

Modula3D

COBOD CONNECT 2024

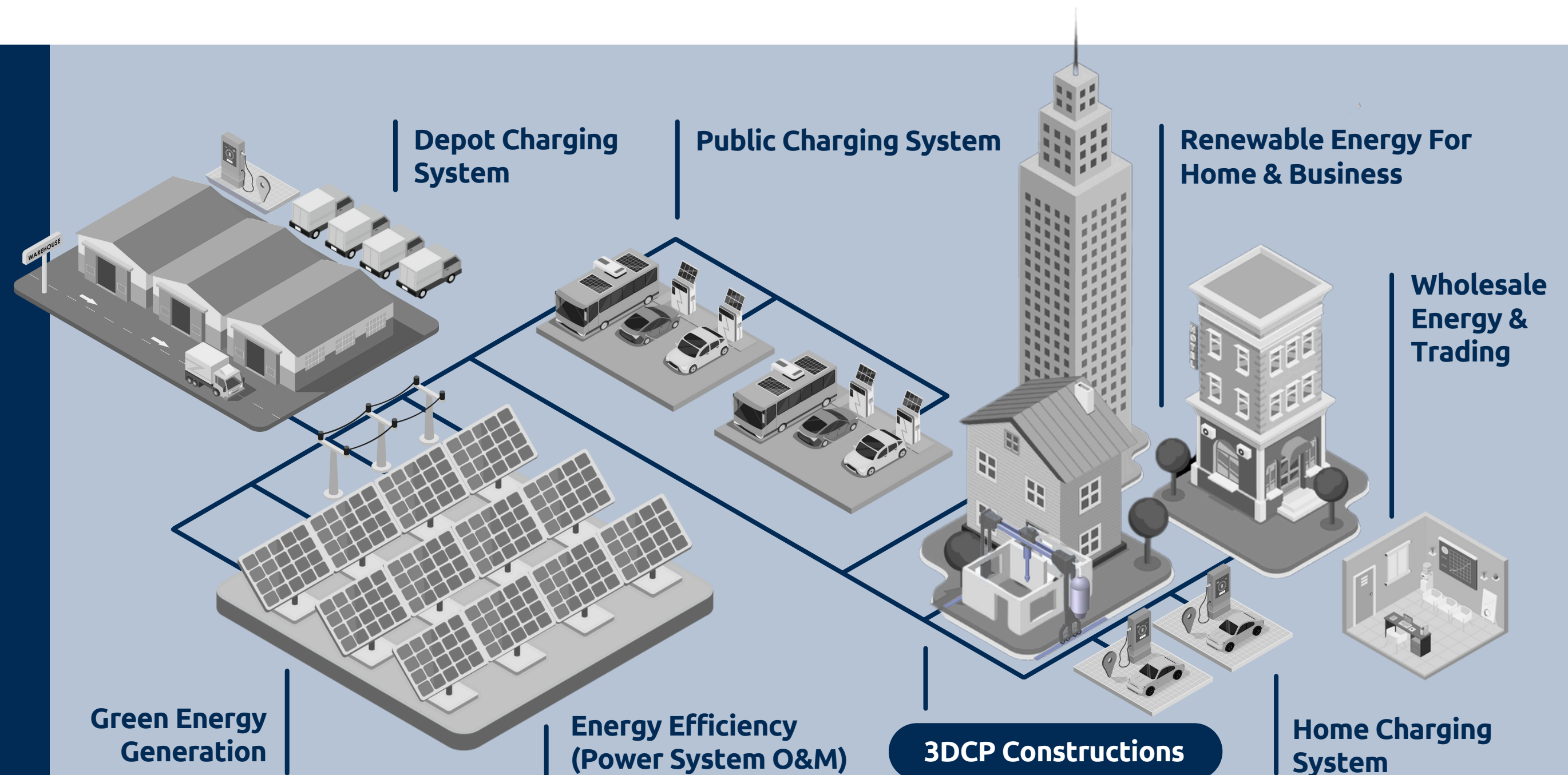
November 26th 2024

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Tiga
Dimensi

Modula3D is a JV between Bakrie & Brothers and COBOD International that provides 3DCP solutions

