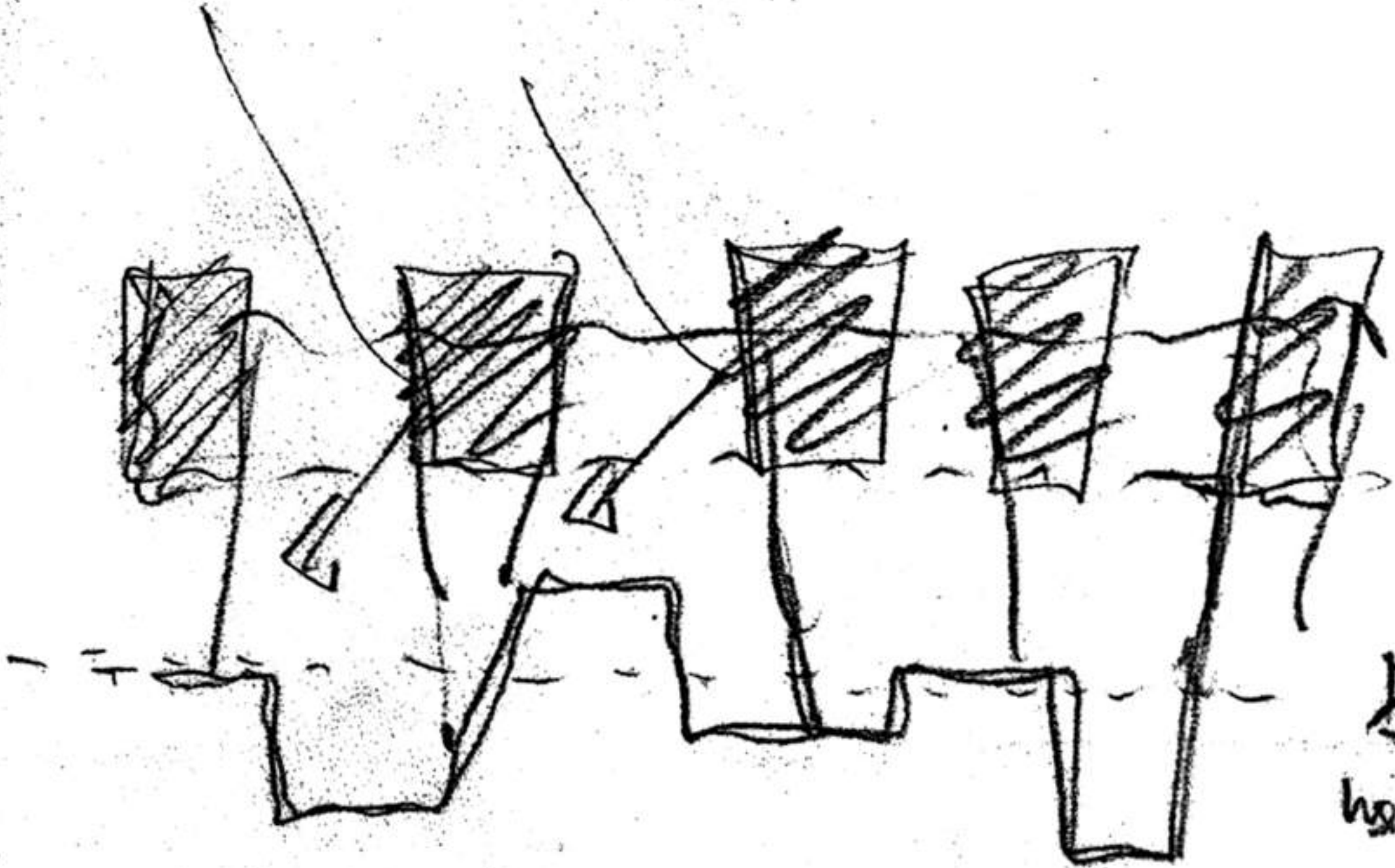


AIA
Conference London

Constructing Worlds

grafon architects

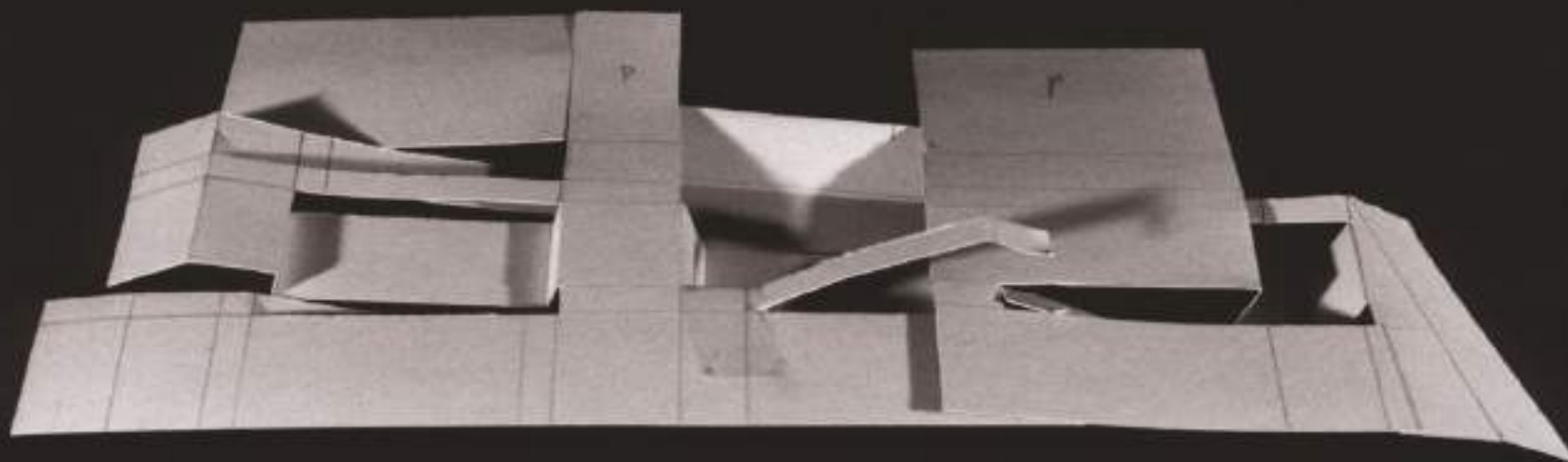
1st October 2022



datum?
no datum?

