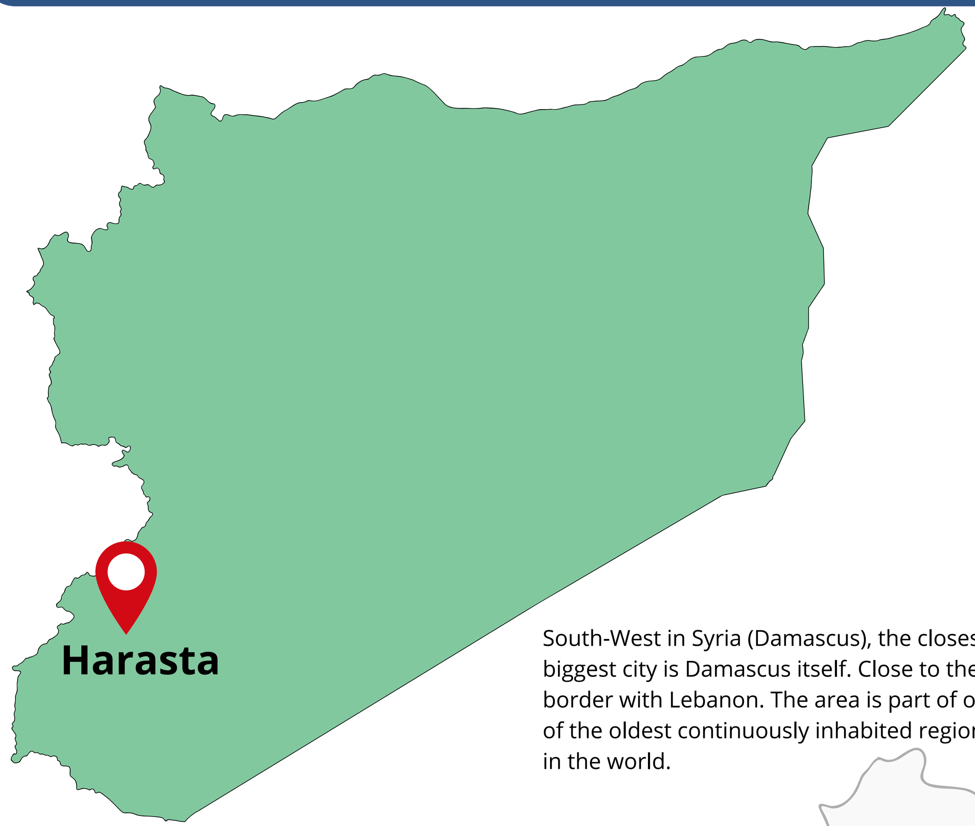
INTERNATIONAL PROJECT

Damascus- Harasta

Group 1

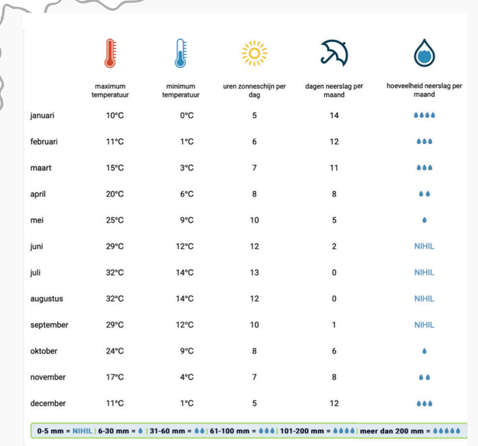
Introduction



South-West in Syria (Damascus), the closest biggest city is Damascus itself. Close to the border with Lebanon. The area is part of one of the oldest continuously inhabited regions in the world.

This project involves the construction of a secondary school complex in Harasta, Syria, aimed at providing education for children aged 12 to 18 who currently lack access to formal schooling. The school consists of two connected buildings—one for girls (grades 7–9) and one for boys (grades 10–12)—as well as a shared communal area. The facility is designed to serve not only students but also the local community, offering classrooms, labs, a library, prayer and recreation spaces, and essential administrative services.

Location research



Site analysis

The project site is located on an open plot surrounded largely by destroyed or collapsed buildings. It directly borders a wide main road (visible on the left), likely a former multi-lane connector route. This road ensures excellent accessibility and makes the site suitable for future construction activities.

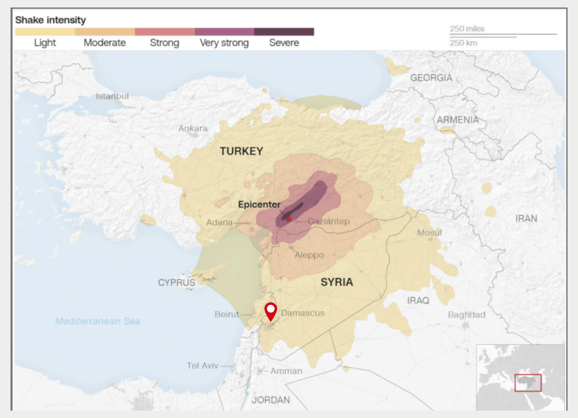
To the right of the plot, there is a roundabout connecting several streets, further enhancing the site's visibility and accessibility. Within the boundaries of the site, remaints of old building structures and foundations are still visible, indicating previous development.

The ground consists mostly of rubble and bare soil, with a few scattered small trees or shrubs, primarily along the edges of the terrain. In the immediate surroundings, traces of former facilities, such as a tailor shop or office space, can be observed, although most are heavily damaged or abandoned.

