

# 2025 Plurial „Villasprint<sup>2</sup>“ project

Cobod Connect



Chikaeze Ugwu  
Application Engineer

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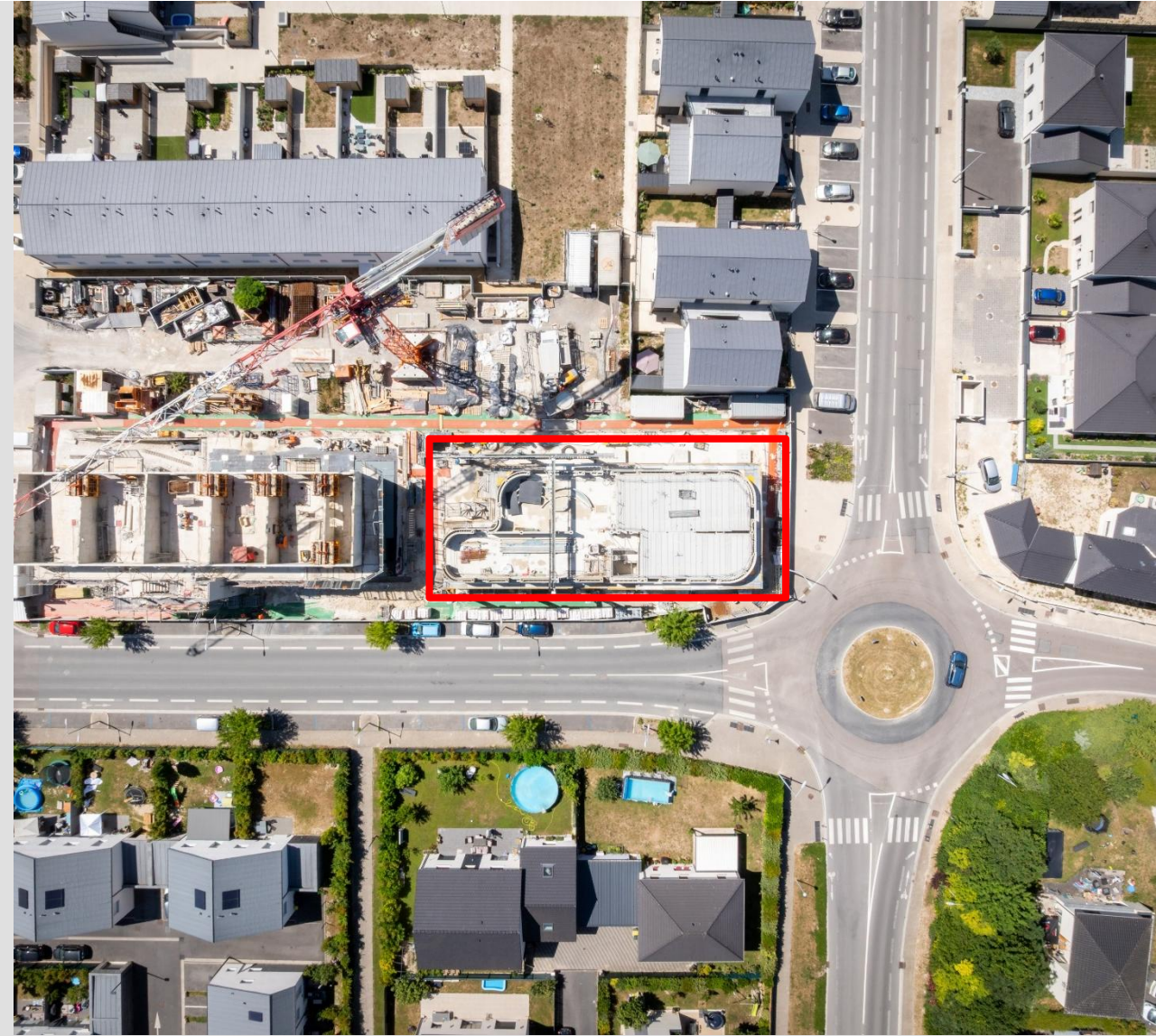
# 1 General project details

- **What`s in:**
  - When and where
  - General conditions
  - Project partners
  - Project targets for PERI