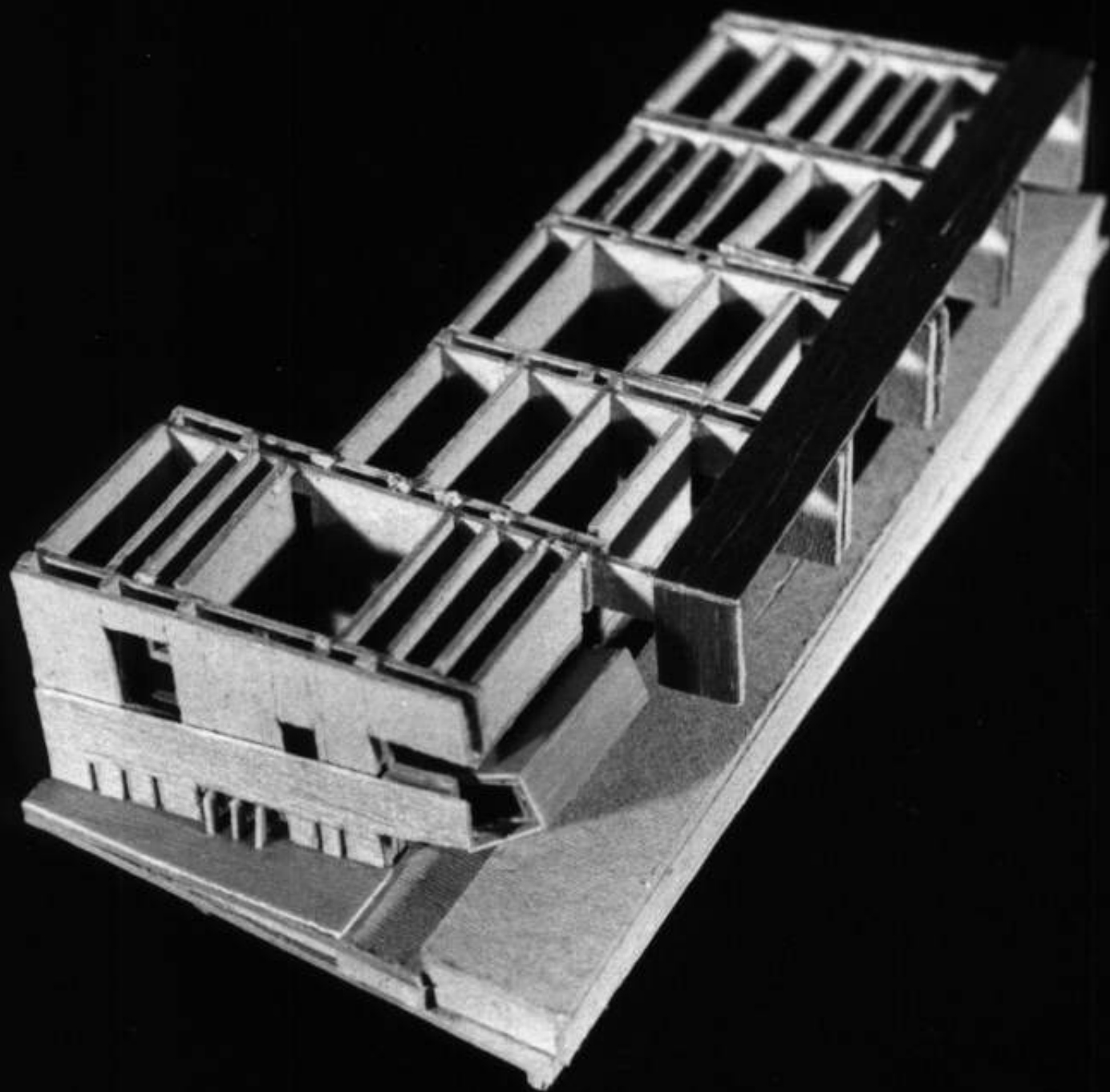
Bocconi University, Milan, Italy

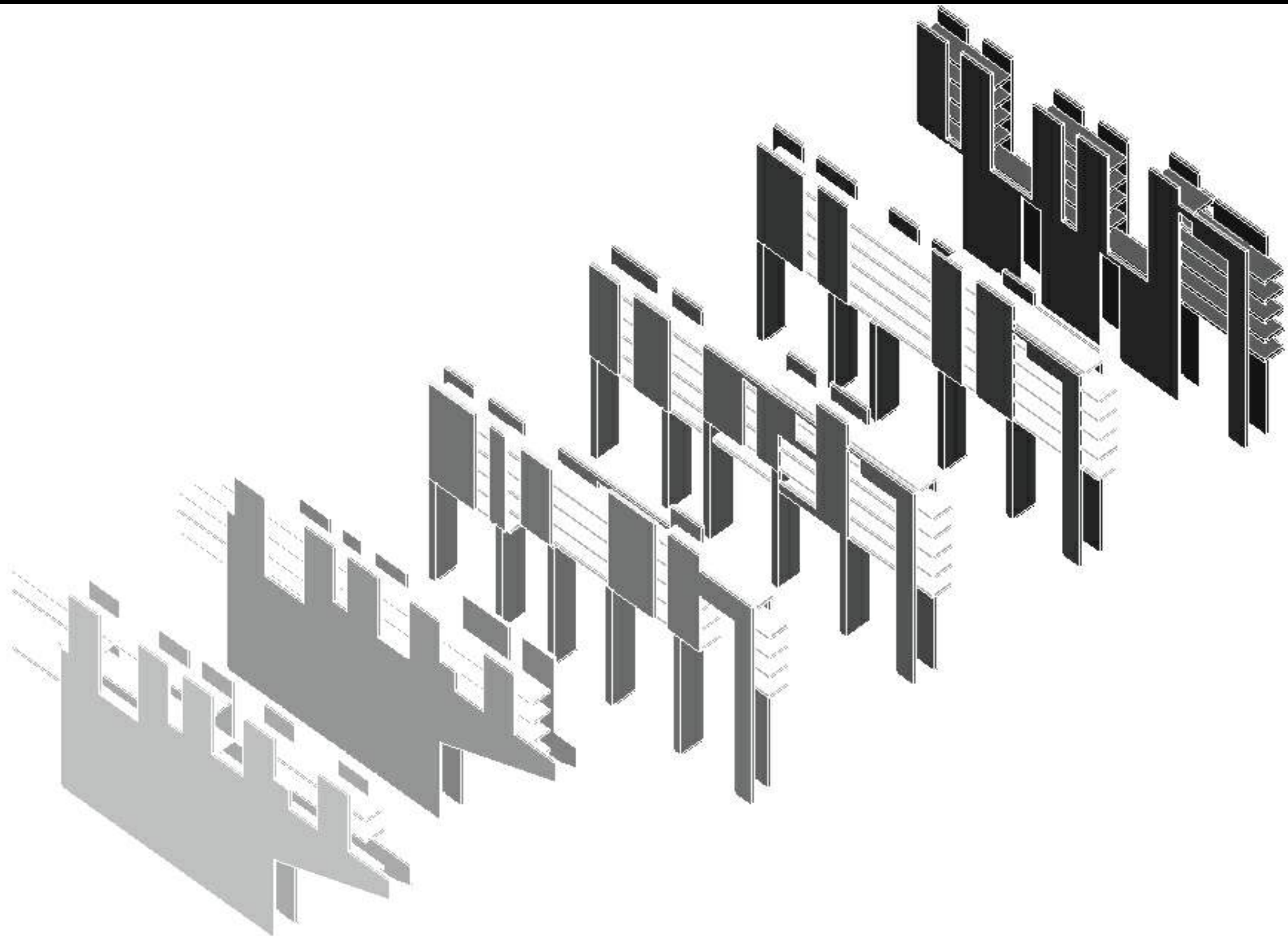




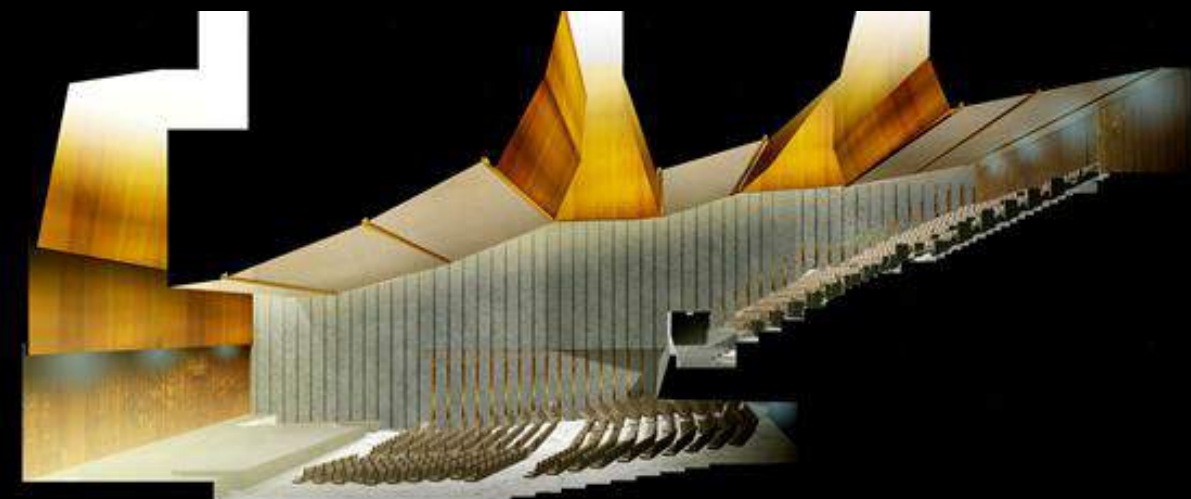
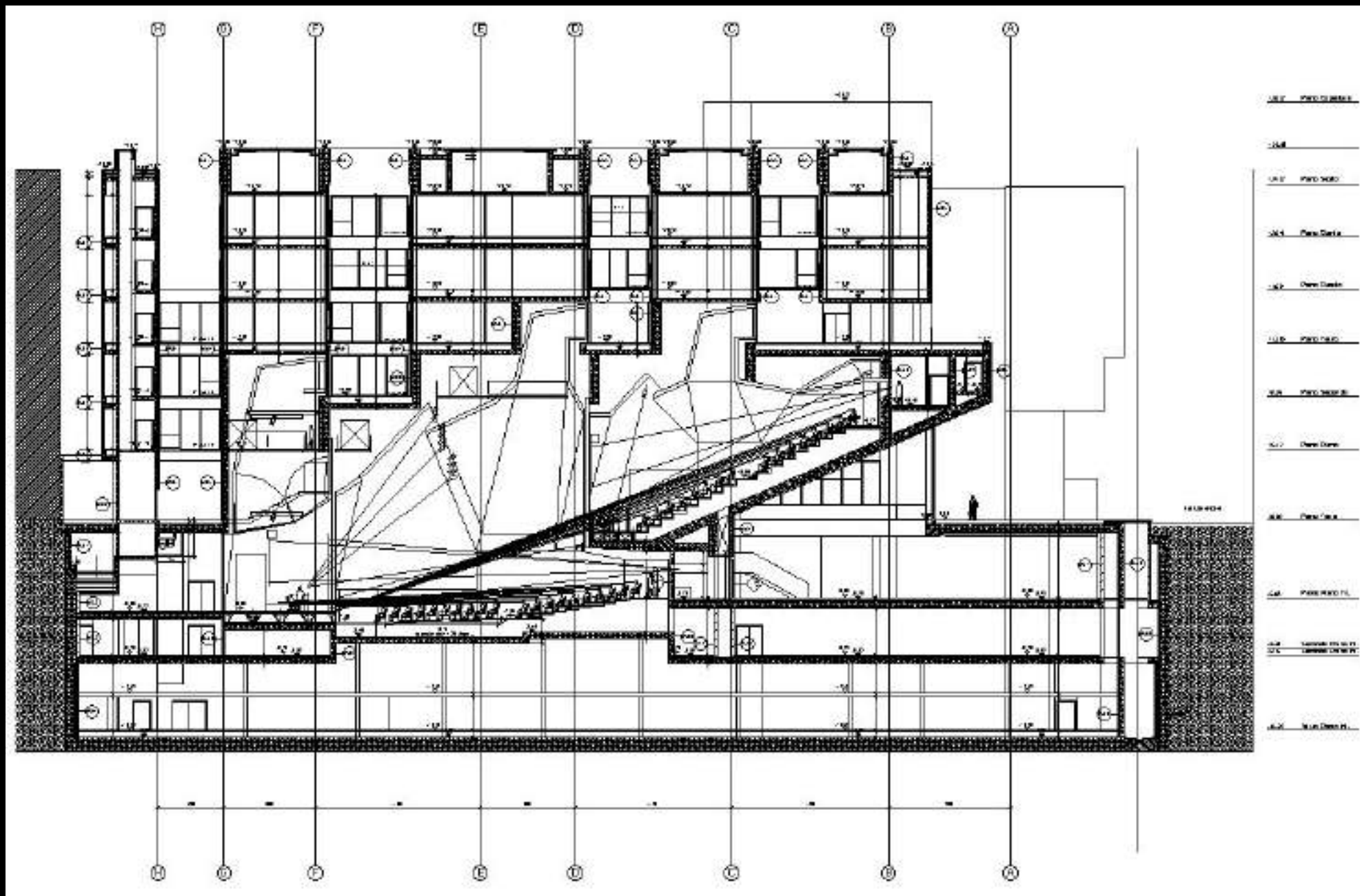


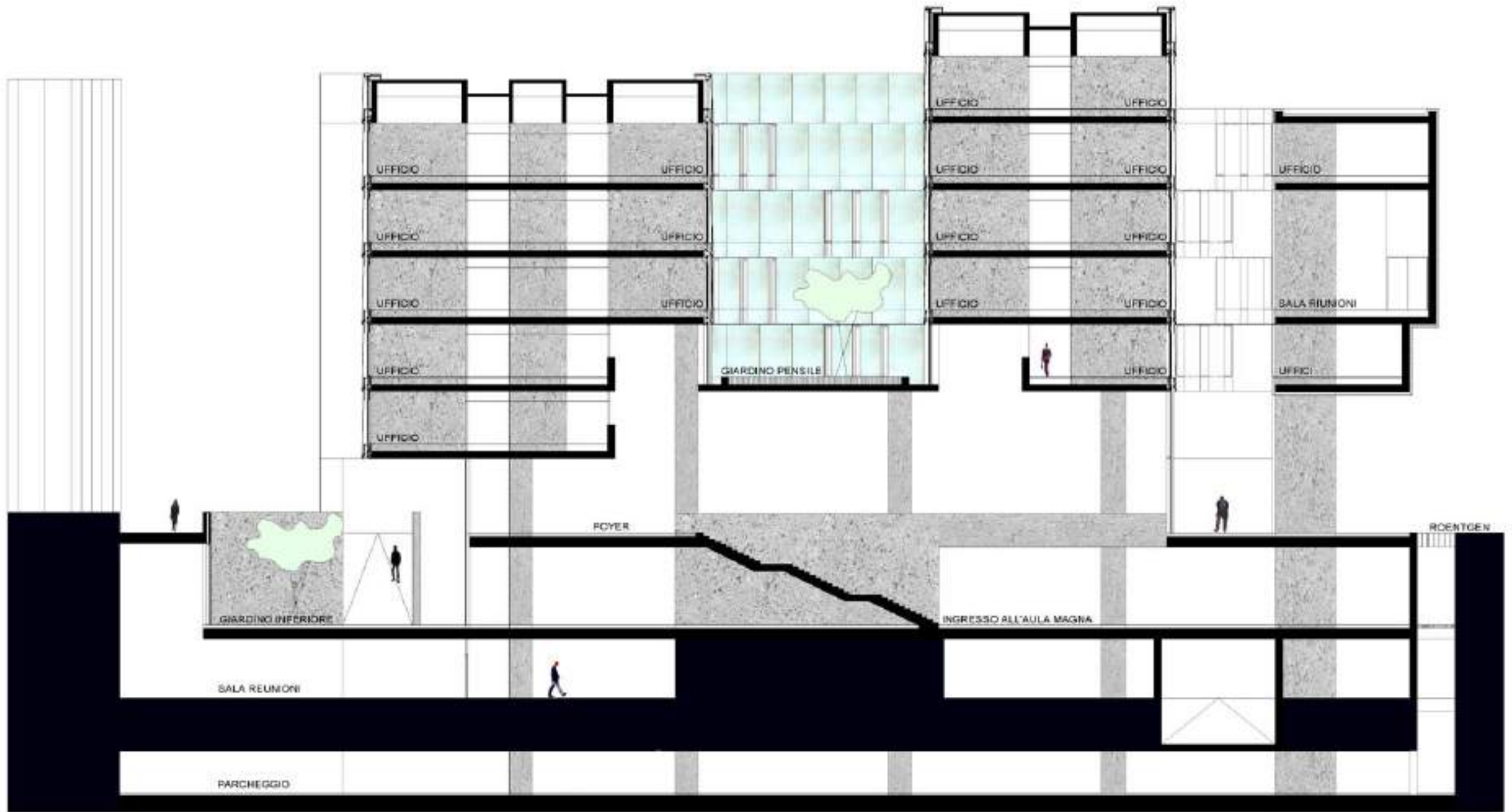






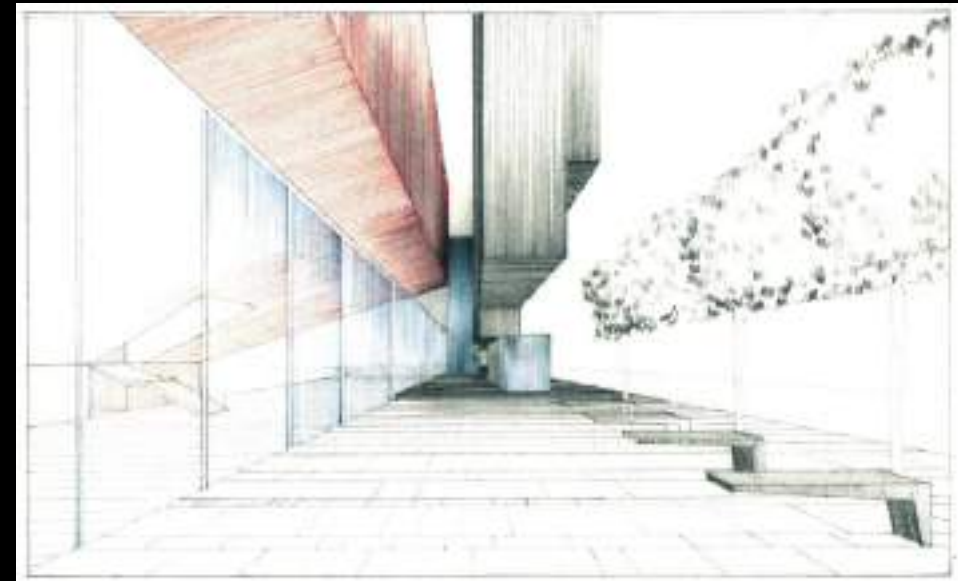
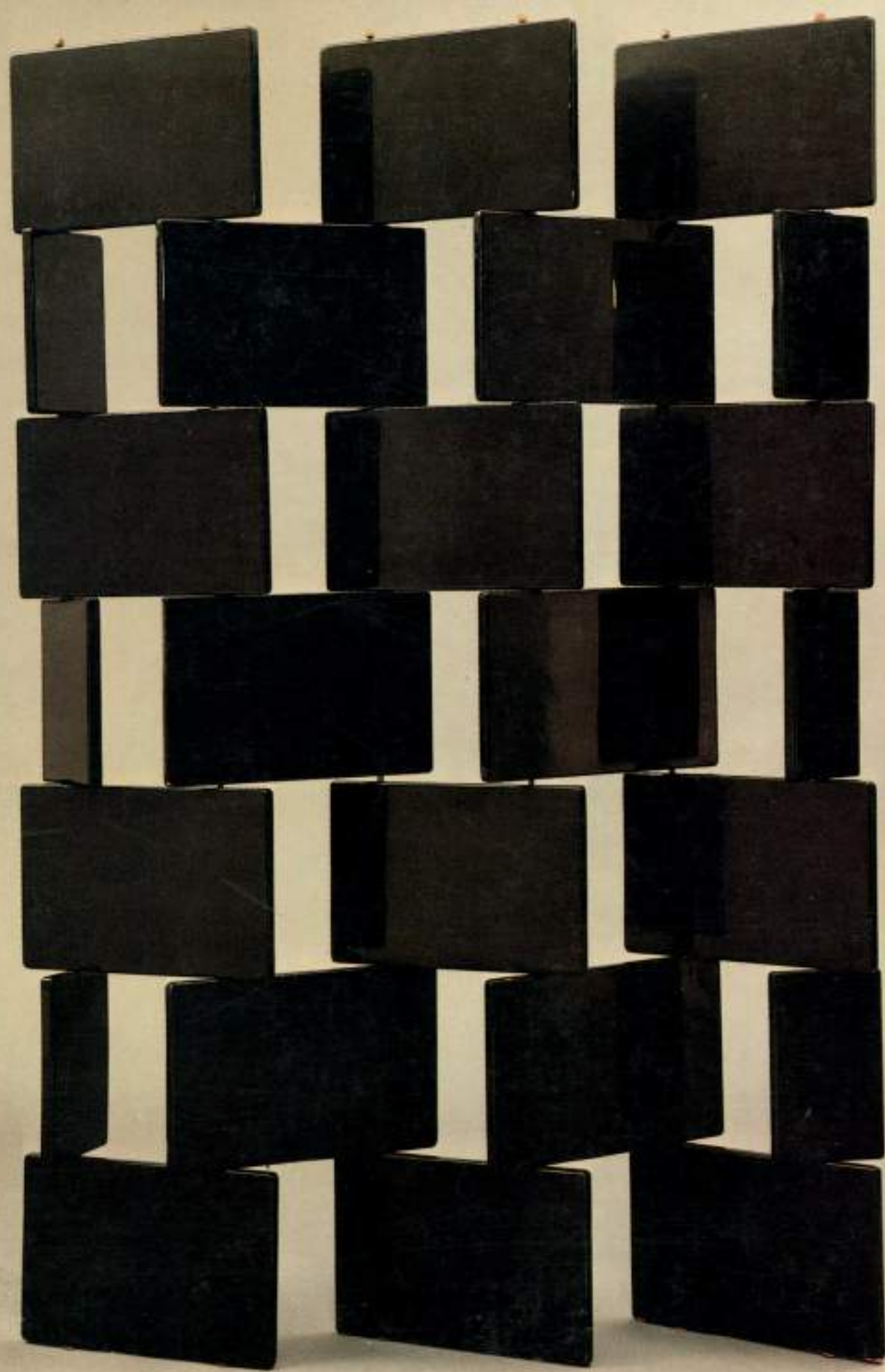


