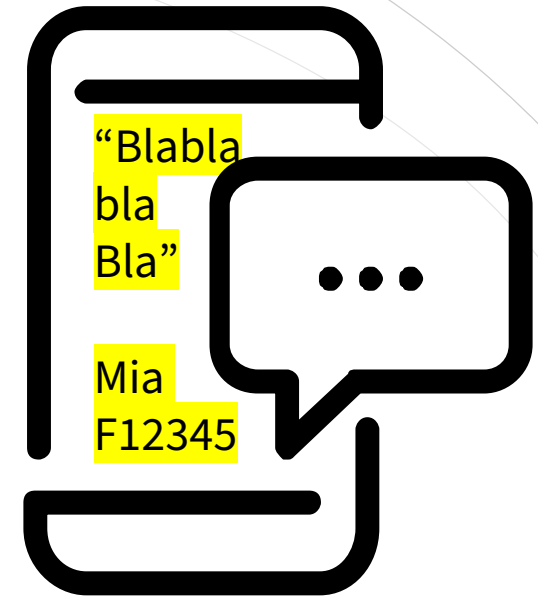
Please note that it is better if you create a Disqus account as sometimes comments need to be moderated.

What do you think?
0 Responses

0 Comments Mia Tedjosaputro 1 Login

Sort by Newest

LOG IN WITH
 OR SIGN UP WITH DISQUS ?



This is how I mark your attendance, spare time to engage in meaningful discussions. Make sure to sign off with in this format: **Name+Student ID**

Forum links will be attached in respective slides.

Ground rules

Any disabilities have to be declared before the beginning of Week 2 class.

Plagiarism is a big issue, in weekly posts or in submissions. It will not be tolerated.

If you have to **miss a class** (*or unable to engage in forum in online environment*) due to extenuating circumstances let me know before the class. Evidence is needed.

Respect your peers whilst engaging in (online or offline) discussions, or any online or offline correspondence. Keep it concise.

I am here to facilitate your learning, you are in charge of your own learning. if you have any learning problems however, kindly notify me.

Mia Tedjosaputro, Facilitator

Preferred academic writing style: **Harvard** referencing style

Download the guide from this link or use *Google Scholar* to generate reference list
<https://miatedjosaputro.com/2021/02/27/week-1/>

IN-TEXT CITATION

Author (Year) or (Author, Year)

Example:

"After that I lived like a young rajah in all the capitals of Europe..." (Fitzgerald, 2004).

or

Fitzgerald (2004) posits that he lived like a young rajah in the capitals of Europe..

REFERENCE LIST

Author (Year).

Example:

Fitzgerald, F. (2004). *The great Gatsby*. New York: Scribner.

(Virtual) office hour

During this online learning environment, I will be happy to received your concern anytime in the day. Preferred method of communication:

Email



MIA@MIATEDJOSAPUTRO.COM

FOR PERSONAL CONCERN
PLEASE SIGN OFF WITH
YOUR NAME+MODULE+STUDENT ID

Group chat



ON WECHAT, IF YOUR CONCERN
MIGHT BENEFIT YOUR PEERS



Teaching materials

Download from this link :

<https://miatedjosaputro.com/category/nbu/archi-structure/>



What to expect from this module

Apart from the listed aims and objective,

1. You will exercise your **independent learning** skills.
2. You will be **more critical** on analysing case studies, theories, methods, etc.
3. You will be able to exercise the notion of “**design by research**”.
4. You will be able to do your own **further learning** and research based on the provided materials.

Recommended reading list

Blake, P. (1968). *Mies van der Rohe: architecture and structure*, Penguin books.

Boake, T. M. (2015). *Architecturally Exposed Structural Steel: Specifications, Connections, Details*, Birkhäuser.

Charleson, A. (2014). *Structure as architecture: a source book for architects and structural engineers*, Routledge.

Macdonald, A. J. (2018). *Structure and architecture*, Routledge.

Minke, G. (2012). *Building with bamboo: design and technology of a sustainable architecture*, Walter de Gruyter.

Pfeifer, G., Pfeifer, G., Achtziger, J., Ramcke, R. & Zilch, K. (2001). *Masonry construction manual*, Birkhauser.

Schierle, G. G. (2006). *Architectural Structures*, University of Southern California.

Steiger, L. (2017). *Basics timber construction*, Birkhäuser.

West, M. (2016). *The fabric formwork book: Methods for building new architectural and structural forms in concrete*, Routledge.



TECTONIC THINKING

What is tectonic approach in architecture?