# 1 General project details

- A 12 apartment multifamily house
- 3 story building (34x12x8,7m)
- First Multifamily house printed in France.
- Biggest Multifamily house printed in Europe
- First Loadbearing house printed by Peri
  
- **Location:** Bezannes, France  
<https://maps.app.goo.gl/RNn2zgZWNLUoY27F7>
- **Building period:**
  - Started March 2025
  - General: Q3-2023 – Q2-2026
  - Printing: 03-2025 – 06-2025
    - Setup: 04.03. – 07.03.2025
    - Testing: 10.03.-13.03.2025
    - Printing execution: 17.03. – 25.06.2025
    - Dismantling: 26.05. – 01.07.2025
  
- **Role of PERI 3DCP:**
  - Planning support and execute printing (PaaS)
  - Documentation of learning process



# 1 General project details

- Pure Print Time: 208 hours
- Material Used: Holcim Tectorprint + Sand + Gravel + Fibers + Additives(Batch Plant)
- Amount of material: 172,8 m<sup>3</sup>
- Average Print temperature: 24 degrees
- Average print speed: 250mm/sec
- Average dry run time: 27mins
- Average Cleaning times: 40mins
- Average print per day: 6hrs 30mins
- Average foil cover: 15mins
- Average labour on site: 2 people (+3 Holcim)