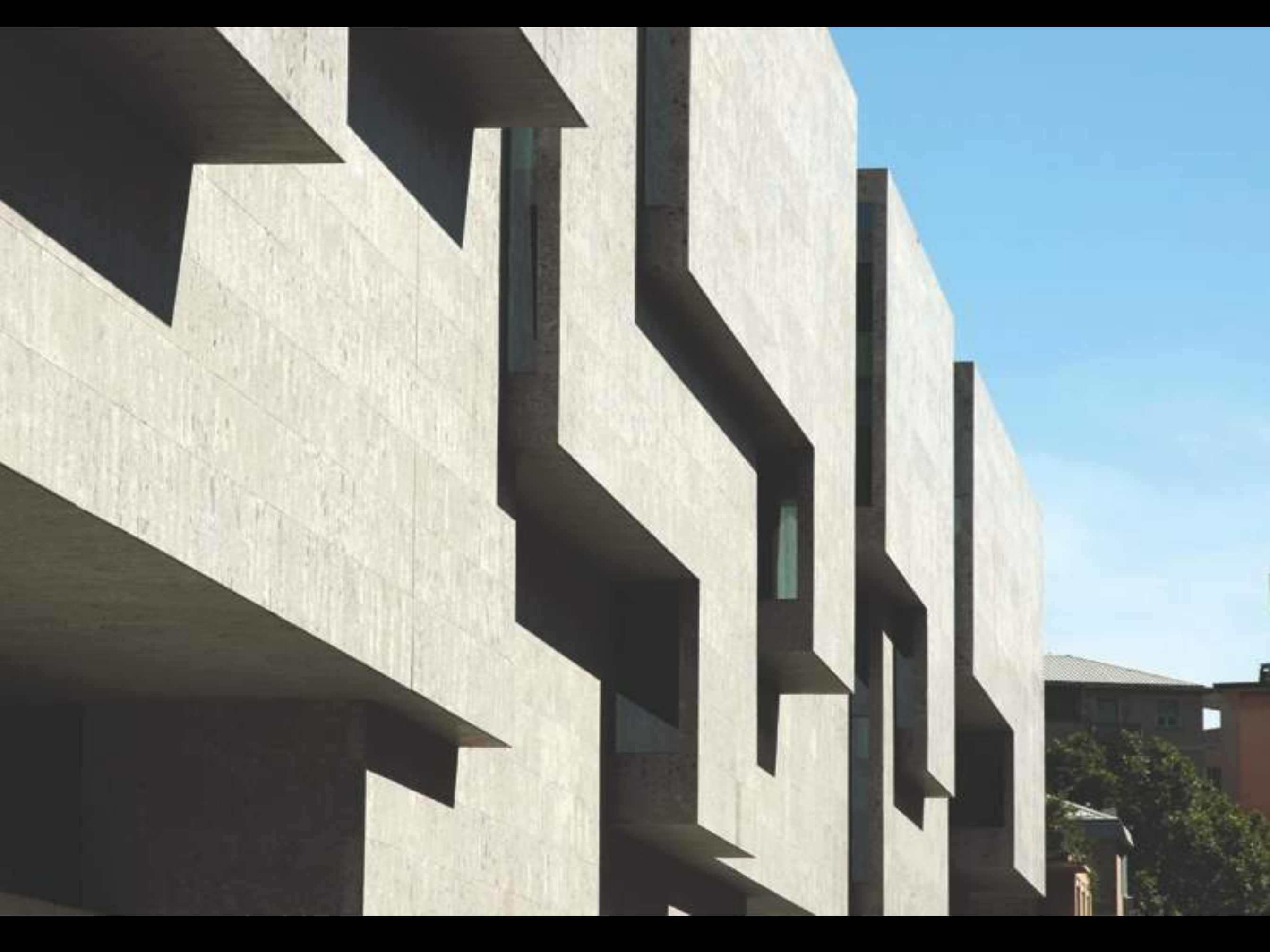




Section D







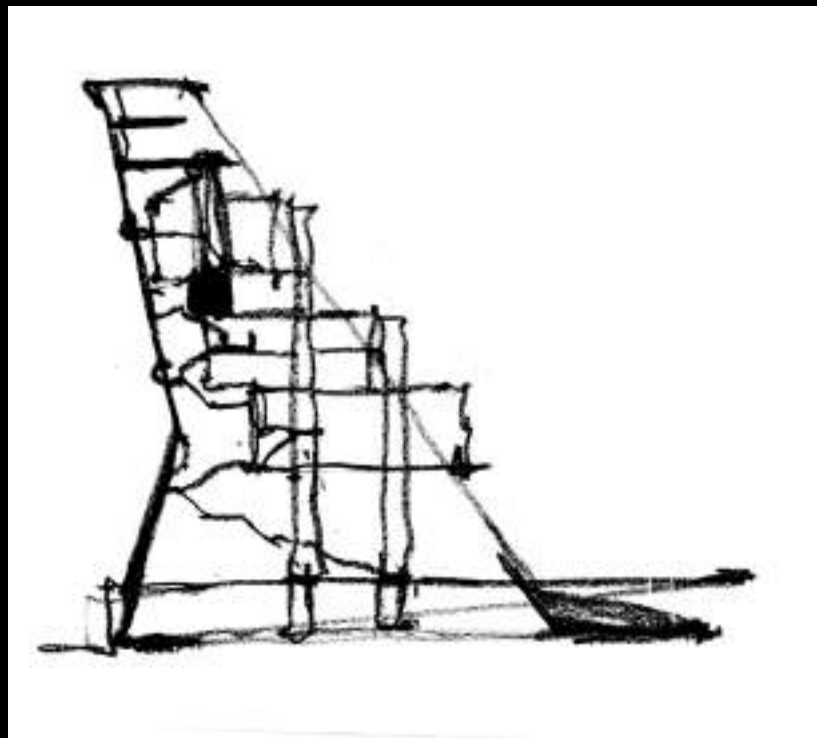












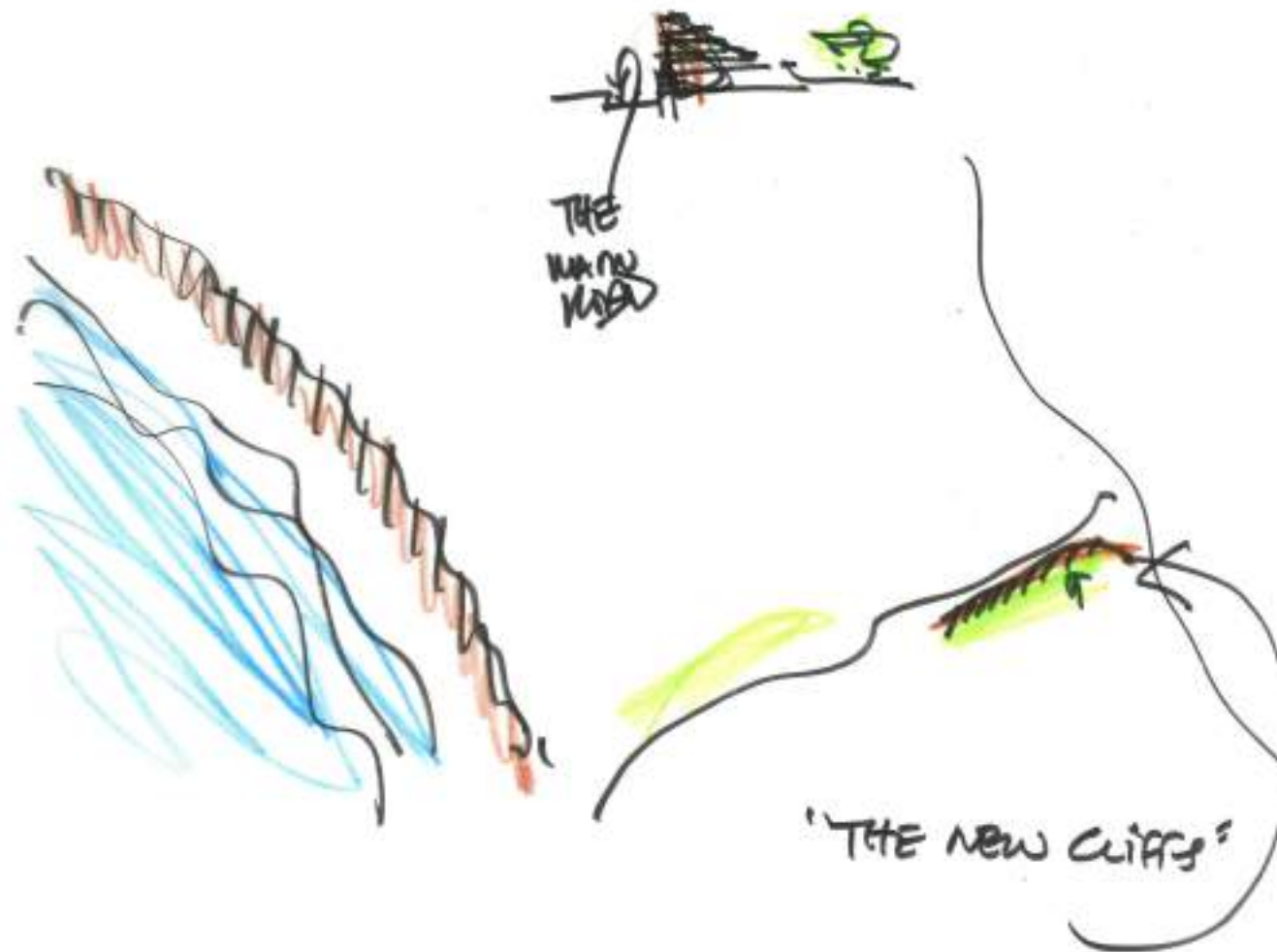


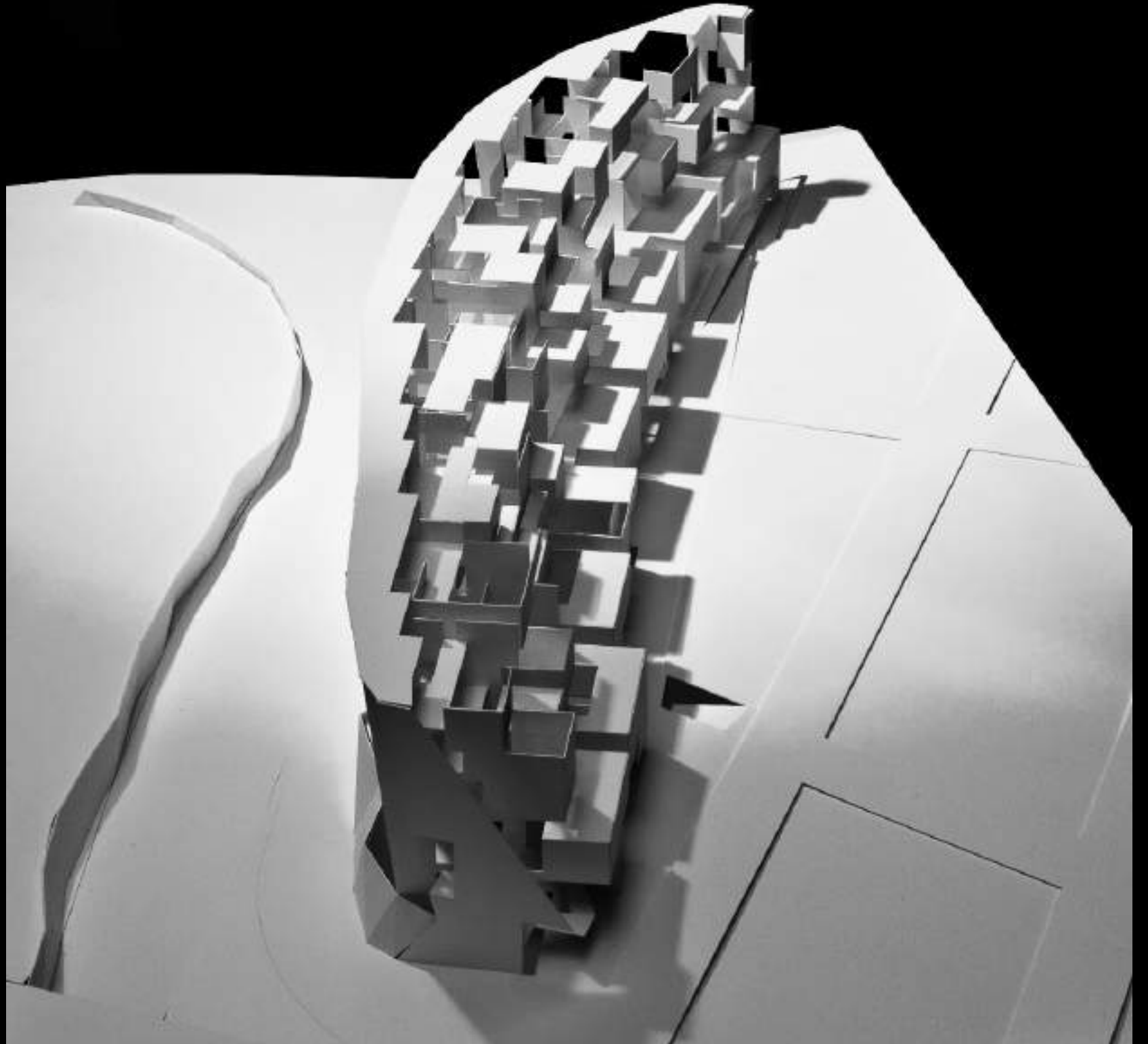
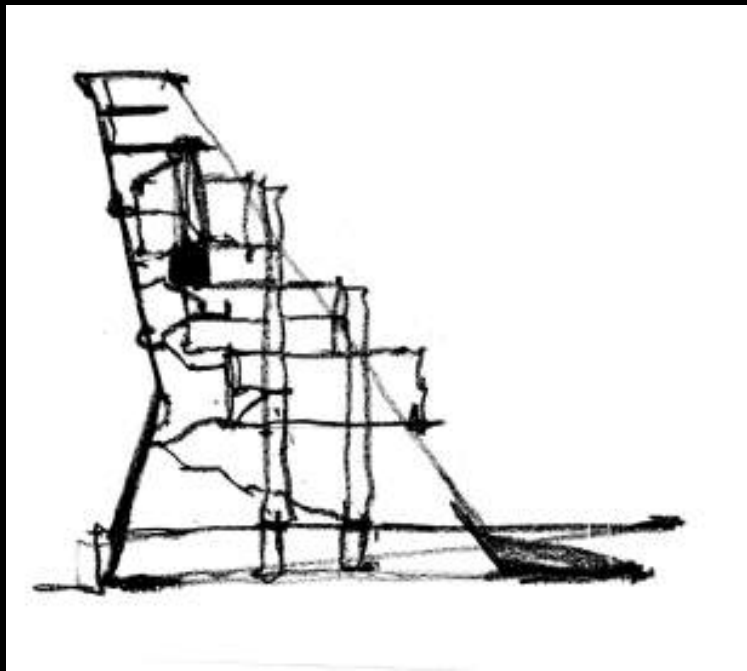
*Geographie der Pflanzen in den Tropen-Ländern;
 ein Naturgemälde der Anden.*

gegründet auf Beobachtungen und Messungen, welche vom 10^{ten} Grade nördlicher bis zum 10^{ten} Grade südlicher Breite angestellt worden sind, in den Jahren 1799 bis 1803.