Tectonics is the science of **art of construction**, both in relation to use and artistic design.

It was derived from a Greek word, “Tekton”, meaning carpenter or builder.

Poetic of construction

Related to material and structure

Tectonics resembles:

- Integration of **structure and construction**
- The application of **technical aspects**
- Attention to detail creativity that reflects **cultural and aesthetic qualities**
- And is related to different aspects of **skills, methods, materials and proportions.**

Al-Alwan, H. & Mahmood, Y. B. (2020). The Connotation of Tectonics in Architectural Theory. IOP Conference Series: Materials Science and Engineering, 2020. IOP Publishing, 012161.

Classical tectonics (as opposed to digital tectonics)

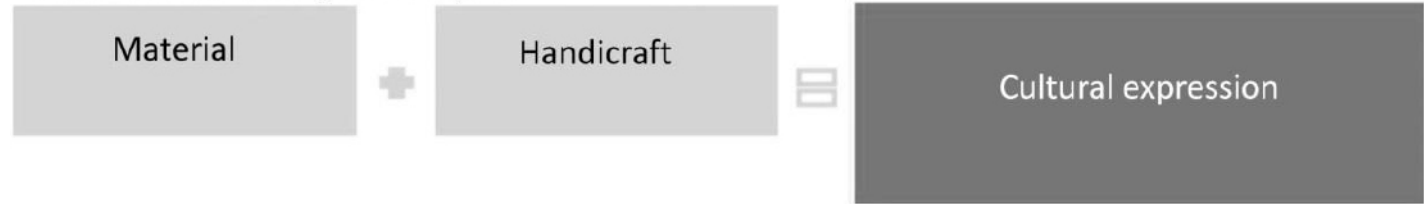
Theorists:

- **Karl Botticher** (1806-1889)
- **Gottfried Semper** (1803-1879)
- **Eduard Sekler** (1920-2017)
- **Kenneth Frampton** (b1930)

Tectonics according to Botticher:



Tectonics according to Semper:



Tectonics according to Sekler:

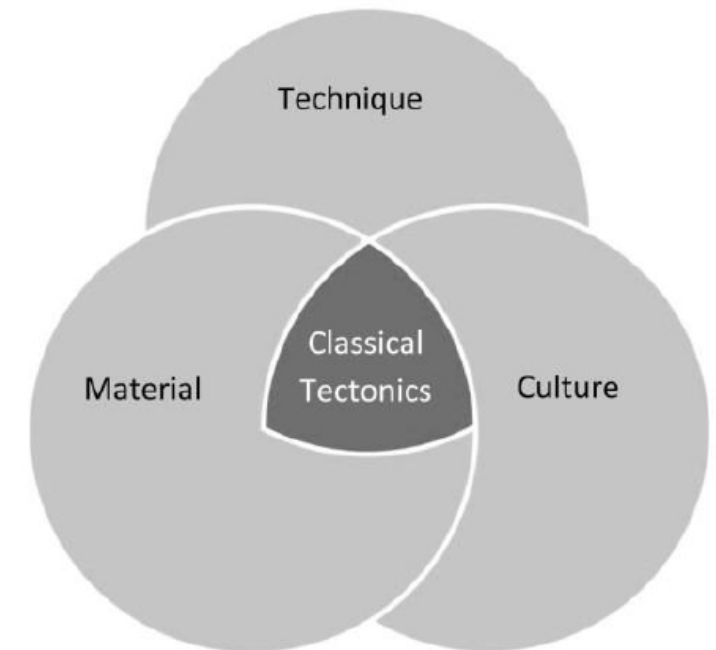


Tectonics according to Frampton:

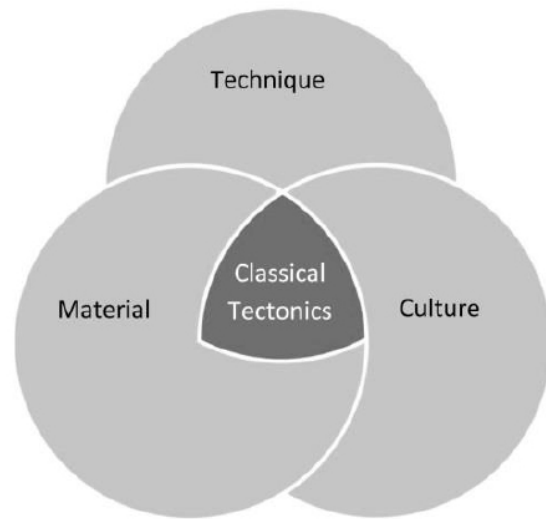


Classical tectonics (as opposed to digital tectonics)

