CoLab

CROSS BREEDING

Scales and Methodolgies: Transformation Studies

WS 24/25 | FG Borrego

Collaborative Design Laboratory
Architekturdarstellung und Gestaltung

We are

CoLab

Collaborative Design Laboratory
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CoLab is a Collaborative Design Laboratory.

The Department of Architectural Representation and Design of the Institute of Architecture at the Technical University of Berlin, known as CoLab, identifies as a Collaborative Design Laboratory.

CoLab Berlin is part of a wider network which includes a team in Madrid, where it emerged in 2009. Our primary interest lies in the interface between design strategies and sustainable manufacturing techniques in contemporary practice. The derived insights are applied in design practice as well as architectural representation that take form in a collectively produced working model.

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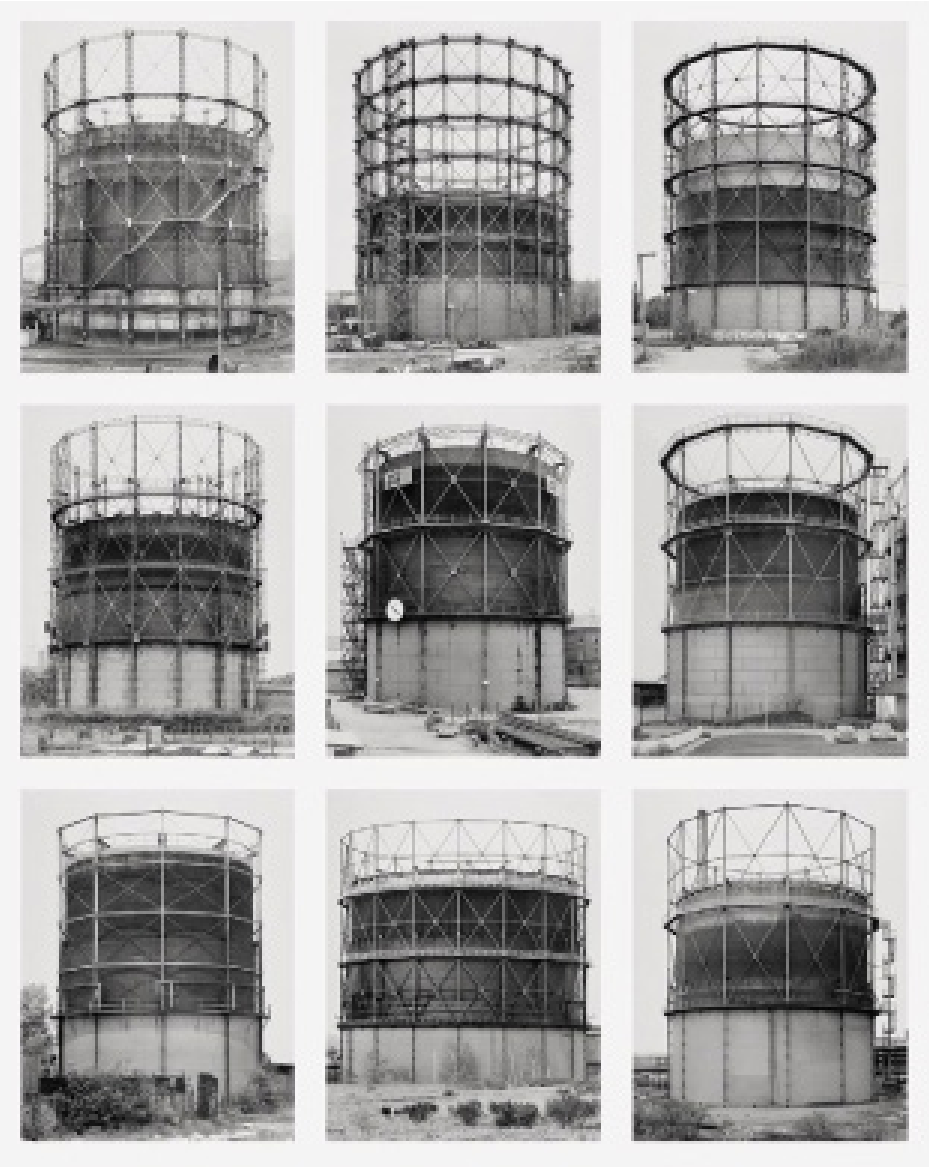
Transformation Studies

What are the elements that allocate a particular case to a certain architectural type?

Which elements are susceptible to change without altering the overall type?

