

UE-S

Spring 2027
AR-410

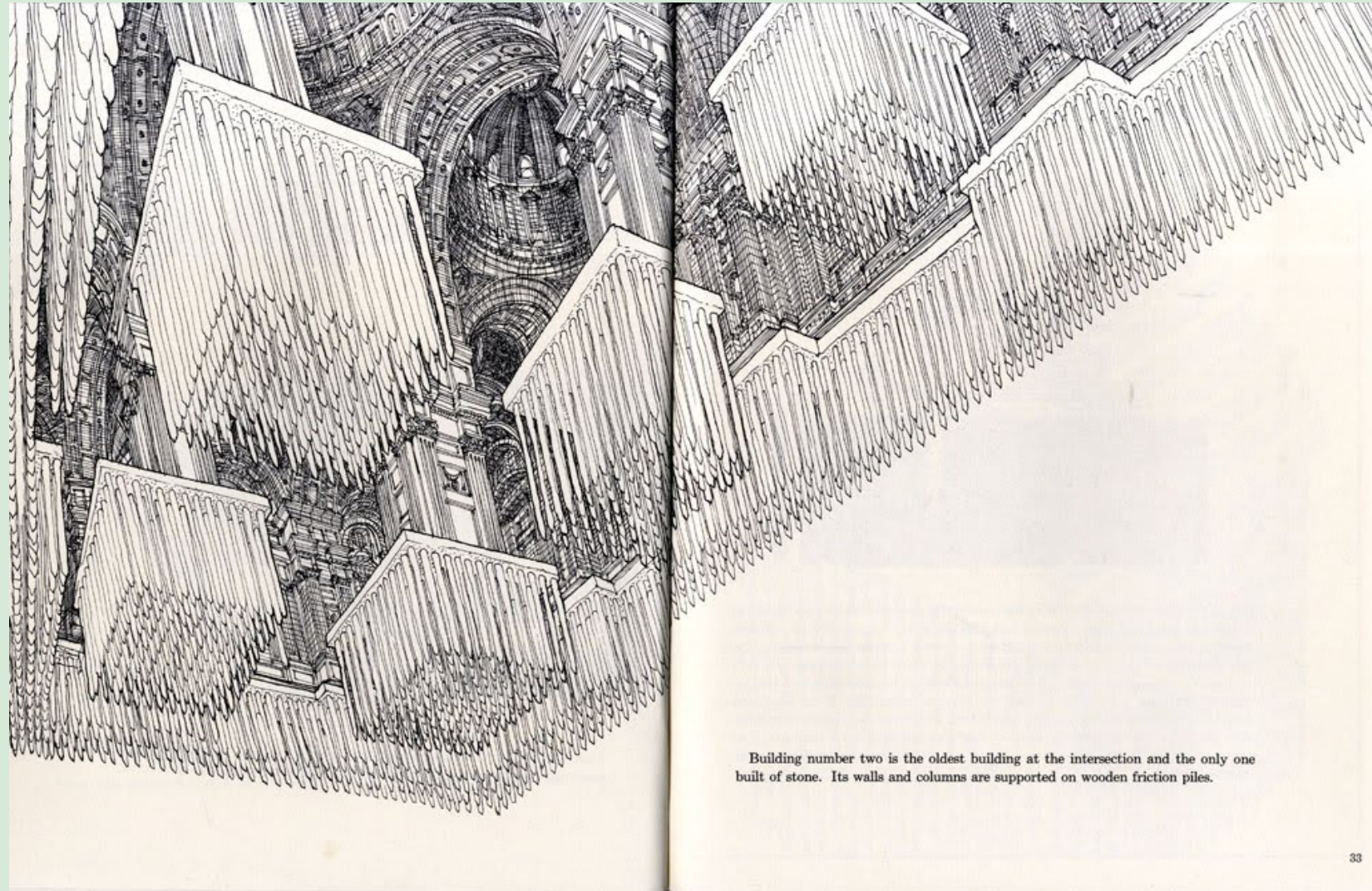
Foundations Basements and the Underground



CONSTRUCT

EPFL

What Lies Beneath



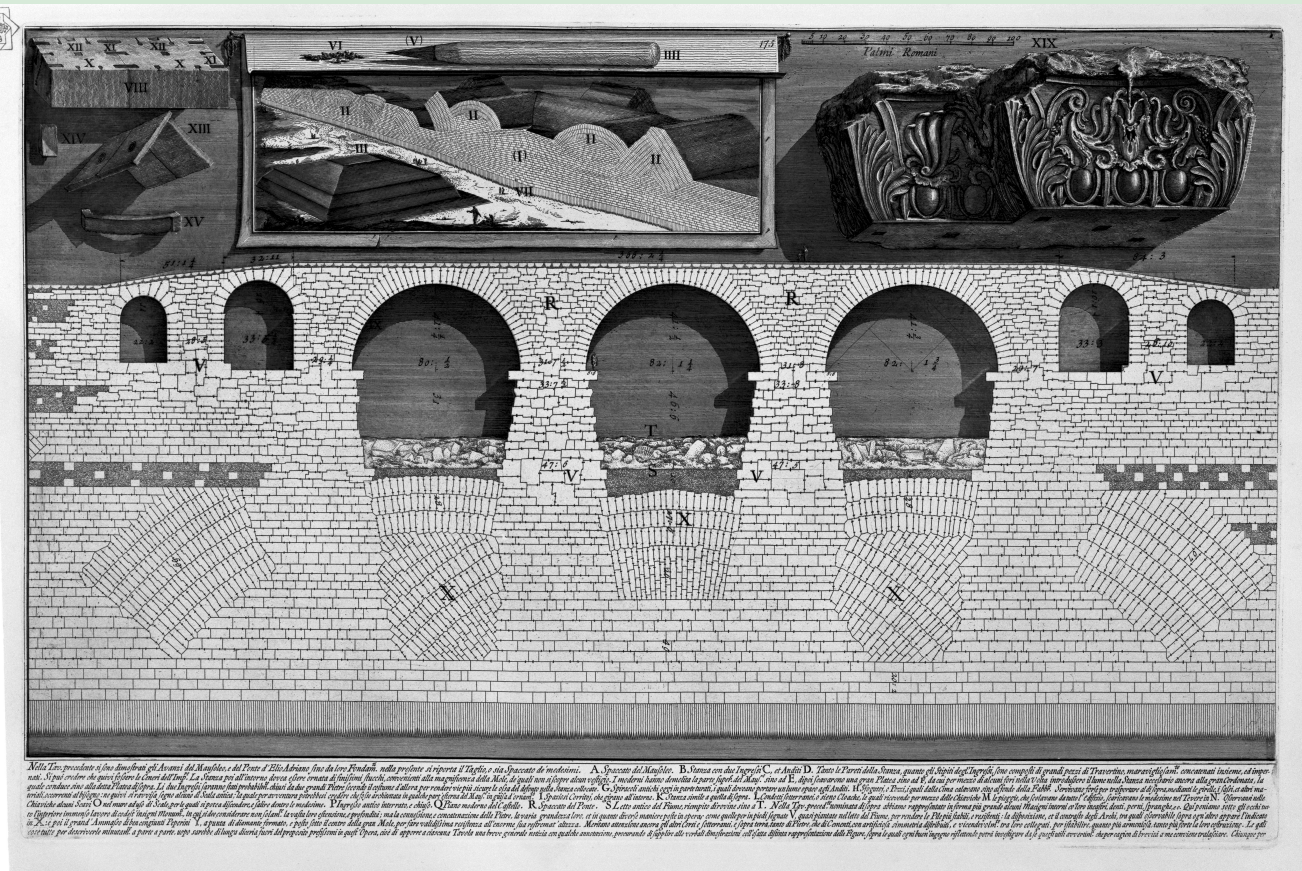
David Macaulay, *Underground*, 1973

Buildings and structures begin below what we see of them when they are completed. Yet the ground they disrupt, the material they consume, the spaces they create, and their support for the superstructure should all be integral considerations for architecture and civil engineering. For both concepts and quantification, the underground has been bracketed out of concern, even as more and more pressure to densify cities causes us to dig deeper and deeper.