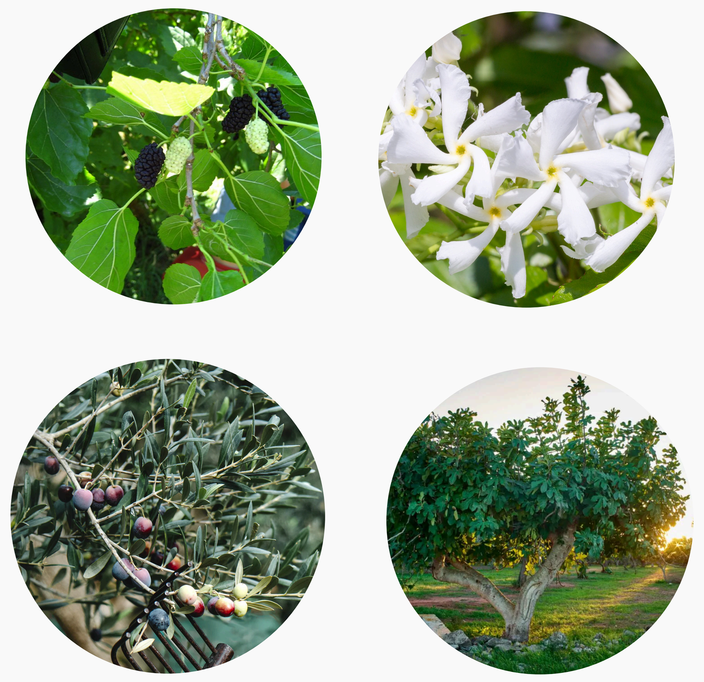
Despite the severe deterioration of the surrounding area, the site's position along a major road and near a key intersection makes it a promising candidate for redevelopment.

Earthquakes

Harasta is located within the medium to high-risk zone in Syria (within the DSF belt and the nearby geological aridity). Statistical probabilities indicate the possibility of an earthquake of magnitude 6 or higher occurring within the next 100–200 years, and may increase with the continuation of the long seismic recession.



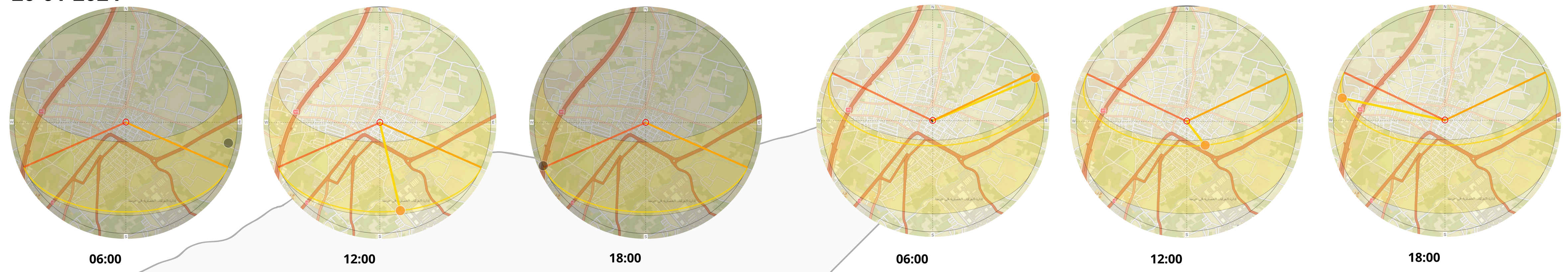
Greenery



Solar study

20-01-2024

20-07-2024

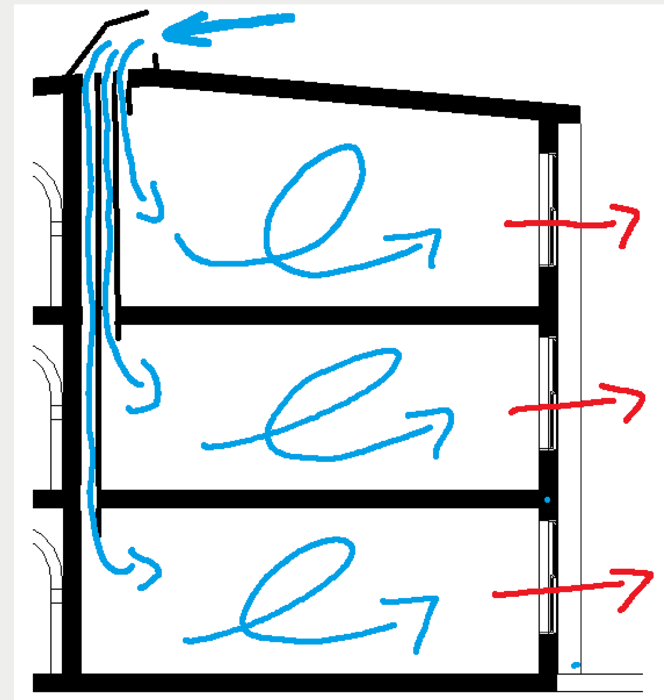


Conclusion:
The solar study highlights the importance of thoughtful spatial orientation to ensure comfort, energy efficiency, and optimal use of natural daylight. By positioning classrooms and study areas towards the south, placing playgrounds in the east or southwest, and locating support functions in cooler zones, the school building in Harasta is designed to be both functional and climate-responsive.