The creative process should not be misconceived as a creation out of the blue or an invention. Rather it is an effort to search for new relations and manifests itself in the recontextualization of existing elements. Memory, understood in its broadest sense, becomes the necessary tool to develop projects. The accumulation of past experiences allows us to build on the work of our predecessors – travelling "on the shoulders of giants".[1]



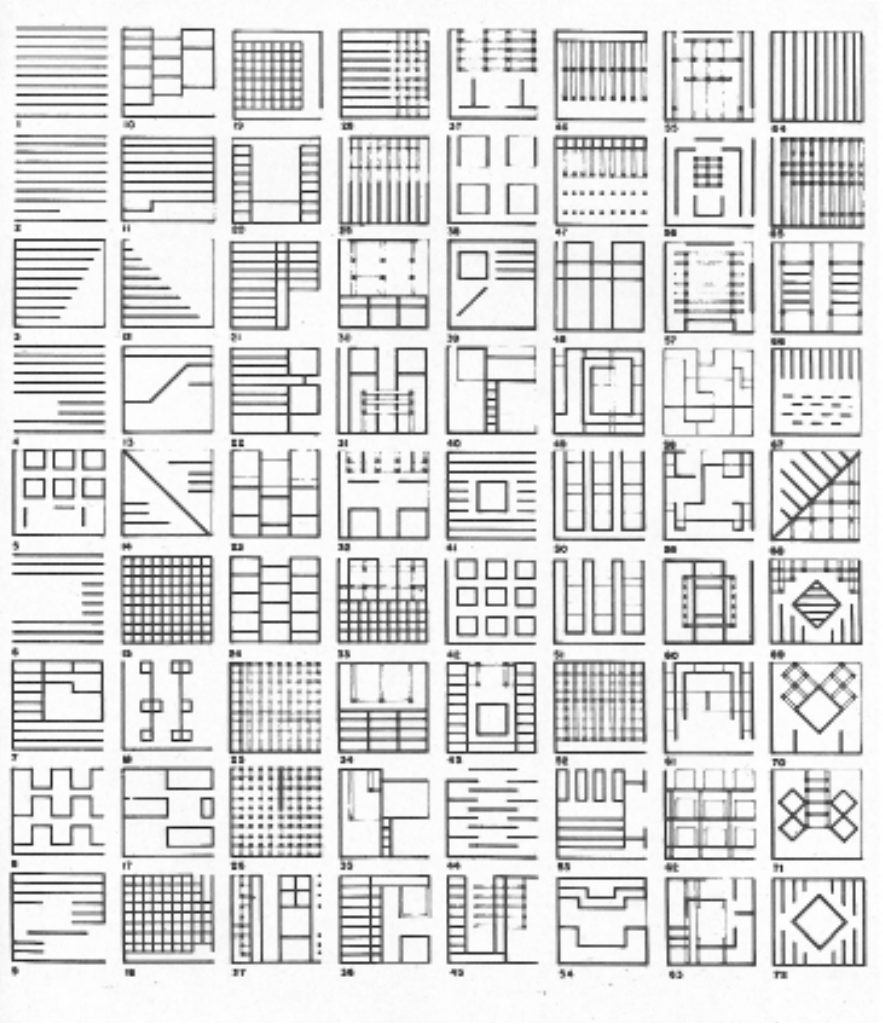
Gas Tanks, by Bernd and Hilla Becher
The photographic works of their tower documentation in Potsdam is currently on display in the Neue Nationalgallerie exhibit: Zerreißprobe. "Kunst zwischen Politik und Gesellschaft Sammlung der Nationalgalerie 1945 – 2000" (18.11.2023 - 28.09.2025)

1 Metaphor of the "collaborative work" introduced by Bernard de Chartres in 1130, which would later be used by Isaac Newton (1643-1727) in a letter to Robert Hooke (1635-1703) dated 15th February 1676.

In the pre-industrial era, architectural types were often repeated with little variation. However, by the 19th century, the thinker Quatremère de Quincy warned in his “Dictionaire historique d’Architecture” (1832) that architectural types are not referents that should be copied exactly 1:1; they must adapt to new contexts. Today, we understand architectural types, not as rigid models but as flexible structures that merely define a set of distinct constituent architectural elements that can take on multiple forms. Just as genetic information can manifest in various ways, an architectural type, viewed as a “genotype,” can interact with its environment to express different “phenotypes”.[2]

In retrospect, we might define a type as a set of formal invariants shared across a succession of examples.
However, from a more contemporary, progressive perspective—which this course encourages—an architectural type is better understood as a set of spatial and constructive relationships that enable the creation of new solutions based on existing projects.