This interdisciplinary course will look at what is beneath structures and buildings through the lenses of architecture, structure, and urbanism as a way of rethinking buildings and infrastructures from below the ground up so that we consider them in their totality and within their soil surroundings.

Through lectures, visits, and their own research project, students will gain an understanding of the underground, broadening architecture and civil engineering perspectives as they intersect with social and ecological concerns.

The course will be designed around a semester project. Working in one of three teams, students will explore the underground in one of three ways: as structure, space, or city. The deliverables of each project will be tailored to the research topic and the students' interest.



An imagined construction of the underground.
Giovanni Battista Piranesi, Le antichità Romane (1784)
Tom IV, tav. VII

Instructors:

Prof. Sarah Nichols THEMA IA ENAC

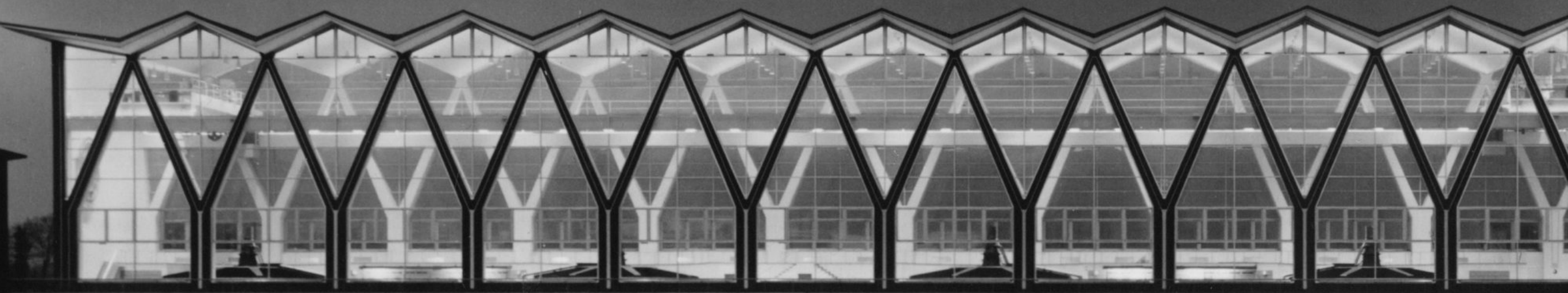
Prof. David Ruggiero CONSTRUCT IC ENAC

Teaching Assistant:

Eva Ruof THEMA

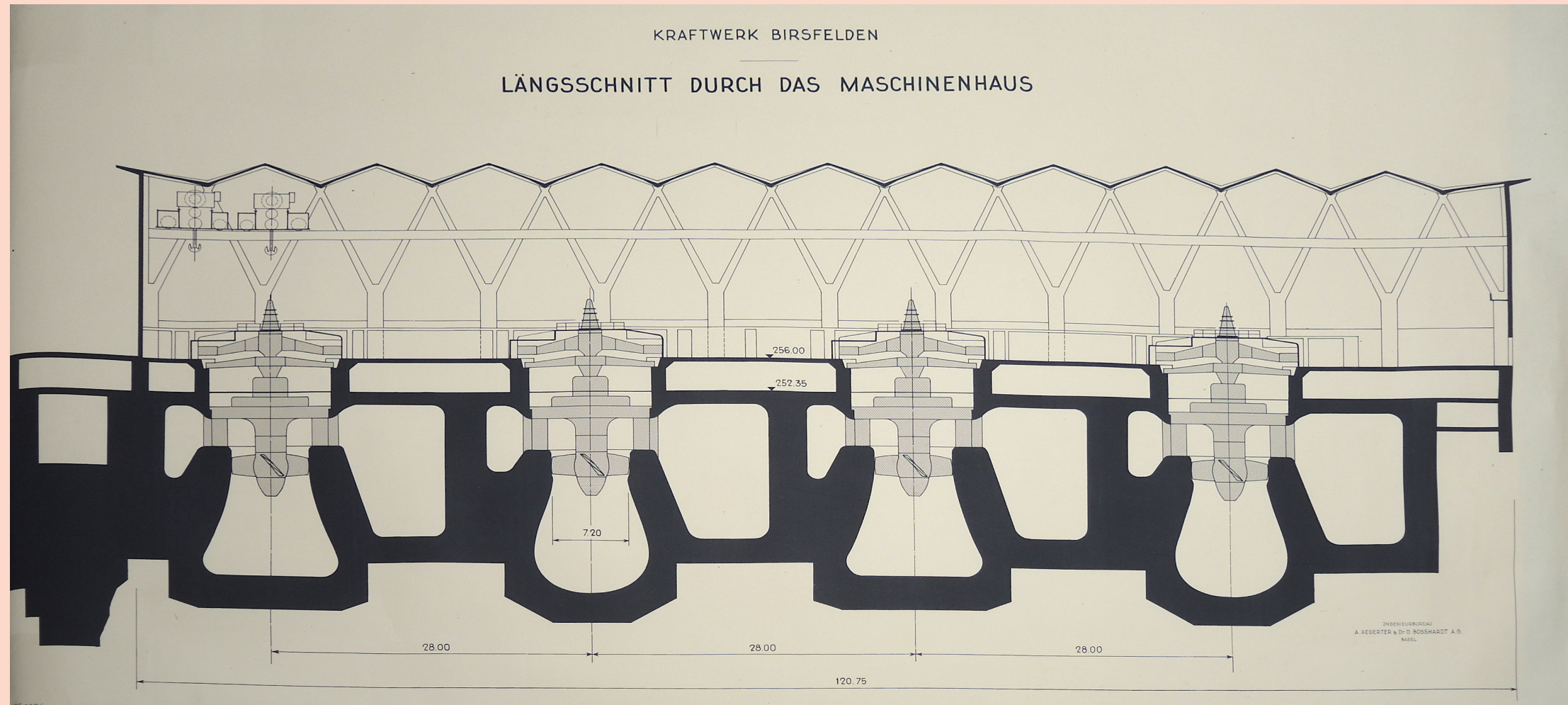
Foundations

How does our understanding of a building change...



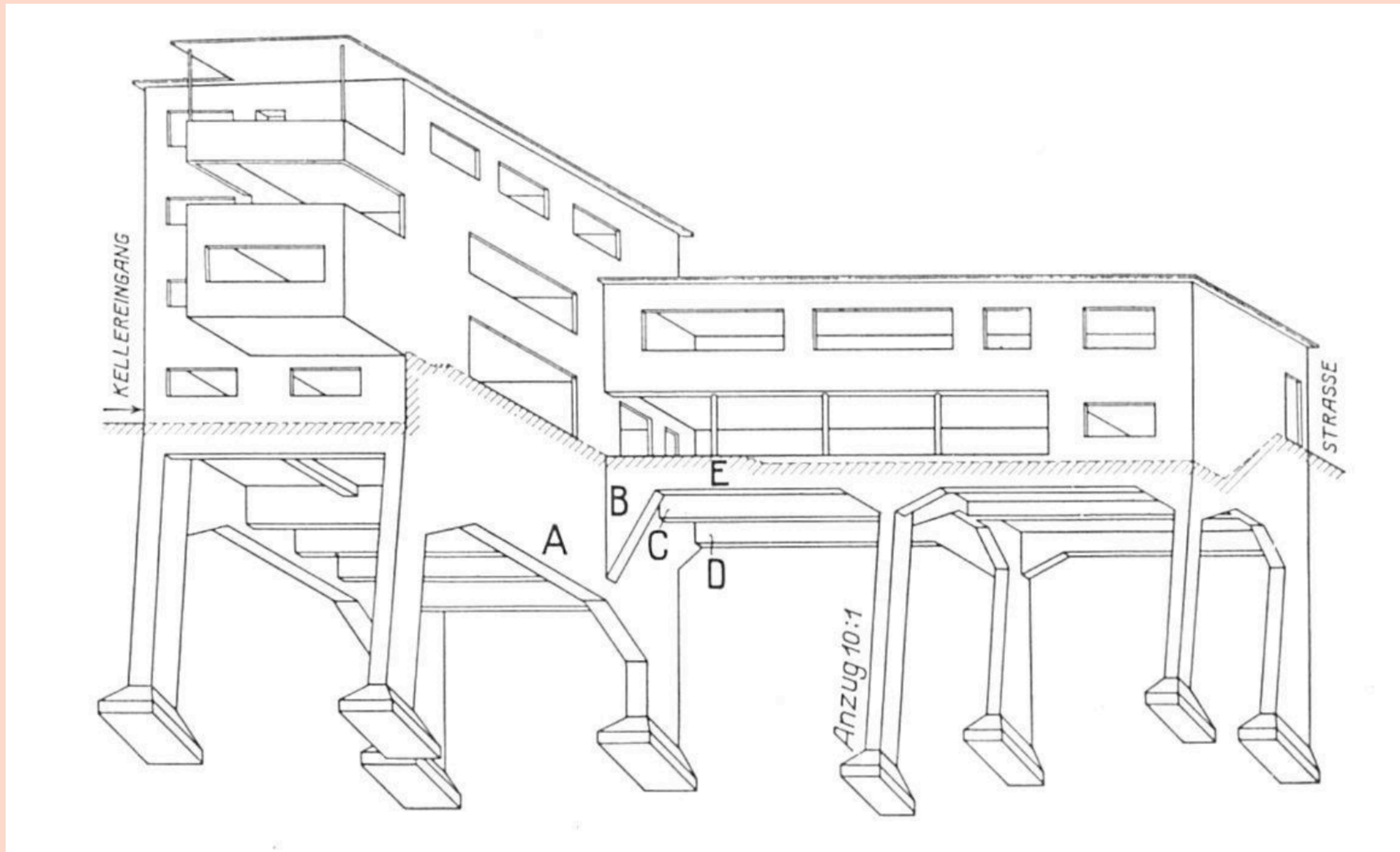
Kraftwerk Birsfelden, Hans Hofmann, 1950-54. gta Archiv 32-