Ventilation system

Fresh air

Polluted air

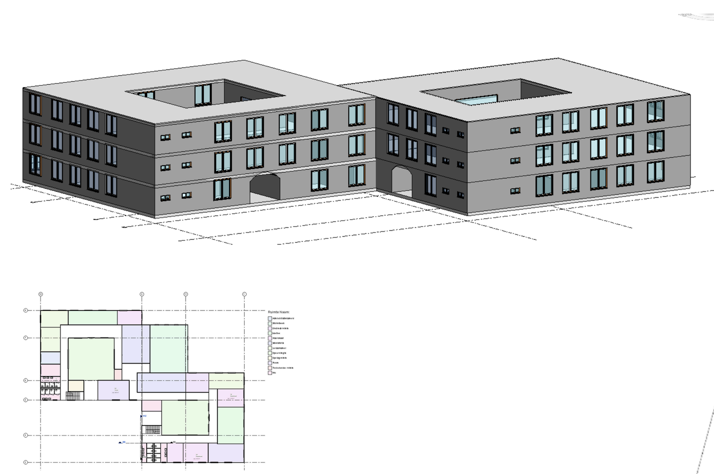


Program of requirements

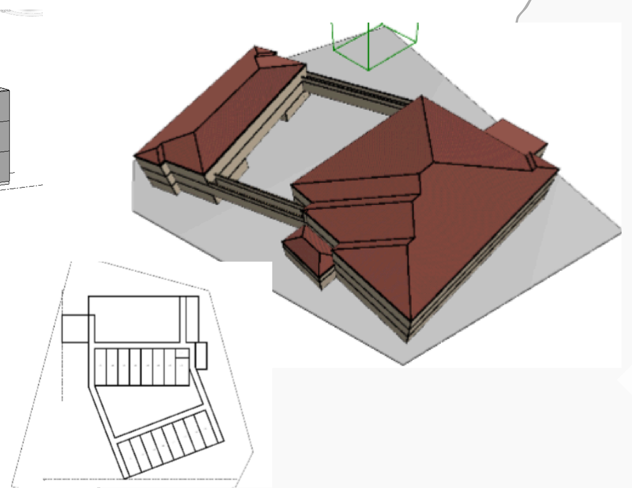
Space	Quantity	Area per Room
Classrooms	24	32 m²
Principal's Office	1	20 m²
Teachers' Rooms (with toilets)	2	32 m²
Service Room	1	20 m²
Administration Offices	2	15 m²
Psychological Counseling Room	1	9 m²
Canteen (if not part of shared area)	Optional	Variable
Indoor and Outdoor Terraces	Various	Custom
Toilets	Various	According to standards
Laboratories	2	60m²
Central Library	1	120m²
Multipurpose Hall	1	150m²
Prayer Room	1	30m²
Storage Areas	1per floor	GF: 68m² 1F:59m² 2F:55m²
Technical Rooms (electricity, HVAC)	-	TBD
Playgrounds (for school & community)	-	TBD

Concept

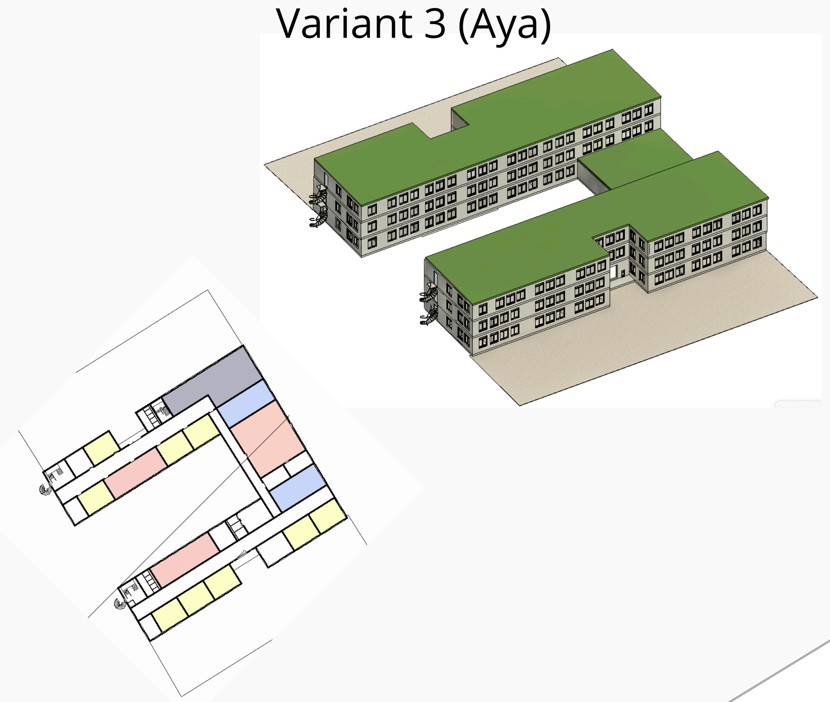
Variant 1 (Salli)



Variant 2 (Ian)



Variant 3 (Aya)



Harris profile

	Variant 1 (Salli)				Variant 2 (Ian)				Variant 3 (Aya)			
Criterion	--	-	+	++	--	-	+	++	--	-	+	++
Functionality												
Flexibility & Adaptability												
Accessibility												
Spatial Quality												

Phases of the construction process

1. Preparation and participation
- Workshops with residents on plans, materials and techniques.
- On-the-job training (making bricks, laying bricks).

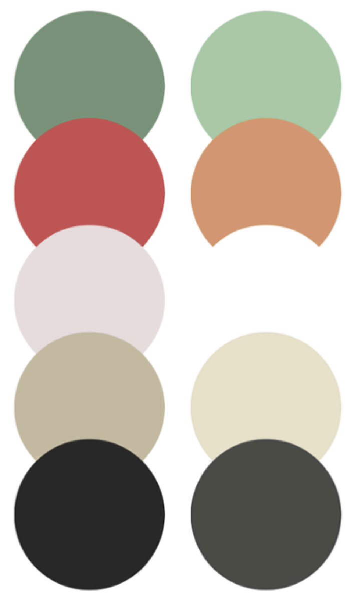
2. Foundation and structure
- Construction of foundation and columns (professional team).
- Use of traditionally cast concrete.

3. Walls (participatory)
- CSEB's or bricks with the help of local residents.

4. Roof construction
- Prefab panels or steel roof trusses with a slightly sloping roof (rain drainage).

5. Finishing and furnishing
- Doors, windows (preferably locally made)
- Ventilation, electricity, plumbing

Local production and storage:
- Production of CSEB's: On site with simple presses.
- Storage: Temporary shed with shelter from rain.
- Transport: Small materials via local trucks.