By exploring the concept of type under these modern considerations, we can better understand the keys to architectural design, grounded in the use of established references. The objective of this research is not merely theoretical nor is it reduced to an academic analysis of a collection of architectural types. Instead, we aim to implement a methodology for design.



Classification by sections of architectural systems by Franco Purini.

2 To deepen this biological analogy of architecture, see third Chapter in P. Collins, Changing Ideals in Modern Architecture, 1750-1950. 1965

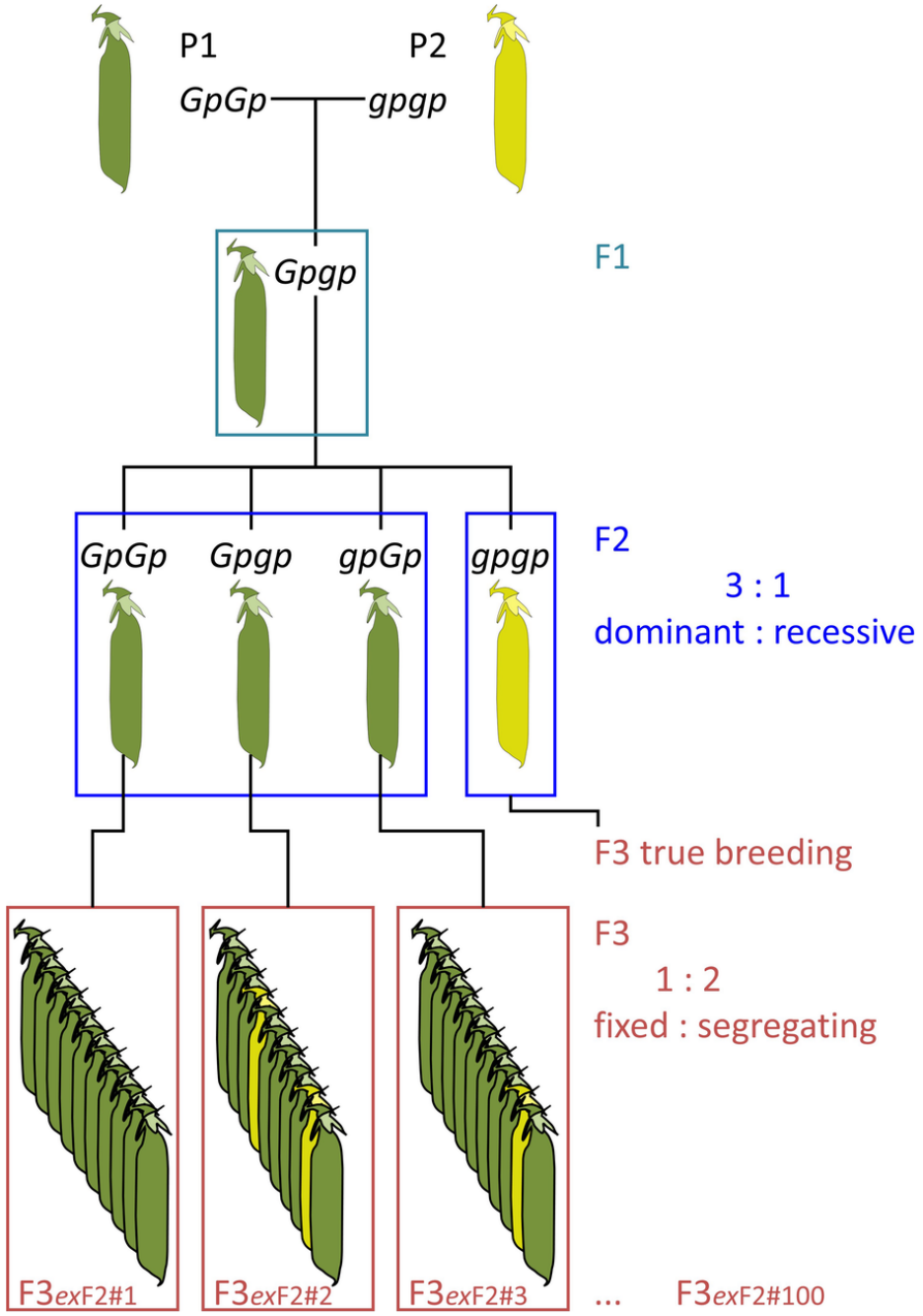
ARCHITECTURAL CROSS-BREEDING

Can we mix architectural types?