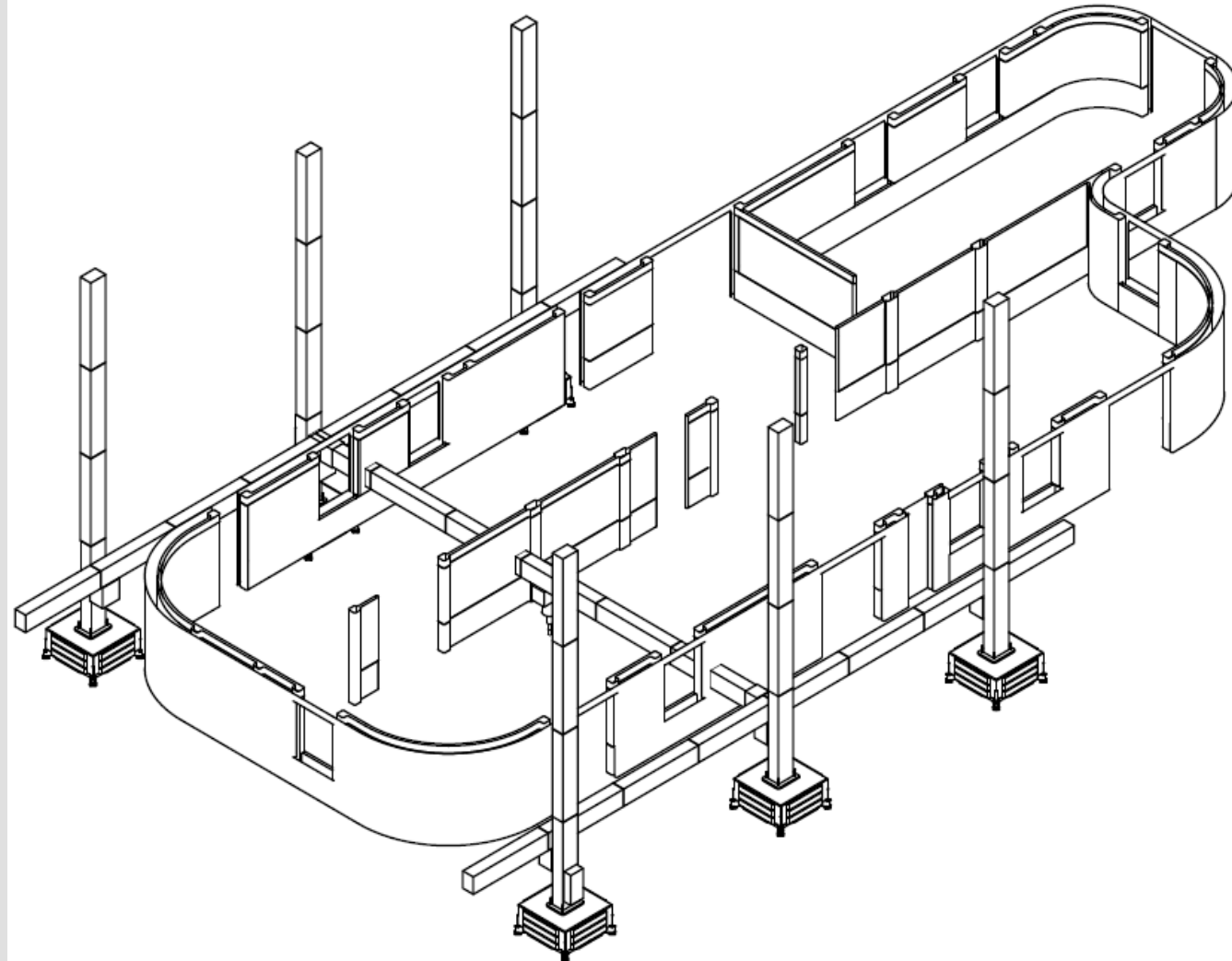
## 2 Planning process

- What's in:
  - Involved parties
  - Planning organisation (meetings structure, ...)
  - Drawings and model generation
  - Changes
  - ATEX

