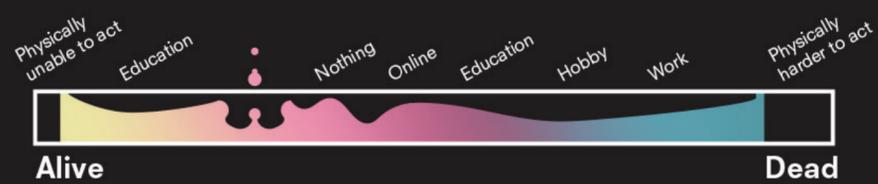


A journey to 2100

In 2100, automation of work will have a massive impact on our society. Labor will not be the primary occupation anymore in adulthood. Education has to adapt to prepare new generations for a life in a non-linear society that values creative and social skills above all. Moreover, education will develop to be an end goal in itself instead of a means to an end. It has become possible to learn your whole life. Education that combines the preparation for a non-linear society, and the ability to participate in lifelong learning requires a new type of school – the learning space of the 22nd century.



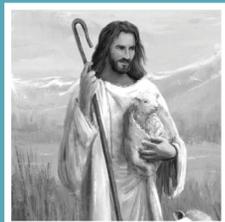
Education research

People interpret the role of education in different ways. Two of the most common paradigms are that education is useful for:

Bildung,
self-cultivation of the
individual

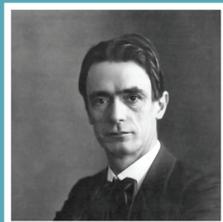
or

A means to help the
whole society forward



Religious

Within public schools, there is room for parochial teaching, with freedom for specific philosophical education. This has subdivided the public school into "algemeen bijzonder", "openbaar", "prot. christelijk", "katholiek", "samenwerking, confessioneel" and more specific types. (<https://www.scholenopdekaart.nl/>, n.d.)



Vrije school

The concept of the Vrije school – Free school – relies on the school of thought of anthroposophy. The subject matter is way for self-development in the form of creativity and social interaction next to raising intellectual intellect. There is a large focus on the atmosphere of the learning environment, like color schemes to create an environment where children can function optimally. (Boersma et al., 1996, pp. 23–24)



Freinet

The Freinet concept does not follow strict methodologies but is based on the experiences of the children. The teacher and student group work together to create a meaningful education. Freinet education goes out of the classroom to visit companies and nature to experience the world firsthand. ("De Vereniging voor Freinetpedagogie - uitgangspunten," n.d.)

Finland public

The Finnish Public school system stands out from other foreign school systems for its performance on the PISA report by OESO. (NOS, 2016) Part of the success of the Finnish education is that the teacher must have a university degree and that the teacher has more autonomy and freedom to prepare classes to his vision. (NOS, 2016) Education is given according to the ideals of phenomenon-based learning. ("Why Are Finland's Schools Successful?," 2011)



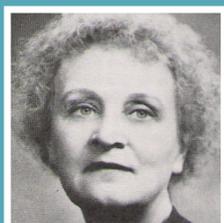
Public

Different concepts and visions for education were always reserved for a minority of society. The public school has been and still is the default school within the Netherlands. The concept of the public school was to prepare all children in Dutch society for a meaningful existence in society. (Boersma, Verstegen, & Bergeijk, 1996, pp. 20–21)



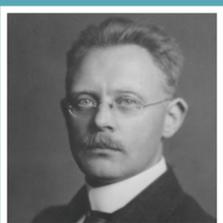
Montessori

Self-development and auto-didactic education are the essence of the Montessori education concept. An essential aspect of the Montessori concept is the goal to make the child independent from adults. Education is aimed at individual work and individual interests; this individuality is countered by working in groups of switching consistency.



Dalton

"Dalton is no method, no system, it's an influence!" -Helen Parkhurst ("Daltononderwijs," n.d.). The concept of Dalton education aims to educate children for a fearless existence filled with confidence, creativity, initiative, and social responsibility. The subject matter concentrates on the individual while it is performed within a group context where social interaction is actively encouraged to create an environment of co-operation. ("Daltononderwijs," n.d.)



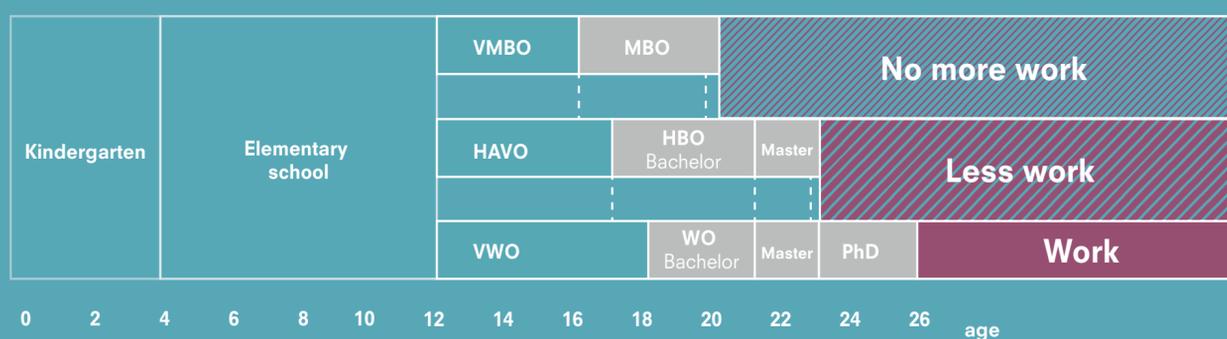
Jenaplan

The Jenaplan concept relies on the belief that the child is a product from the relation with his fellow humans. The education process is placed in a community that shares the same norms and values. The school has to be part of the society it reflects on and education is conducted in part through adults from the neighborhood. The space for learning has to be arranged in such a way that curiosity is triggered for a diversity of activities. (Boersma et al., 1996, p. 22)

- 1806 - Education legislation makes education possible on Christian principles.
- 1810
- 1820
- 1848 - Freedom of education act within the Dutch constitution
- 1857 - Education law of 1857: dictates which courses are given
- 1866 - Introduction of general grammar by of de Vries and te Winkel
- 1830
- 1840
- 1863 - New legislation for Secondary education: Introduction of the (higher) civil school, agriculture and polytechnic school
- 1874 - "Kinderwetje" by Van Houten, forbade children under 12, to work in factories
- 1876 - New law on higher education: More oriented on society; Dutch becomes main language in universities instead of Latin
- 1850
- 1860
- 1895 - Rise of the business education of Jan Ligthart, as a defense against contemplative education
- 1870
- 1900 - First compulsory formal education law in the Netherlands**
- 1909 - First lyceum by Rommert Casimir in The Hague
- 1880
- 1914 - First Montessori school in the Netherlands
- 1934-1936 – New grammar by Marchant
- 1923 - First free school to Rudolf Steiner in The Hague
- 1890
- 1900
- 1910
- 1930 - First Dalton School in The Hague
- 1920
- 1963 - First Jenaplanschool in the Netherlands
- 1968 - New education system for Secondary education through the Mammoth law: Education partially compulsory until 18 years old
- 1976 – STARO founded by BNA, architectural research group with focus on education
- 1985 - Primary school introduced: kindergarten and primary school are merged together
- 1998 - Introduction Second Phase: the subject packages are replaced by profiles
- 1950
- 1992 – First time that "Scholenvoerprijs" was rewarded, to stimulate innovation in the architecture of schools
- 1993 – "Basic education" introduced in elementary school: regulation that mandates that all students have the same base knowledge
- 1970
- 2006 – Fresh schools campaign launched by VROM: Increase sustainability and interior climate of elementary and secondary schools
- 1980
- 2008 – First MOOC, Massive Open Online Course: Introduction to Open Education.
- 1990
- 2011 – First Pleion school: Pleion stands for Platform for contemporary education.
- 2000
- 2014 – Onderwijs2032, Education 2032 research group with recommendations to improve Dutch education
- 2010
- 2014 – First iPadschool in the Netherlands
- 2018 – Curriculum.nu, research group/ think-tank to discuss the future of Dutch education.
- 2020

Freedom of education act

Education since 1800



Schematic overview

Fluid education

Life in 2100 requires a new type of education that focuses on future skills and lifelong education - Fluid education.



Public

Fluid education is open to everyone



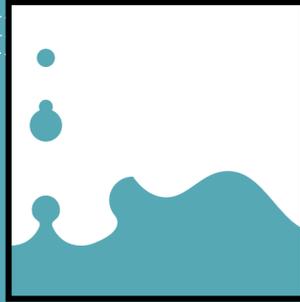
Montessori

Within Fluid education there is room for Self-development and auto-didactic education as thought by Montessori



Dalton

In Dalton, the teacher is present to guide, in Fluid education this is also incorporated



Jenaplan

Fluid education takes the focus on conversation, work, play and celebration from Jenaplan



Vrije school

Fluid education takes the focus on social, creative, technic and craftsmanship from the Vrije school



Freinet

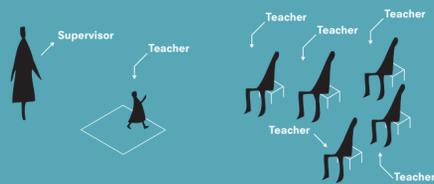
Fluid education takes the fact that Freinet experiences the world firsthand

Fluid education



Education for all ages

Fluid education focuses on offering lifelong education. Therefore the school is open for adults that come in for respecialization. Adults that come for respecialization can learn everyone about their experiences so far and inspire.



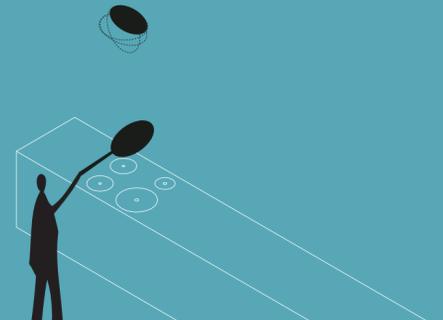
Focus on social skills

Alain du Buton, the founder of the School of Life said that "Everyone has to take the role of the teacher and learn how you get an idea inside your head, in that of someone else."(theschooloflife.com). Social skills will be one of the most important in the future, by making everyone a teacher, they will become more social in the process.



Focus on creativity

As creativity is one of the few skills that will be unaffected by automation, it will become one of the most important skills in the future. Problem-solving relies heavily on creativity. In an uncertain future, one of the only certainties is that there will be problems that need to be solved.

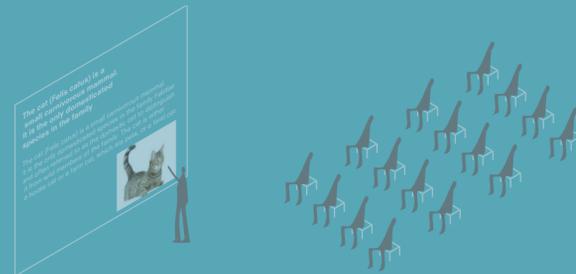


Focus on vocational skills

Some might say that "robotics can do it better", but we still need to understand how the robotics clean, do maintenance on our homes and calculate rent. Vocational skills are an important part of the curriculum.