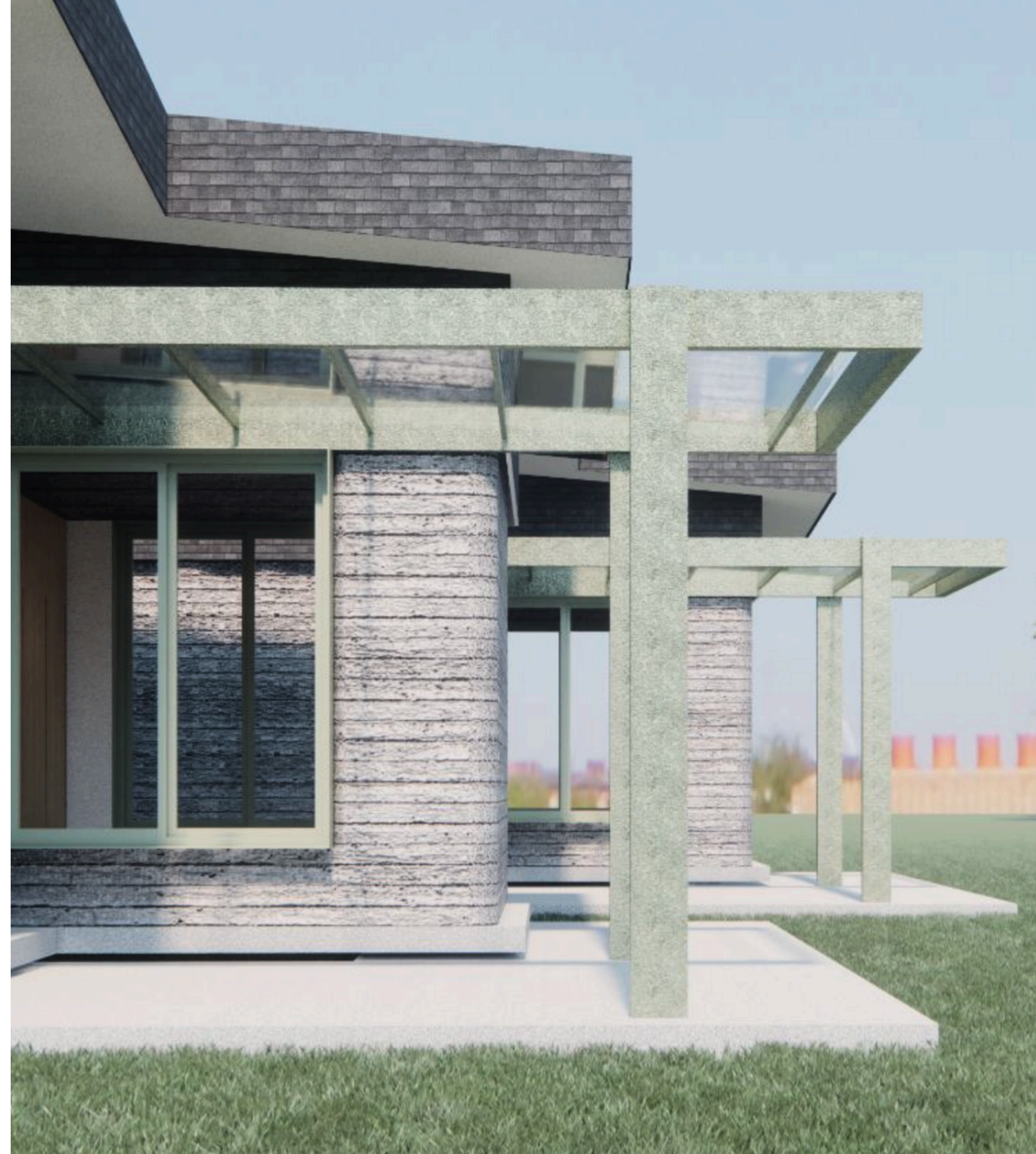
We aim to be the leading and most trusted 3DCP company in Indonesia, creating a positive impact for the society of tomorrow

How Modula3D Contributes to Sustainable Development Efforts



Our Mission

**To build a smarter, faster,
sustainable, and energy-
efficient construction.**



Our Services



We offer everything from printer sales, machine rental, construction services, and after-sales to help you meet your business goals



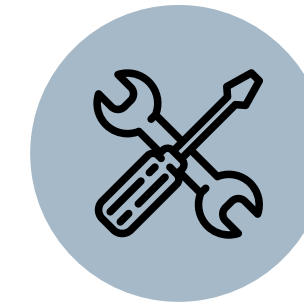
Printer Sales

Modula3D provides a wide range of printers to choose from for your construction needs with access to financing solutions to support your business goals.