Designs conclusion

Variant 2 clearly emerges as the most suitable option, scoring the highest across most of the evaluation criteria. It successfully incorporates key strengths from the other design alternatives while introducing thoughtful modifications. The layout ensures adequate privacy between the boys' and girls' sections by placing them in separate buildings, connected by corridors that also facilitate smooth movement for teachers between the two areas.

A dedicated corridor was also designed specifically for the girls, allowing them direct access to shared facilities such as the library and laboratories without having to pass through the boys' section.

Importantly, the design addresses the needs of people with disabilities. In response to the significant number of students with special needs in Syria following the war, elevators have been included to support their mobility throughout the school.
These design choices make Variant 2 the most appropriate and inclusive solution for the given context.

Our building method

This project proposes a hybrid construction system that combines the advantages of modern techniques, traditional knowledge and the possibility of participation by local people. This approach consists of three collaborative construction principles: masonry construction, the use of Compressed Stabilized Earth Blocks (CSEB) and cast-in-place concrete components.

1. **Masonry**

Description: Brick walls reinforced with vertical and horizontal reinforced concrete columns/beams.
Advantages:
- Good resistance to earthquakes (EERI Earthquake Engineering Research Institute, 2019).
- Good application by semi-experienced construction workers.
- Relatively cheap and use of local material.

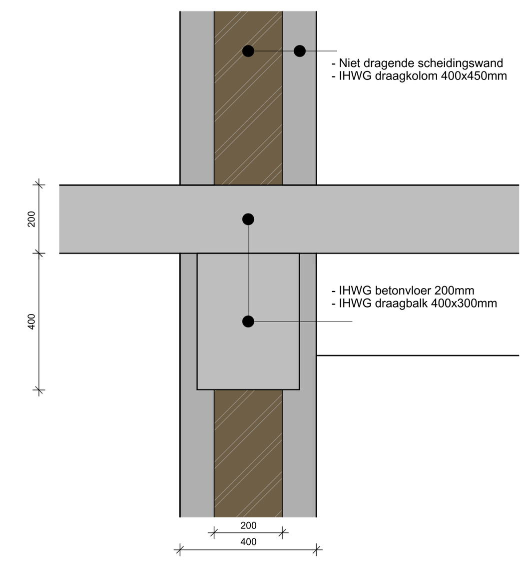
2. **Compressed Stabilized Earth Blocks (CSEB)**

Description: Blocks of compressed earth with stabilizers (e.g. lime, cement)
Advantages:
- Sustainable, low CO2 emissions.
- Local production with simple tools.
- Participatory construction: neighbors can help with production and installation.
- Good thermal comfort (suitable for warm climates).

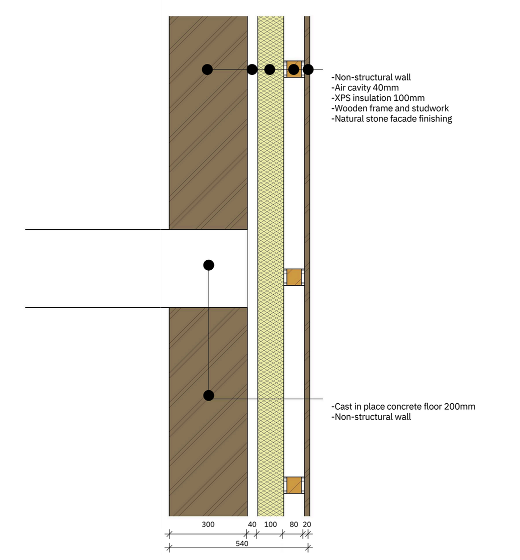
3. **Cast-in-place concrete elements (for structure)**

Description: Concrete elements (columns, beams and floors) produced on-site.
Advantages:
- Fast placement.
- Good structural performance.
- Can be combined with local techniques.

Detail



Scale: 1:10
Construction detail



Scale: 1:10
Exterior wall with concrete floor

Materials

This project proposes a hybrid construction system that combines the advantages of modern techniques, traditional knowledge and the possibility of participation by local residents. This approach consists of three collaborative construction principles: cast-in-place concrete construction components, masonry and the use of Compressed Stabilized Earth Blocks (CSEB).

The load-bearing structure of the building is constructed according to the principle of concrete columns and beams. This means that the masonry walls (made of bricks or earth blocks) are reinforced with vertical and horizontal concrete beams and columns. This method is particularly suitable for earthquake-prone areas, as the structure better absorbs and distributes forces during an earthquake. In addition, this method is relatively simple and can be partly carried out by local construction workers with some guidance. According to research by the Earthquake Engineering Research Institute (EERI, 2019), masonry construction offers a good balance between safety, affordability and feasibility.

Compressed Stabilized Earth Blocks (CSEB) are recommended for the walls. These are building blocks that can be locally produced from clay and sandy soil, stabilized with a small amount of cement or lime, and then pressed with a hand or machine press. The production of CSEB is environmentally friendly, as no firing process is required (as with bricks) and they provide excellent thermal mass. This keeps buildings cool in summer and relatively warm in winter. More importantly, the production and processing of CSEB is very participatory: residents can be trained to make, dry and lay the bricks. The Auroville Earth Institute (India) provides extensive documentation on this technique, which is used worldwide in reconstruction projects.