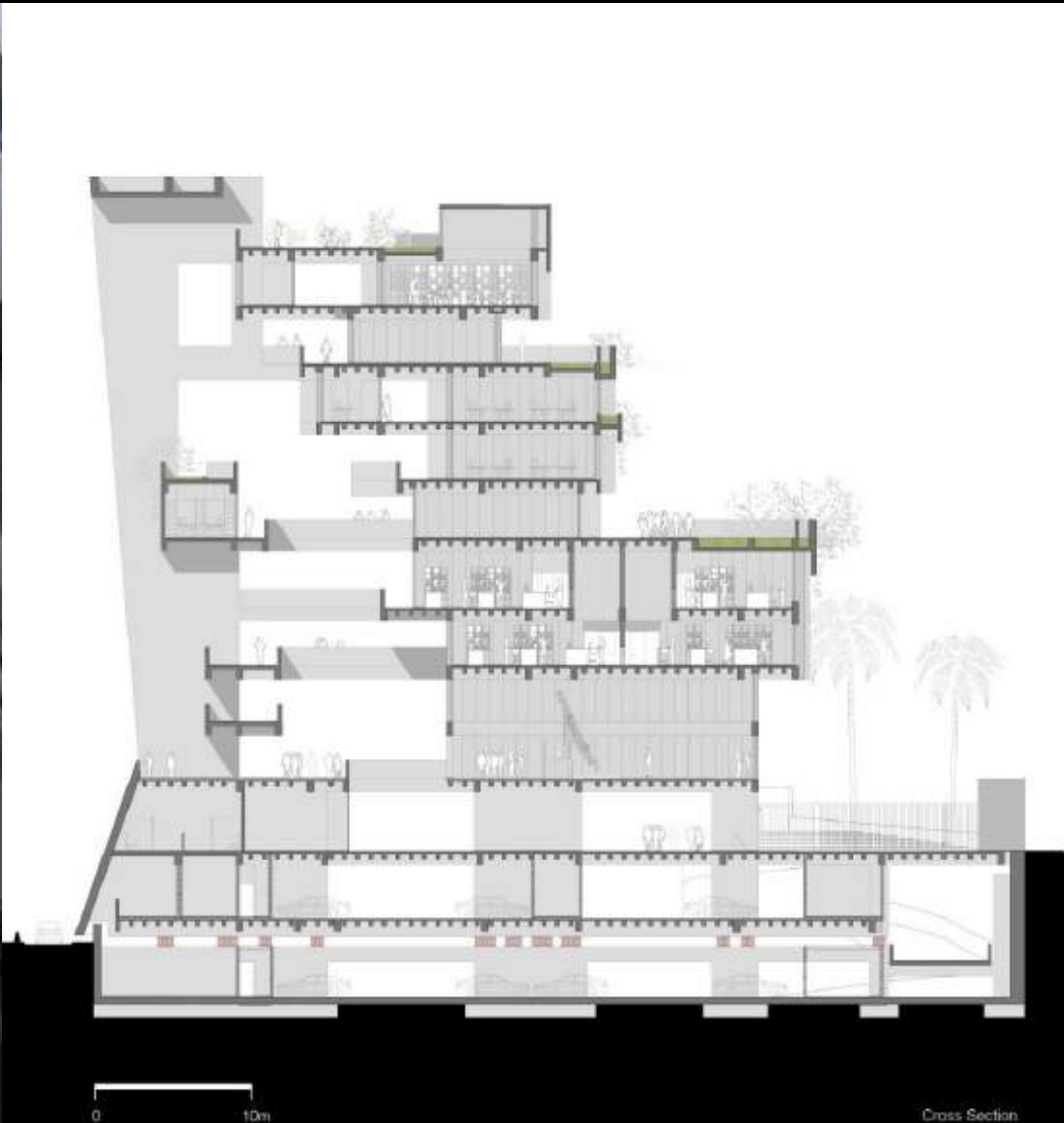
von ALEXANDER VON HUMBOLDT und A. G. BONPLAND.

The physics of culture



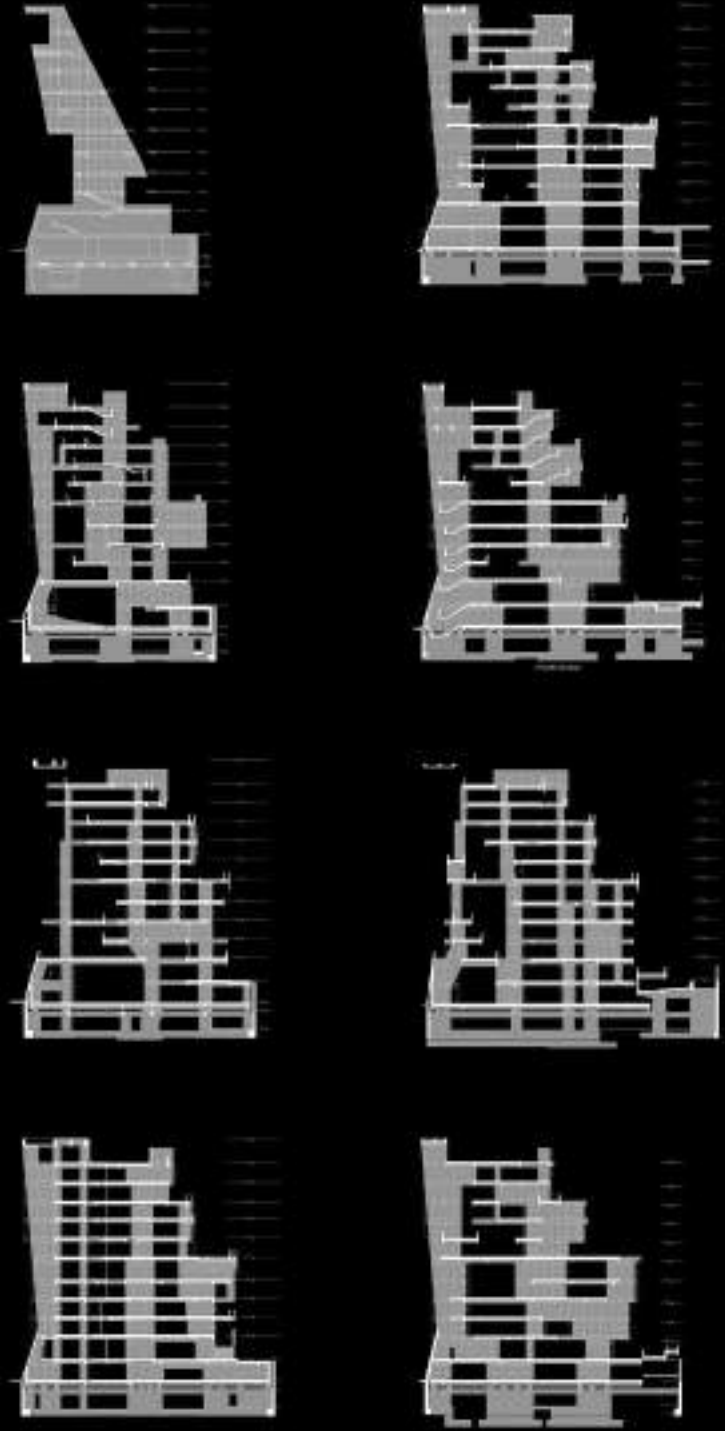








in situ concrete 20m (67ft) main structure
and 10m (32.8ft) elevated structure



Wolfson Structure



New Circulation Landscape

NT



N10



N09



N08







SIN UNIVERSIDAD
NO HAY PROFESION
SIN MAESTROS
NO HAY UNIVERSIDAD

ALFONSO ARREOLA
ALFONSO ARREOLA



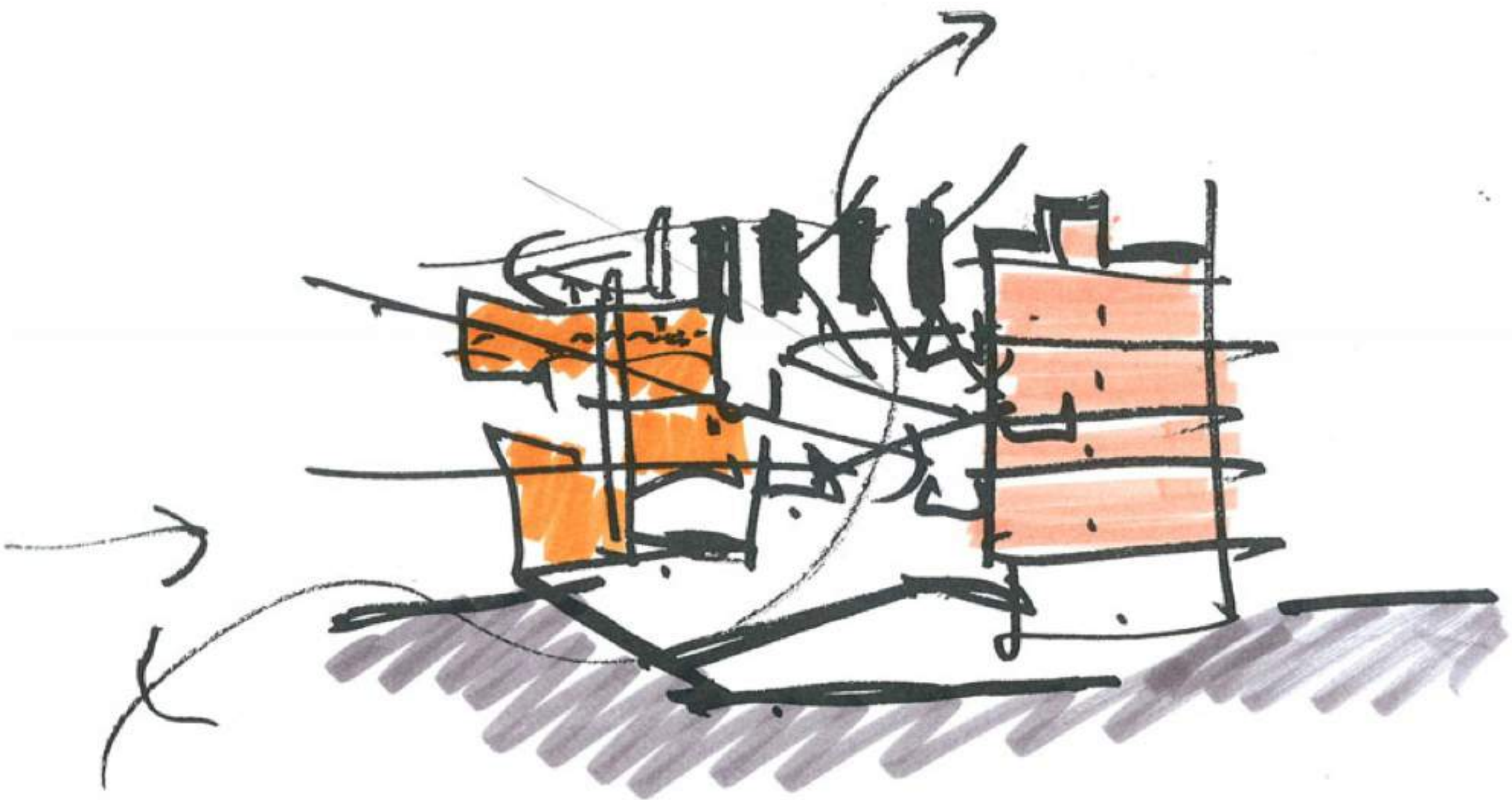
Toulouse parcelles de mémoire
L'Ancien Régime (16^e - 18^e siècle)