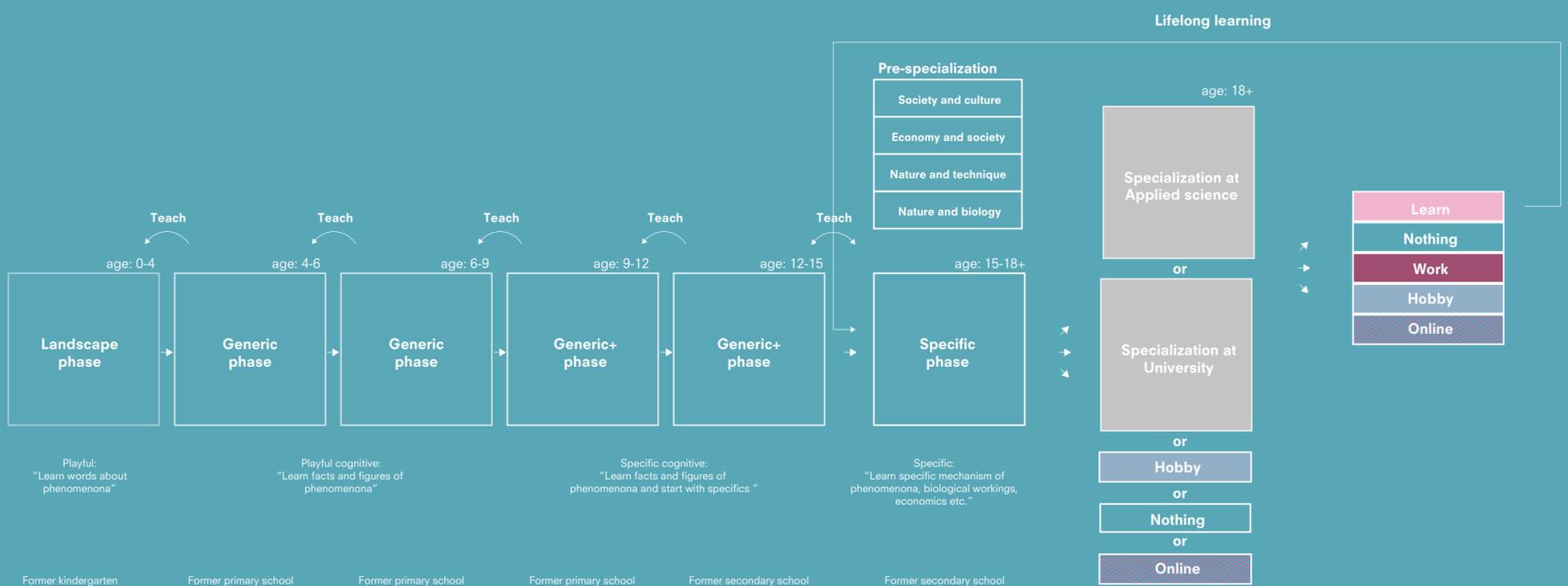


Active contextualized phenomenon-based education



Passive decontextualized education

Fluid education uses the phenomenon-based learning method



Schematic overview

Learning space research

School buildings are built up from the same elements. These are the generic elements of a learning space:



Sports



Classroom



Playground



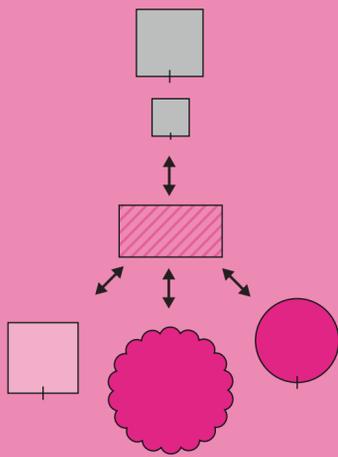
Facilities



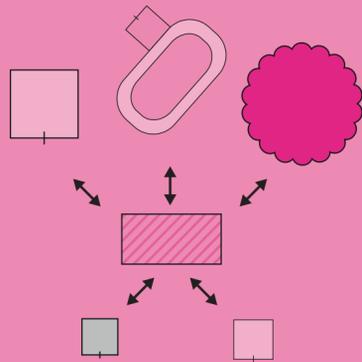
Storage



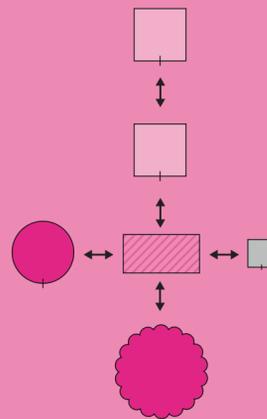
Toilets



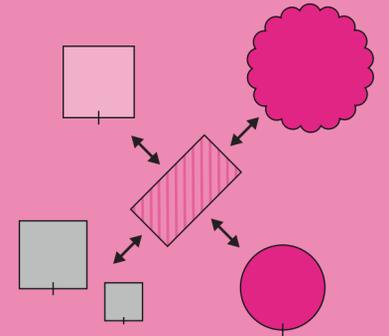
Fuji Kindergarten



H-Type school



Openluchtschool



Montessori school Delft



“Help me to do it myself! a real paradox which involves developing self-sufficiency and which assumes that the capacity for learning lies within the child.”

- Yui y Takaharu Tezuka

(Y. Tezuka as cited in a+t, 2018, p. 17)



“Schools must constantly adapt to new demands, visions and demographic developments, a process to which the school building, in practice, is not well-suited.”

- Schoolparasites

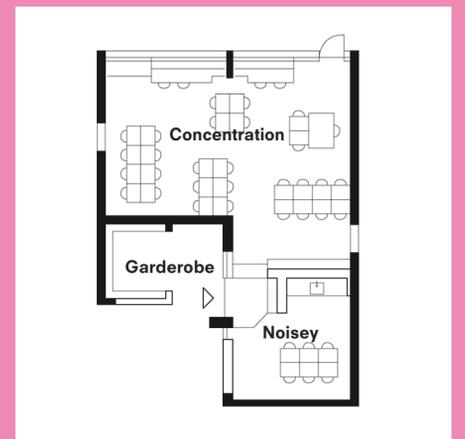
(Kempinga, Aarsman, & Bouvier, 2004, p. 163)



“Het is een sterke hygiënische kracht, die ons leven beïnvloedt en die tot een stijl: een hygiënische stijl zal uitgroeien.”

- Johannes Duiker

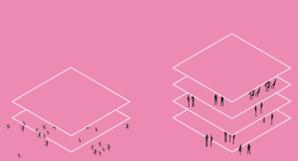
(Duiker J. as cited in Dam, Komossa, Swakman, & Schouten, 2011, P.41)



“Montessori education requires as many places for individual activities as possible. [...] a classroom with many corners and different zones”

- Herman Hertzberger

(Space and Learning, Hertzberger H., (2009), P.162)



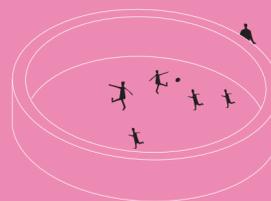
School buildings tend to grow in size alongside the growth of their students.



School buildings are everywhere



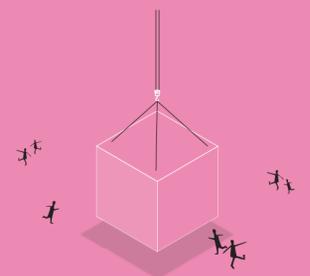
The school could be envisioned as a micro version of the real city.



Students attending the kindergarten are out of the control of their parents and are in large quantities compared to their adolescent teachers.



The cleanliness of the structure and the lack of ornamentation reflect the ideals of the school.



The Schoolparasites teach us that it is possible to create qualitative spaces that are of temporary nature.

Conclusions from typological research

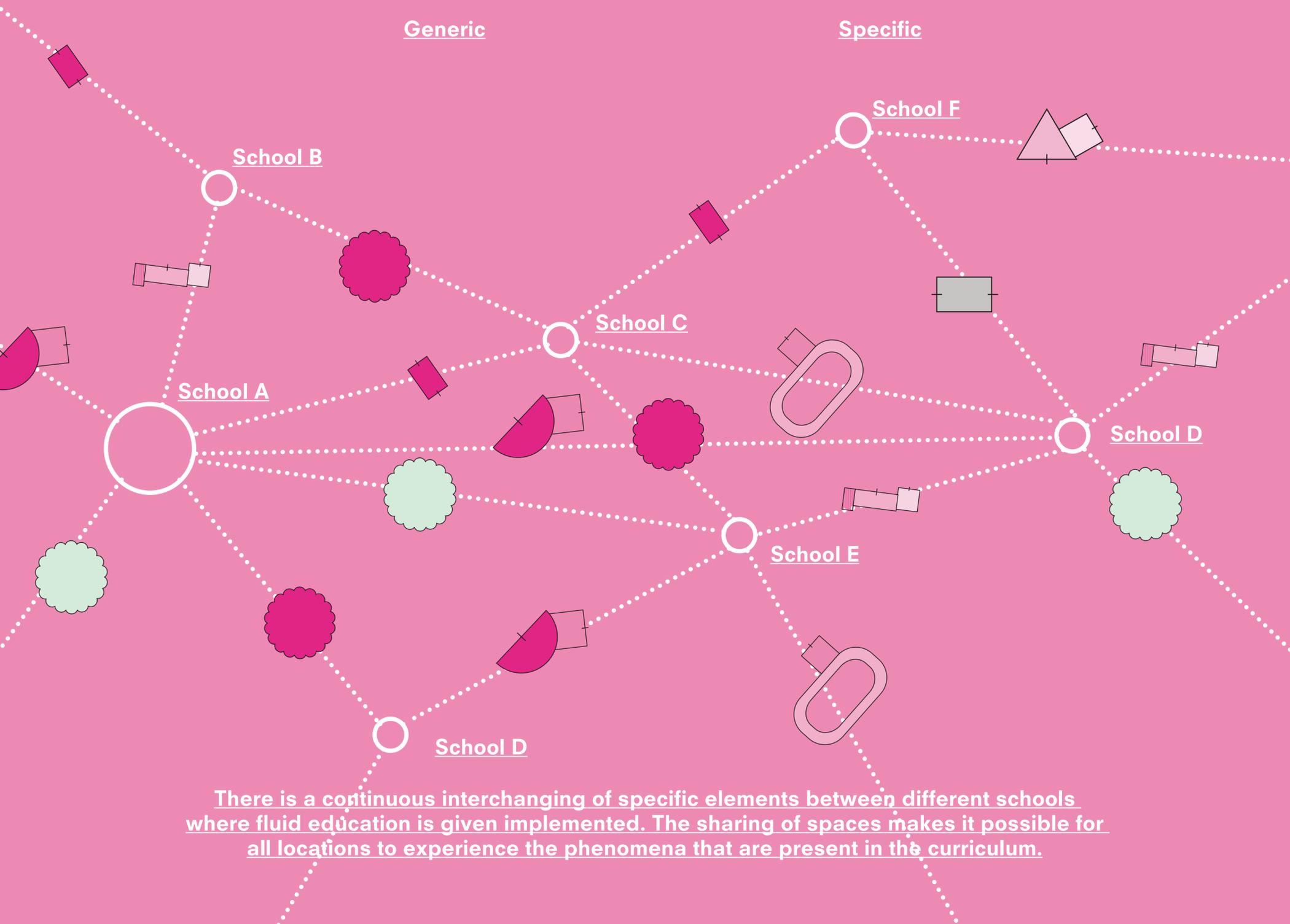
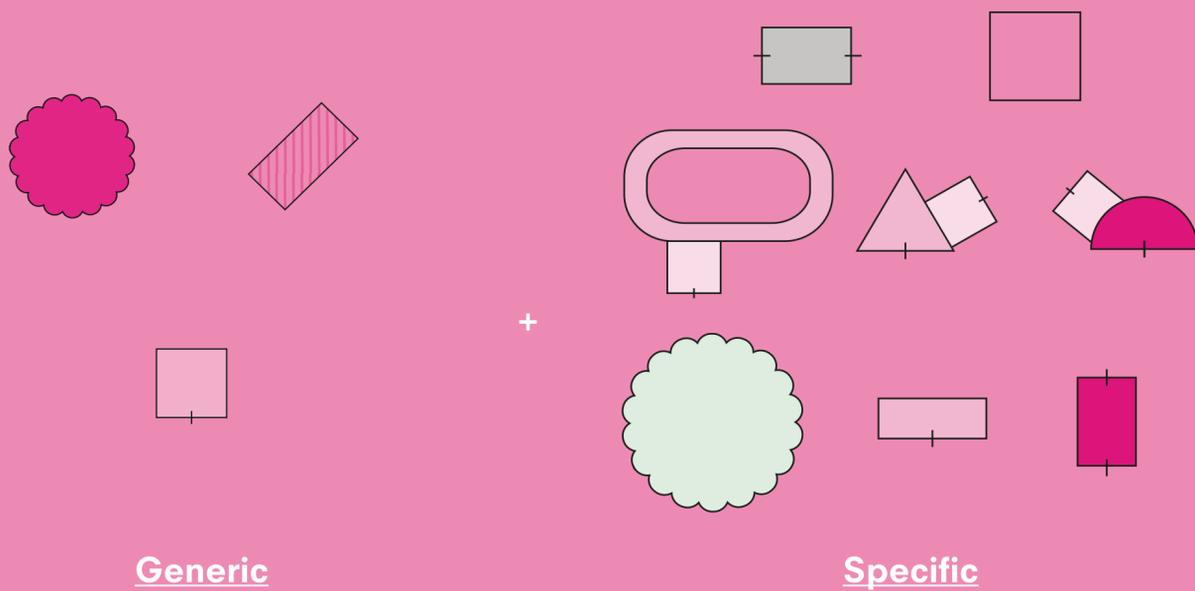
Learning space of the 22nd century

All the school buildings have been adapted to the specific type of education given. We can conclude that the ideals of education influence the design of the school.