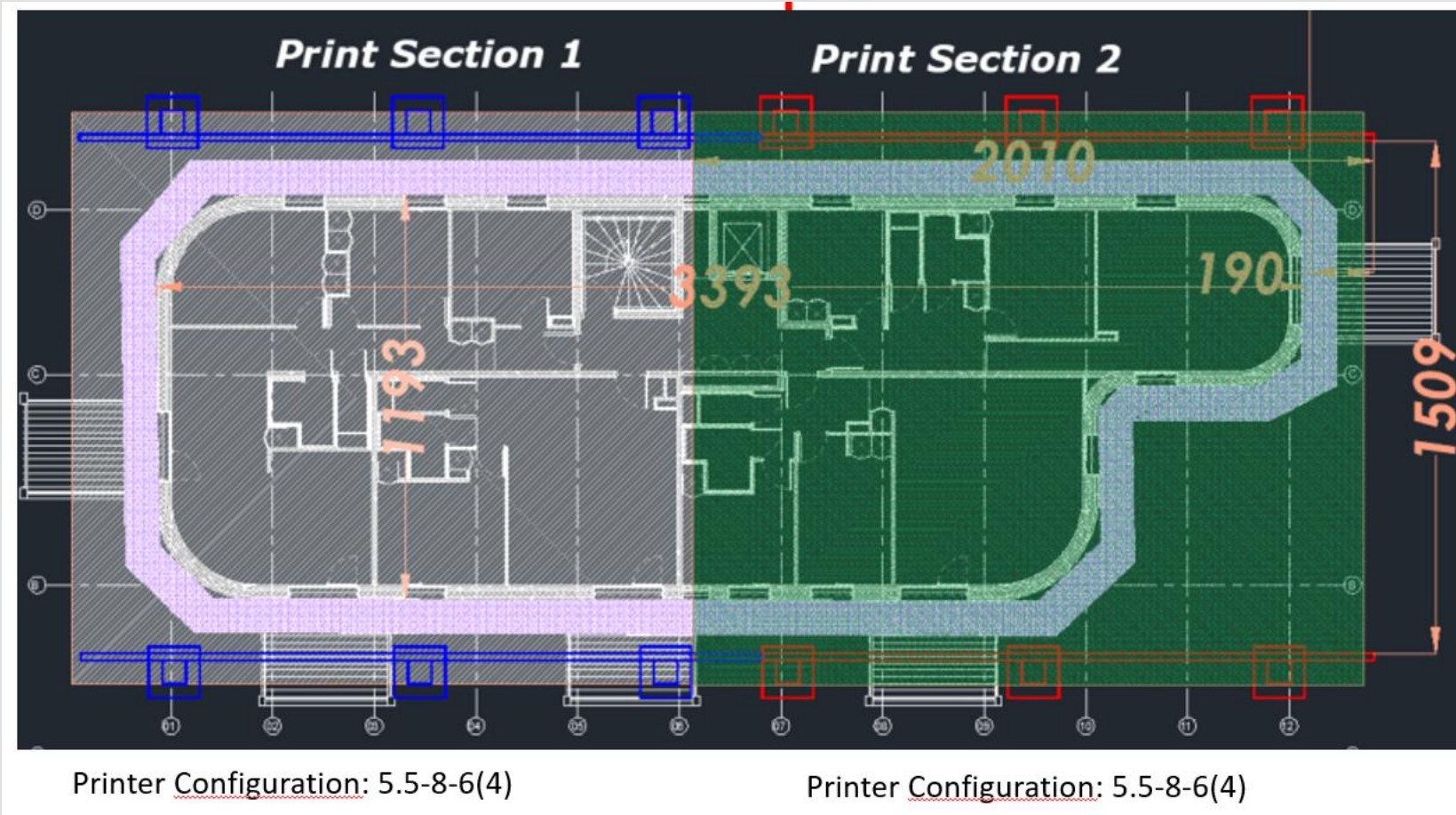


## 2 Planning Process

- Mostly involved partners in printing related planning:
  - PERI 3DCP, Hobo, Holcim, Demathieu Bard, Plurial Novilia (Action Logement).
- Monthly meeting (1h), organized by official site manager Demathieu Bard.
  - PERI always required to take part.
- Planning process:
  1. General architectural drawing created by Hobo.
  2. Peri Created centreline drawings and print files.
  3. Centreline was created using fusion 360 and COBOD Slicer for the gcode.

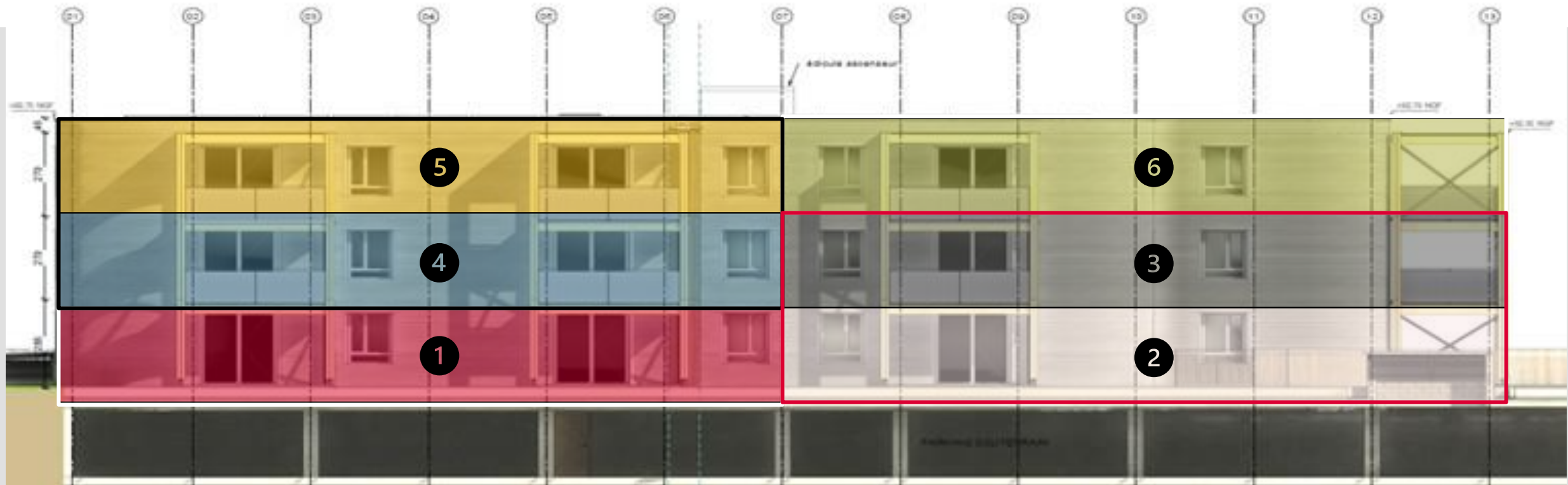


## 2 Planning Process



- 12 concrete feets on site.