... when we see it in its entirety?



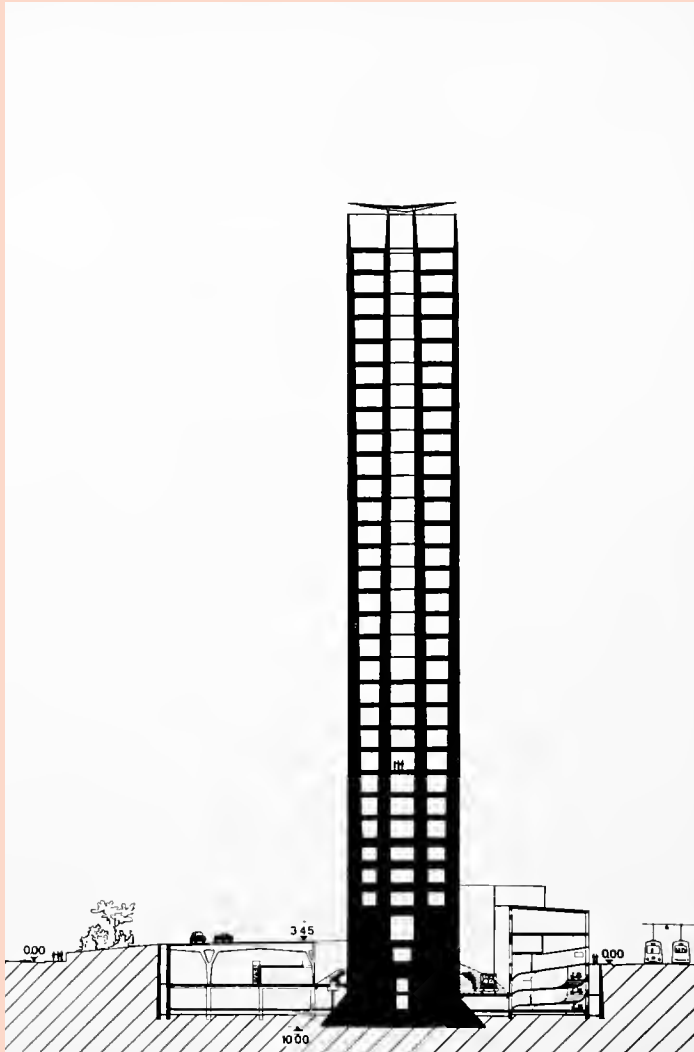
Kraftwerk Birsfelden, Hans Hoffman, 1950-54. gta Archiv 32-

What does a bottom-up view tell us?

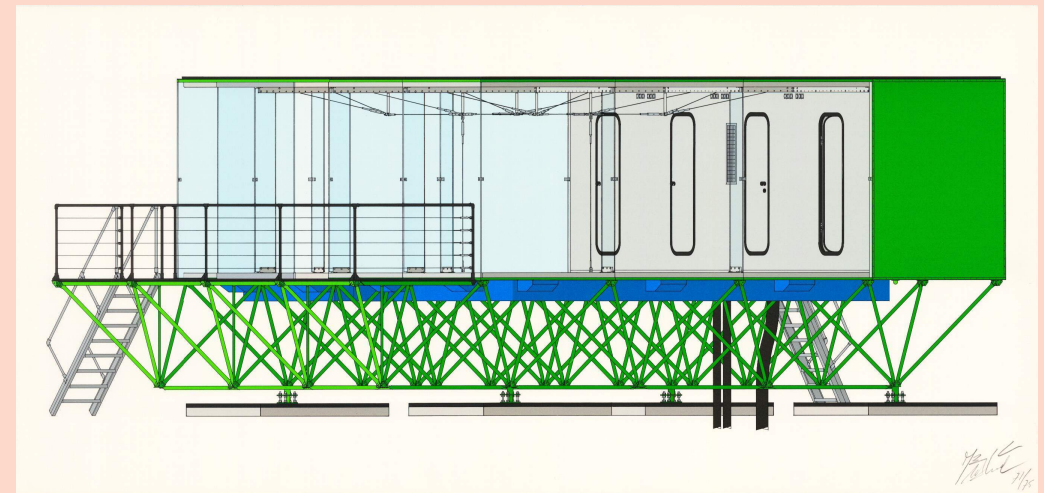


Salvisberg house Restelbergstrasse, isometric of reinforced concrete construction - 23.2 m from base to roof. structure by A. Wickert

How can foundations be designed as an integral part of a project?



Pirelli Tower, Gio Ponti, Pier Luigi Nervi, Milan, 1956-60



Bentham Crouwel, De Fantasie house, Almere, 1983

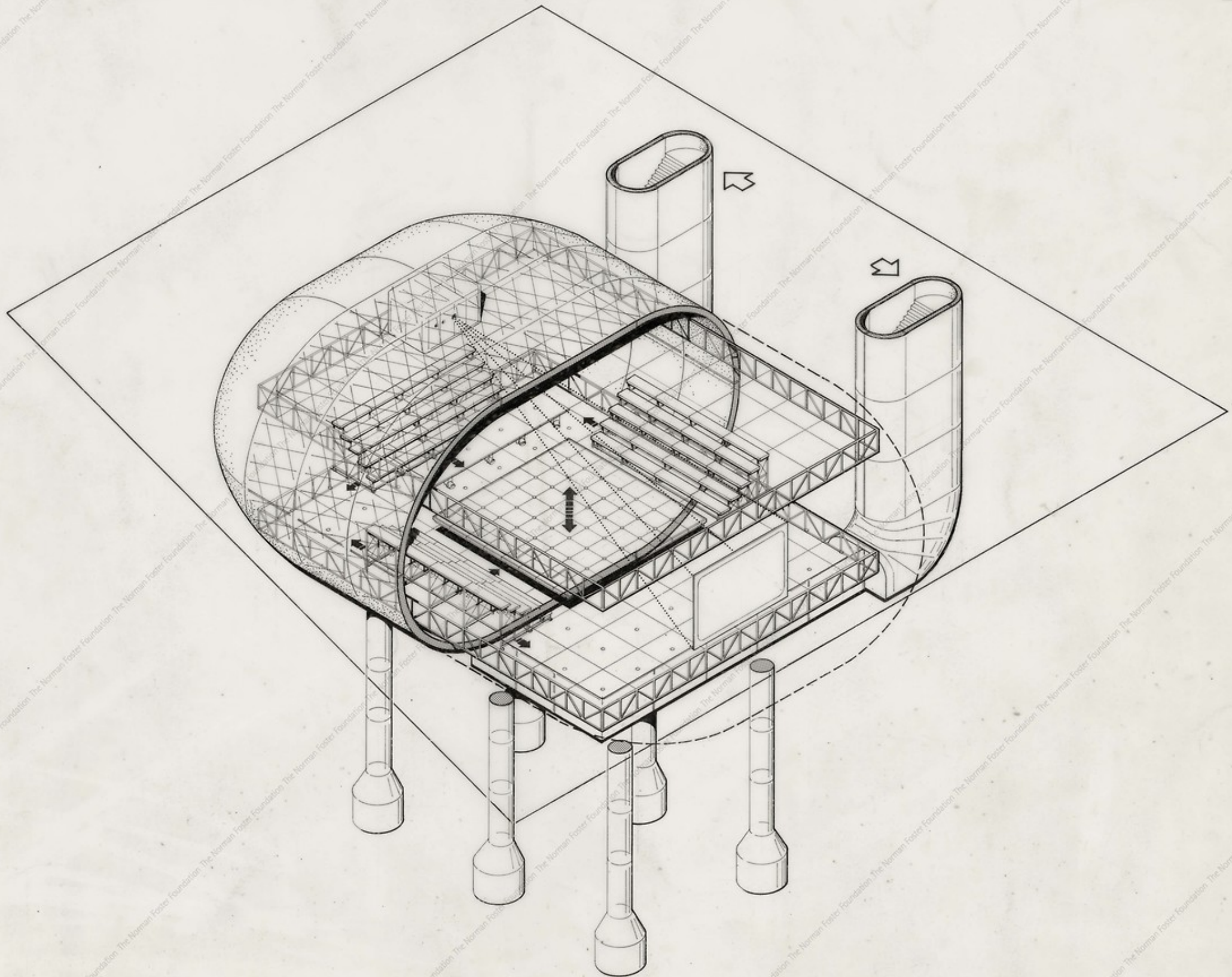
Can thinking about a building and its ground help rethink construction processes?