"Fluid education employs phenomenon-based learning. It is required to actively experience these phenomena during the learning process. A diverse range of specific spaces is required to experience all phenomena during education."

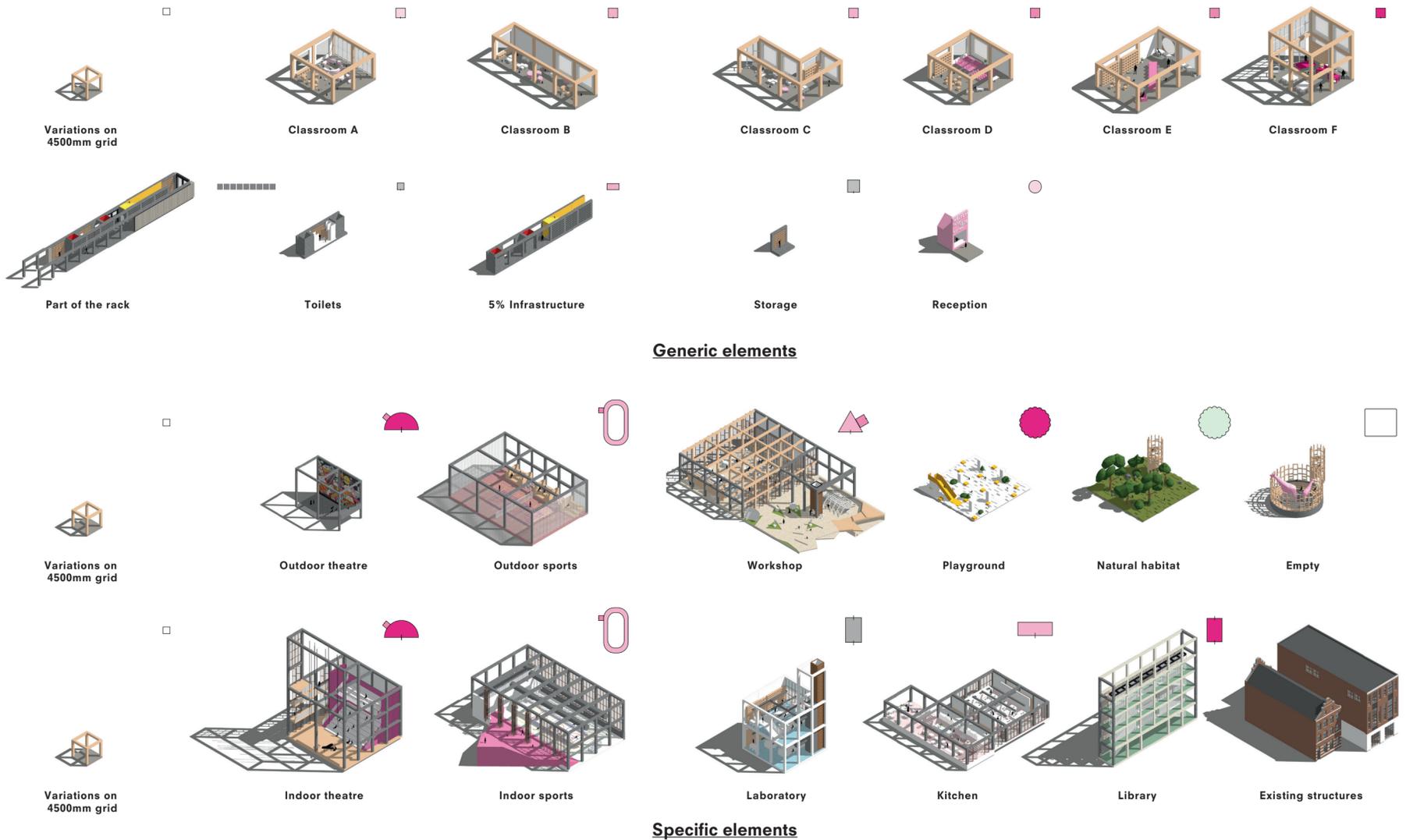
Ideal of fluid education



There is a continuous interchanging of specific elements between different schools where fluid education is given implemented. The sharing of spaces makes it possible for all locations to experience the phenomena that are present in the curriculum.

Implementation

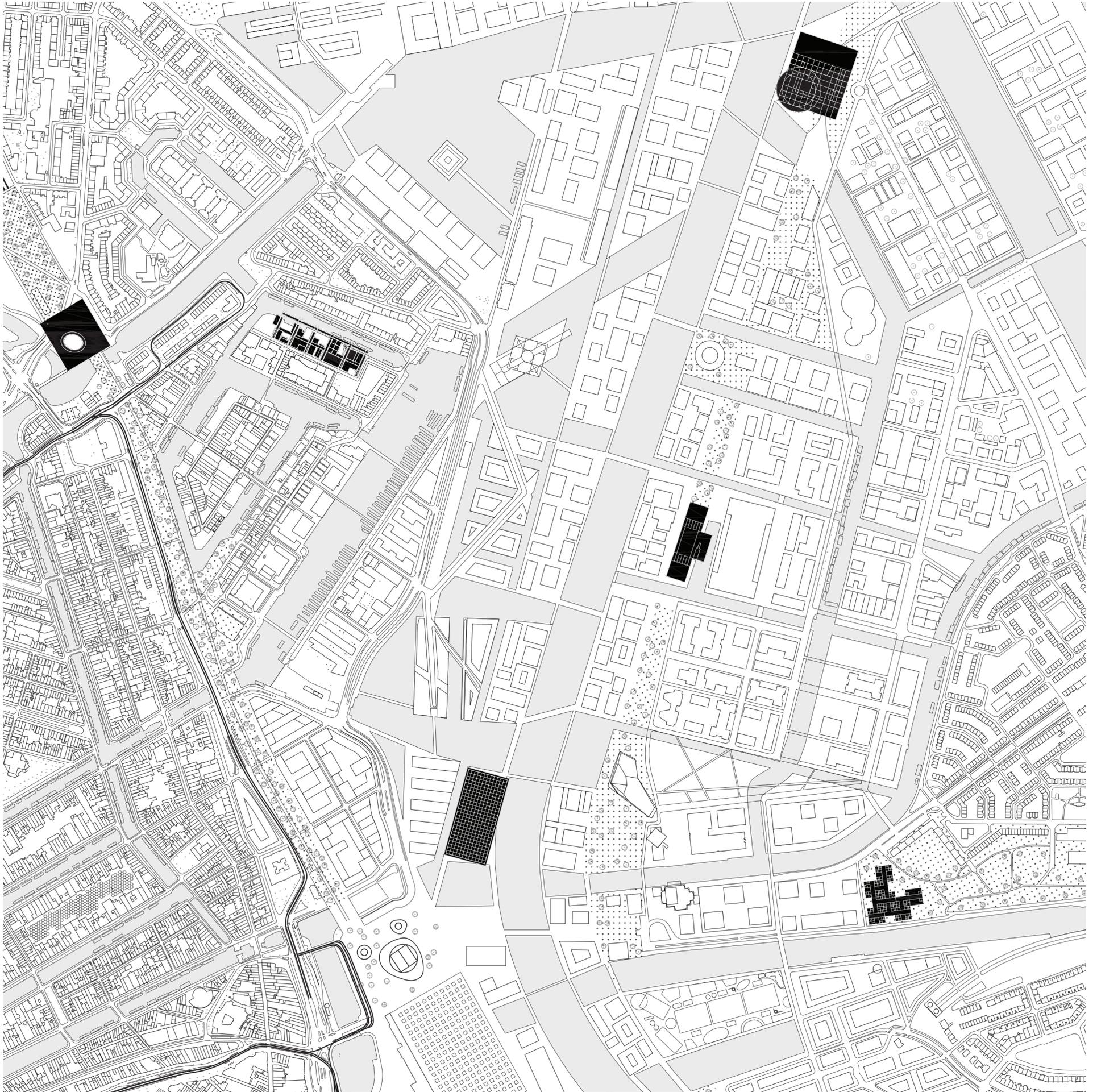
The building uses a modular 4500mm x 4500mm x 4500mm grid. All elements are adapted to be placed within the grid. Listed below are all the elements in the building, at this particular moment in the year 2100.



This open isometric shows the first two levels of the building.

Group plan

Amsterdam Central in 2100



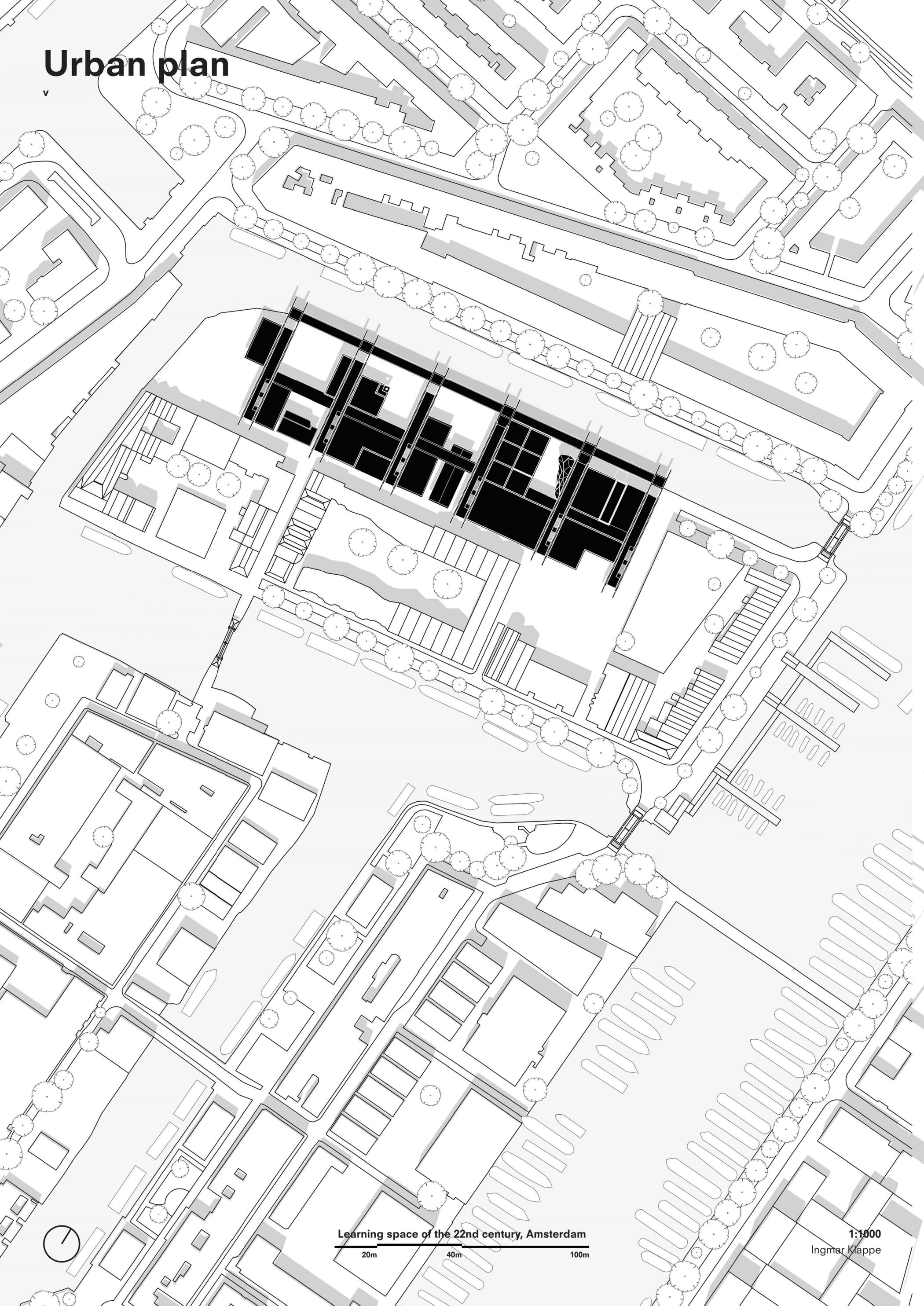
Learning space of the 22nd century, Amsterdam