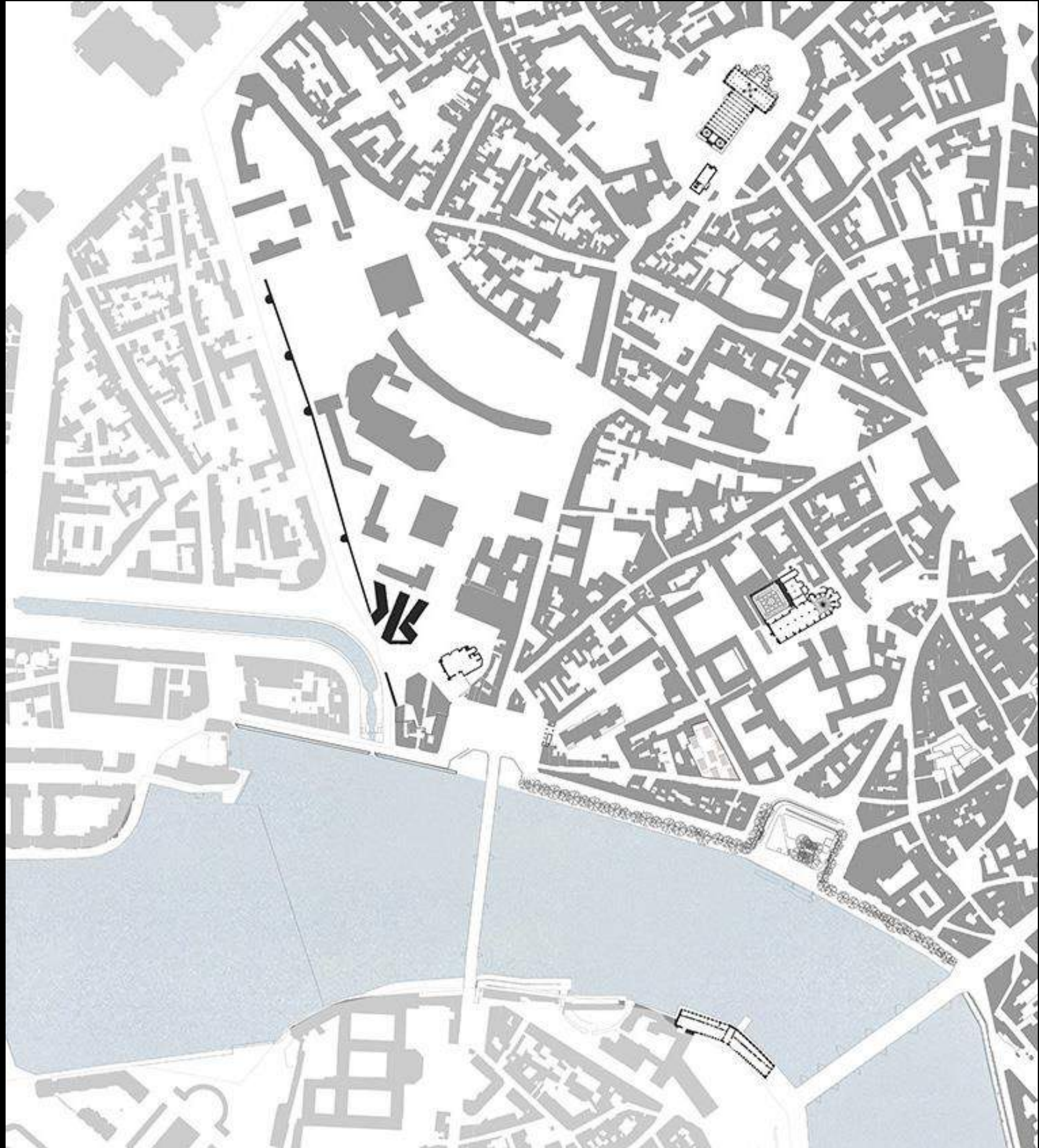
University TOULOUSE FRANCE





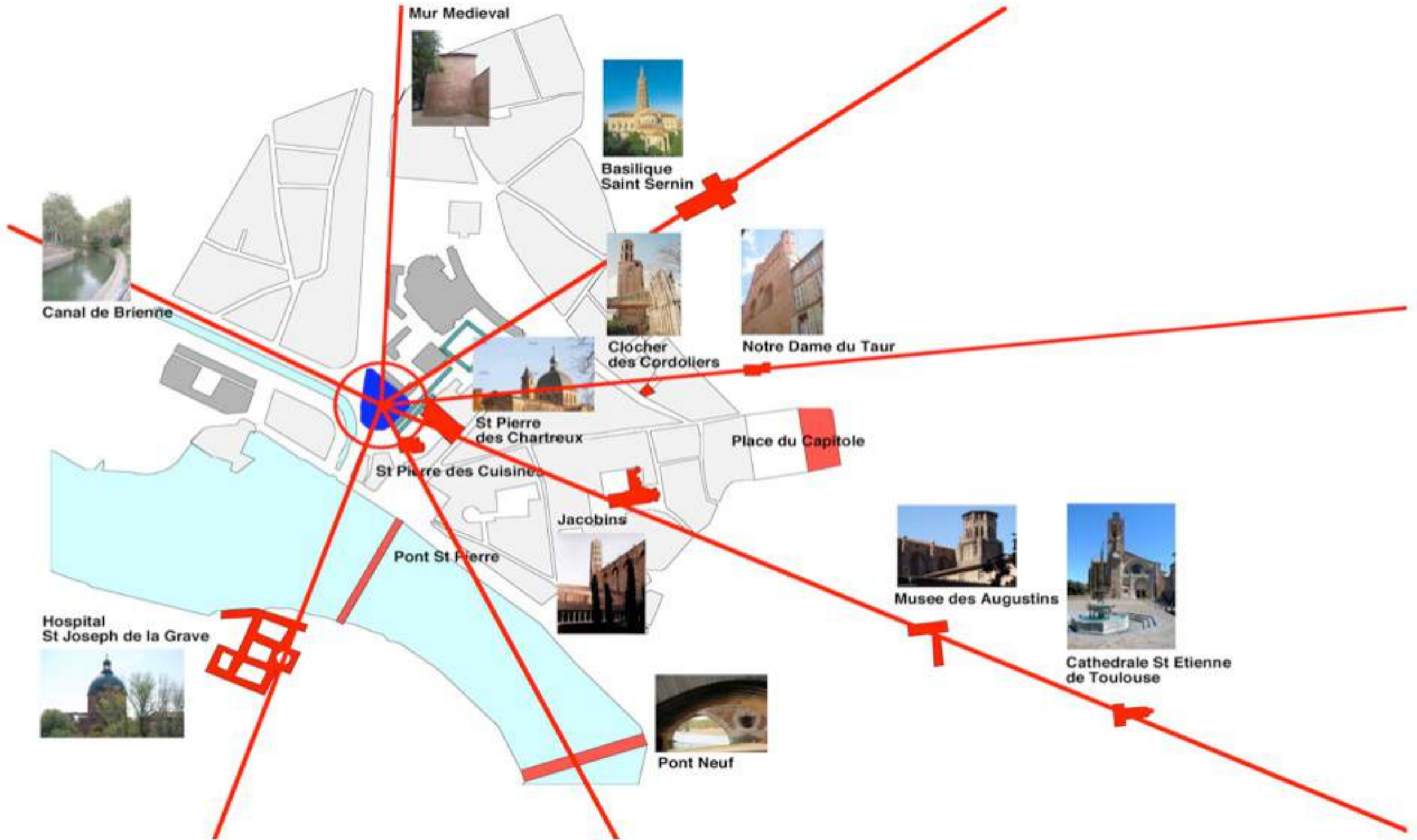






**TOULOUSE SCHOOL OF ECONOMICS
TOULOUSE, FRANCE**







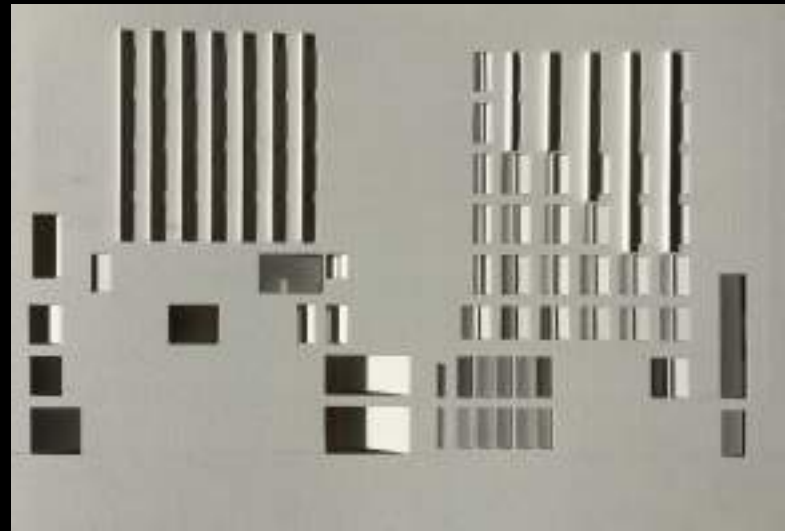
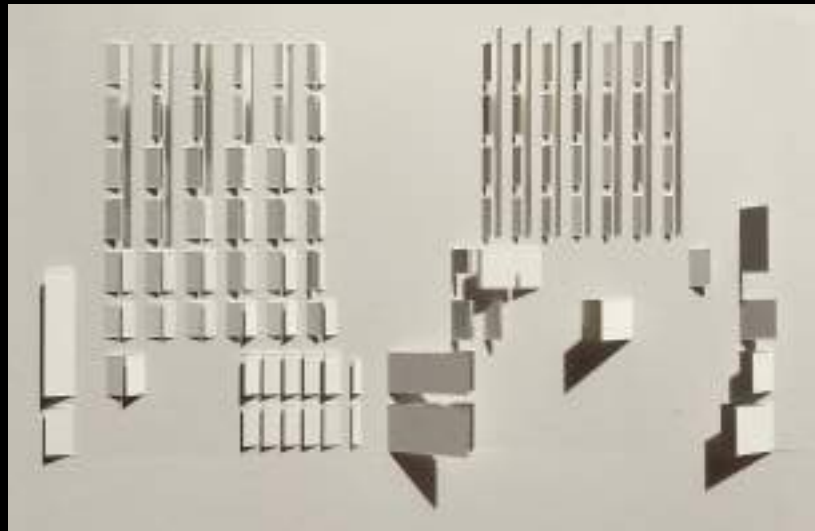
Auditorium 6















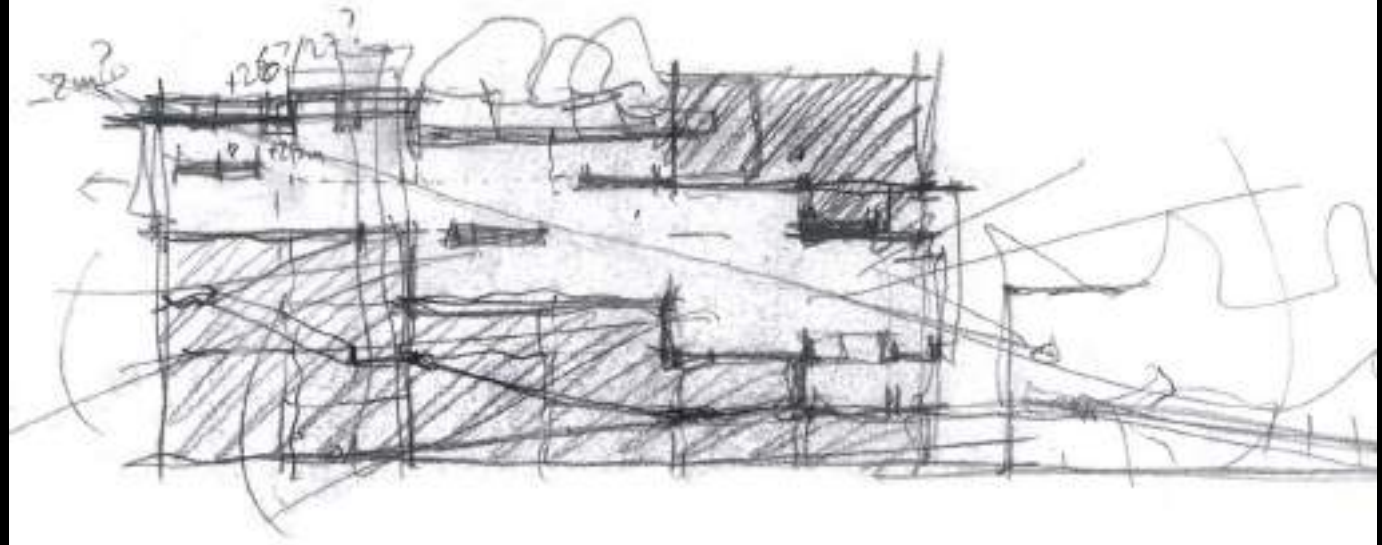
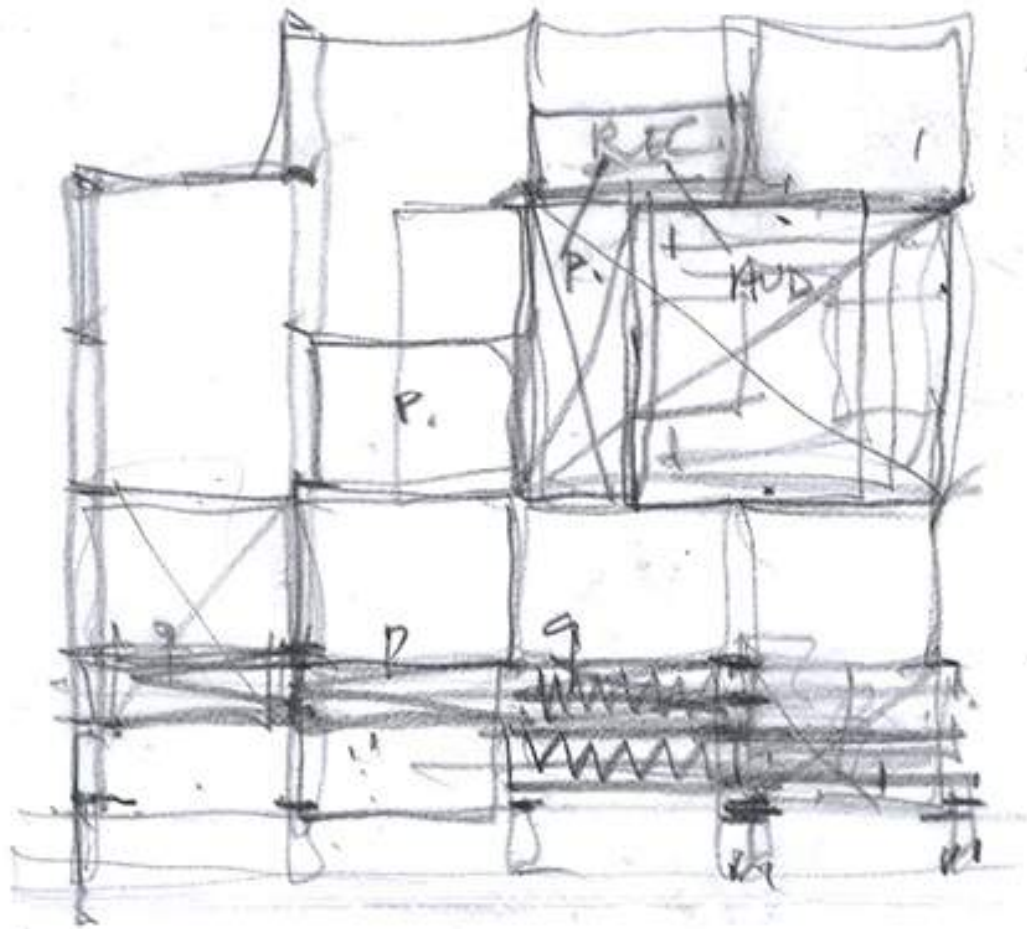