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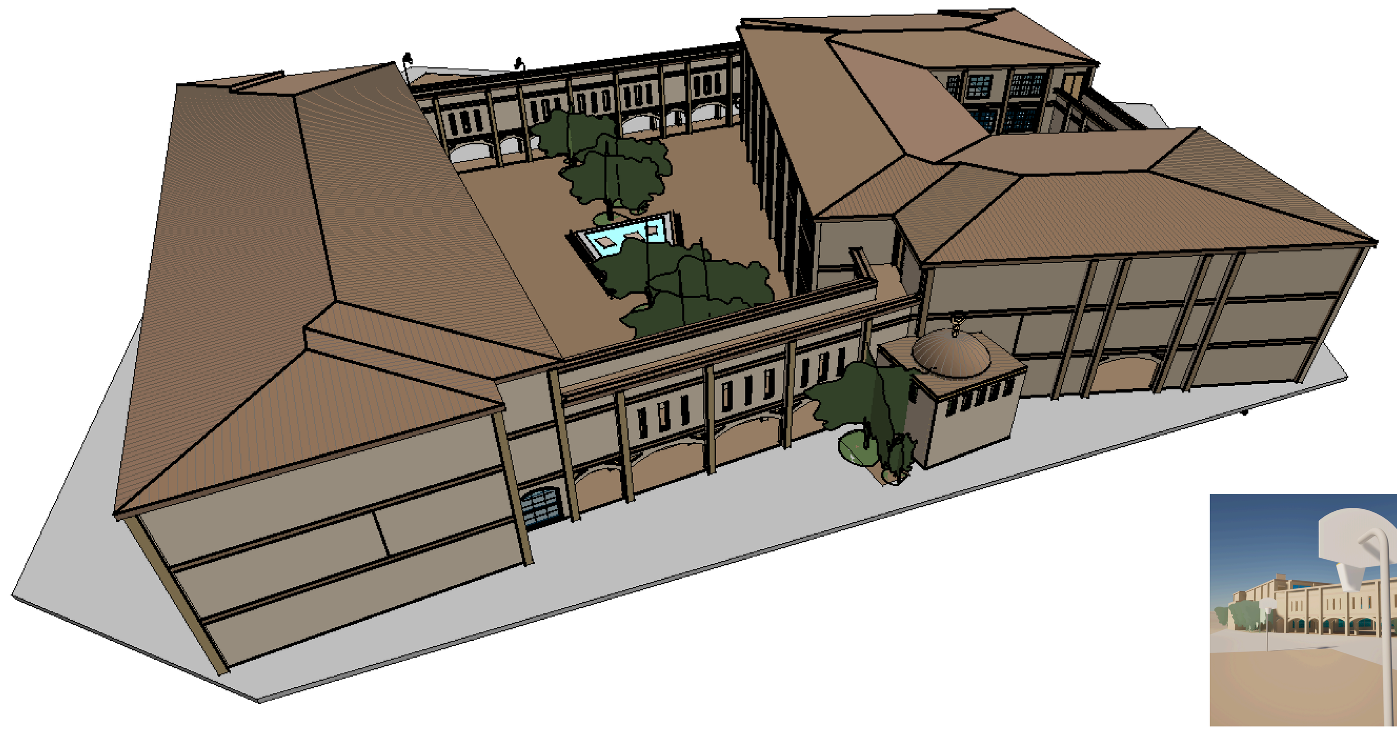
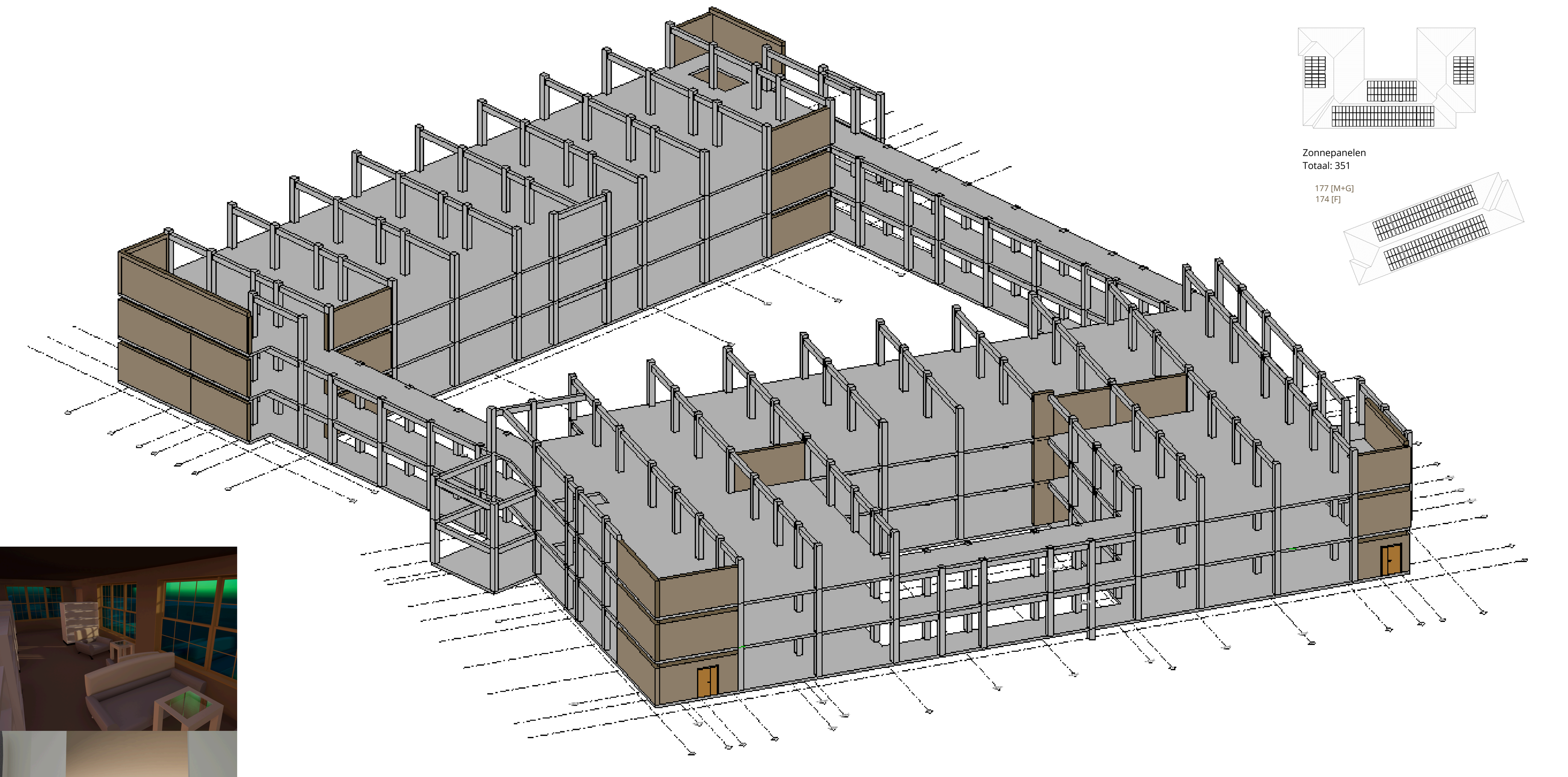
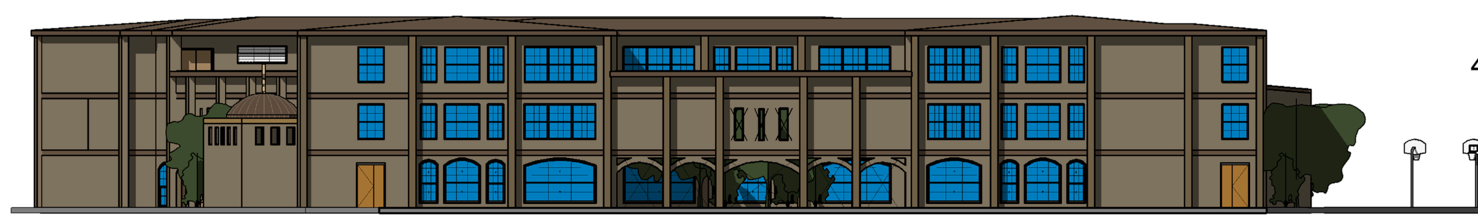
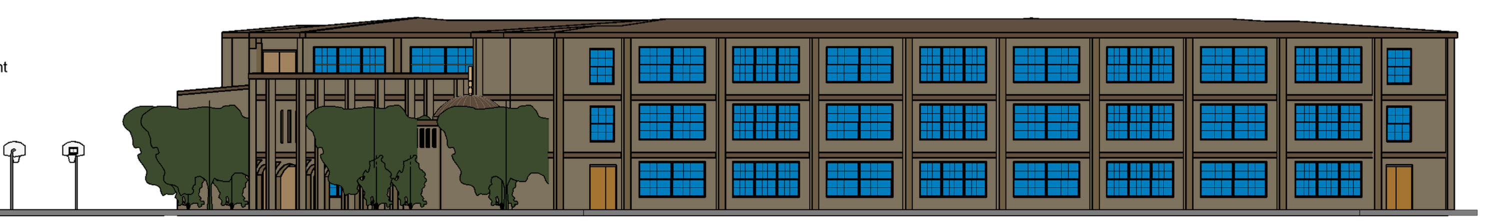