50m 250m

1:5000

Ingmar Klappe

Urban plan



Learning space of the 22nd century, Amsterdam

20m

40m

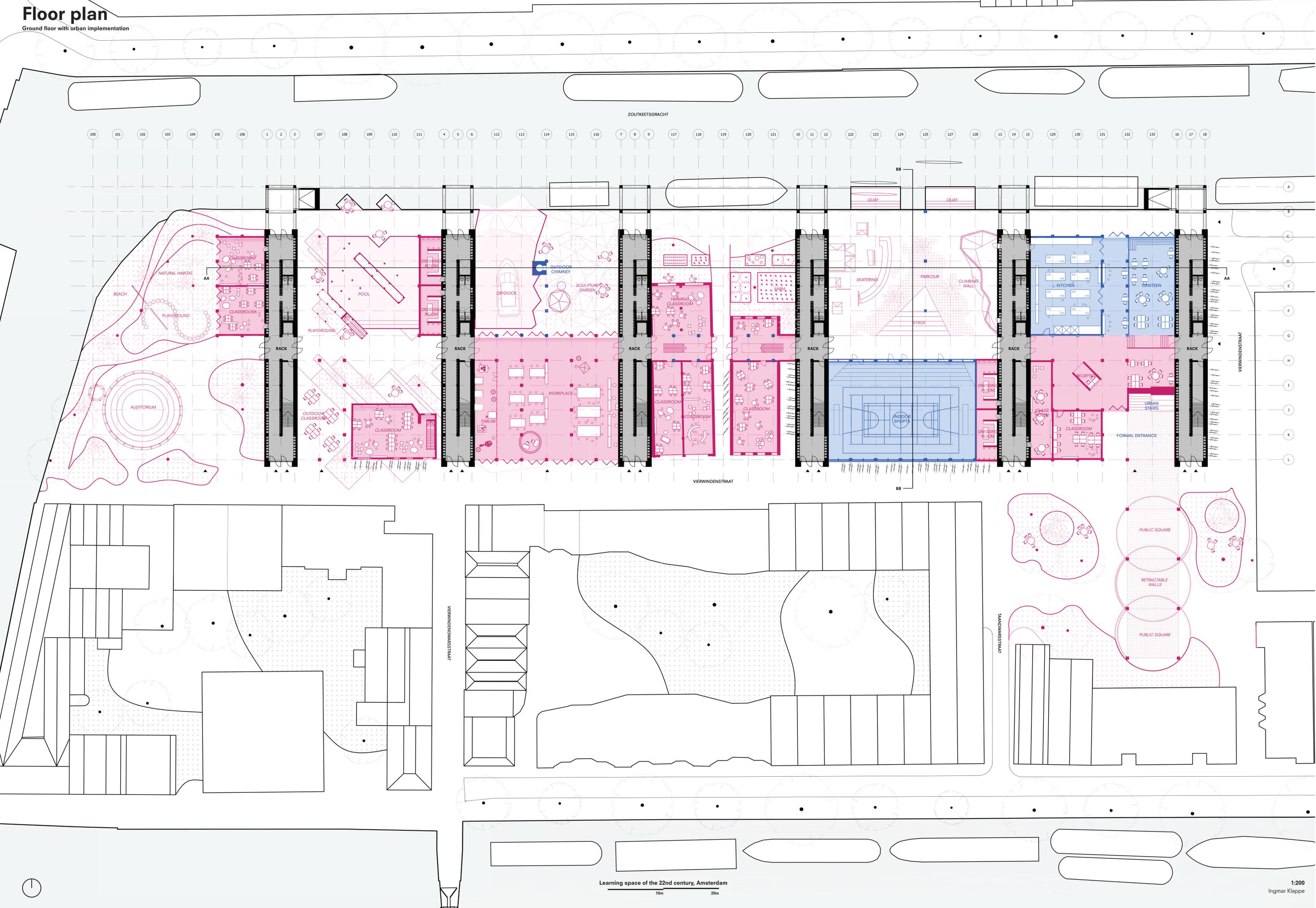
100m

1:1000

Ingmar Klappe

Floor plan

Ground floor with urban implementation

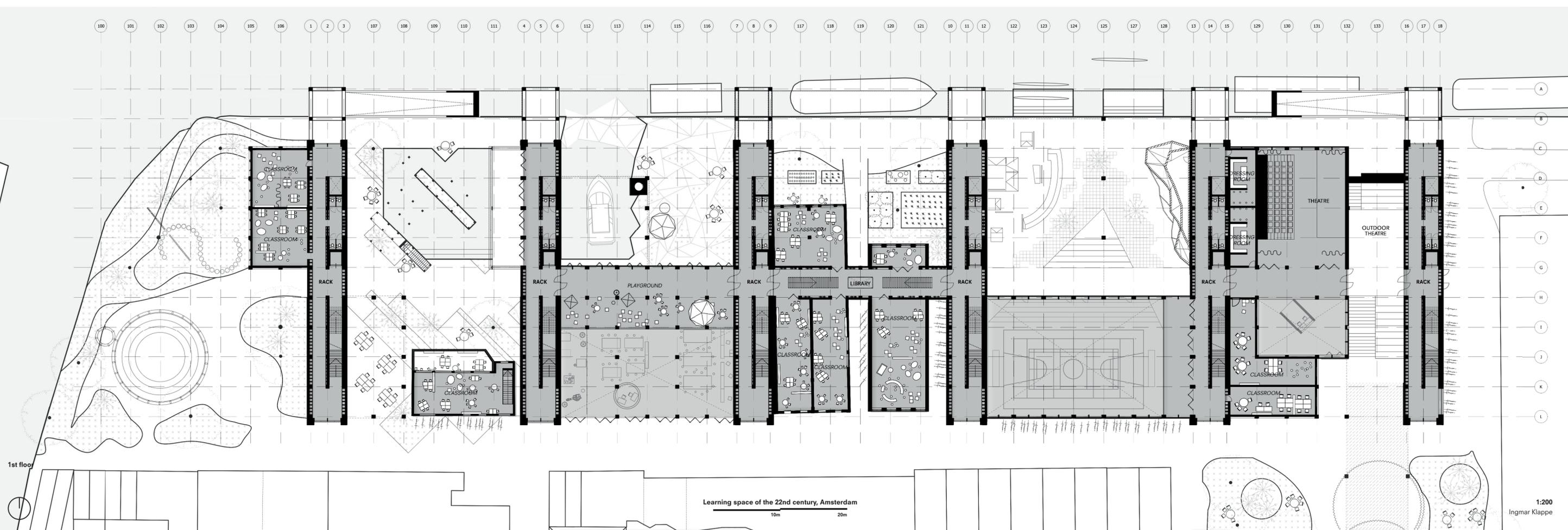
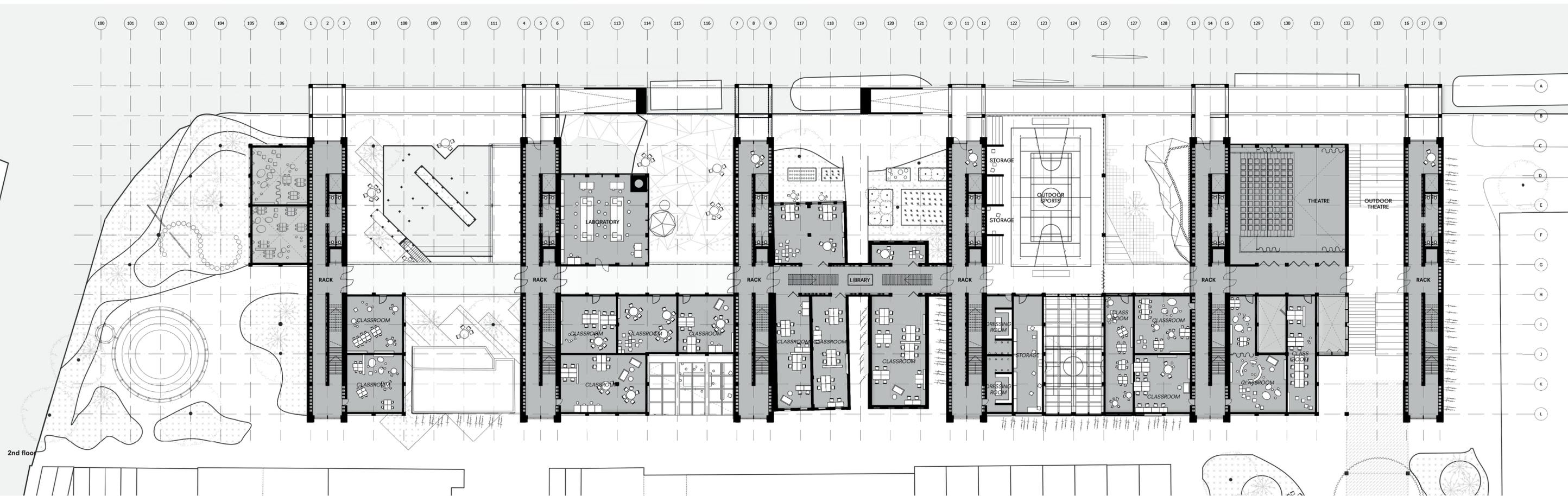