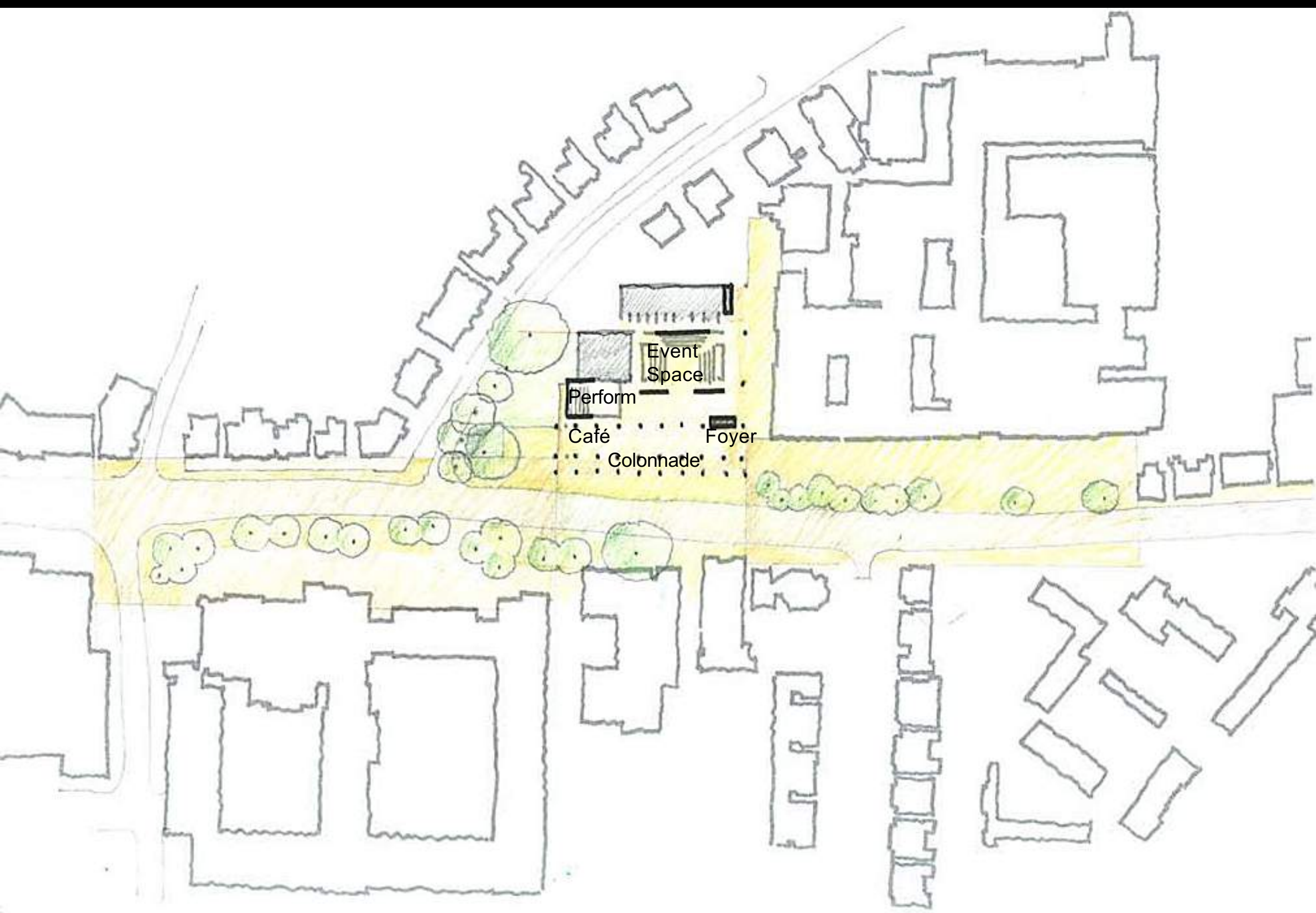


Town House, Kingston University, UK



Town House, Kingston University, UK





Event
Space

Perform

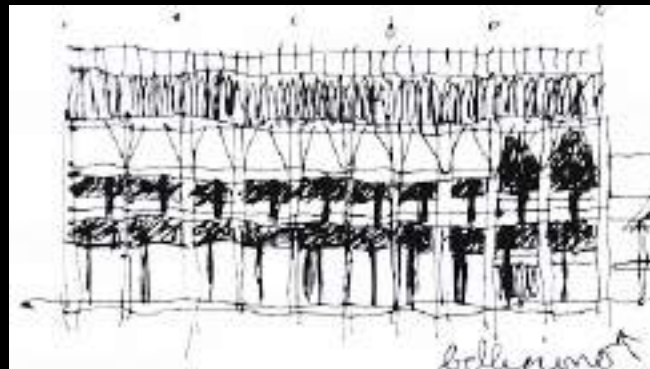
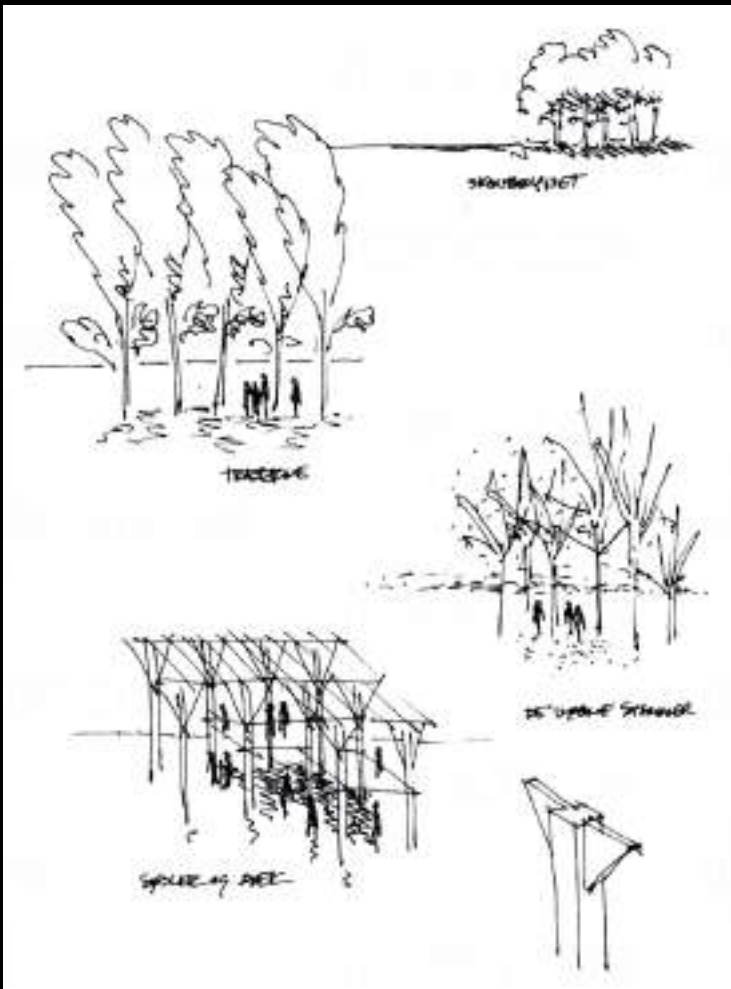
Café

Foyer

Colonnade



TOWNHOUSE. KINGSTON UNIVERSITY, LONDON

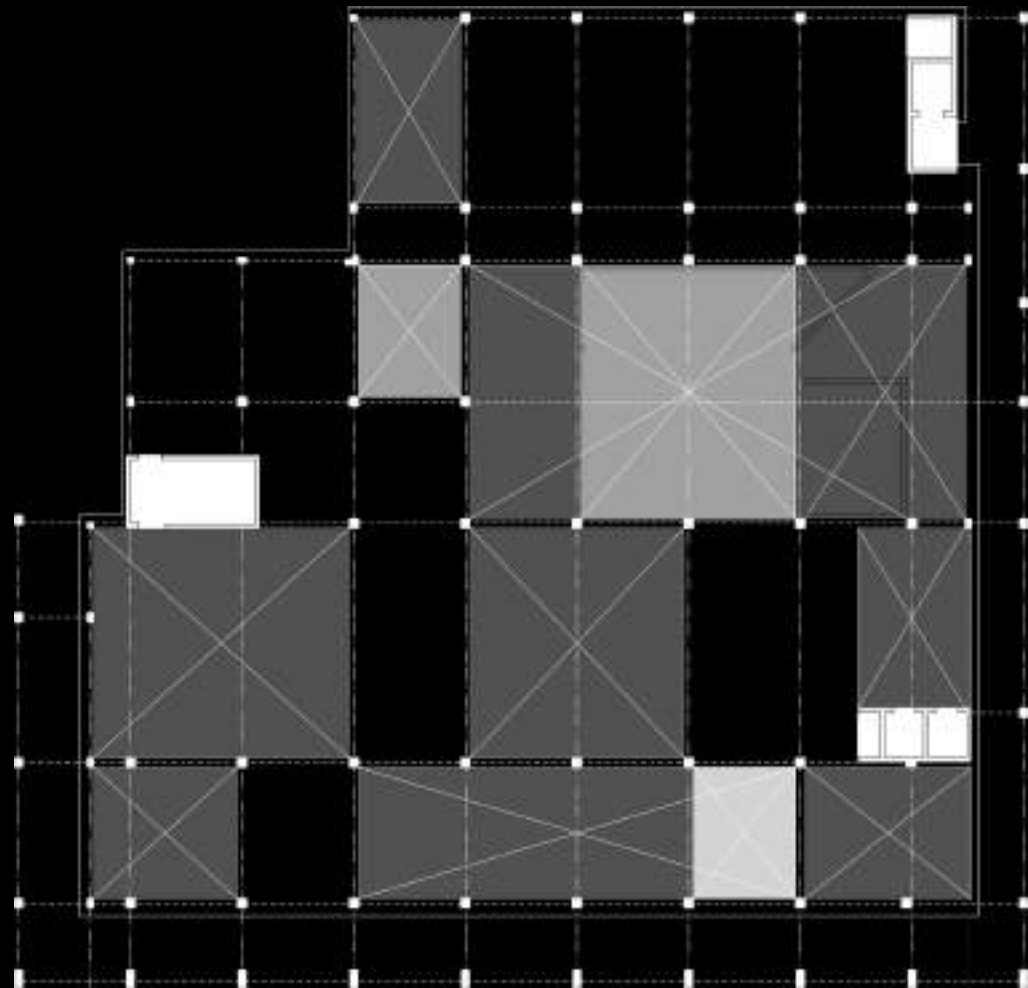


**PAUSTIAN HOUSE by JORN UTZON
COPENHAGEN, DENMARK**



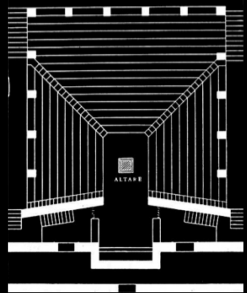


Firminy Church Floor, Le Corbusier

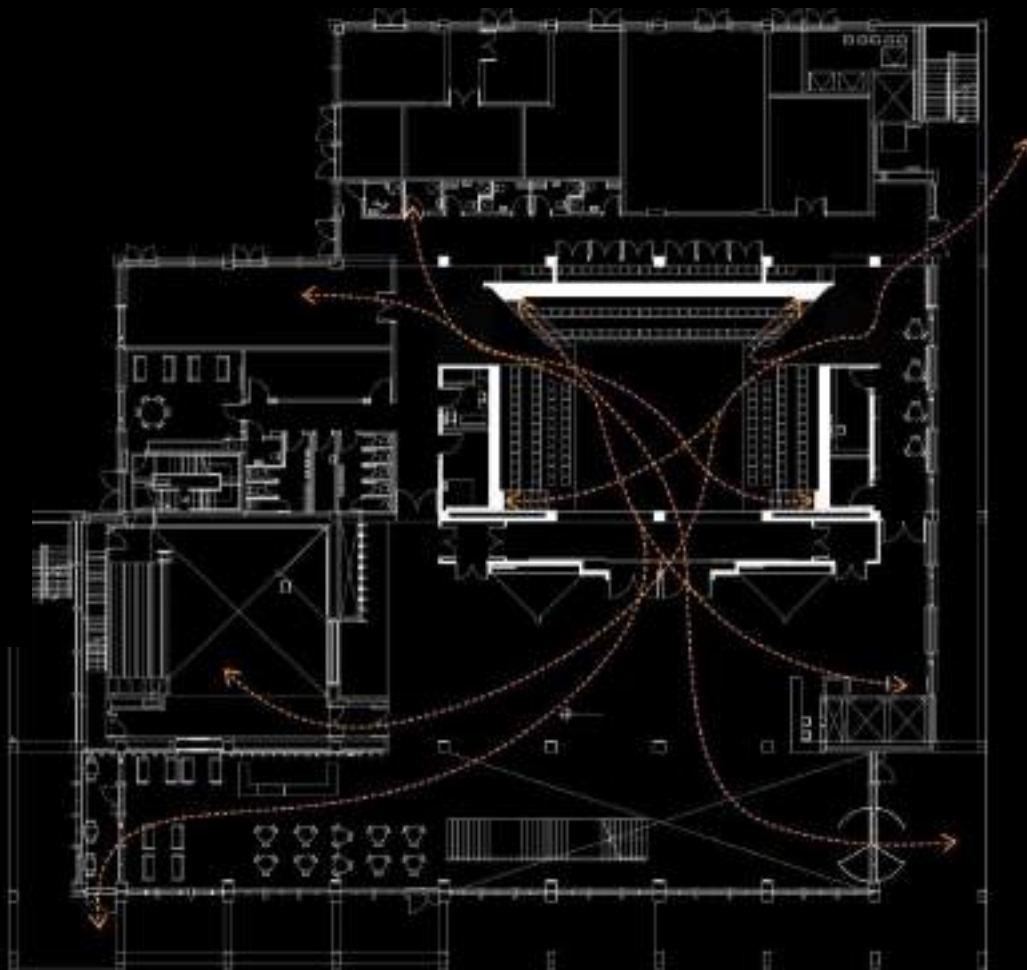


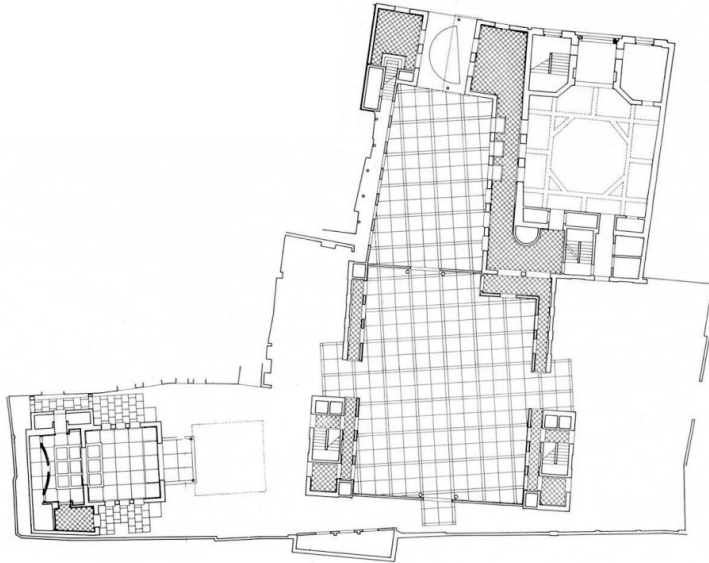


Bouleuterion

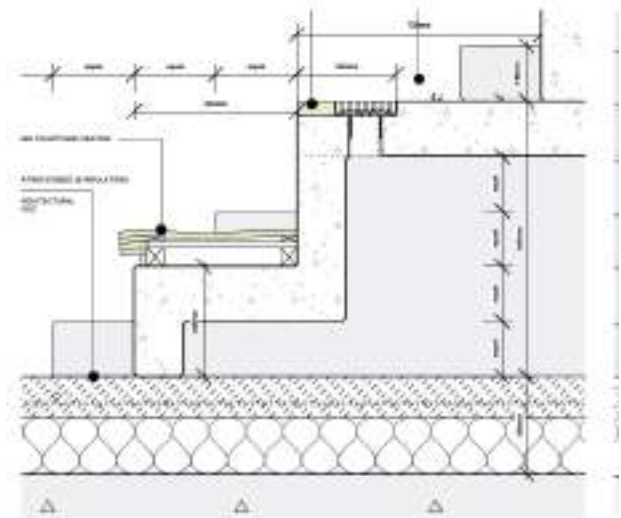


Bouleuterion









Integration of Air supply within Concrete seating



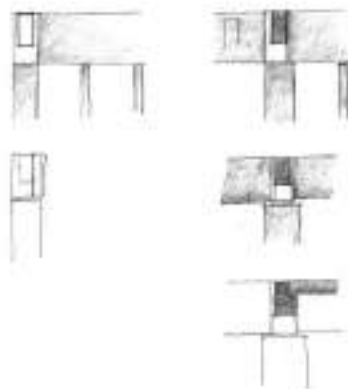
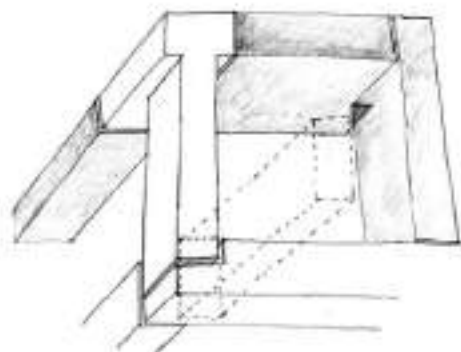
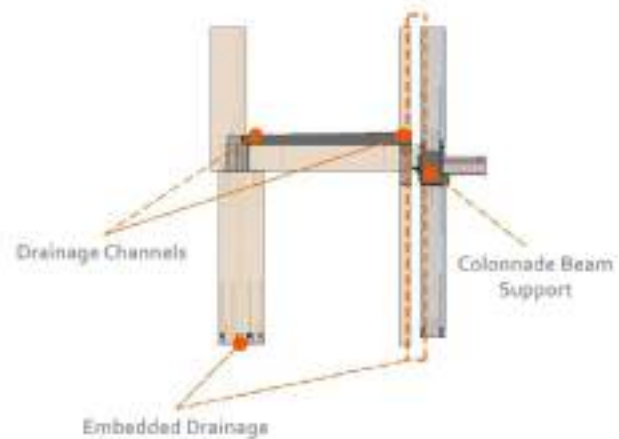
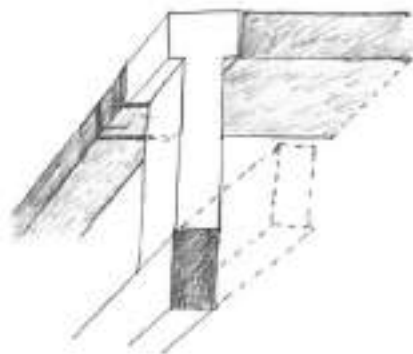
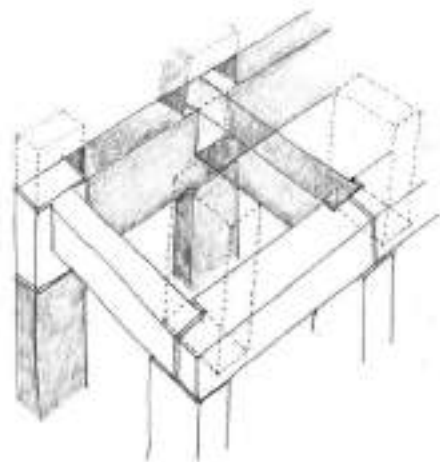






