Junya Ishigami, Mud-covered House, poured and excavated, 2016-2022

Underground Space

What does going underground spatially enable that the above-ground does not?



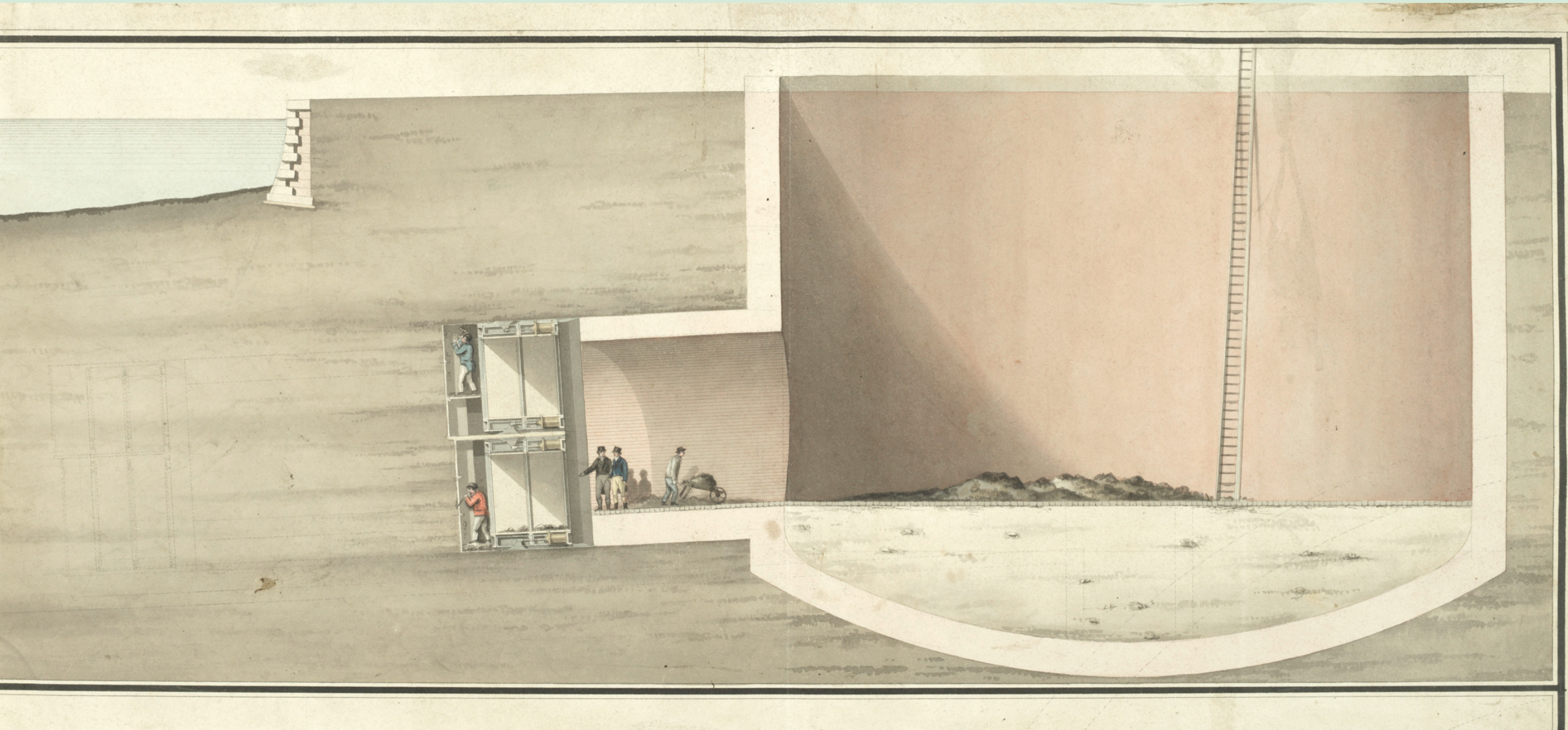
Axonometric of unbuilt proposal for Samuel Beckett Theatre, St Peter's College, Oxford, United Kingdom. Norman Foster and Buckminster Fuller, Drawing Undated.
Norman Foster Foundation Archive.

How to extend without being seen?



Gunnar Birkets, University of Michigan Law Library Extension (early scheme), year

What is distinct about building underground?



Marc and Isambard Kingdom Brunel, Thames Tunnel at Rotherhite, Undated (ca 1825) The Brunel Museum