Learning space of the 22nd century, Amsterdam

10m 20m

Floor plan

1st floor and 2nd floor

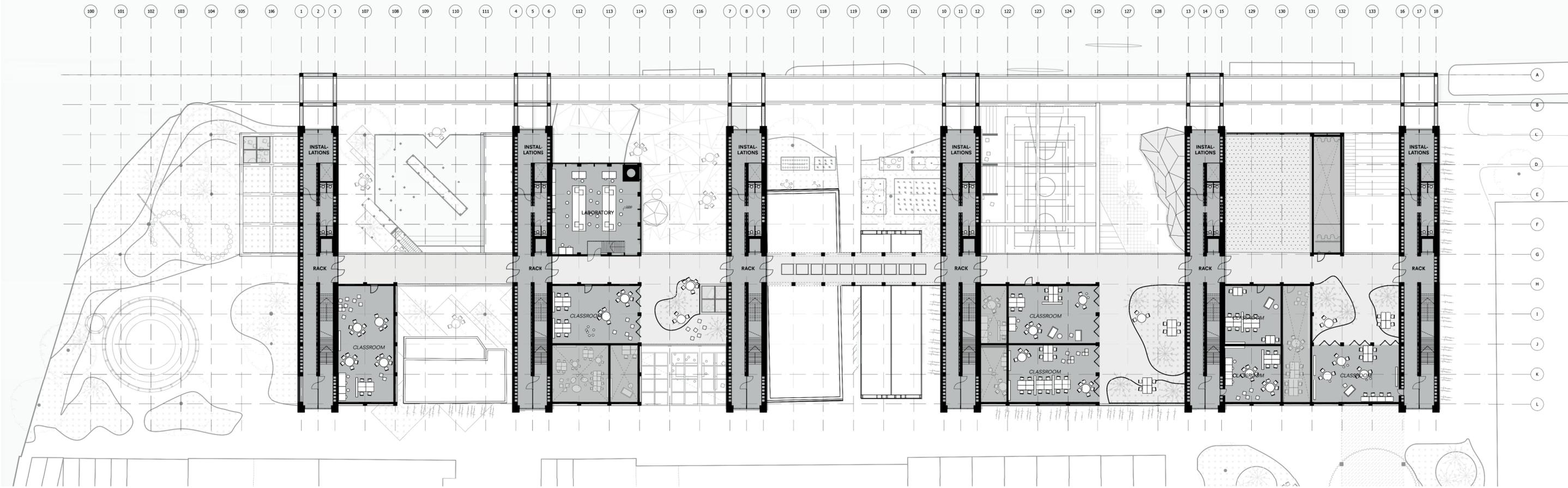


Learning space of the 22nd century, Amsterdam
10m 20m

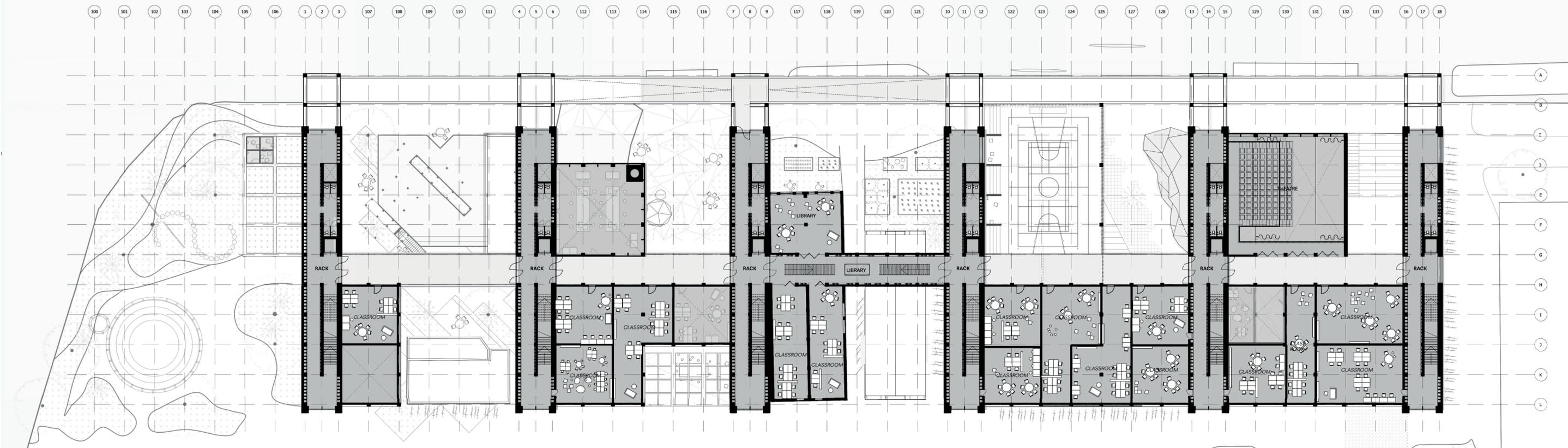
1:200
Ingmar Klappe

Floor plan

3rd and 4th floor



4th floor

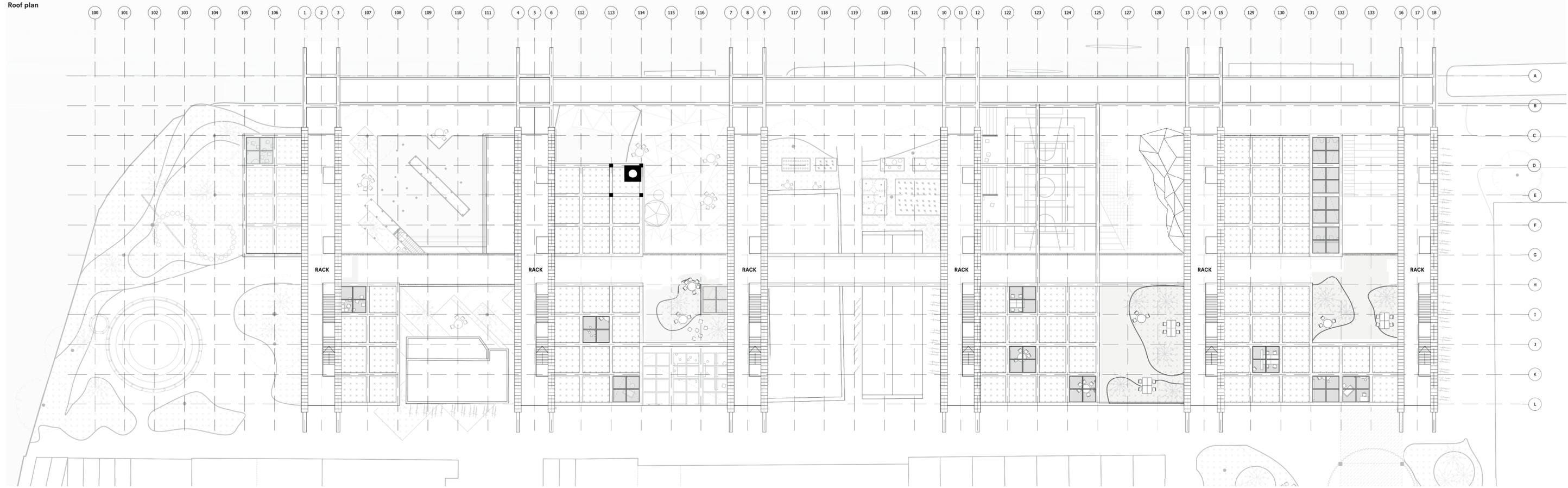


3rd floor



Floor plan

Roof plan



Roof



Learning space of the 22nd century, Amsterdam
10m 20m

1:200
Ingmar Klappe

Facades

South



North



Learning space of the 22nd century, Amsterdam

10m 20m

Ingmar Klappe

Facades

West

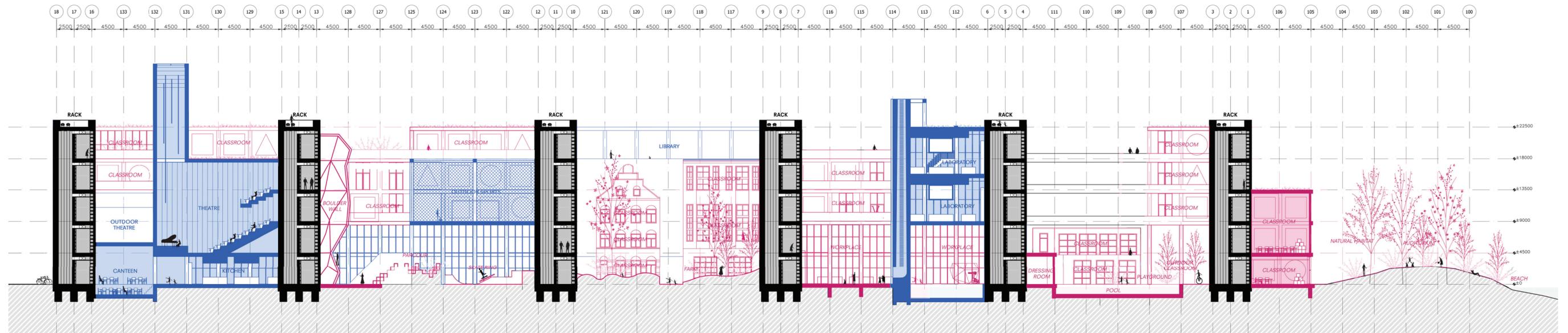


East



Section

Section AA

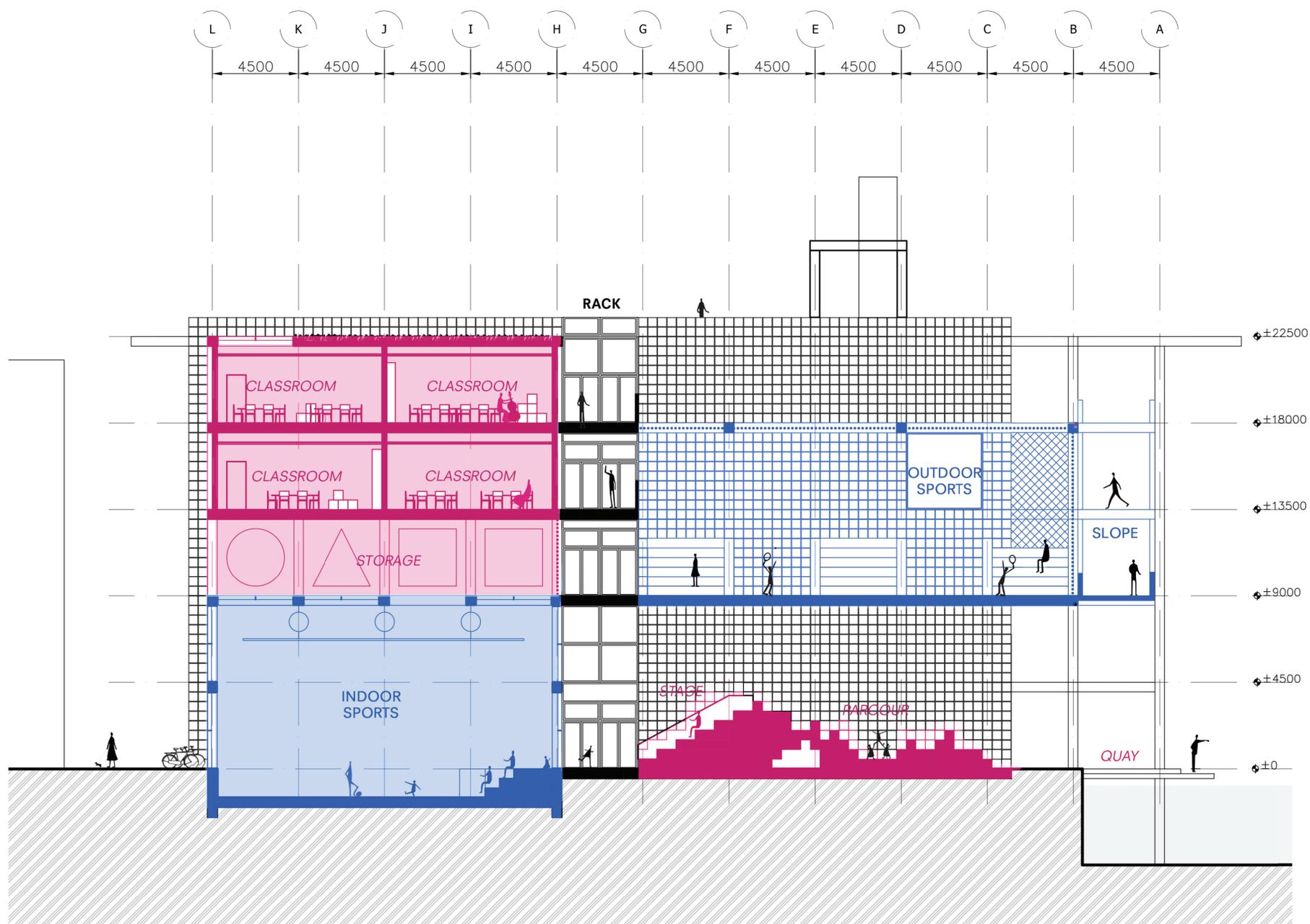


Learning space of the 22nd century, Amsterdam



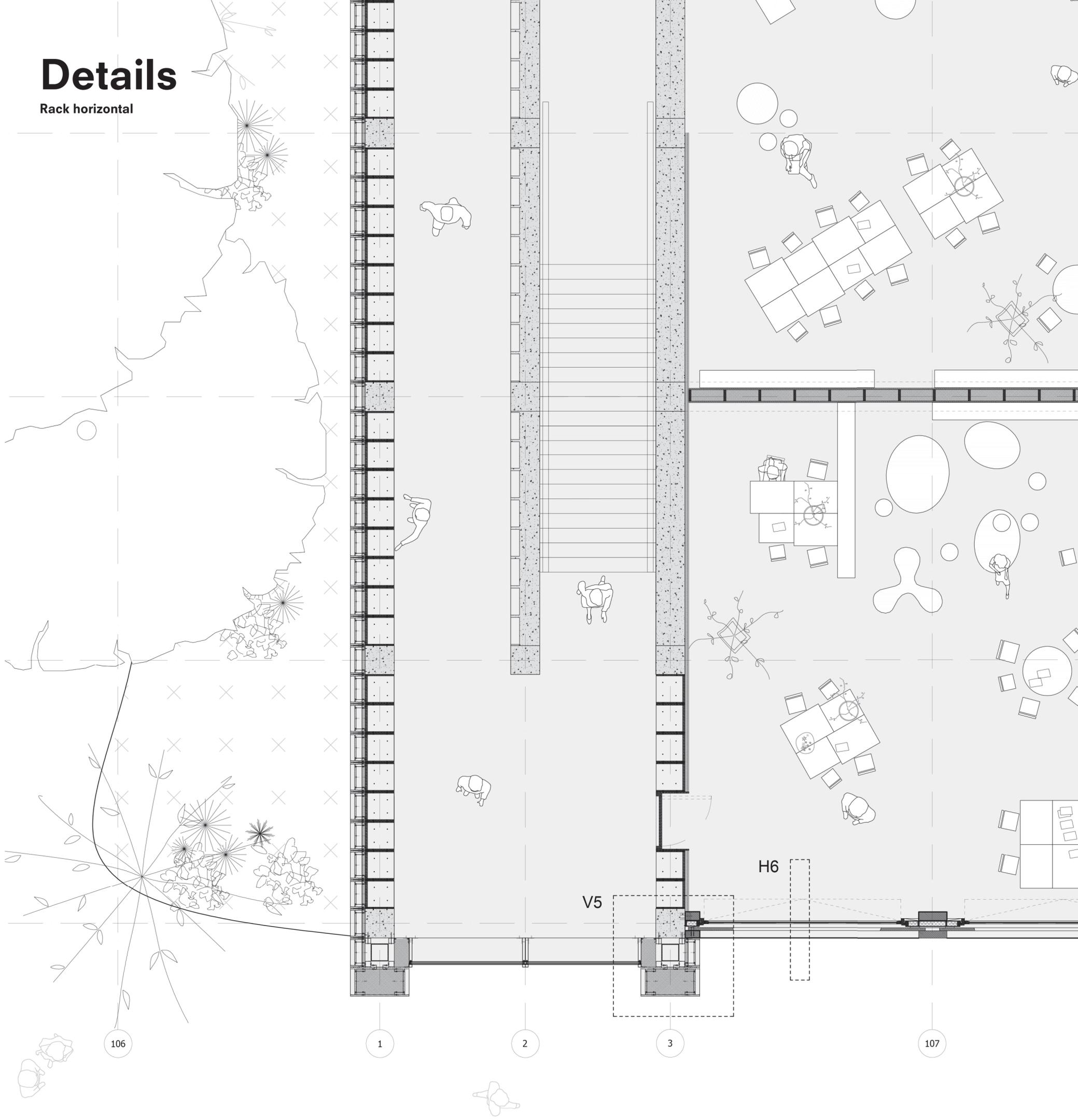
Section

Section BB



Details

Rack horizontal



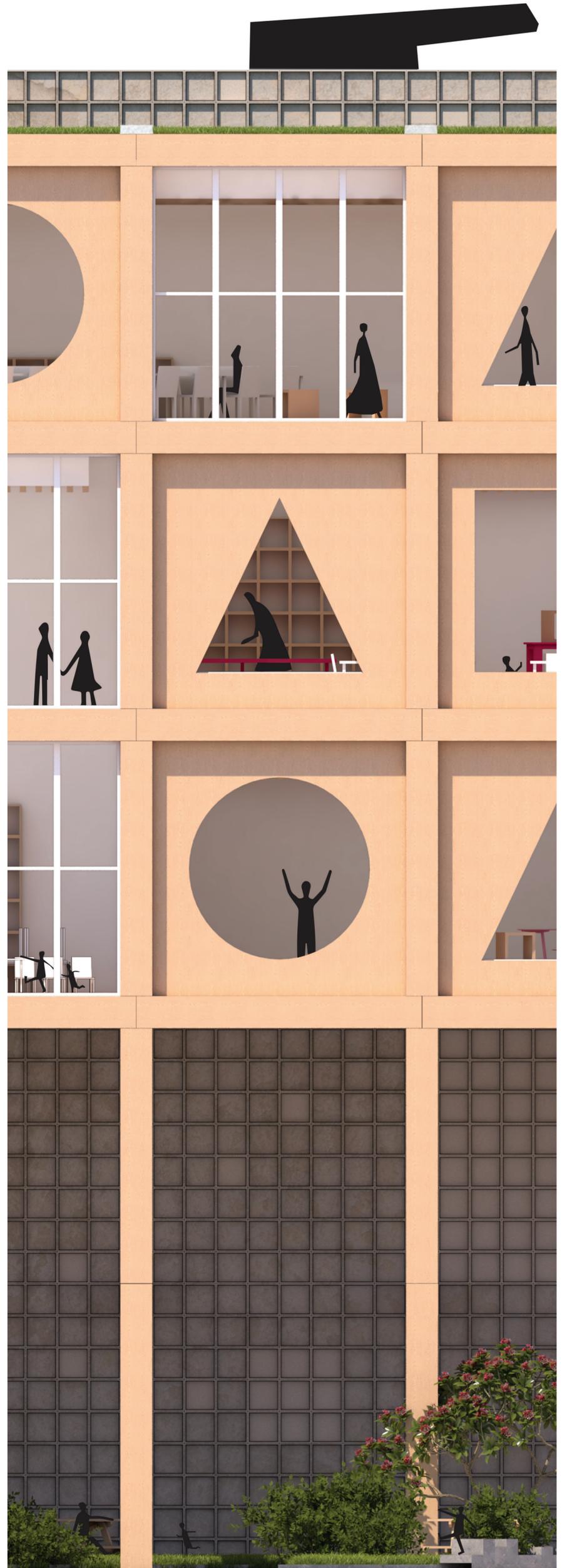
Learning space of the 22nd century, Amsterdam

0,5m 2m

1:50
Ingmar Klappe

Details

Rack facade fragment with materialization



Learning space of the 22nd century, Amsterdam

0,5m 2m

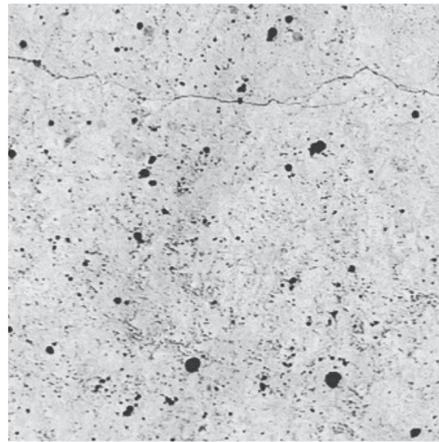