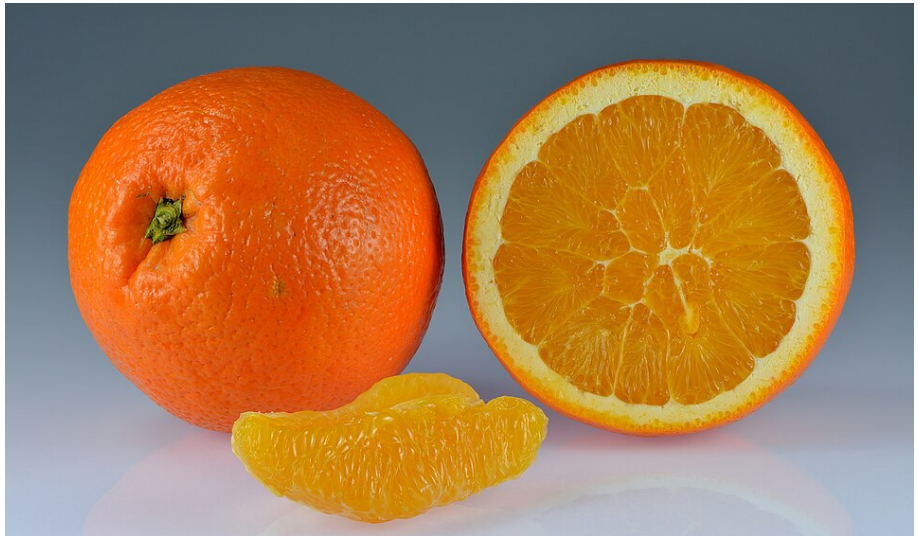
The term cross-breeding refers to the practice of crossing different organisms to obtain new combinations of traits. Its roots go back to ancient agriculture and livestock farming. Farmers mixed seeds to obtain more fertile crops, and shepherds selected animals in the hope of passing on strength, endurance, or docility. For centuries, it was an intuitive art, guided by observation and patience.

Over time, these empirical practices were systematized: in the 18th century, European naturalists began experimenting with controlled pollination, while breeders such as Robert Bakewell in England applied more rigorous methods to livestock. The great conceptual leap came in the mid-19th century with Gregor Mendel, whose experiments with peas showed that the transmission of traits was not random, but followed defined statistical patterns. His “laws of inheritance” laid the foundations of modern genetics and turned crossbreeding—previously an intuitive art—into a scientific tool capable of predicting and guiding results.

Throughout this seminar, we will bring the concept of cross-breeding to architecture. We will experiment using a design-based prospective research method to try to find out which architectural types, and especially which of their features, can be crossed in order to create new architectural typologies.



The golden kiwi (Actinidia chinensis var. chinensis) was first developed in New Zealand in the 1990s through selective crossbreeding of different kiwi species. With its smooth bronze skin and bright yellow flesh, it offers a sweeter, less acidic taste than the traditional green variety and has since become a global export fruit.



"Botanically, sweet organge is the hybrid Citrus × sinensis, between the pomelo (Citrus maxima) and the mandarin orange (Citrus reticulata). The chloroplast genome, and therefore the maternal line, is that of pomelo. Hybrids of the sweet orange form later types of mandarin and the grapefruit." - Wikipedia -

"The pomato (a portmanteau of potato and tomato), also known as a tomtato, is a grafted plant that is produced by grafting together a tomato plant and a potato plant, both of which are members of the Solanum genus in the Solanaceae (nightshade) family. Cherry tomatoes grow on the vine, while white potatoes grow in the soil from the same plant" - Wikipedia -

TYPOLOGICAL PERMUTATIONS

Over the last years, we have been working on different typological transformations and have identified certain aspects that we believe define typologies in most cases. These are: Structure/Construction, Circulation, Envelope/Facade, Format/Volume, Floorplan/Layout, Climatic Performance, and Context. The objective of this course will be to mix different cases through these features in order to create new types.

Students will be divided into eight groups and will work with eight case studies. In the first phase, each group will choose a case study and analyze the seven aspects mentioned above and share that information with the rest of the class.

In the second phase, each group will have to compose two new buildings by combining the different features of the other seven buildings. In one of the buildings, the features to be combined will be chosen at random, while in the second, the students themselves will choose the features to be combined.