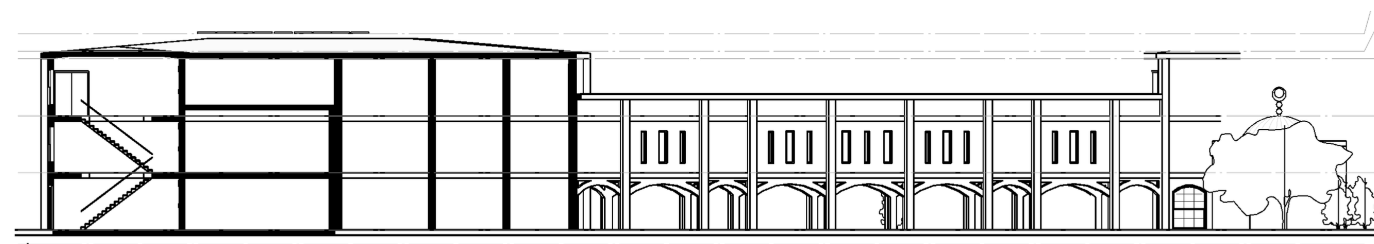
4 Achteraanzicht 1 : 250

5 Linkerzijaanzicht 1 : 250



7 Vooraanzicht 1 : 250

6 Rechterzijaanzicht 1 : 250



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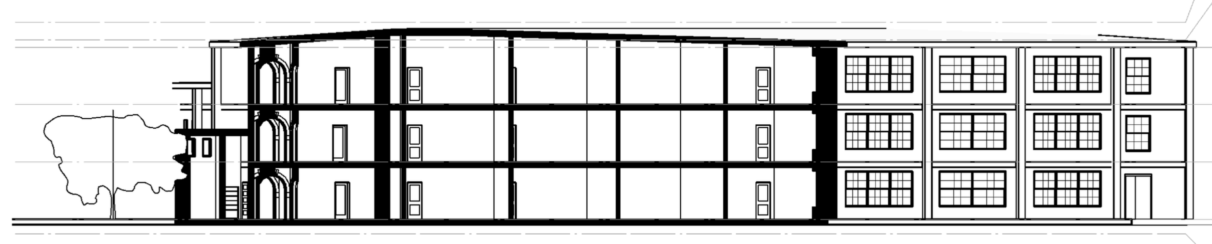