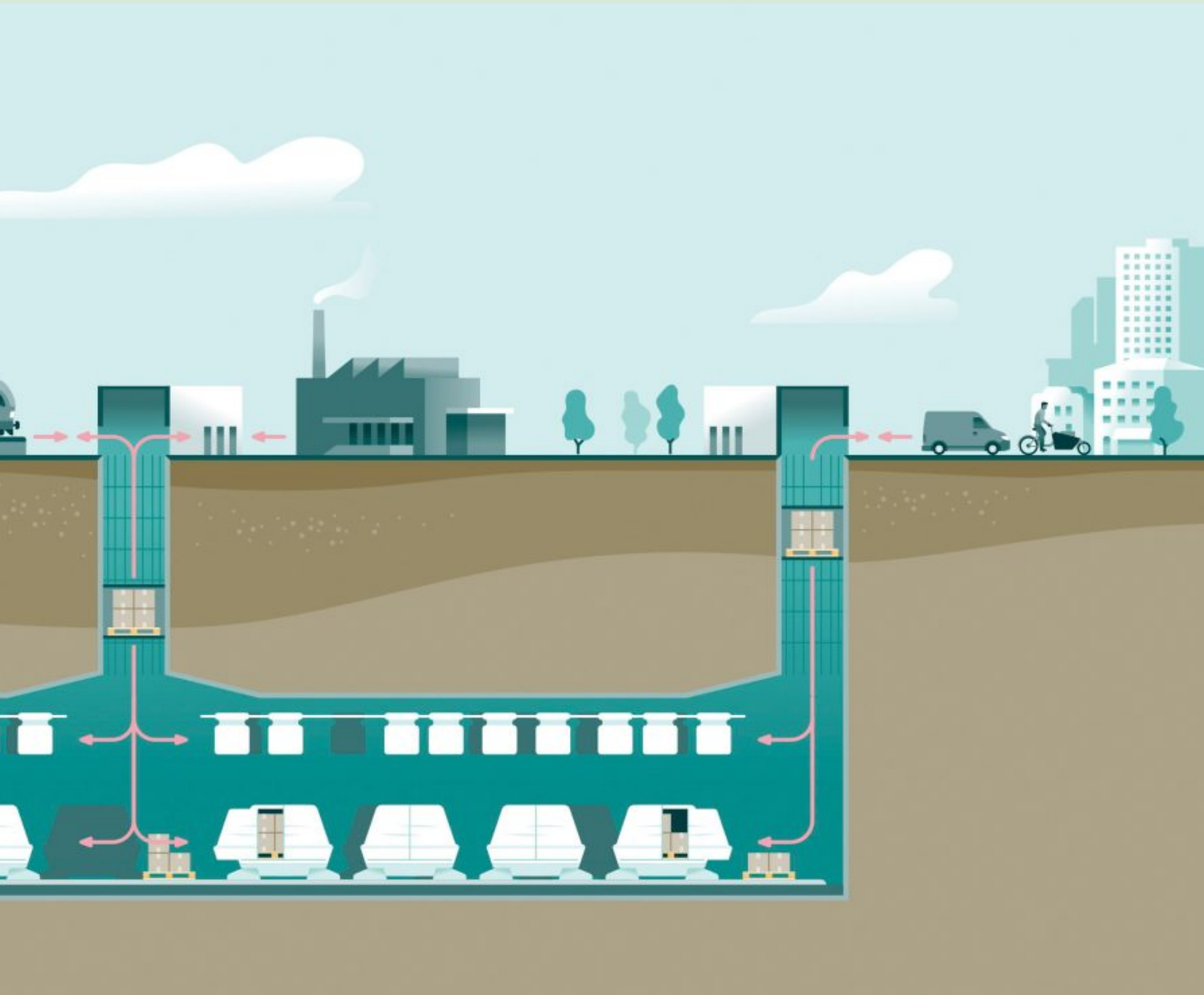
What to do with sites of extraction?



SubTropolis former mines, Kansas City

The City Underground

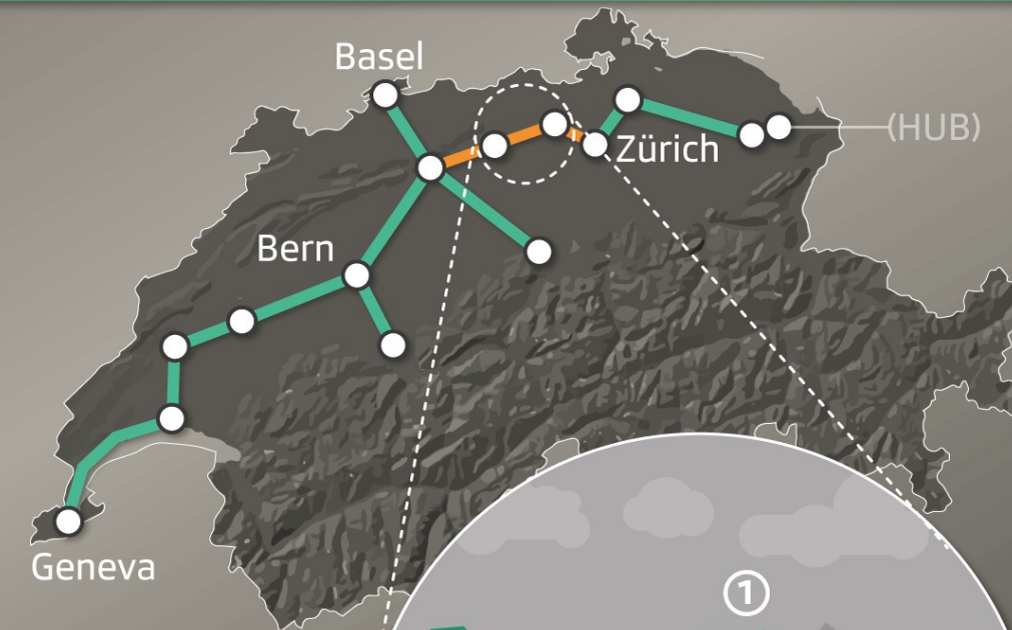
What do we push below ground?



People above the ground

Goods underground

The Cargo sous terrain project



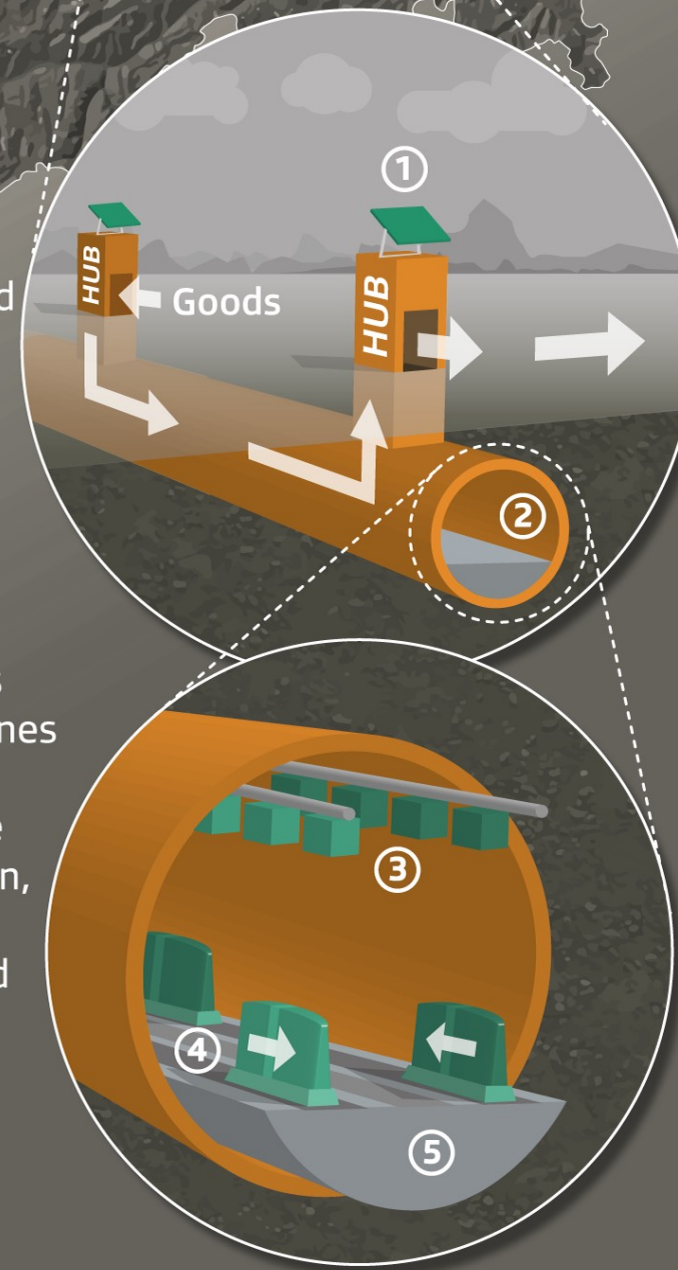
① Hubs where goods are loaded and unloaded operate using solar energy

② Tunnel (6m diameter)