1:50

Ingmar Klappe

Details - Material list



14



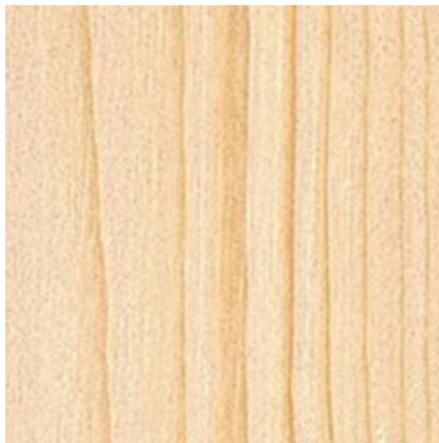
A



9



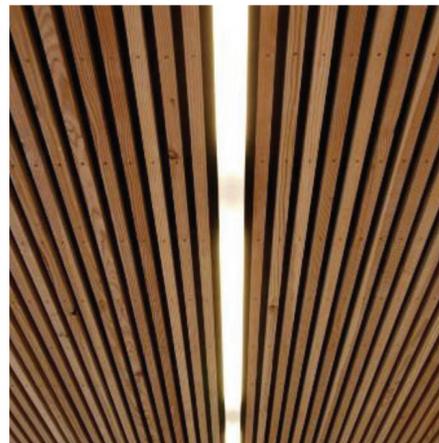
5



B+C



10



101



6



7



1



6



102

STRUCTURE

- A** Cast in-situ concrete with steel reinforcement for the floors, with prefabricated concrete columns
- B** Exterior timber beam, Douglas fir, impregnated
- C** Interior timber beam, spruce wood, impregnated
- D** Prefabricated timber rib floor with inner insulation
- E** Prefabricated wooden facade element with inner insulation
- F** Steel rectangle hollow section framework
- G** Steel bracket as reinforcement of the timber beam and to connect it to main construction of (A)
- H** Facade fastener, steel anchor in concrete
- I** Facade fastener, steel anchors, connected to cast-in dowels and grooves of (1)
- J** 4x4 bolt connection, possible to be individually dismantled for future alterations
- K** Adjustable ceiling hanger
- L** Adjustable frame to correct vertical elevation of boxes
- M** Waterproof membrane
- N** Regular insulation
- O** High-density insulation