Printer Rental

Allows you to use a 3D construction printer with no upfront investment while making it easy for you to get professional help, including 3DCP design and construction services.



After-Sales Service

Efficient procurement of printed materials, comprehensive repair services, and prompt troubleshooting support from technical experts.

Directors



Adi Bagus Tirto
President Director

Experienced in business development, manufacturing, and transportation.



Debiyarto
Director

Experienced in material manufacturing, management & strategic planning.



Simon Klint Bergh
Director

Expert in 3D printing technology.

Operations Team



Vanda
Material Engineer

Expert in material R&D, manufacturing, and procurement.



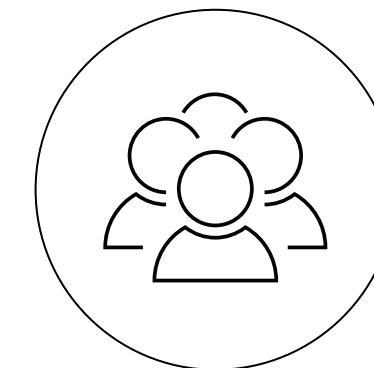
Kemal Firdaus
Printer Engineer

Expert in printer preparation and printer operation.



Bangun
Construction Engineer

Expert in structural design and construction supervision.



Additional 4 Helpers

Finishing, refinement, and assist in cleaning.

Modula3D & BOD3

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How Modula3D benefit from BOD3