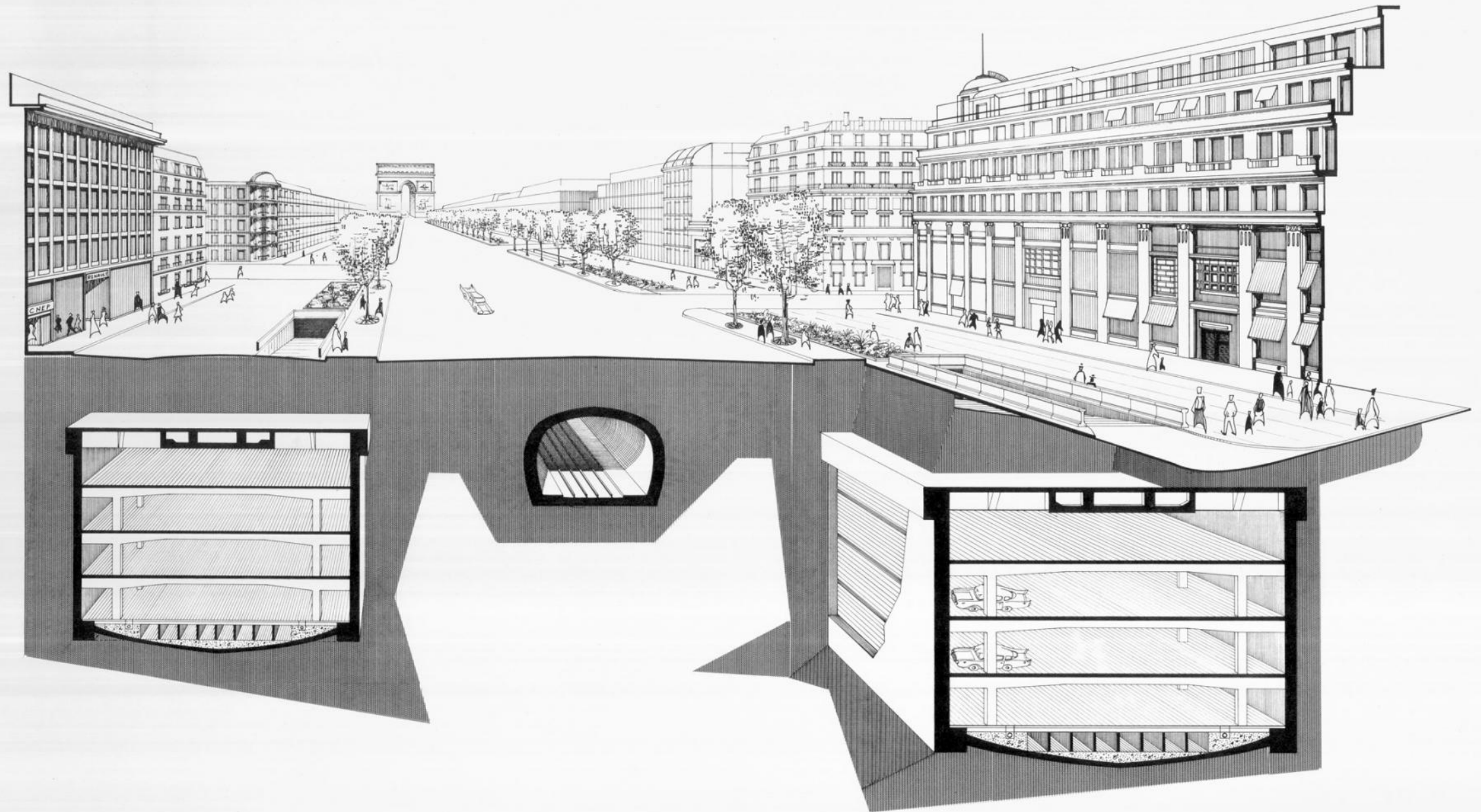
③ Overhead tracks and container lanes

④ Three lanes: one for each direction, and another for service work and maintenance.

⑤ Electric drive system with induction track

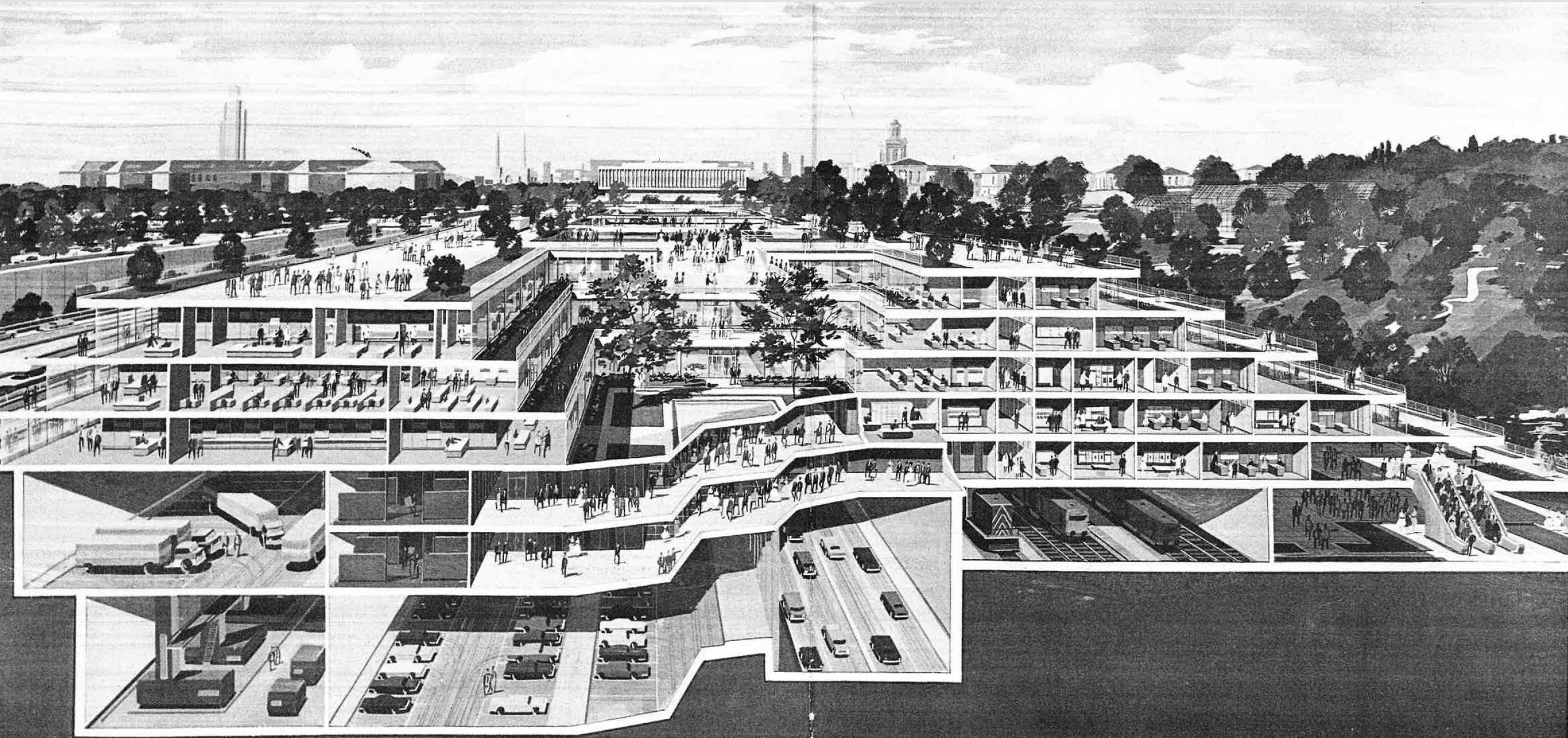


How does the underground help us understand the car's configuration of the city?