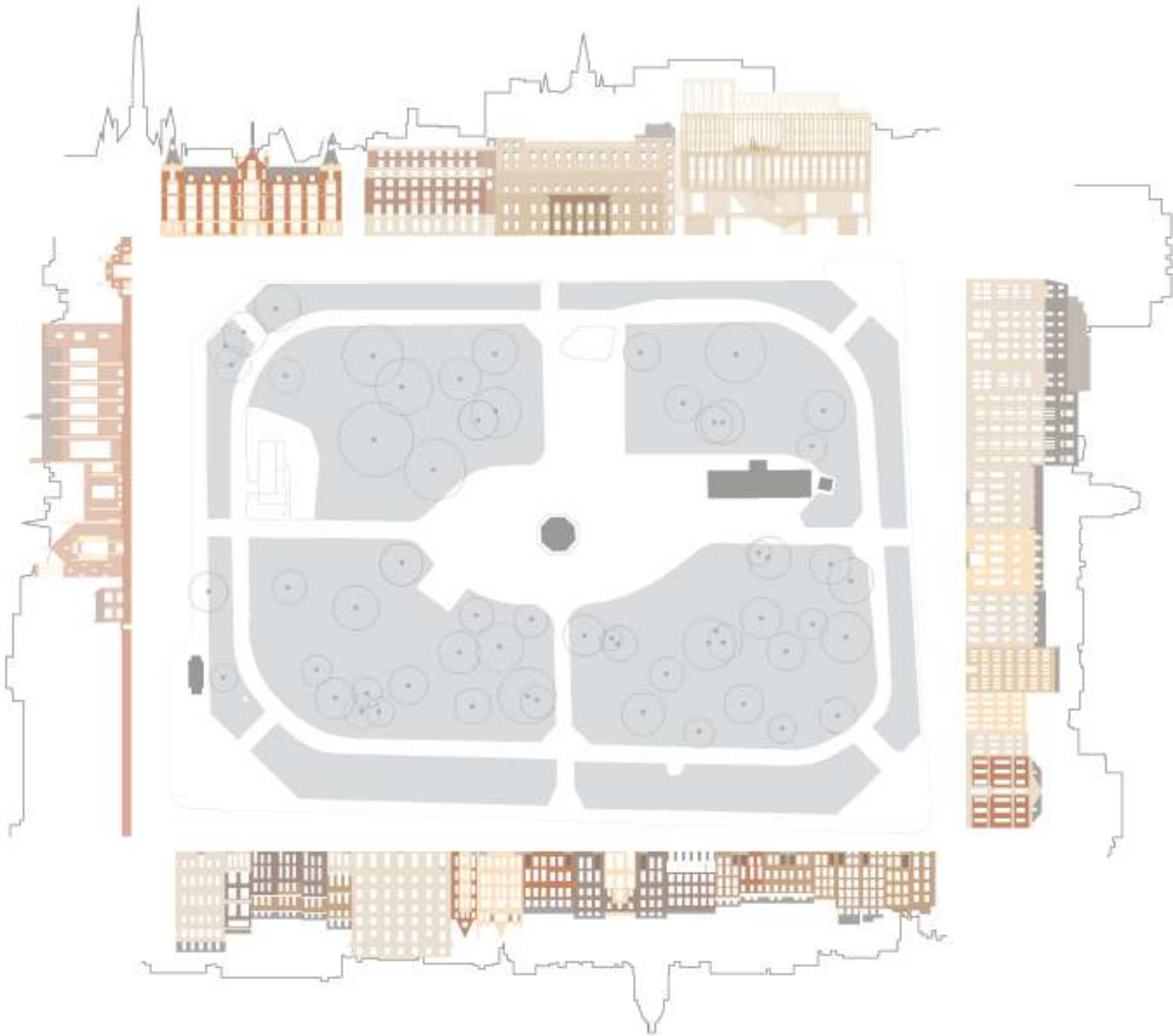




**THE MARSHALL BUILDING,
LONDON SCHOOL OF ECONOMICS,
UNITED KINGDOM**



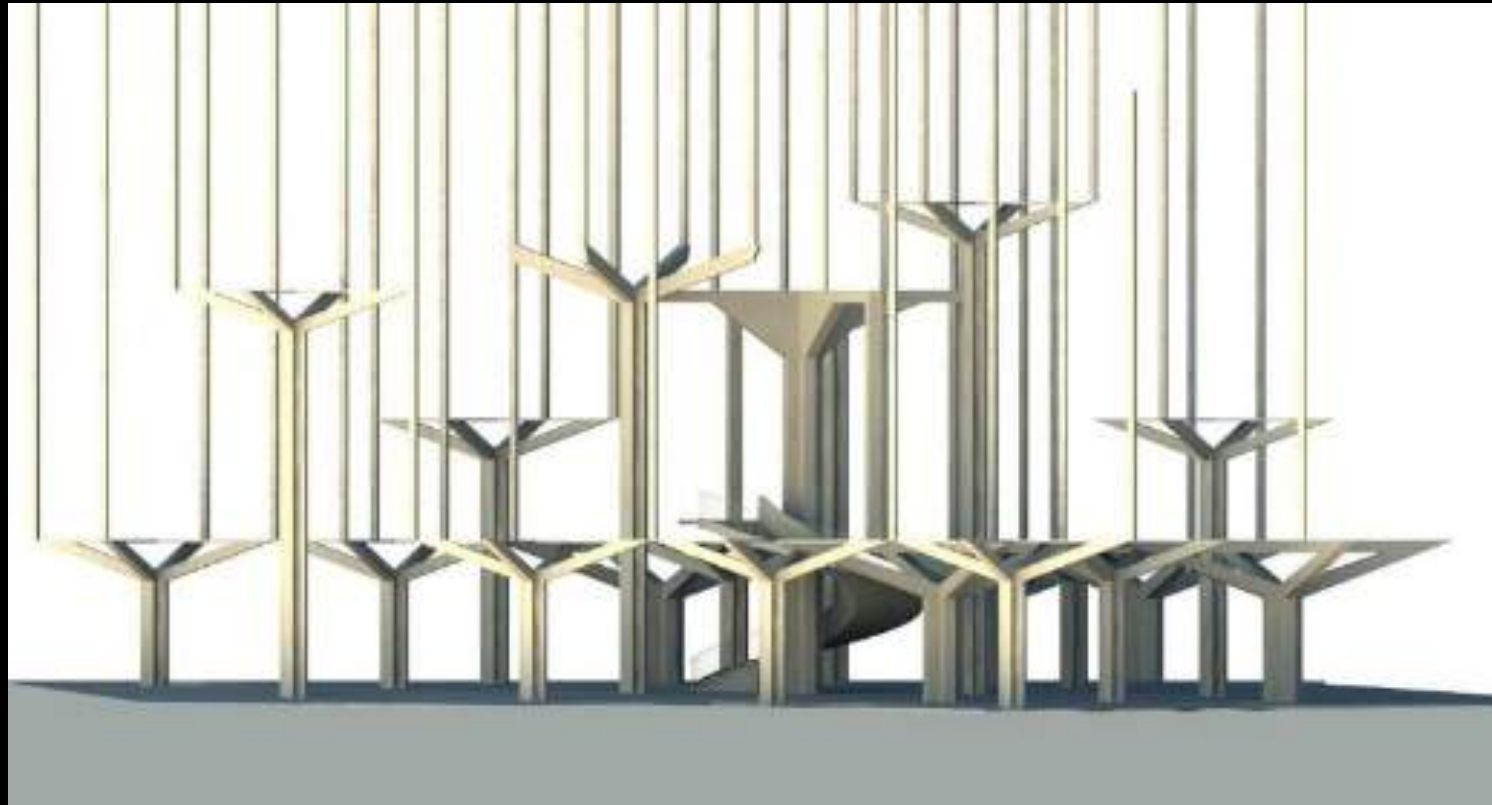


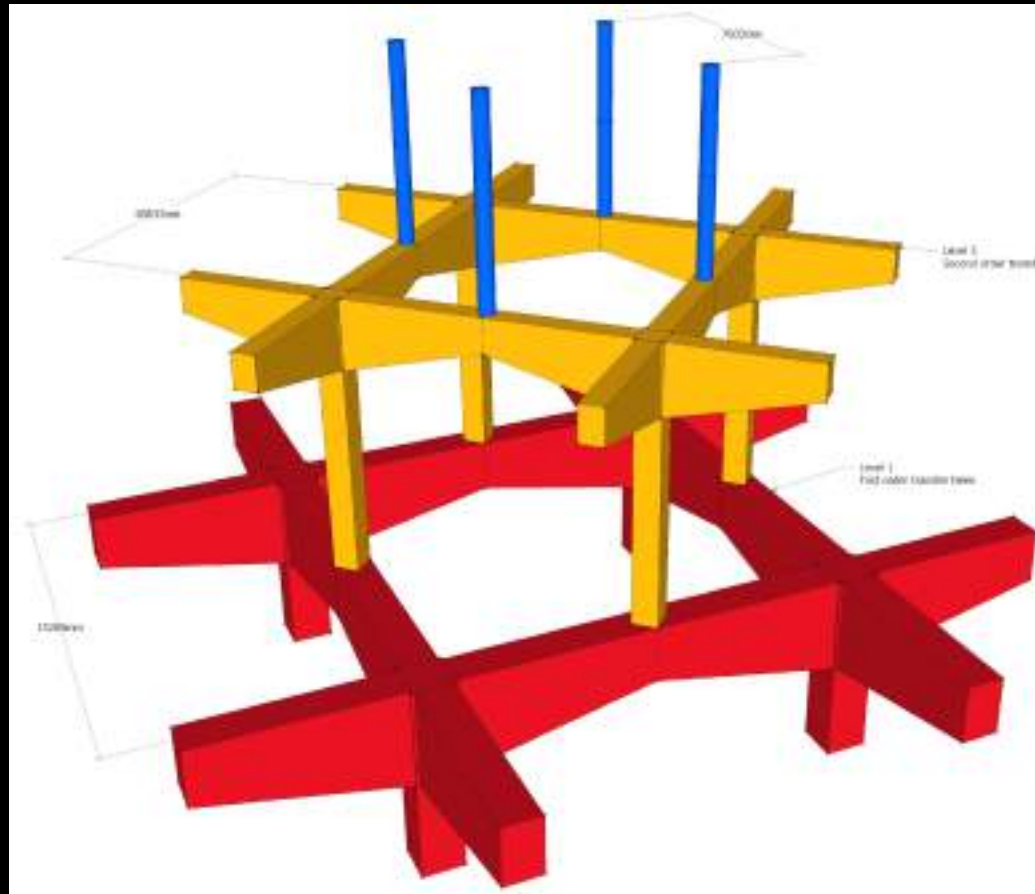




	Red Marshall Institute	+8
	Block 2 (EMD & SPC Finance Management & Finance Management Accounting)	+8 +7 +6 +5 +4 +3
	Spexing Spexing	+2 +1
	Messroom The Great Hall	+000 +00
	Spex & SPC	01 & 02
	Plan & Back of House	01 & 02





