*“**Tectonics** is the essence of architecture that deals with the **aesthetic aspects** of **structure, construction, and materials**. It tends to consider the handicrafts, **details and joints** as **an essential part of architectural practice** and as an important means of **showing cultural expression** by using the simplest techniques and materials. Tectonics creates emotional interaction between people, nature, and culture by its dependence on the human ability to understand the inspirational relations between the elements of the building.”*



Classical tectonics (as opposed to digital tectonics)



A. Palazzetto dello Sport, Rome, 1961, Pier Luigi Nervi. The perfect integration between structure and construction



B. Sagrada Família, Rome, Antonio Gaudí. Details enrich the architectural capacity; enhance it in artistic and decorative sense.



C. Notre Dame du Ronchamp, Paris, *Le Corbusier* 1950 The Ingenuity of joining



D. Waterfall House, Pennsylvania, F. L. Wright, 1935 Full interaction between architecture and environment

Figure 7. The embodiment of Tectonics essential elements.

Classical tectonics: Essential factors



TECHNIQUE

Represented by:
construction, technology
and representation



CULTURE

Represented by art,
handcraft empathy



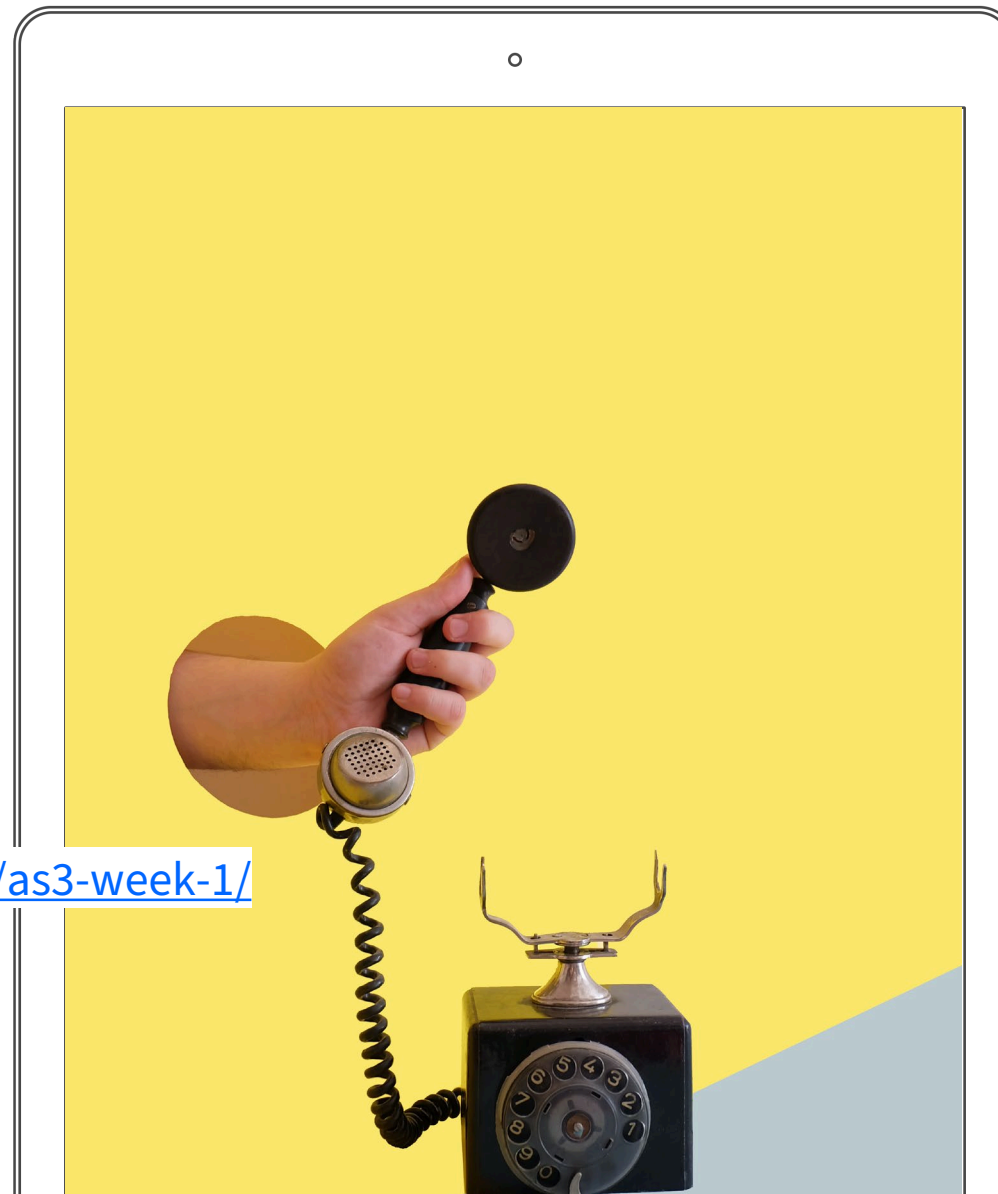
MATERIAL

Represented by structure,
science and ontology

ACTIVITIES

1. WATCHING PRACTITIONERS
DIALOGUE: 30MINS
2. DISCUSSION IN PAIRS: 30MINS
3. APPLICATION TO A NEW SITE
(INDIVIDUAL): 60MINS
4. ONLINE SUBMISSION: 10MINS

<https://miatedjosaputro.com/2022/02/16/as3-week-1/>



1- Practitioners dialogue

**Watch a recorded team dialogue between
an architect and a structural engineer**

Video duration: 25 mins

Note down what they discuss related to
technique, culture and material.

A DESIGN MEETING

[https://youtu.be/29-
xtjX8rAk](https://youtu.be/29-xtjX8rAk)

Next,

2- Discuss in pair:

30 minutes

Three important aspects of tectonic approach

What is tectonic thinking in architecture practice?