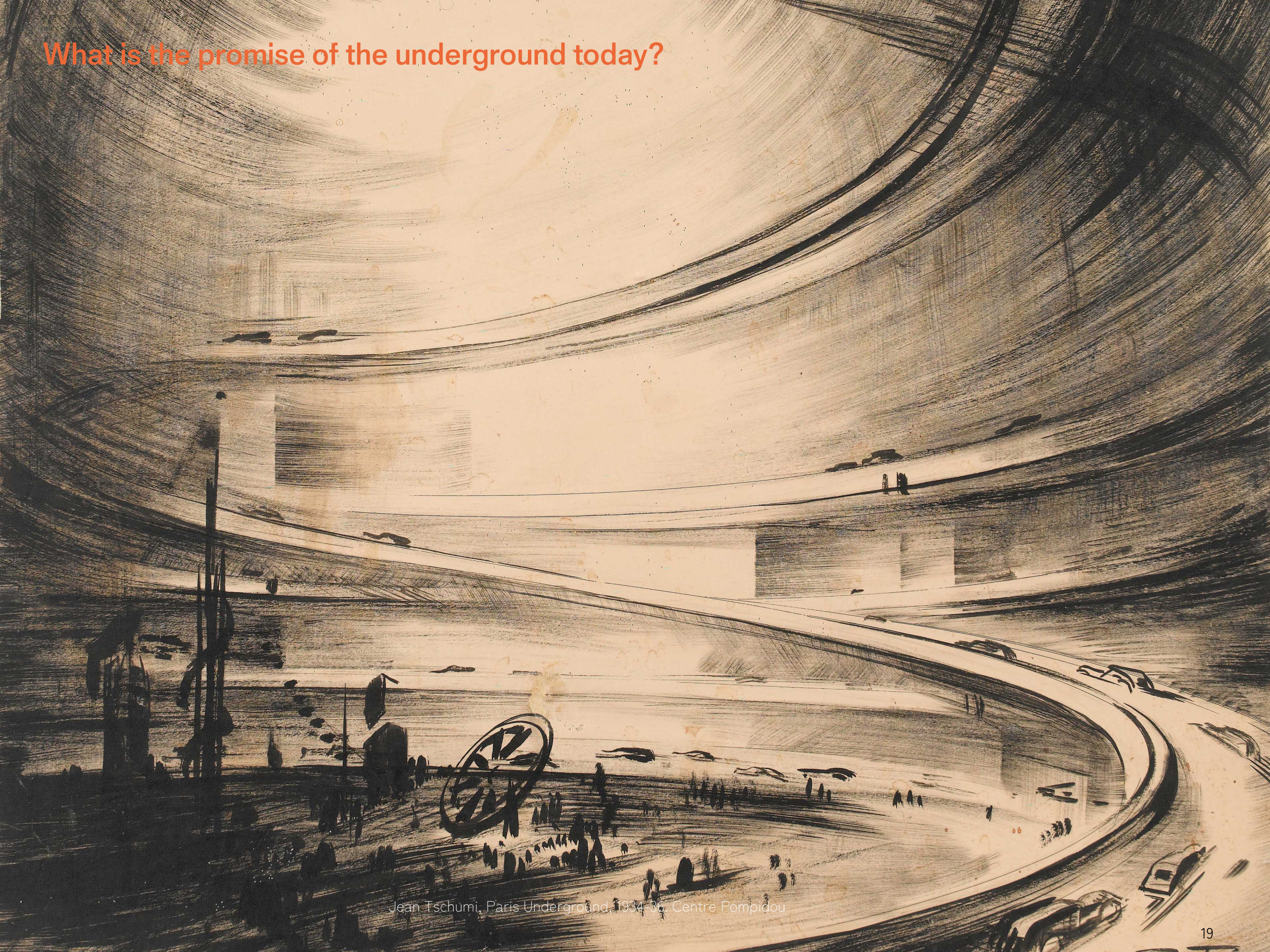
Edouard Utudjian, Projet de parking sous sol les Champs Elysées, Paris, 1963. Fond Utudjian Cité de l'architecture

Underground, do we see the limit between infrastructure and building?



Panther Hollow Project, Harrison & Abramovitz, Pittsburgh, 1963

What is the promise of the underground today?



Jean Tschumi, Paris Underground, 1934-36, Centre Pompidou

Course Setup

Setup

- student-directed, semester-long group research project
- most work is completed in-class with ongoing input from instructors
- three vectors of investigation: structure, space, and city
- The deliverables of each project will be tailored to the research topic and the students' interest and could include structural analysis modeling, LCA analysis, a written historical report, or reportage from field work
- complemented by input lectures by professors and guests, methods workshops, and site visits

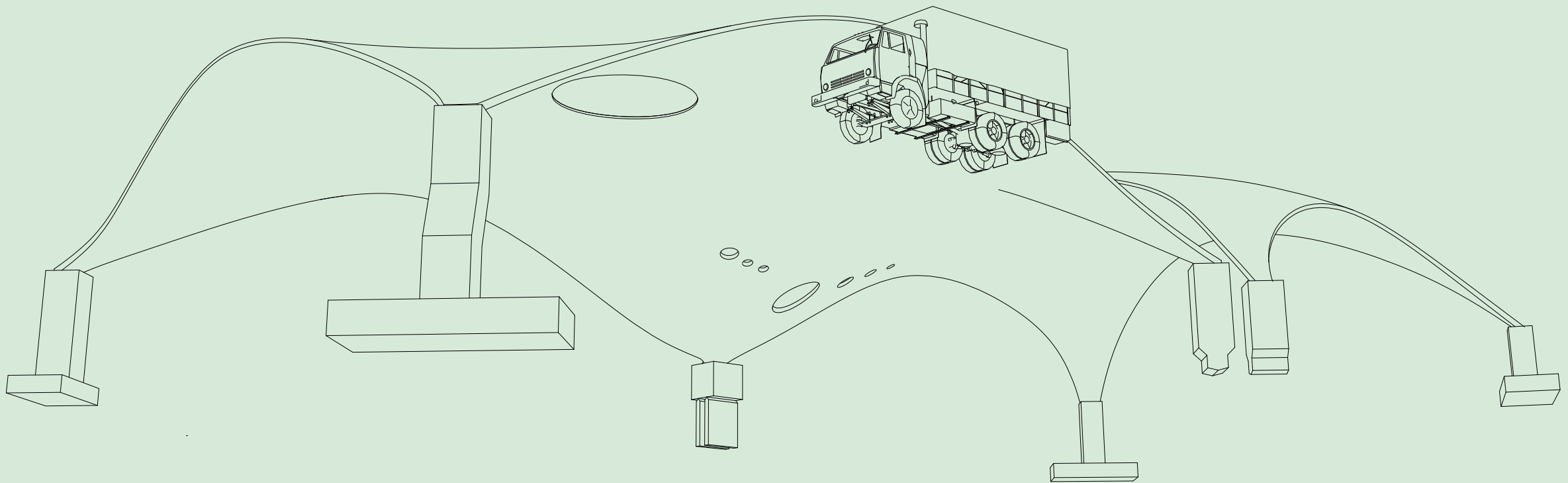
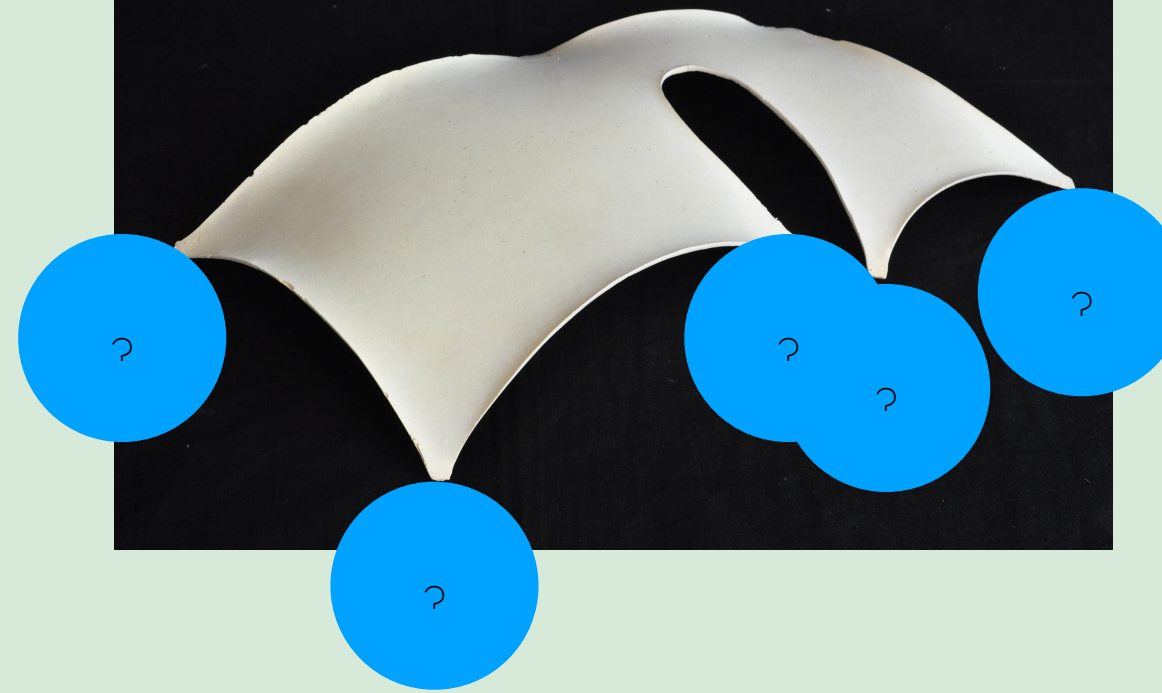
Learning Outcomes