## 2 Planning Process – sectioning



Setup:  
4 Days Setup Printer  
4 Days Training with Holcim and  
Material Test

Planned per section:  
10 Days Print (7 Print+ 3 Buffer)  
2 Days relocation

Reality per section:

|                   |                    |
|-------------------|--------------------|
| 1. 5,5 Days Print | 1 Day relocation   |
| 2. 5,5 Days Print |                    |
| 3. 4,5 Days Print | 1 Day relocation   |
| 4. 4,5 Days Print |                    |
| 5. 4 Days Print   | 1 Day relocation   |
| 6. 4 Days Print   | 3 Days disassemble |

## 3 Building details

- **What`s in:**
  - Base plate prep.
  - Reinforcement
  - Static approach (columns/walls, etc.)
  - Precast
  - Windows details
  - Slab details



### 3 Building details – *base plate*



- Base plate casted in place with conventional formwork
- One site was elevated 30cm down.
- Outer shape planned to fit exactly the shape of the facade (incl. Roundings).
- Evenness of groundplate was very good.

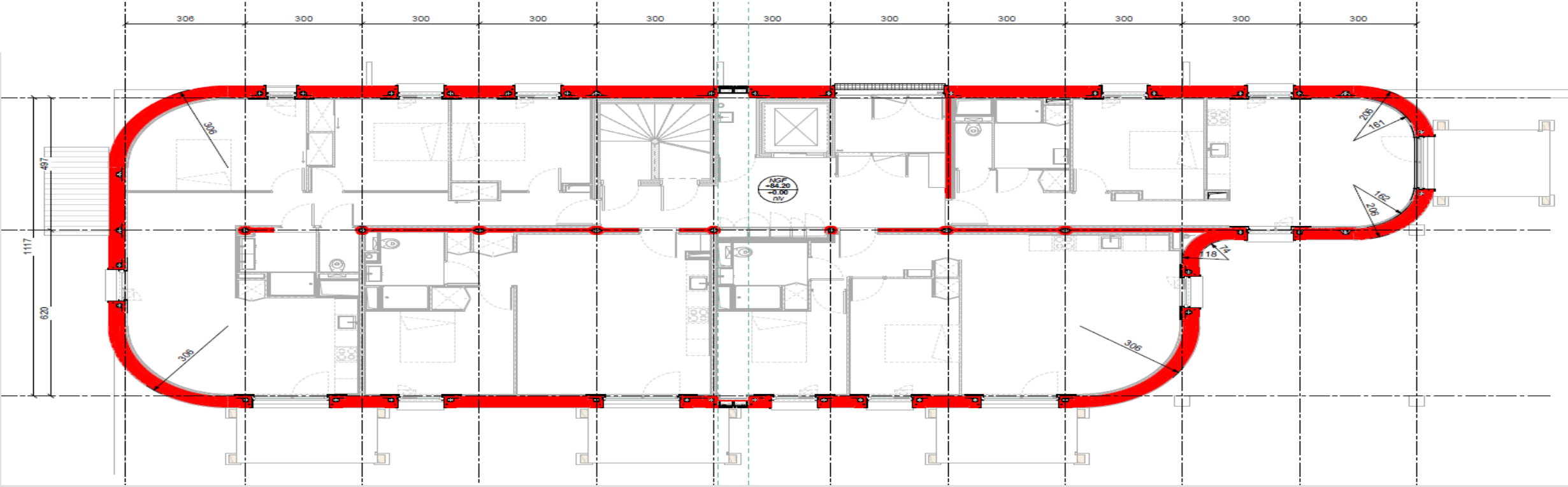
### 3 Building details – *reinforcement*



- Screw in reinforcement was used for this project.
- The starterbars are screwed after achieving 600mm height.
- An opening is created below the columns for easier tightening of the reinforcements.
- 3D Printed Colum cutting tool to ensure the rebars are entering the columes.

### 3 Building details – static approach

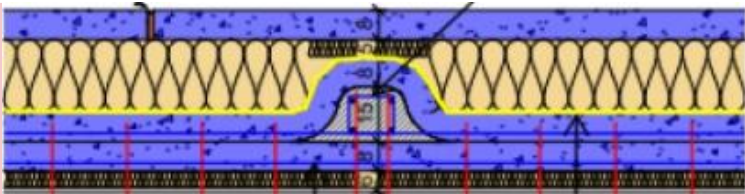
#### Ground floor



#### WALL COMPONENT TYPES

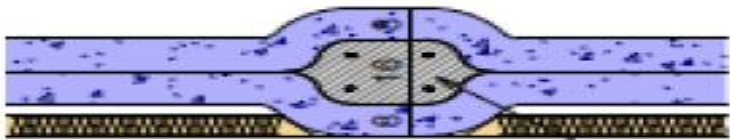
**Type A**

(load bearing printed wall with 1 single layer and 2 double layer walls)