**What are the advantages of this mode of thinking?
How would it improve our design?**

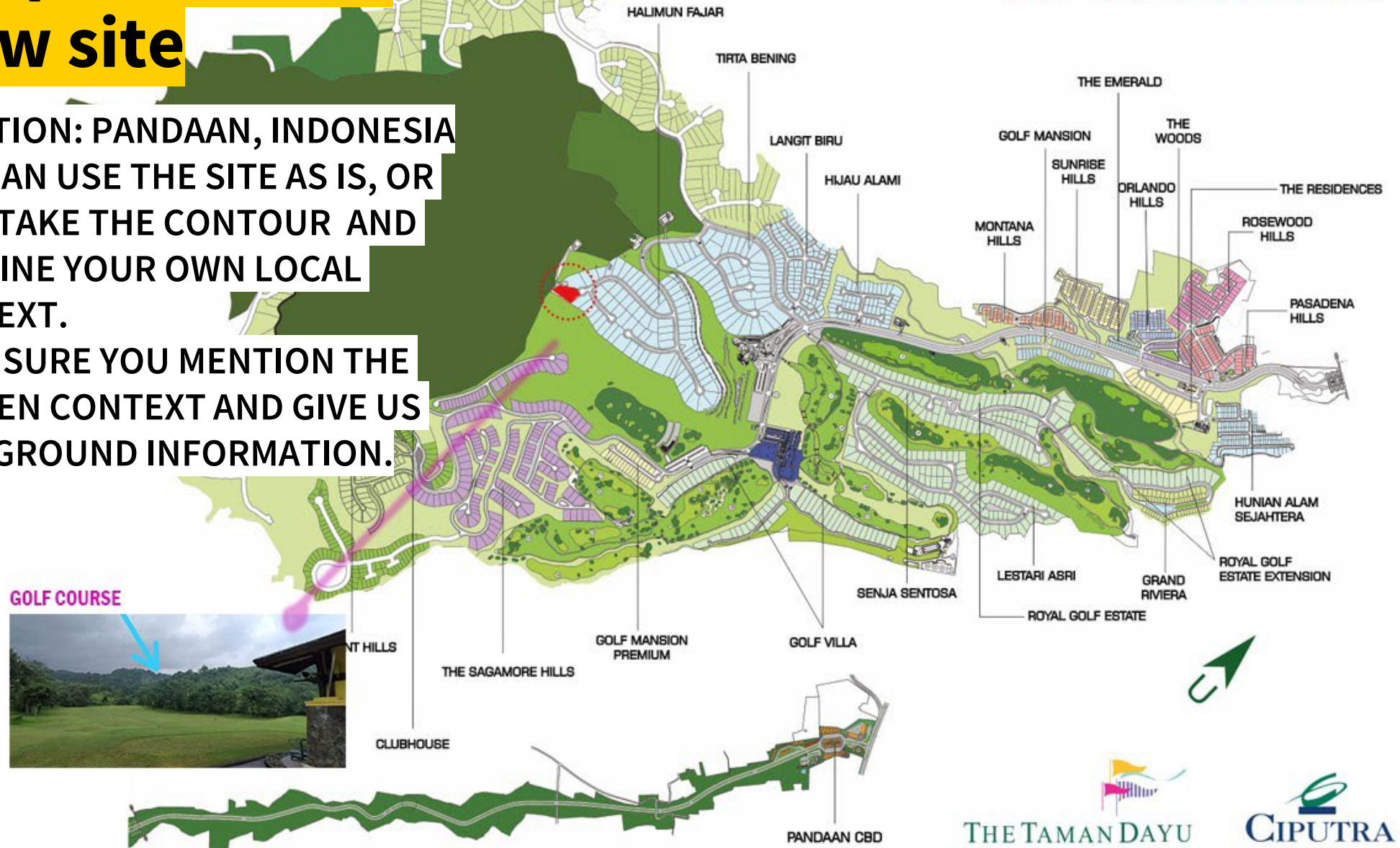
3- Application to a new site

**Get the SKP file of the contour for easy
reference.**

3- Application to a new site

1. LOCATION: PANDAAN, INDONESIA
2. YOU CAN USE THE SITE AS IS, OR JUST TAKE THE CONTOUR AND REDIFINE YOUR OWN LOCAL CONTEXT.