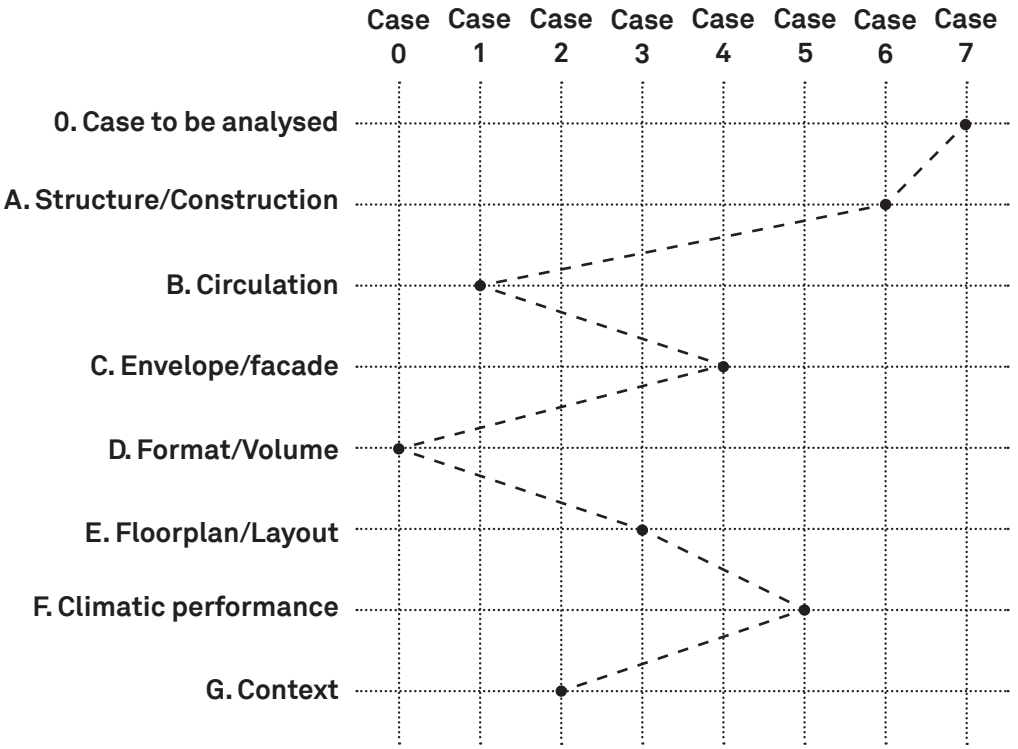
The rules for combining features are:

- Features from the same building cannot be combined in the same building. That means that a total of 40.302 different permutations are posible.
- Two groups of students cannot repeat the same feature from the same building.

PerMutation code

7 6 0 2 4 1 5 3

0 A B C D E F G



Example of a permutation that fullfill the rules for combining the typologica features.

No. 0: Nakagin Capsule Towe | Kisho Kurokawa Tokyo| 1972

No. 1: Nemausus| Jean Nouvel

Nîmes| 1987

No. 2: Gifu Kitagata Apartment Building | SANAA

Kitagata| 2000

No. 3: Mirador | Winy Maas, Natalie de Vries and Jacob van Rijs (MVRDV) + Blanca Lleó Sanchinarro | 2005

No.4: 23 dwellings | Lacaton & Vassal

Trignac| 2010

No. 5: Terrassenhaus Berlin | Brandlhuber + Emde, Burlon + Muck Petzet Berlin| 2018

No. 6: 85 social housing units|Peris + Toral arquitectes Cornellá de Llobregat| 2020

No. 7: Casa Pádel | Nuñez Ribot Arquitectos Madrid 2023

Calendar

kw 42
14.10.2025
Introduction
Introduction of the seminar and the teaching team.
Group formation and choice of case studies.

kw 43
21.10.2025
General description
General description of the assigned case study.

kw 44
28.10.2025
Submission Phase 1. Case study typological analysis
Comprehensive analysis of the assigned case study, addressing and delving into each of the seven typological aspects. Suggested format: Axonometrics.

kw 45
04.11.2025
Analysis of assigned features
The different features of the various buildings will be analyzed, and we will begin to consider how to make them compatible.
Suggested formats: sketches and diagrams.

kw 46
11.11.2025
Integration I
The various features will begin to be integrated. The buildings should begin to take shape. Suggested formats: sketches, diagrams, models.

kw 47
18.11.2025
Integration II
Integration of the seven features into a single building.
Suggested format: floorplan + sections.

kw 48
25.11.2025
Define
Increase the definition of designs.
Suggested format: floorplan, sections, elevations, axonometrics.

kw 49
02.12.2025
Inhabit I
Visualization of how transformations are inhabited.
Suggested format: interior + exterior renderings

kw 50
9.12.2025
Inhabit II + Wrap-Up
Visualization of how transformations are inhabited.
Adaptation of graphic documents to the layout template
Suggested format: interior + exterior renderings.

kw 51
16.12.2025
Final supervision
Final supervision before the final presentation

kw 52

kw 01

kw 2

kw 03
13.01.2026
Final Presentation
Final deadline and presentation
10:00 - 14:00

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