- Understand the technical and environmental aspects of underground construction
- Critically analyze the spatial and urban implications of subterranean spaces
- Engage with archival materials to inform design or research-based output
- Collaborate in interdisciplinary teams to develop a substantial semester project
- Contribute to the groundwork for a public exhibition at Archizoom (Fall 2027)

Opt 1: Structure

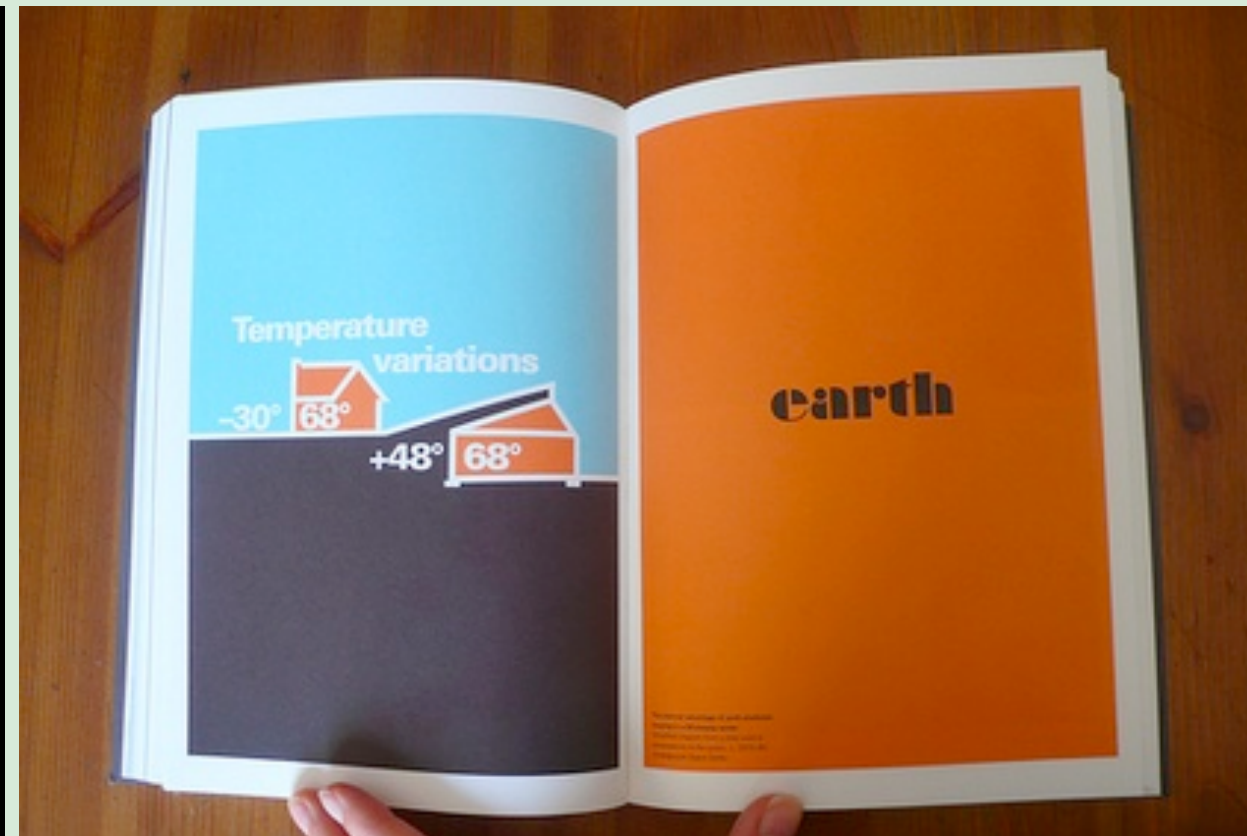
Example: forensically reconstruct and analyze the foundations of a canonical building to see if it changes our understanding of it

Heinz Isler, study model for Sicli Pavilion, Geneva. gta Archiv



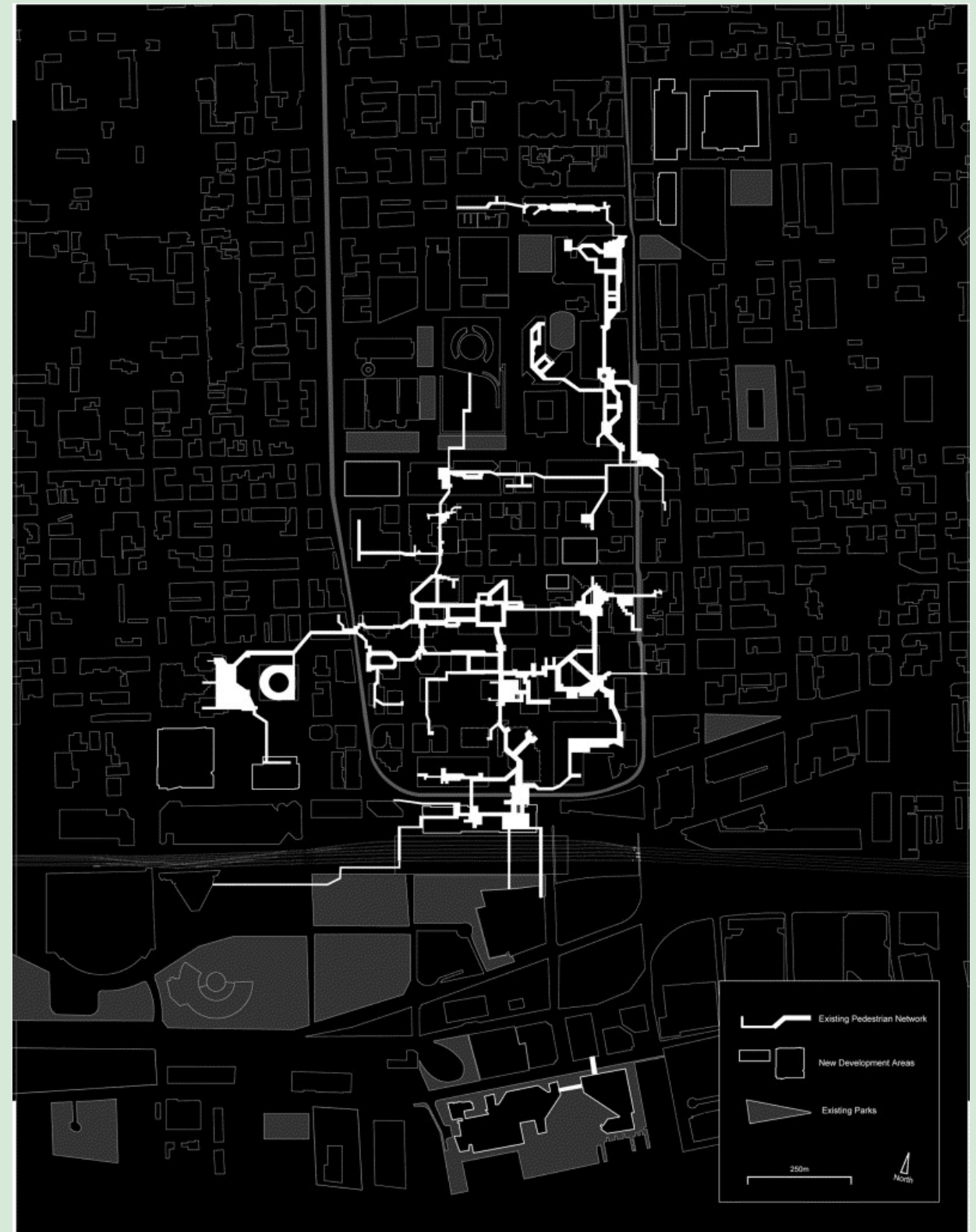
Opt 2: Space

Example: conduct primary source and archival research to critically analyze a specific generation of underground projects



Opt 3: City

Example: map the underground of a city



Opportunity

Fall 2026
ENAC Semester Project

Unearthing Foundations

4 ECTS

Supervised by Sarah Nichols (THEMA) and David Ruggiero (CONSTRUCT)
Open to Master's students from Architecture (SAR), Civil Engineering (SGC),
and Environmental Sciences and Engineering (SSIE)