BOD3 for building typology in Indonesia

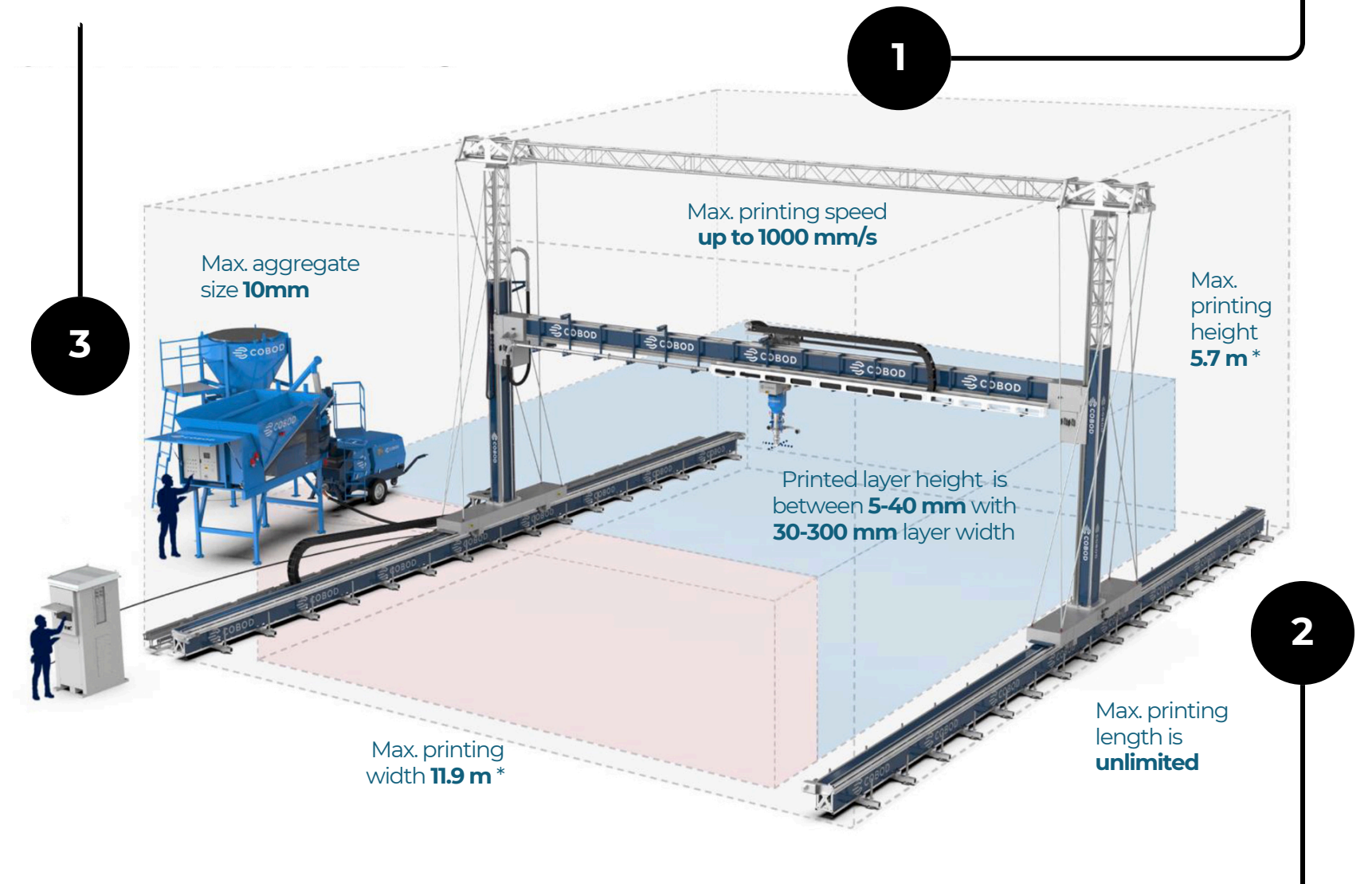


Allows 3D-printed Ordinary Concrete

BOD3 provides a specific concrete formula that is locally accessible, plentiful, and affordable.

Versatile printer size

BOD3 is constructed from modular components, allowing for easy adjustments in size to fit the specific requirements of any project.



Extendable printing track for Indonesian housing typology

The BOD3 features an extendable ground-based track system that enables uninterrupted, large-scale printing. It is suitable for row house construction, particularly prevalent in Indonesia.

Commissioning & Trial, Project, & Key Findings

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Commissioning & Trial Stage

Our journey in 20 printing days

Commissioning & Trial Stage
Printing Day 1-5



Achievement Highlight:
Independently designed, sliced, material sourced, and 3D printed MTD Logo, demonstrating our team's capabilities

Project Stage
Printing Day 6-14



Achievement Highlight:
Printing 46m² house unit in 9 days

Project Stage
Printing Day 15-20



Achievement Highlight:
Printing 46m² house unit in 6 days

Commissioning & Trial Stage

Insight:

The number of trucks required varies depending on whether the machine arrives fully disassembled or partially dismantled.

Fully Disassembled
(on 1st arrival)

2 containers



Partially Dismantled
(when moved to site)