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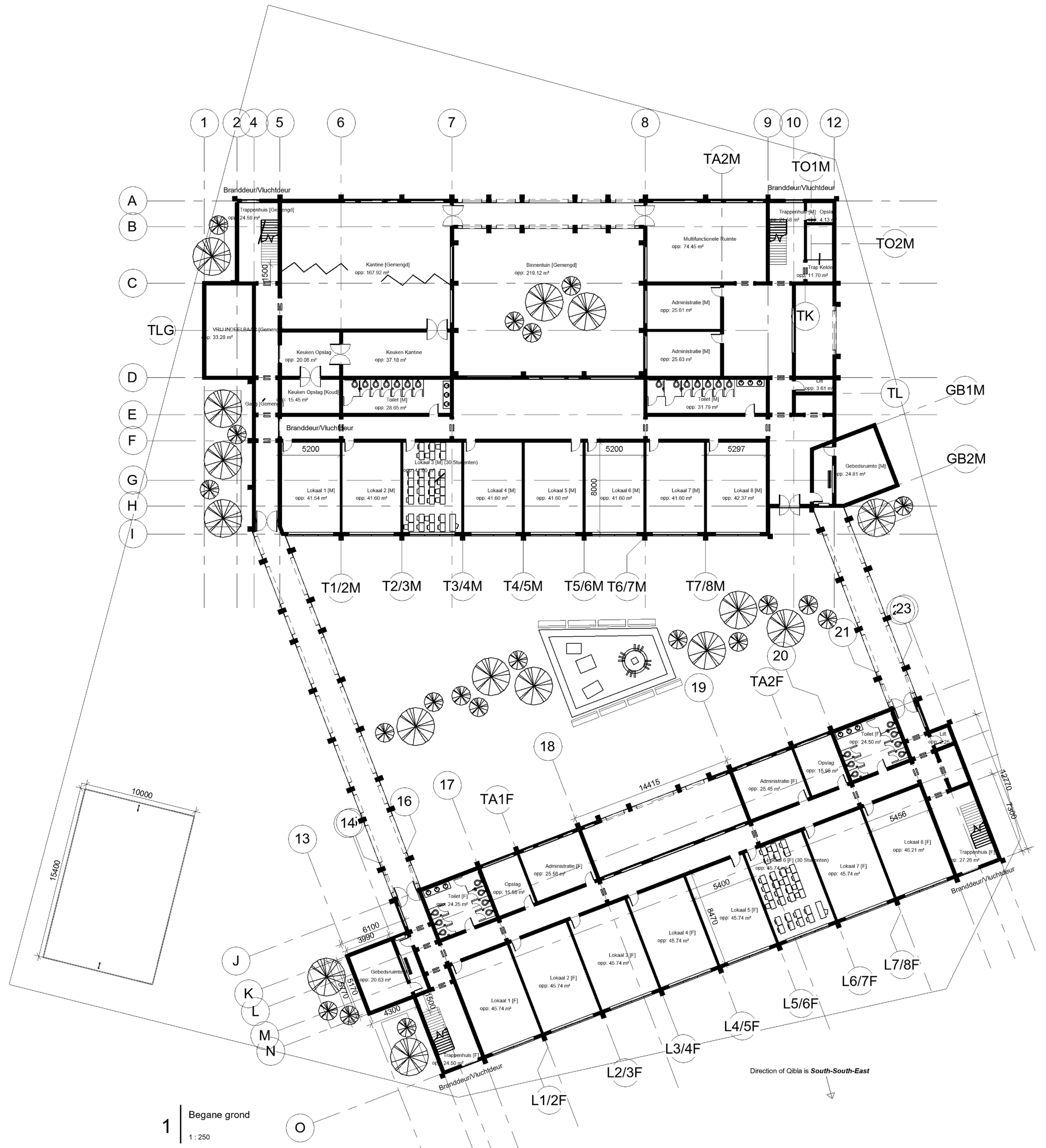