3. MAKE SURE YOU MENTION THE CHOSEN CONTEXT AND GIVE US BACKGROUND INFORMATION.

MASTER PLAN THE TAMAN DAYU



3- Application to a new site

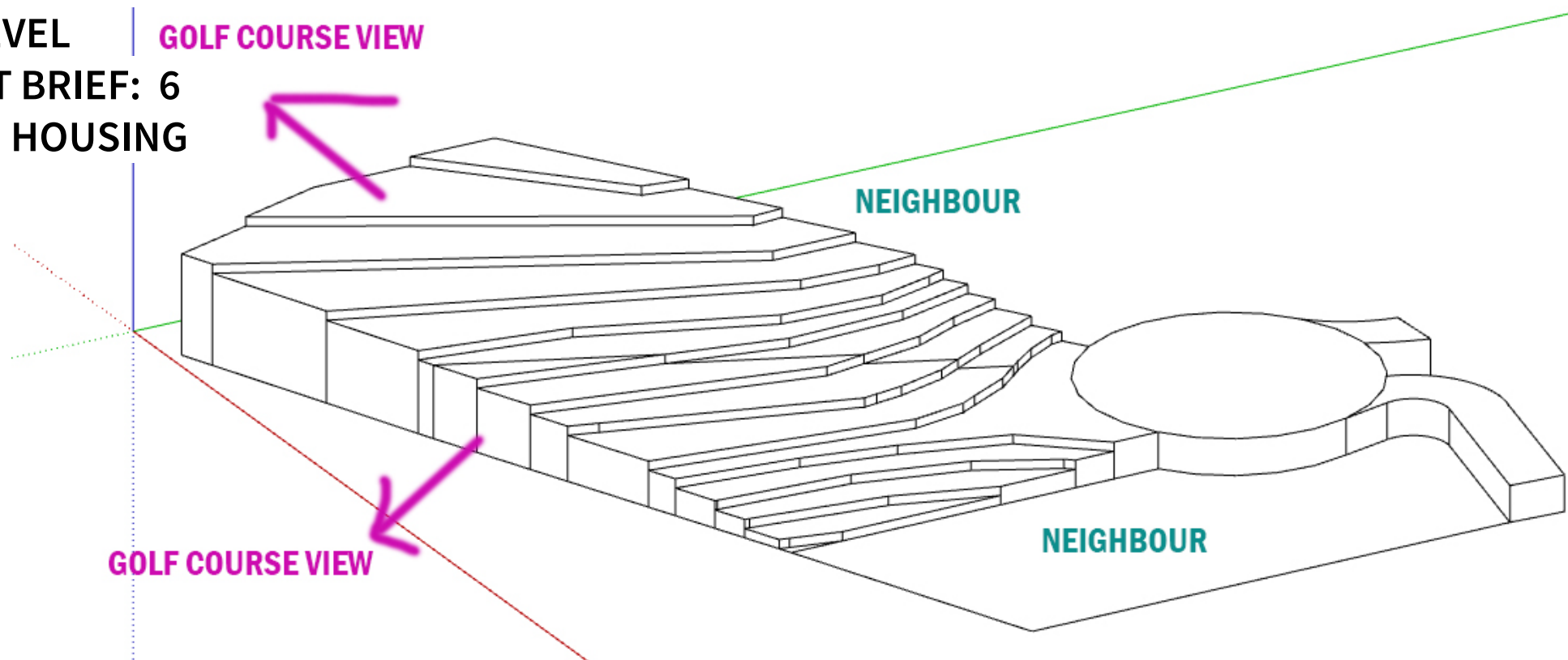
1. 1M CONTOUR LINES
2. HIGHEST LEVEL IS 507M ABOVE THE SEA LEVEL
3. CLIENT BRIEF: 6 MICRO HOUSING