1 container +
trailer trucks



Printer assembly



1st time printing

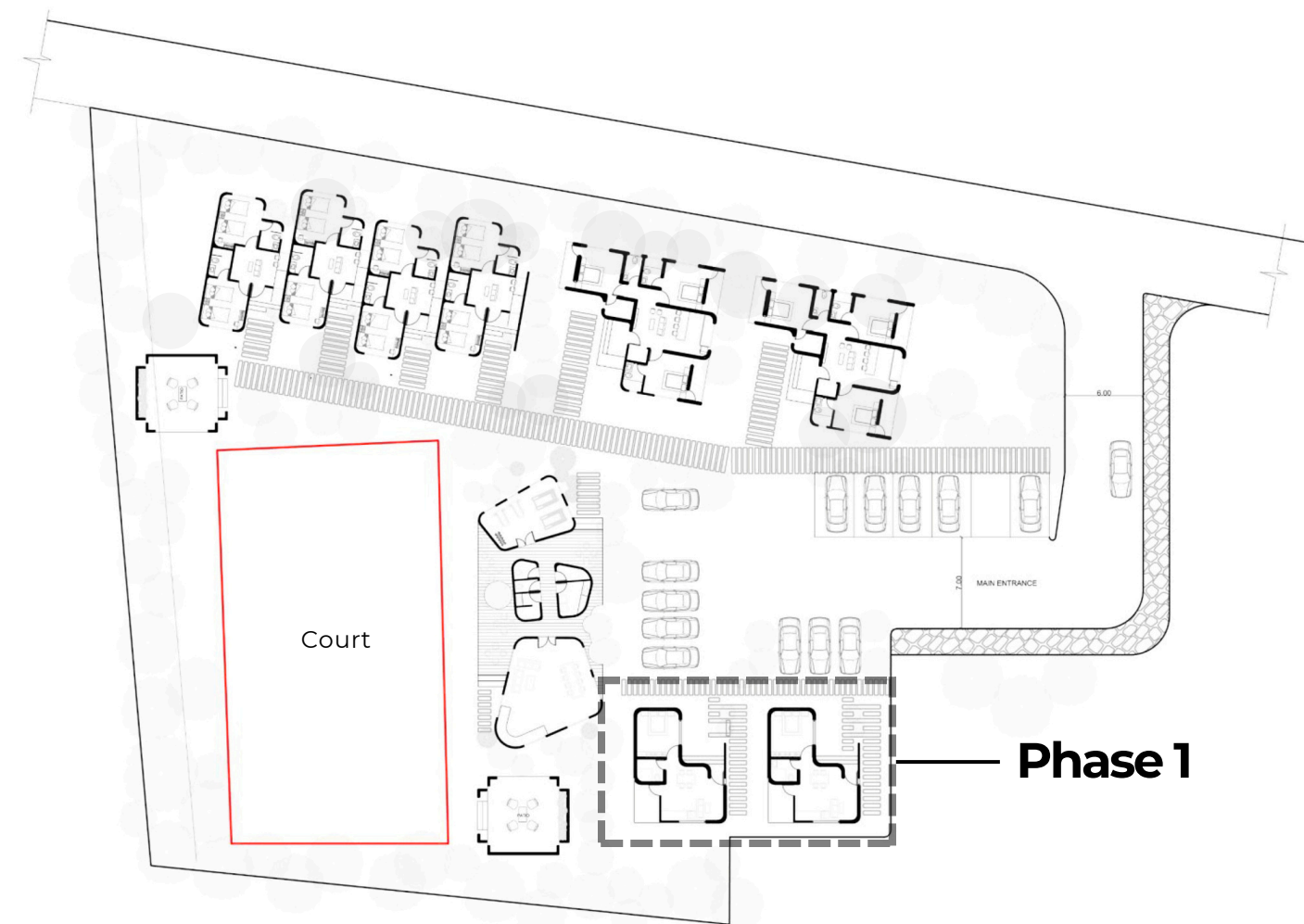
Our Project

SEAPI Ecovillage

Bakauheni, Lampung



Introducing a community village tailored for Southeast Asia Pipe (SEAPI) employees, providing an eco-friendly short-stay experience. Crafted with locally sourced concrete and combined with prefabricated materials, it minimizes the carbon footprint from construction all the way through operation. Built using BOD3 technology, the project explores functionality in various architectural designs for dwellings and communal spaces.



Site will comprise of 11 enclosed buildings with a total area of $\pm 530 \text{ m}^2$



BOD3 will be oriented to 3 different positions to complete the 11 buildings on site

SEAPI Ecovillage Phase 1



Perspective

Legends

- 1 entrance
- 2 dining area
- 3 living room
- 4 kitchen
- 5 bathroom
- 6 bedroom



Entrance



Kitchen and living room



Bedroom

Site Preparation



Discussion with structural experts



Findings: The Planning Stage

Designing the appropriate foundation to reduce seismic risks, while ensuring cost-efficiency through collaboration with structural experts, is essential for a strong, regulation-compliant design.

Challenges include:

1. Detailed planning and investment for site preparation.
2. Adhering to local regulations due to earthquake risk.
3. Structural planning to prevent building integrity failure.



Material handling



On-site concrete curing



Findings: The Printing Stage

A hands-on team approach to streamlining material sourcing, adjusting material formulations, appropriate printing, and cleaning processes are significant to optimize printer output.

Challenges include:

1. Limited qualified suppliers and potential delays from remote quarries.
2. Material variations and extreme weather exposure impact curing performance.
3. Care handling during of printer interface interactions.
4. Appropriate cleaning process post-printing by the end of the day is mandatory for an optimal printing process for the next day.

Findings: The Finishing Stage

Integrating craftsmanship in refined wall finishes and exploring roof options that complement the 3DCP design.