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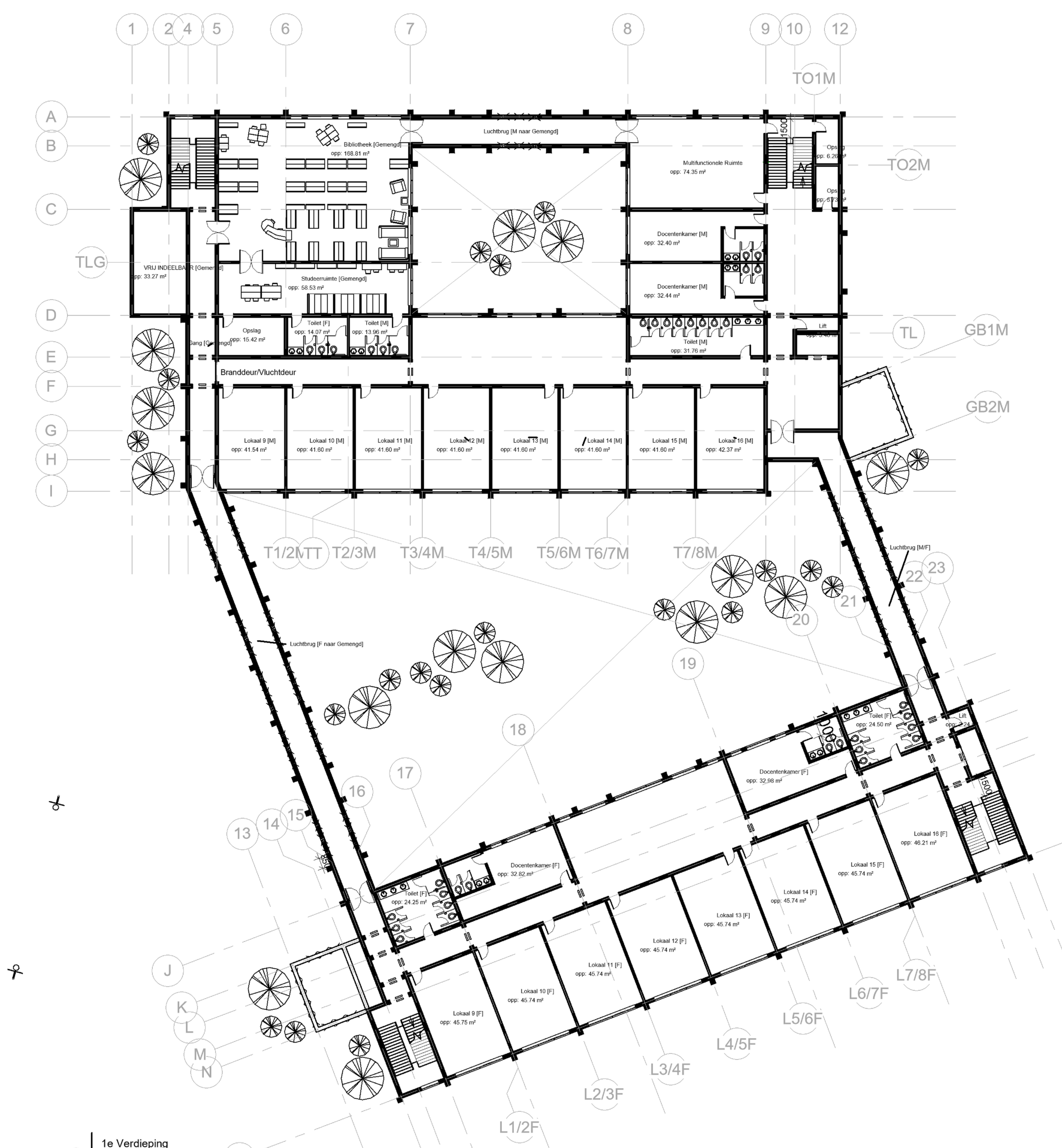
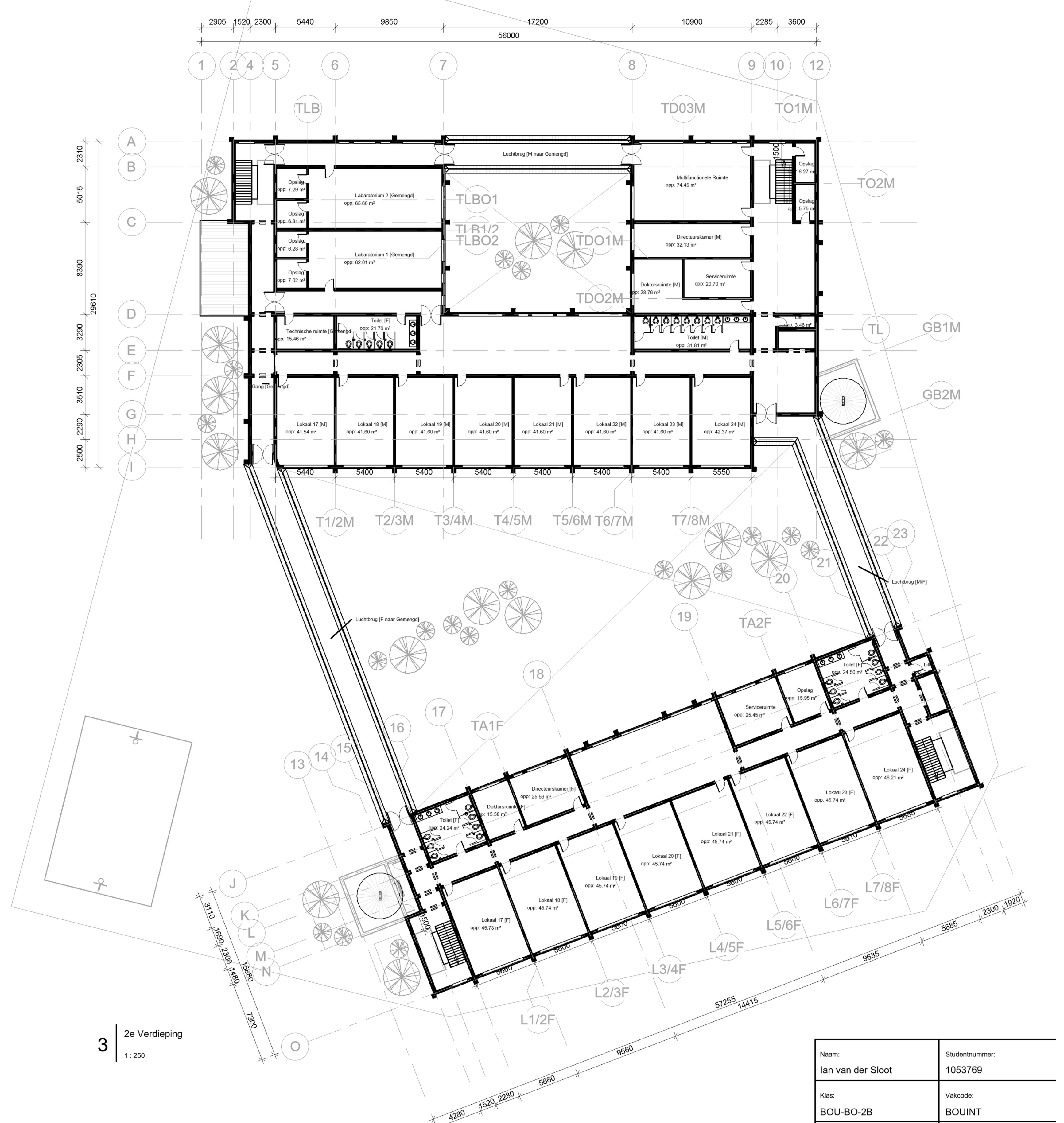


2 1e Verdieping 1 : 250



3 2e Verdieping 1 : 250

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