INSTALLATIONS

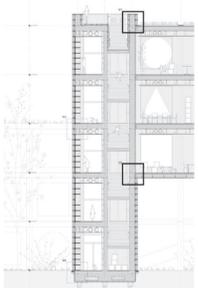
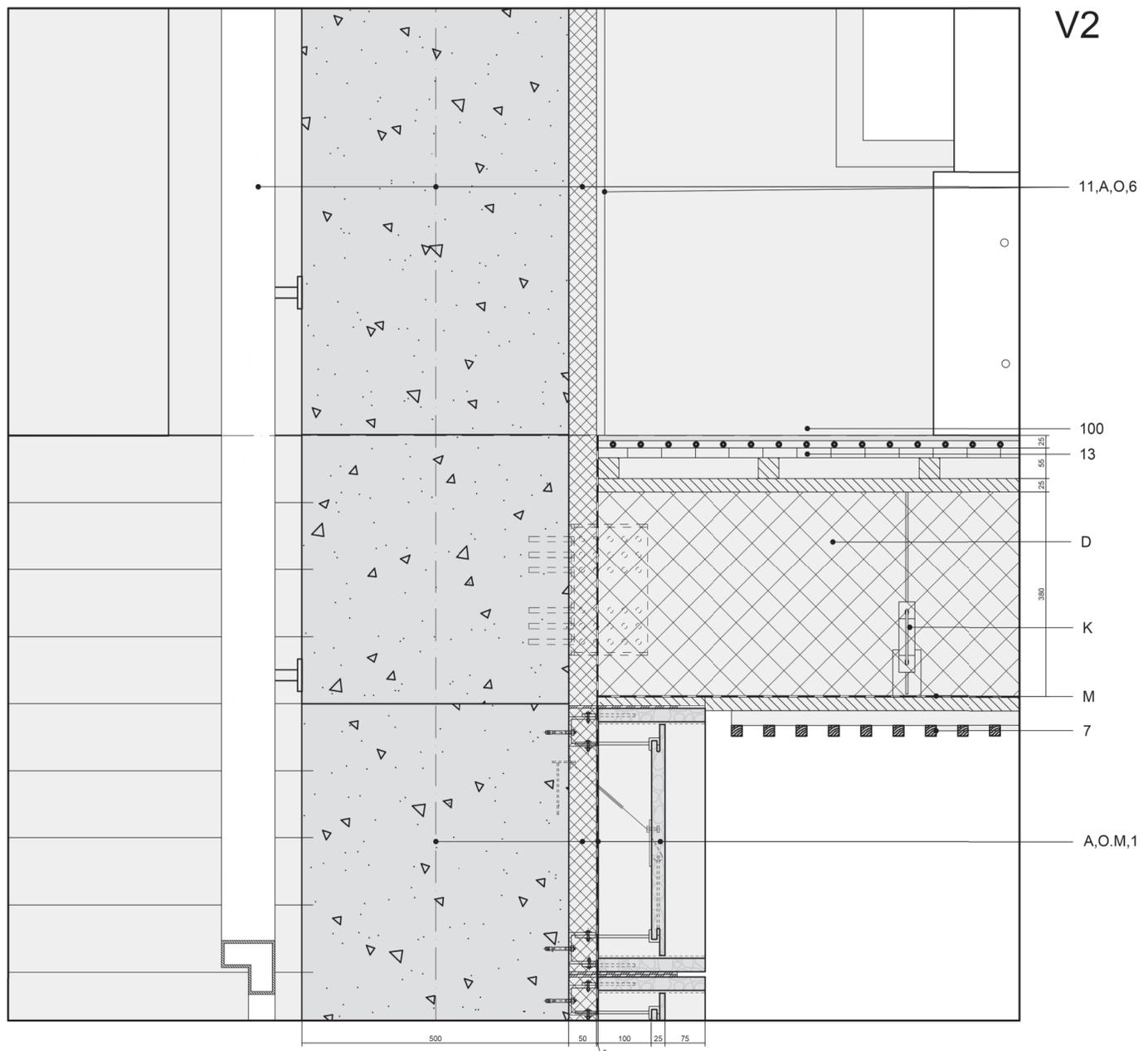
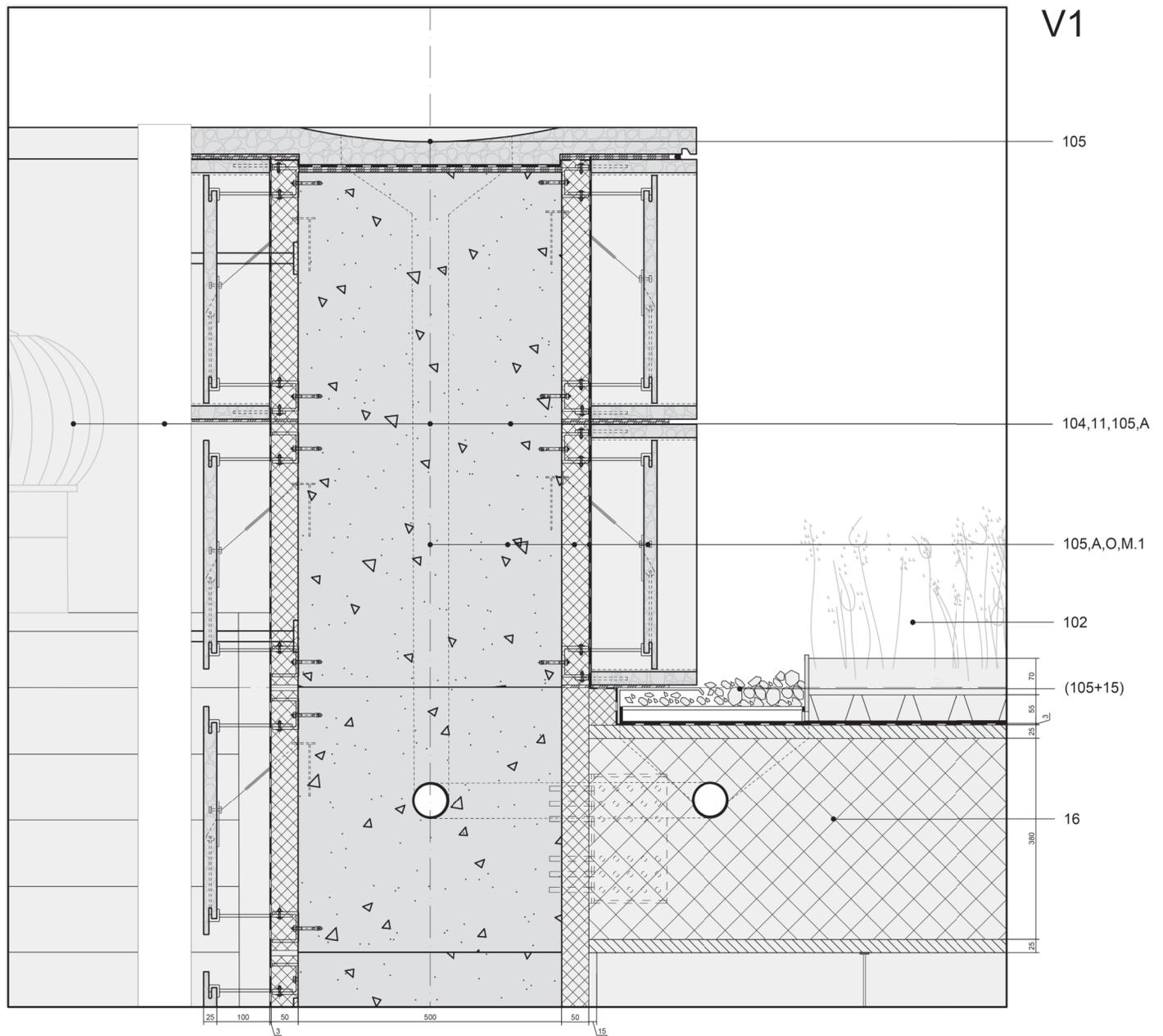
- 100** Demountable climate flooring with waterproof PVC floor panel finish
- 101** Demountable climate ceiling with wooden finish (for cooling, light fixtures and fresh air, with acoustic capacity), 500mm edge along ceiling with upward light fixtures
- 102** Green roof
- 104** Outlet of HVAC installation
- 105** Drainage gutter connected to

- 106** the water collection basin for reuse
- 106** Integrated rainwater pipe connected to water collection basin for reuse
- 107** Integrated automatic window opener
- 108** Reserved space for installations

FINISH

- 1** Off-white, white clay panels, structurally strengthened by carbon fiber, matt and visible aggregate, porous material to enable algae growth
- 2** Glass panel
- 3** Timber window frame
- 4** Outer facade padding panel 50mm thickness of CLT wood
- 5** Curtain wall system with matt black finish, 50mm width
- 6** Wall finish to preference
- 7** Timber paneling finish
- 8** Steel mesh grate cover for (20)
- 9** Beechwood panels, impregnated with child-safe fire retardant, matt finish
- 10** Brass cap
- 11** Stair railing
- 12** Demountable wall panels
- 13** OSB placed on timber beams - reserved space for future alterations
- 14** Coarse aggregate concrete (visible gravel) floor finish
- 15** Gravel

Details

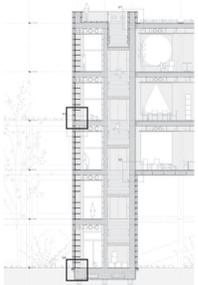
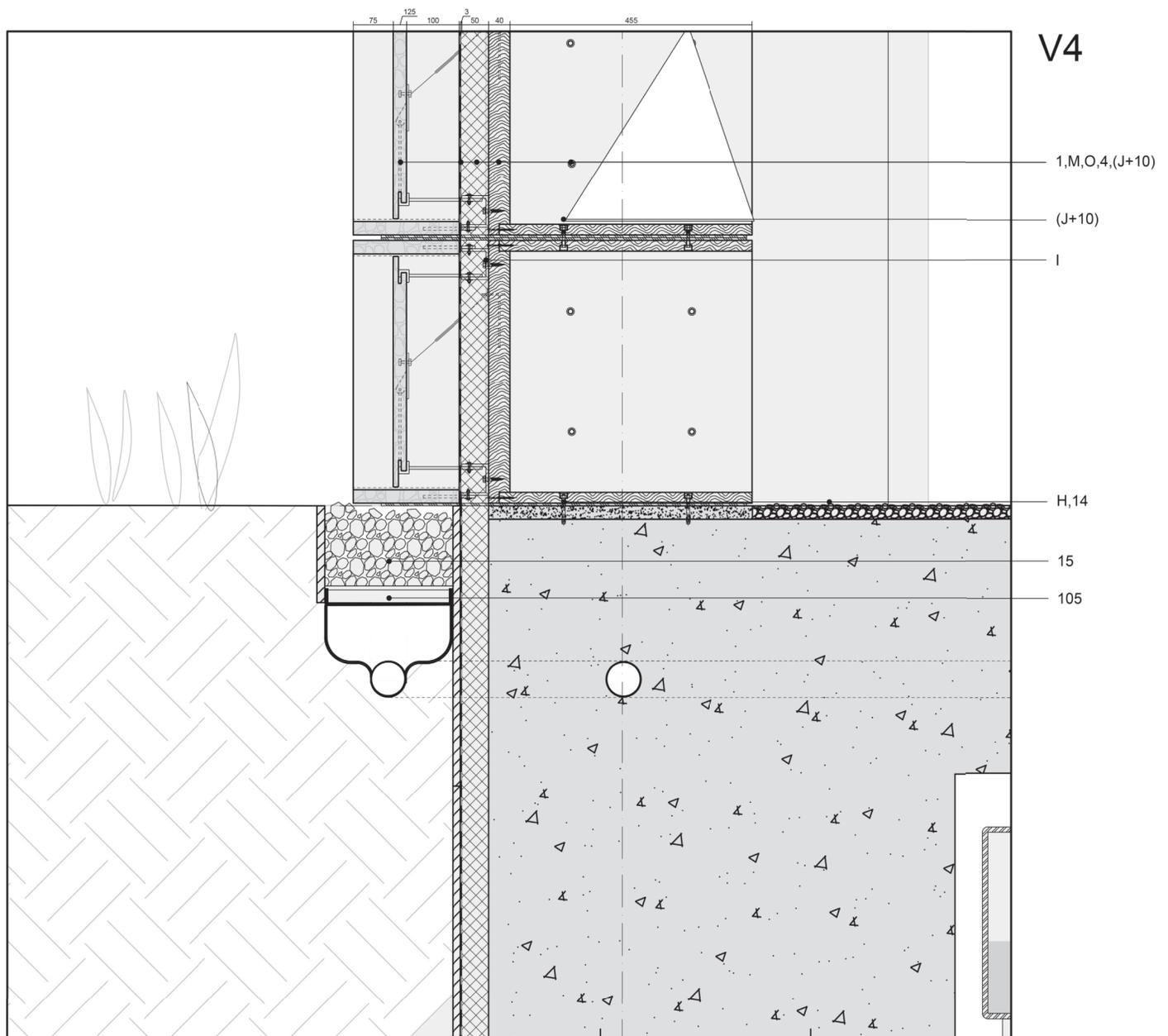
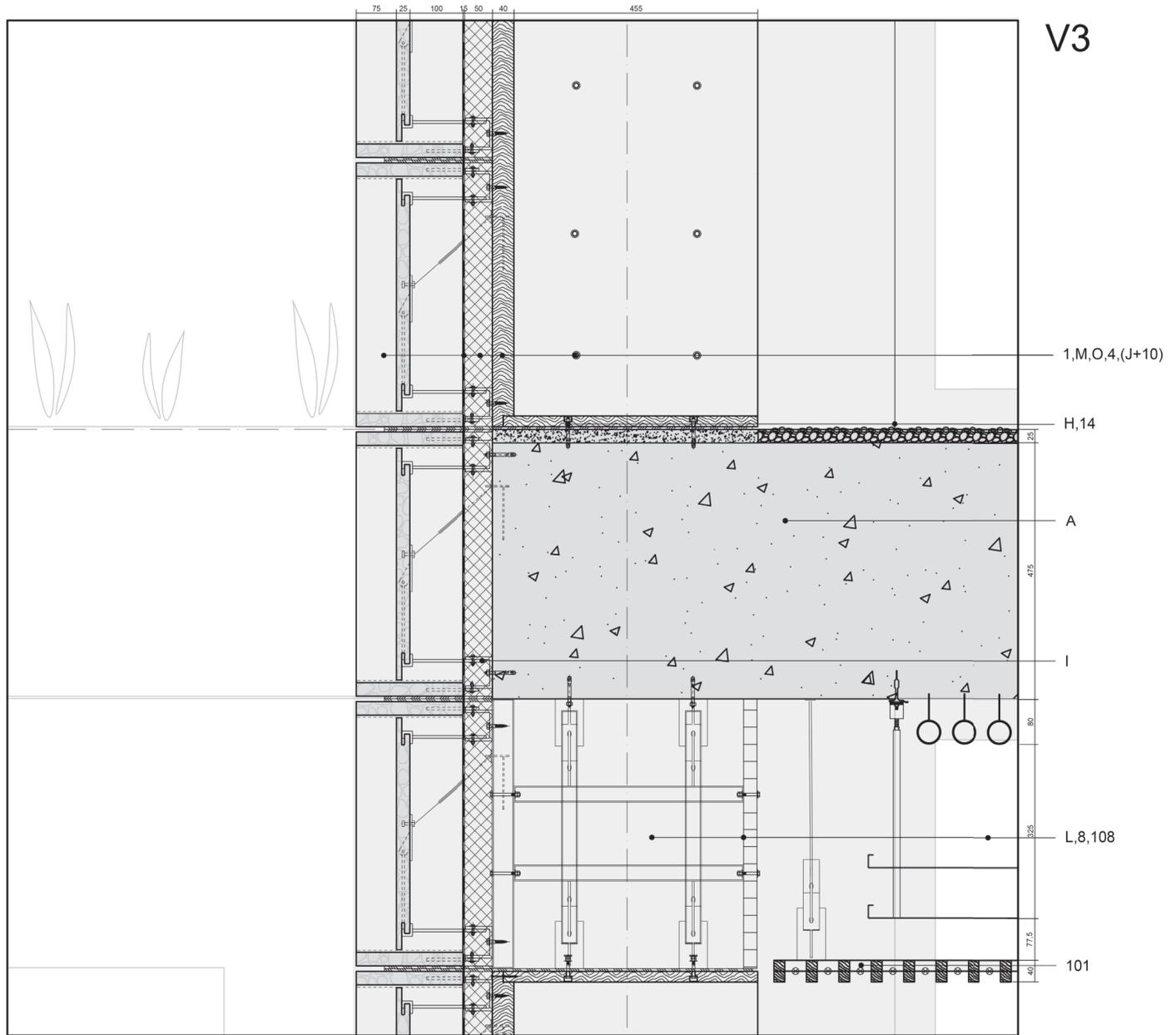