GOLF COURSE VIEW

GOLF COURSE VIEW

NEIGHBOUR

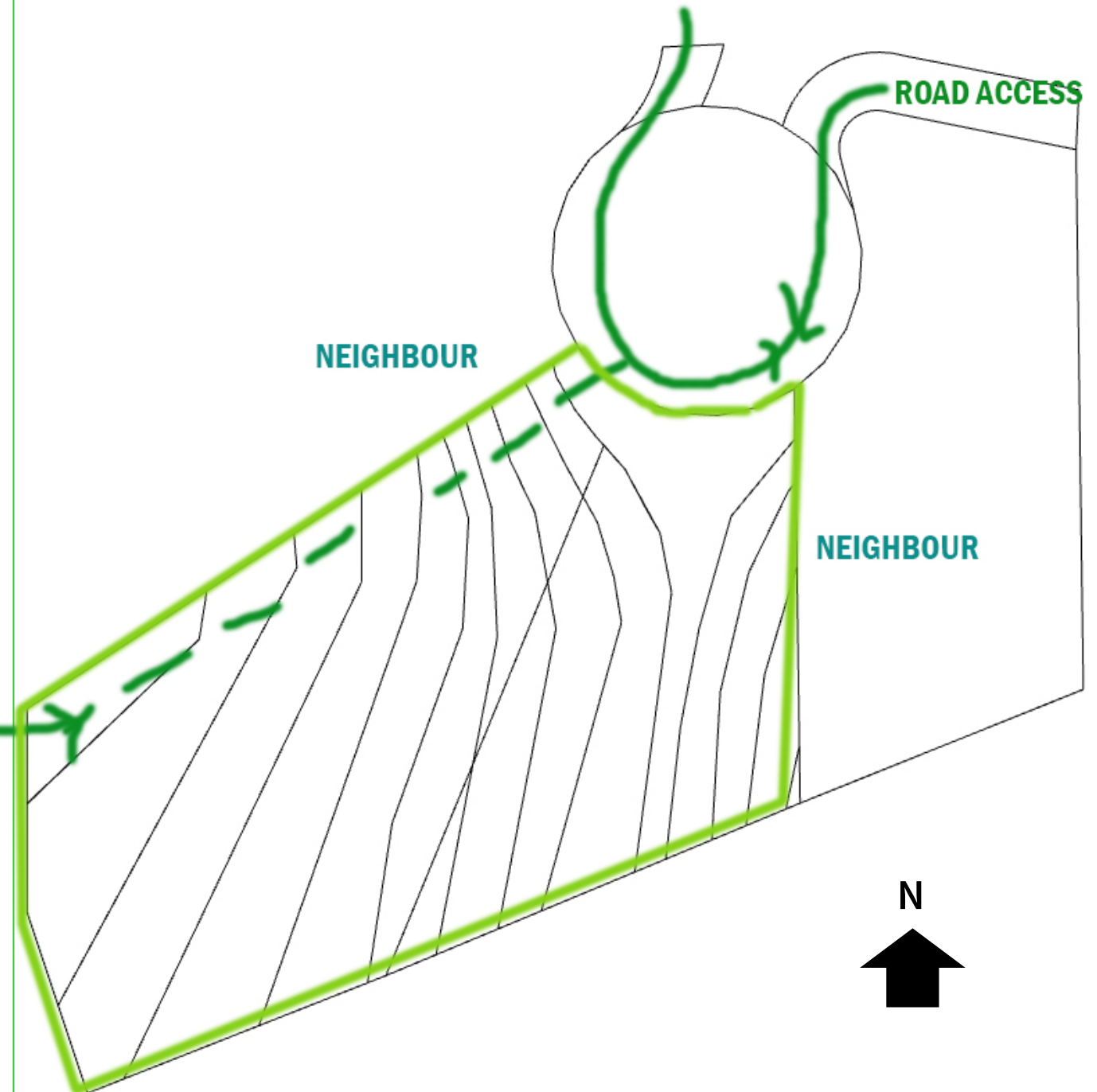
NEIGHBOUR



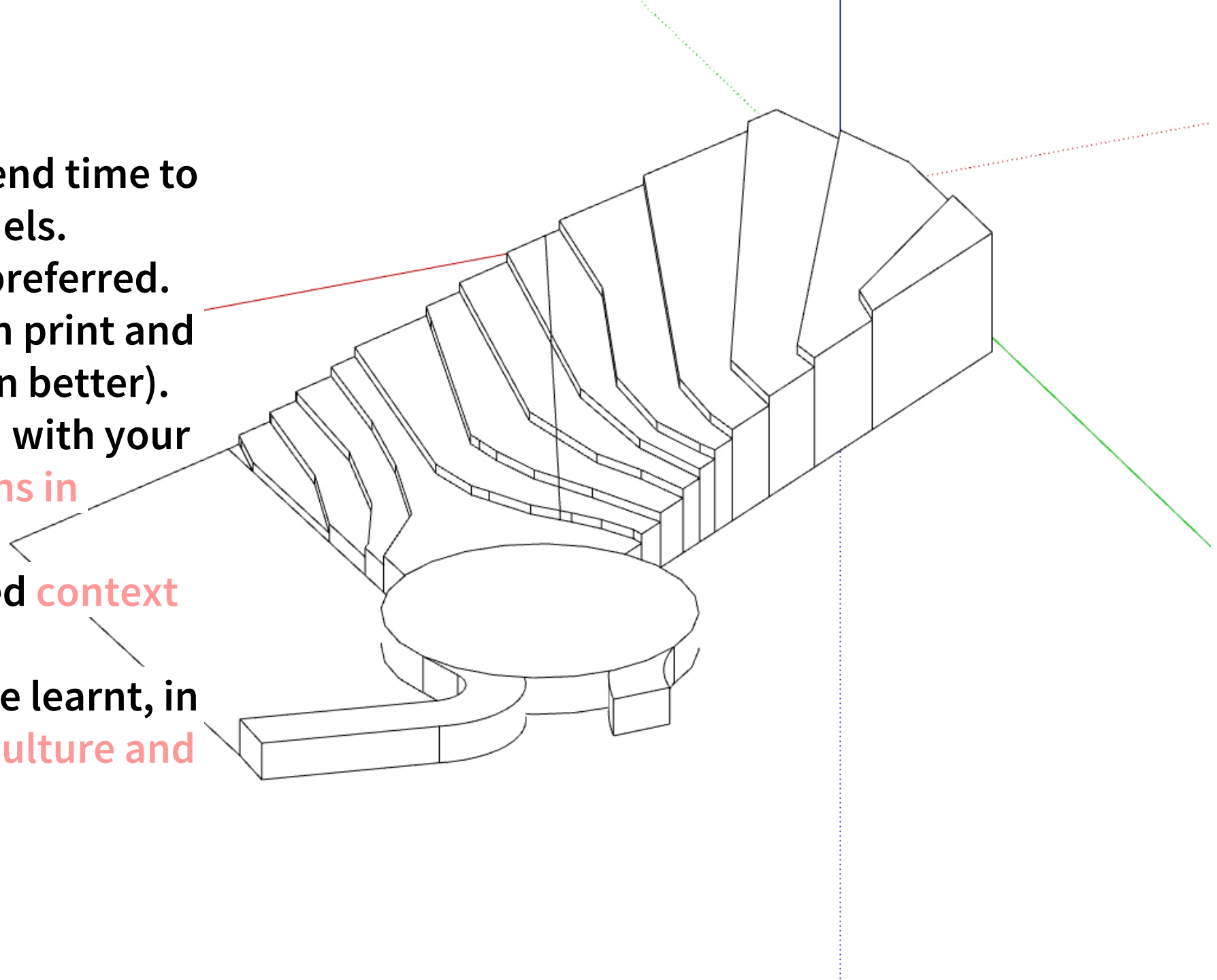
3- Application to a new site

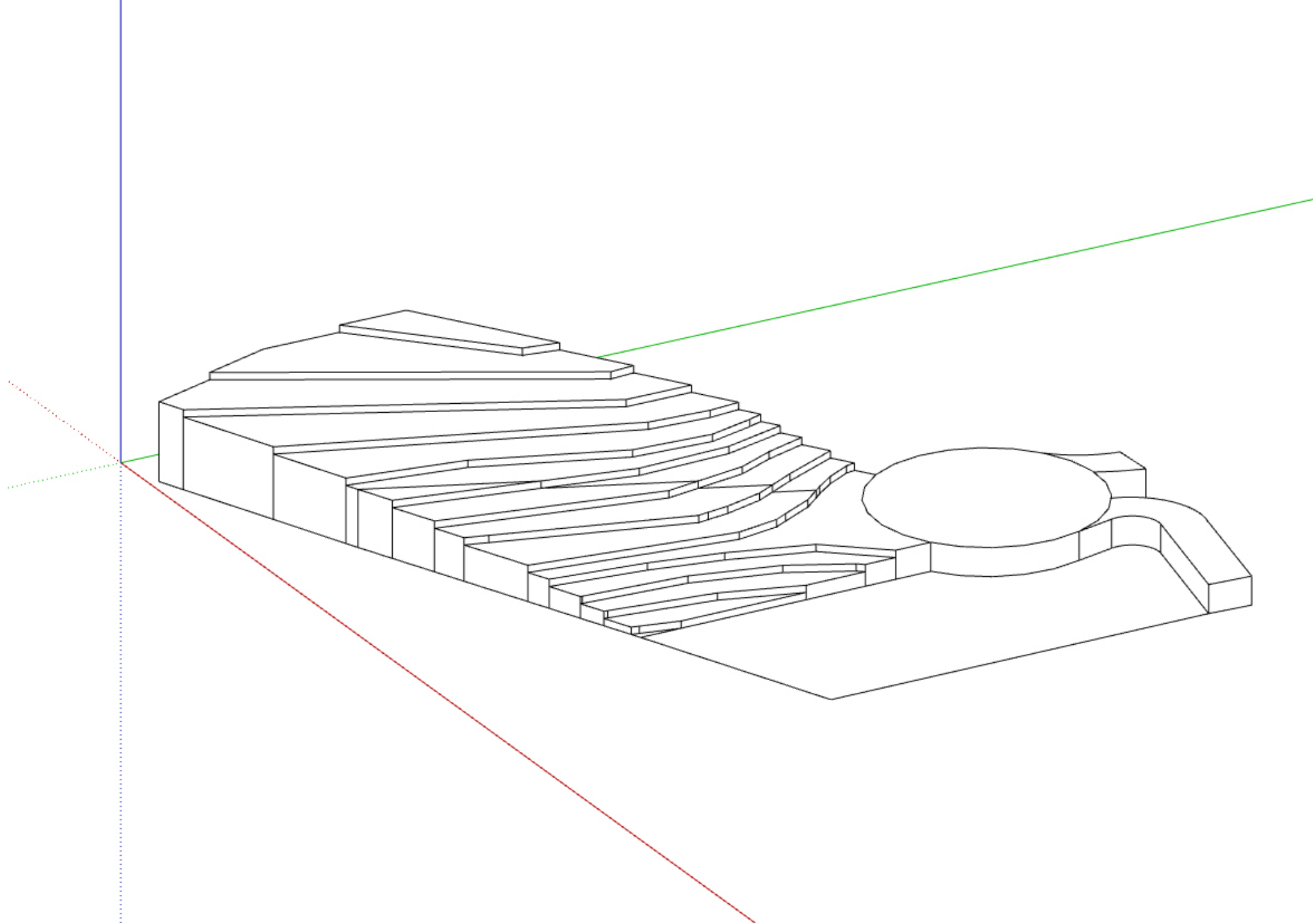
1. 1M CONTOUR LINES
2. HIGHEST LEVEL IS 507M ABOVE THE SEA LEVEL
3. CLIENT BRIEF: 6 MICRO HOUSING

(DOTTED LINE)
POTENTIAL
ROAD ACCESS
TO SITE FOR 6
MICRO HOUSING



- You don't have to spend time to build any digital models.
- **Digital sketches** are preferred. Alternatively, you can print and **sketch on paper** (even better).
- To be complemented with your **thoughts or reflections in writing**.
- Explain your preferred **context and location**.
- Refer to what we have learnt, in terms of **technique, culture and material**.





4- To do after class

<https://miatedjosaputro.com/2022/02/16/as3-week-1/>

password: nbu-as

Upload your task to the forum at the bottom of the page.

We cannot upload files so please do it manually (*copy and paste text, then upload images in sequence*).

Deadline: right after the class finishes (Monday at **11:00pm**)

Submit whatever you did during the class.



Learning materials

<https://miatedjosaputro.com/2022/02/16/as3-week-1/>

password: nbu-as

PDF of ppt slides

Supporting materials

Sketchup file of the site for easy reference

This module's page: <https://miatedjosaputro.com/category/nbu/archi-structure/>