**Type B**

(load bearing interior wall)



### 3 Building details – *Precast Elements(Installation)*



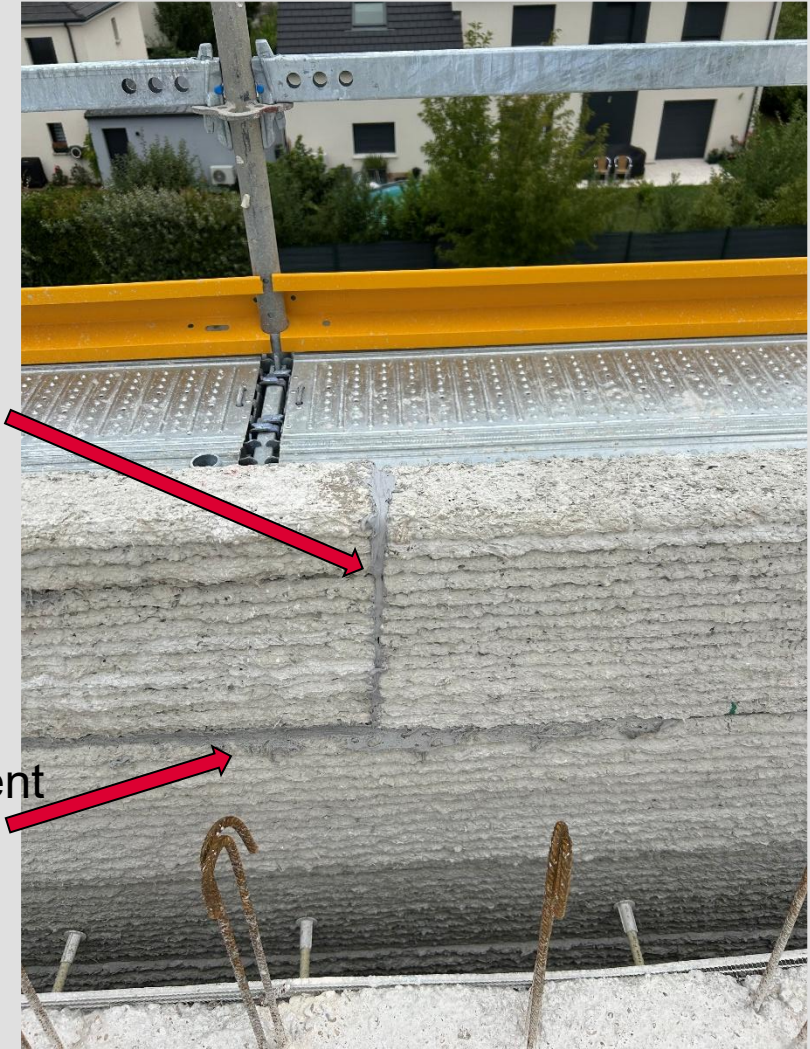
- Moving and aligning the precast

### 3 Building details – *Precast Elements(Post processing)*



- Filled the joints with sikaflex

- Fixed it with 2 Rods per element and Epoxy

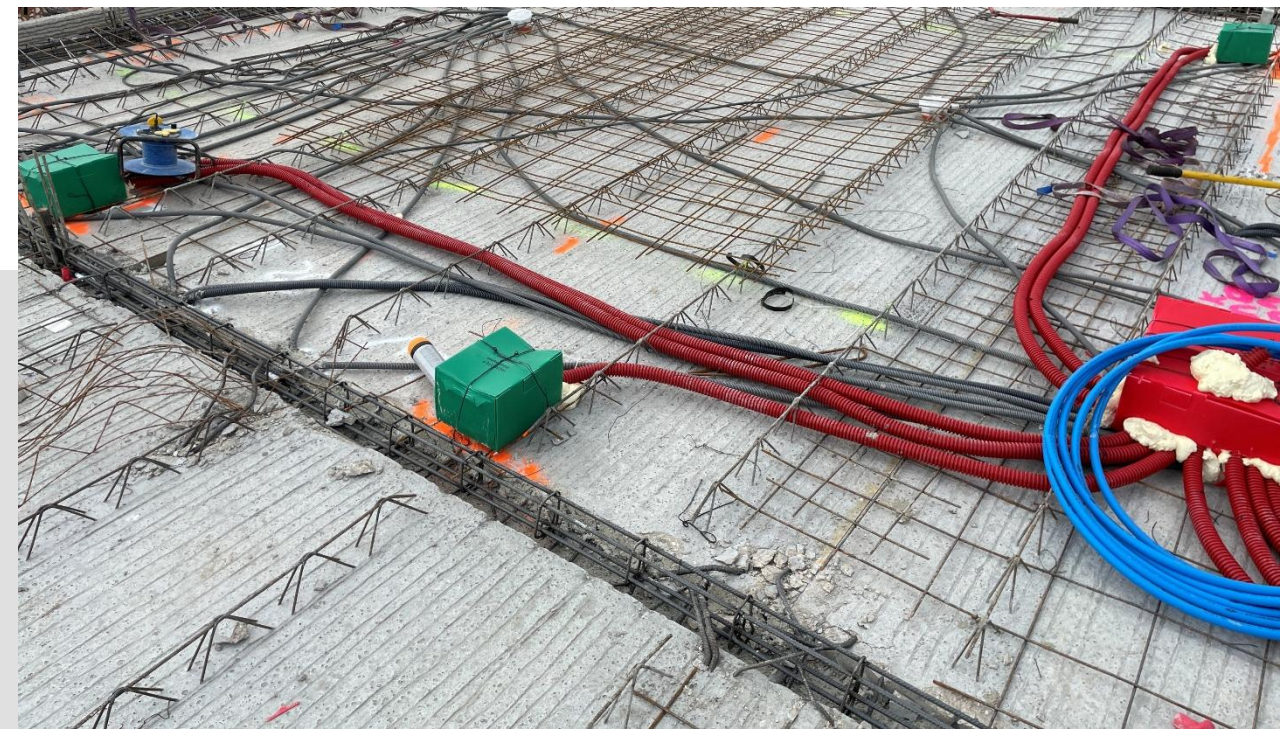


### 3 Building details – *Windows*



- Cutting of Window opening for precise openings

### 3 Building details – slab



- Installation of prefabricated slabs

## 4 Site installation

- **What`s in:**
  - Installations of machines and ways on site
  - Prep. Ground and surveyor work
  - Truck packing and unpacking
  - Tools and machinery (crane, forklift etc.)



## Technical facts

- PERI HQ3 (5,5-8-4)
- Printer was moved 3 times
- Site team: 2 people
- Fibo FB500 Batchplant + 3m<sup>3</sup> Cement silo
- Putzmeister P720 Pump
- Hose length : 55m
- Hilti Total station for set up



## Technical facts (Transport Runge)

- Use of Transportrunge for easy shipping



## Technical facts(Relocating)



- Traced the outlines of the iron ground plate to ensure same positioning when relocating
- Placed 12 feet instead of only 6



### The Team

- 2 Peri Employees on site Chikaeze & Simon.
- First and last week of Project help from Valentin.
- One Printer Operator, filling print protocol, manage Pump.
- One putting anchors, watching the print, removing dots.
- 4 Holcim Employees (2 Operater + 1 Lead + 1 Local Helper).



## 5 Execution – curing



## 5 Execution – Advanced Hosemanagement

- New Advanced Hosemanagement with DN65 hose and Igus E-Chains.
- 5m of Pipe installed on X-Axis.



## 5 Execution – *Epoxy Spatula*



- 3D Printed Spatula for applying Epoxy.
- Due to the Fibers in the material painfull with applying by hand.



### Printer Issues

- Overload of E with mounted Rubber on extrusion screw caused by the fibers.
- 24v powersupply in Y2 broken.
- Hose E-chain fall 2 time out in Y.
- Y2 Side bearing broke.
- X bearing made noises.

### Material Issues

- 4 Blockages in the Hose.
- Had to throw away 1 complete hosesystem (26m+14m).
- Difficult to print on hot days (Overload of E motor).

# Thank You for Listening