Challenges include:

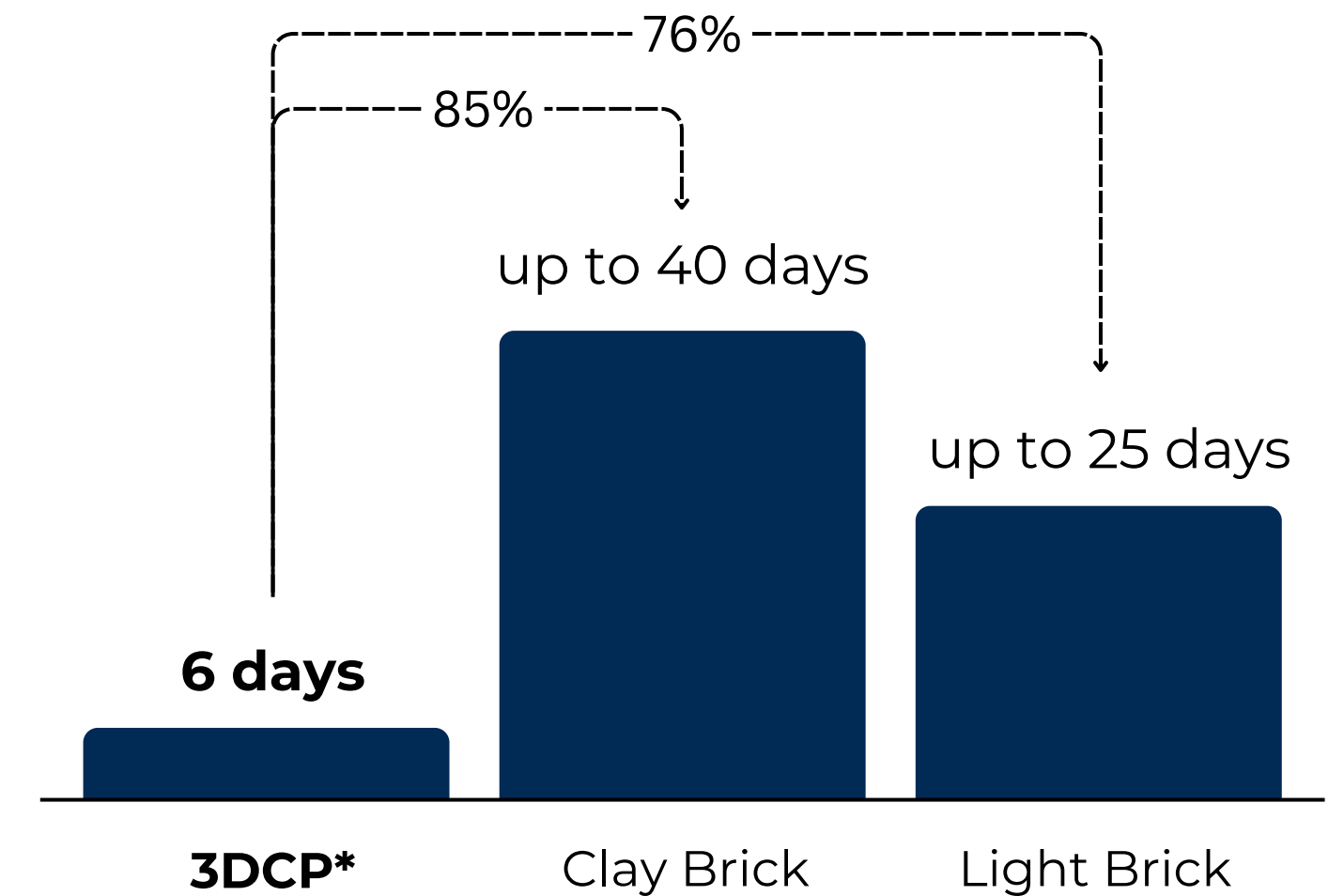
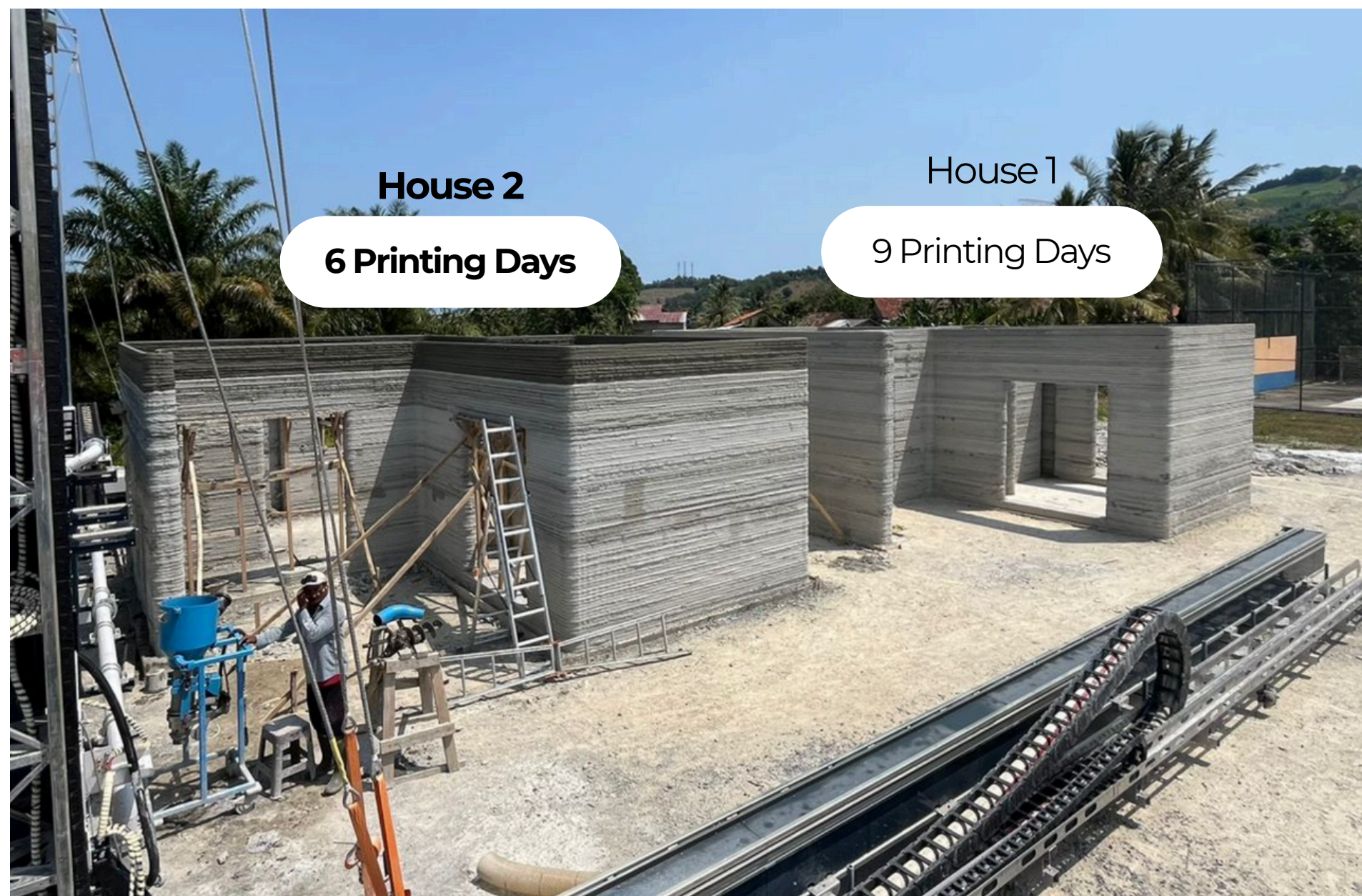
1. Achieving 3DCP layers uniformity using 5 cm x 4 cm ($w \times h$) printer nozzle.
2. The discovery of roof design that balances aesthetics, structural integrity, and customer preferences.



Key Finding on Construction Speed



3DCP walls offer up to 85% and up to 76% faster construction speed compared to clay bricks and lightweight bricks, respectively



Next milestone: 4-5 of printing days in the typical house

**) 1 day is equal to 1 shift of 6 hours printing time*

Explore the future of construction

Where possibilities are limitless, and the future is already being built today.



Bakrie Tower Lantai 36

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Stay tuned for what's next –