Learning space of the 22nd century, Amsterdam

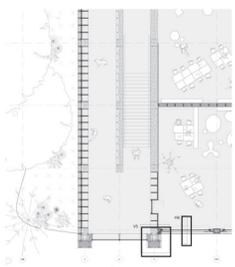
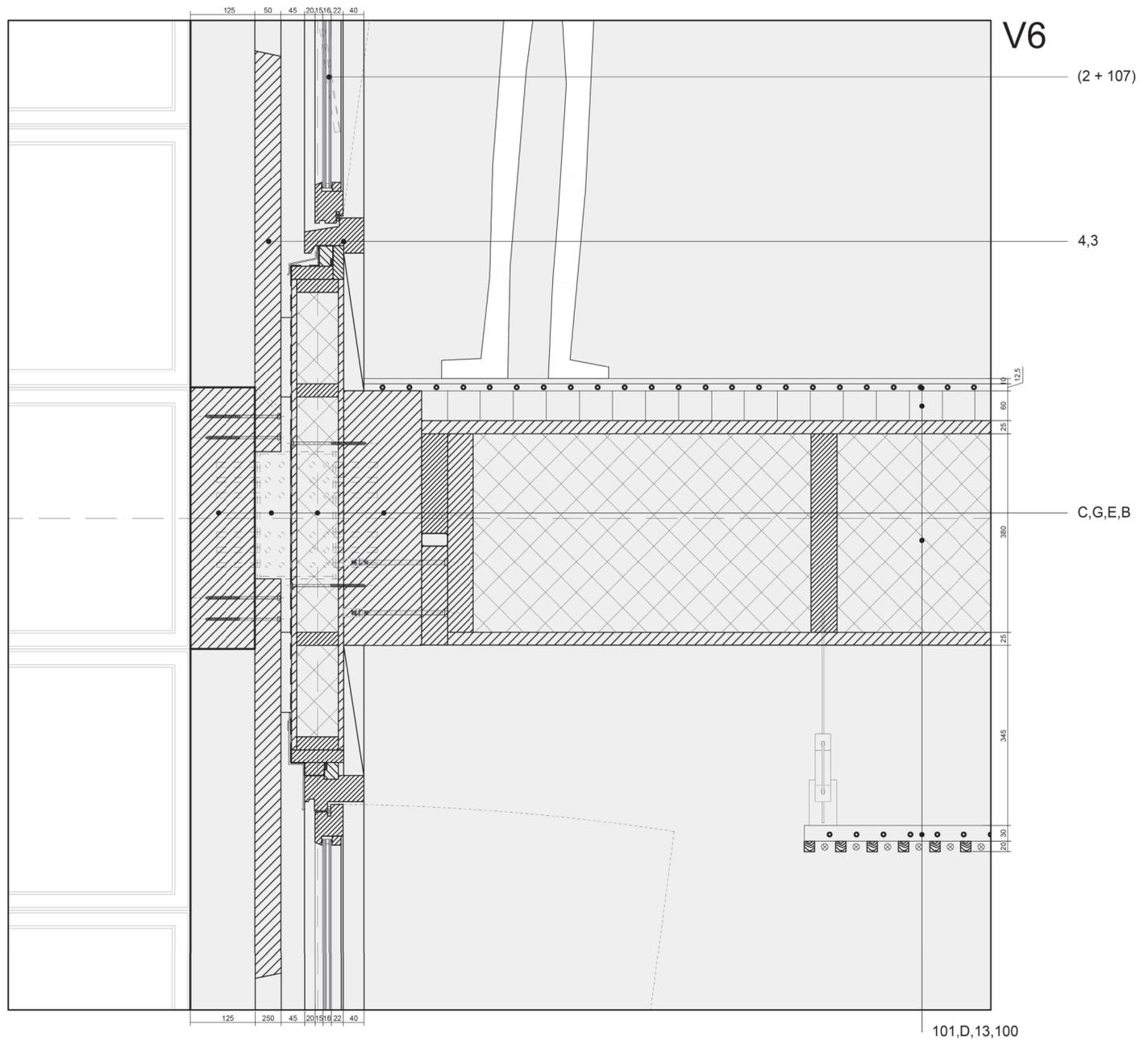
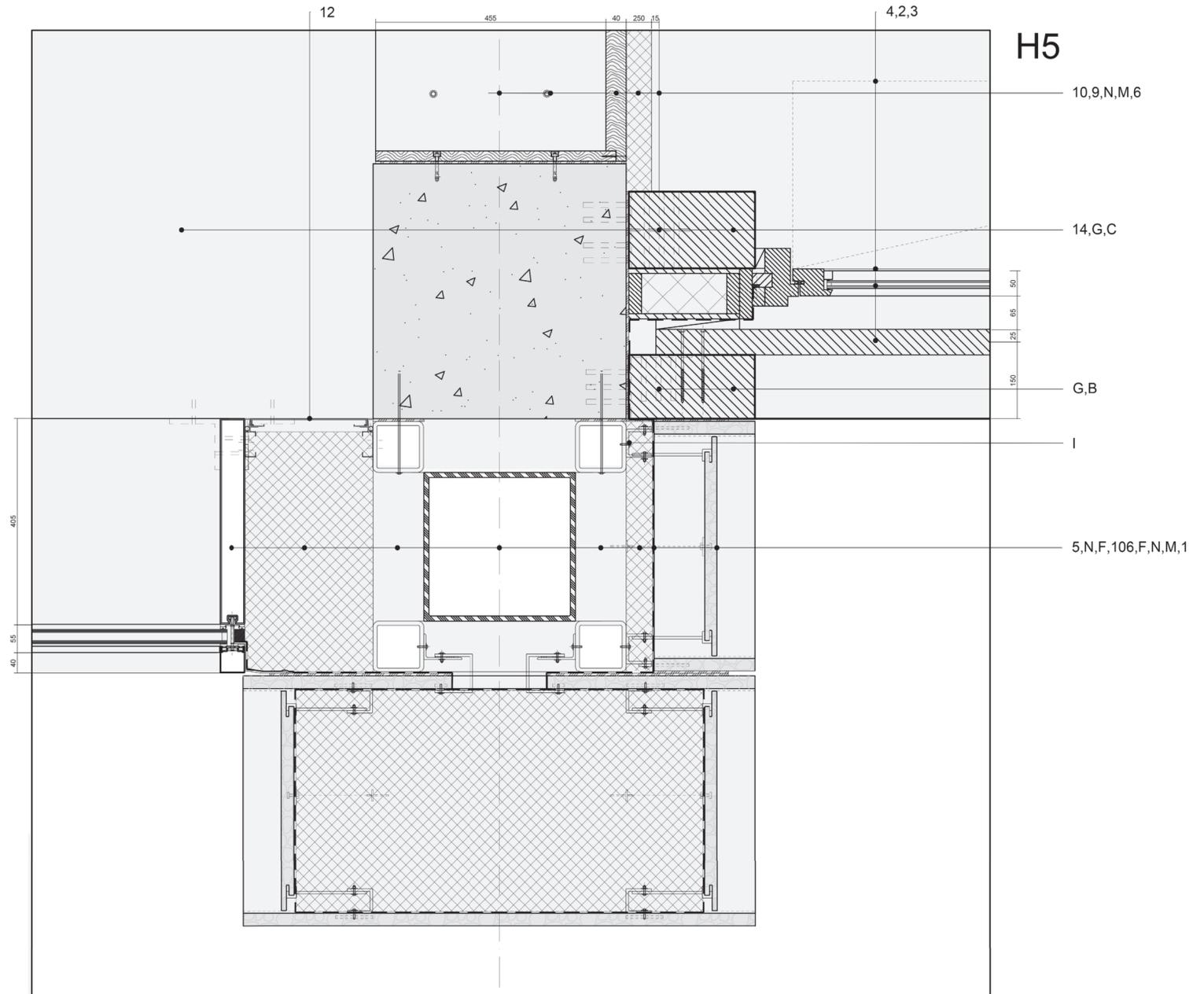
250mm 500mm

Ingmar Klappe

Details



Details



Learning space of the 22nd century, Amsterdam

250mm 500mm

Ingmar Klappe