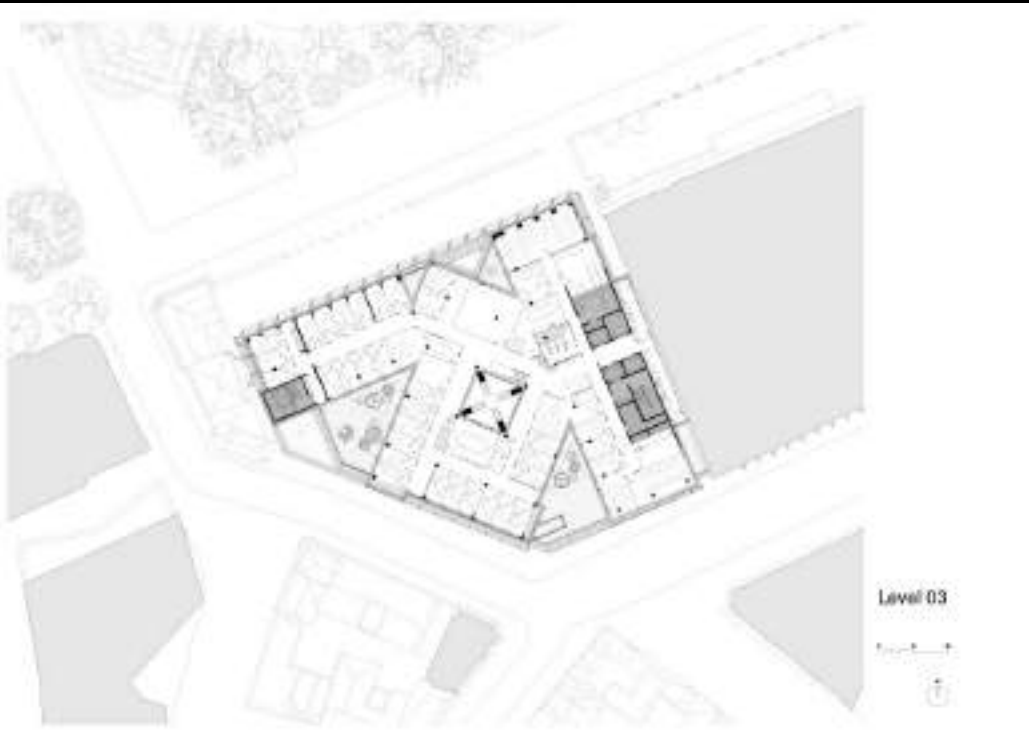


















**ANTHONY TIMBERLANDS CENTER,
UNIVERSITY OF ARKANSAS, USA**



Delaware and Hudson, PA, 1905



Thorncrown Chapel 1980

Fay Jones

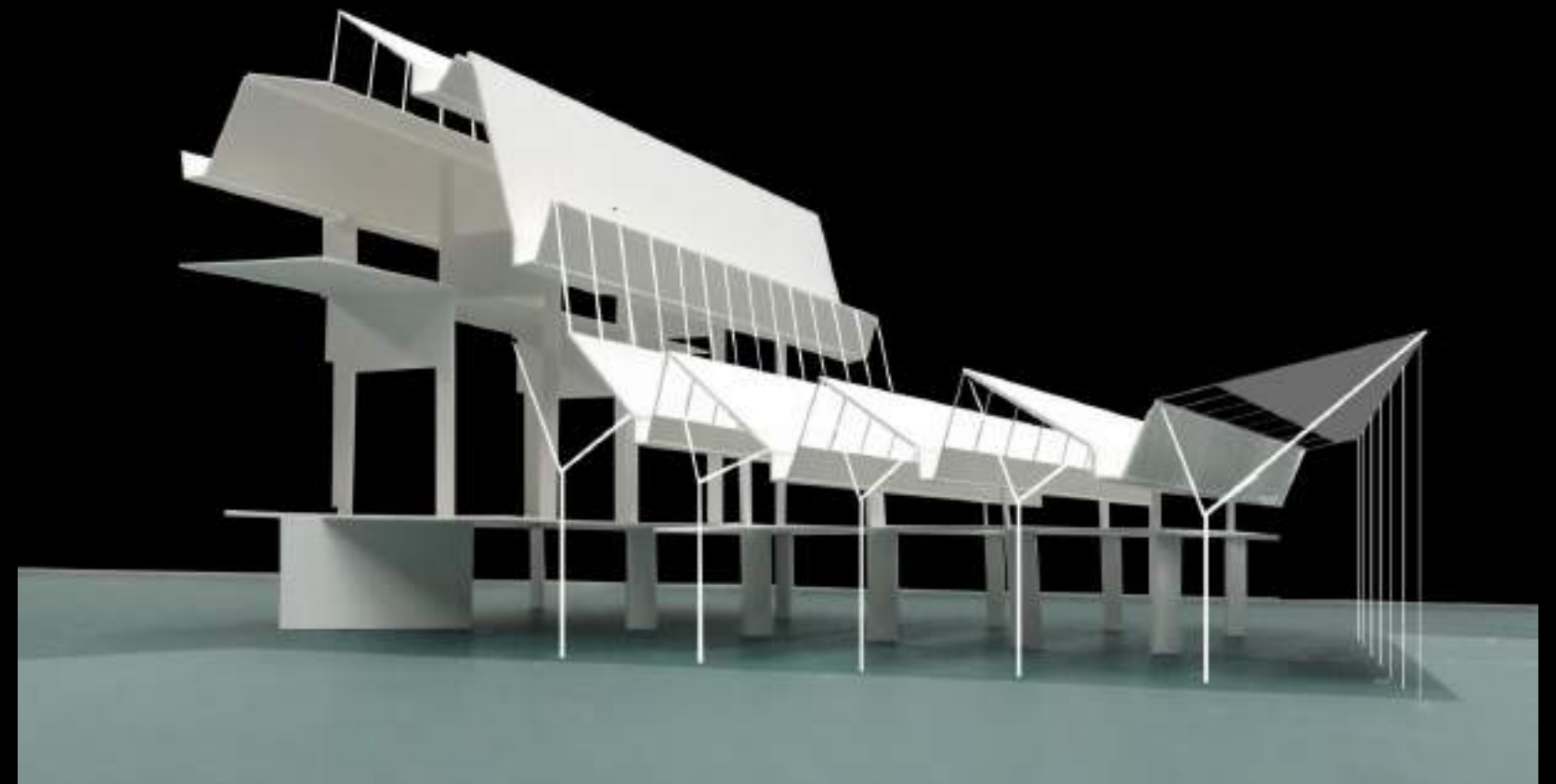
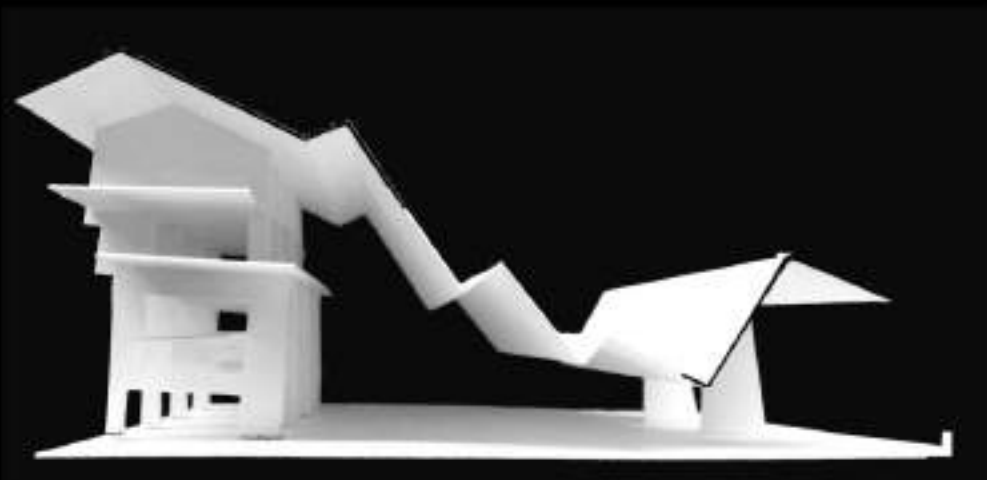
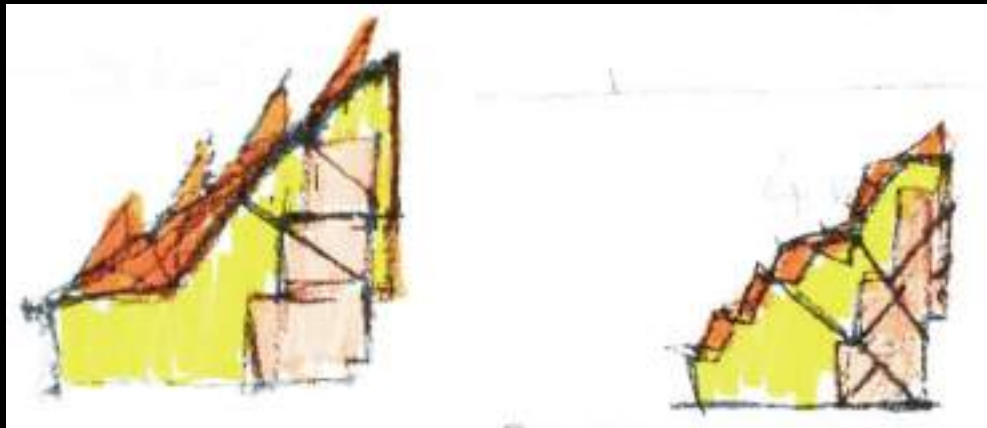
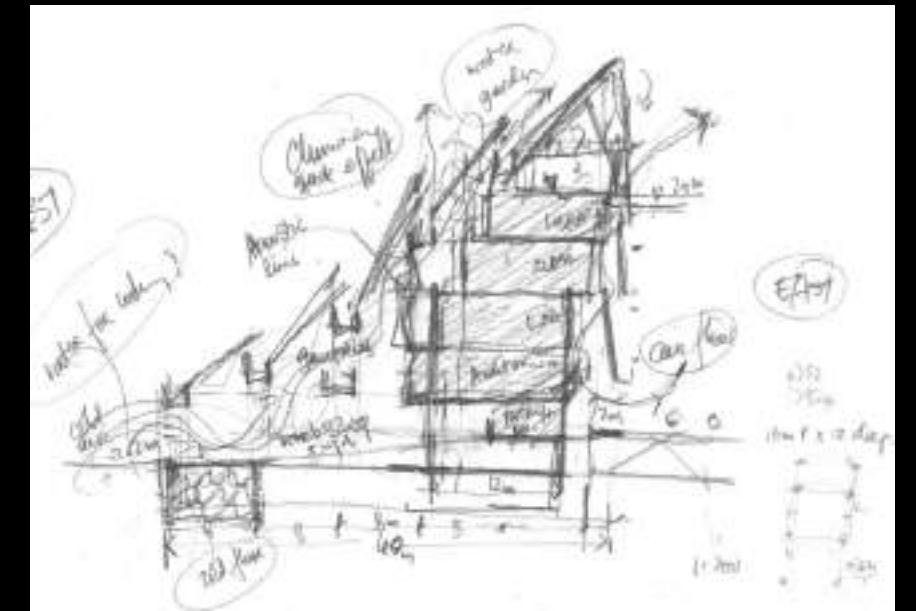
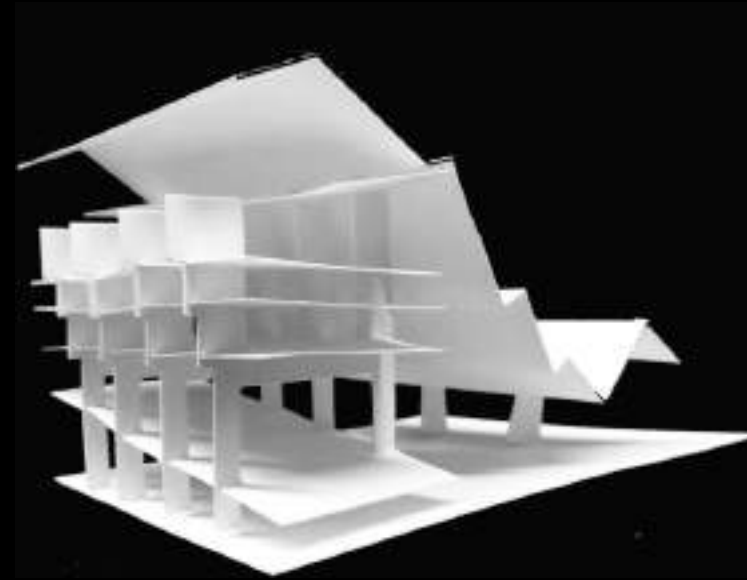
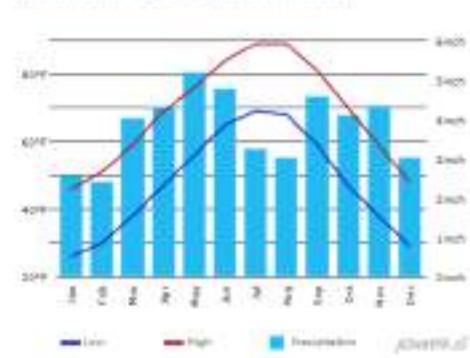
CLIMATE of FAYETTESVILLE

Climate Fayetteville - Arkansas

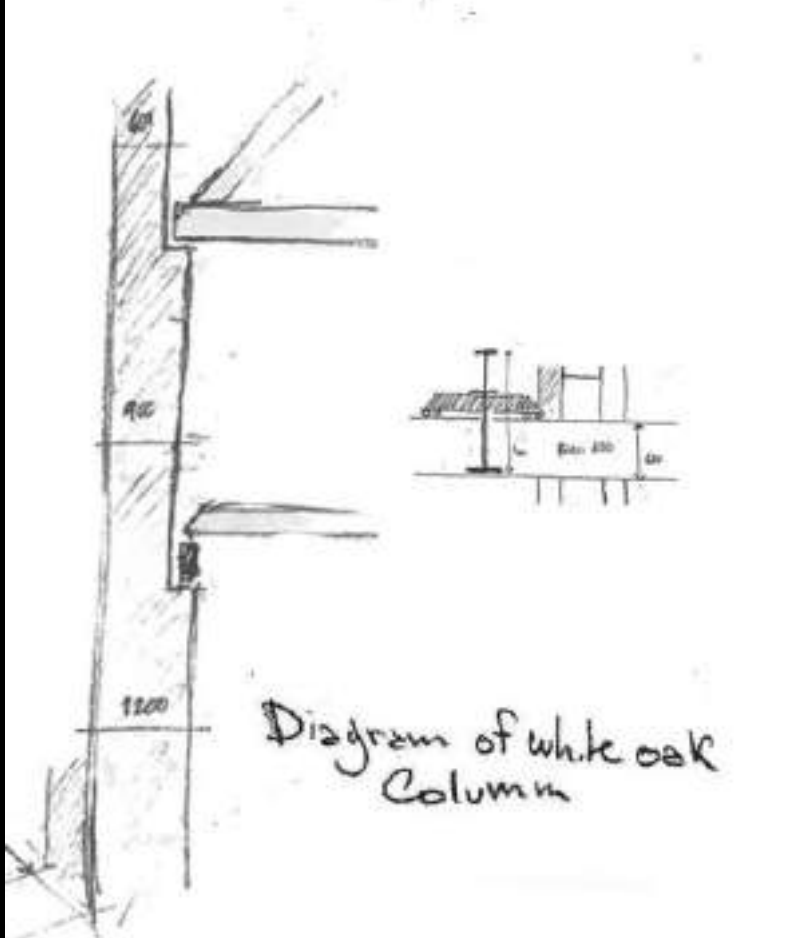
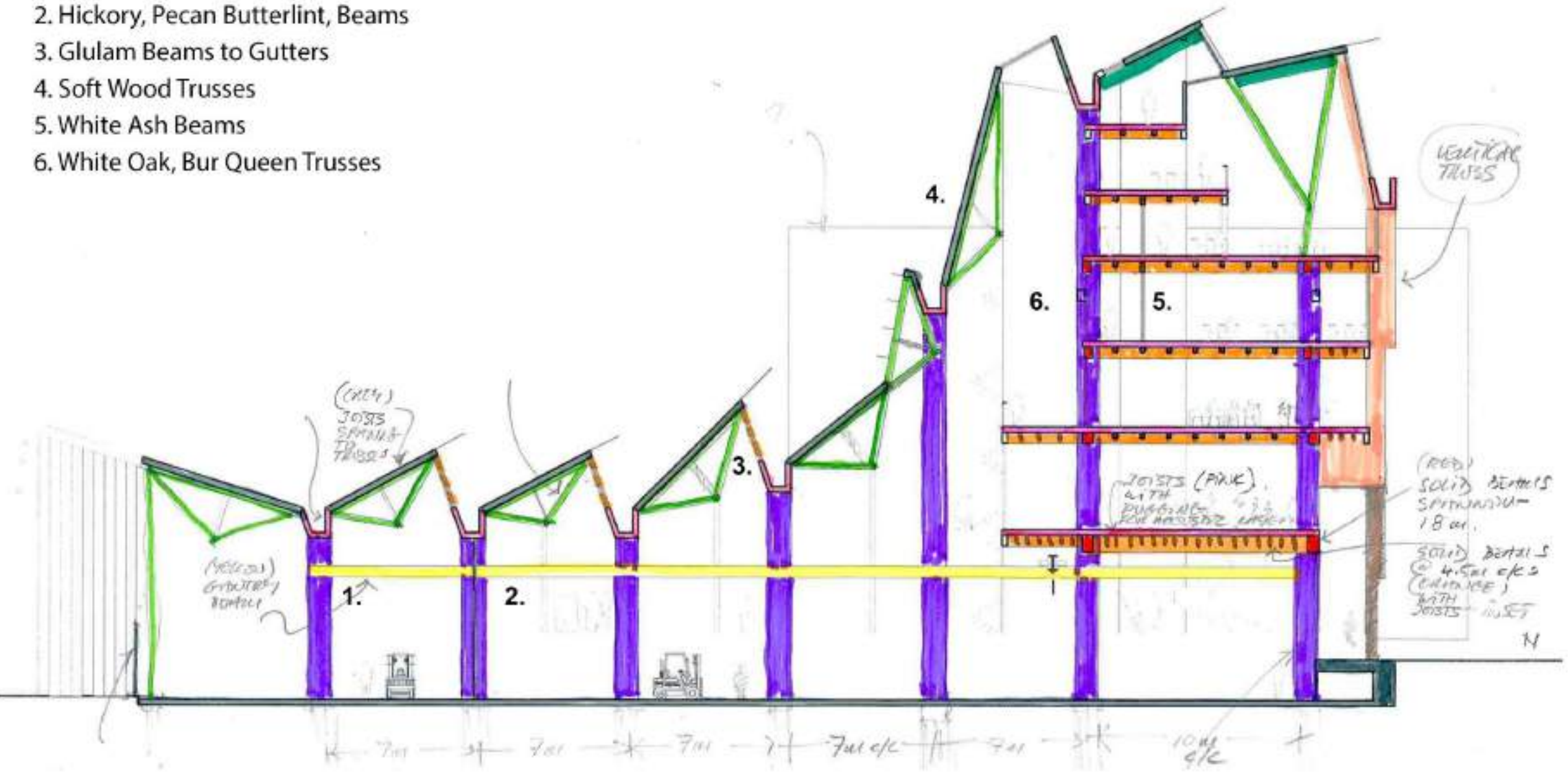
	Jan	Feb	Mar	Apr	May	Jun
Average high in °F	46	51	59	66	74	84
Average low in °F	26	30	35	41	48	57
Avg. precipitation in inch	3.26	2.4	4.62	4.29	6.2	6.76
Days with precipitation	-	-	-	-	-	-
Hours of sunshine	-	-	-	-	-	-
Average snowfall in inch	2	1	0	0	0	0

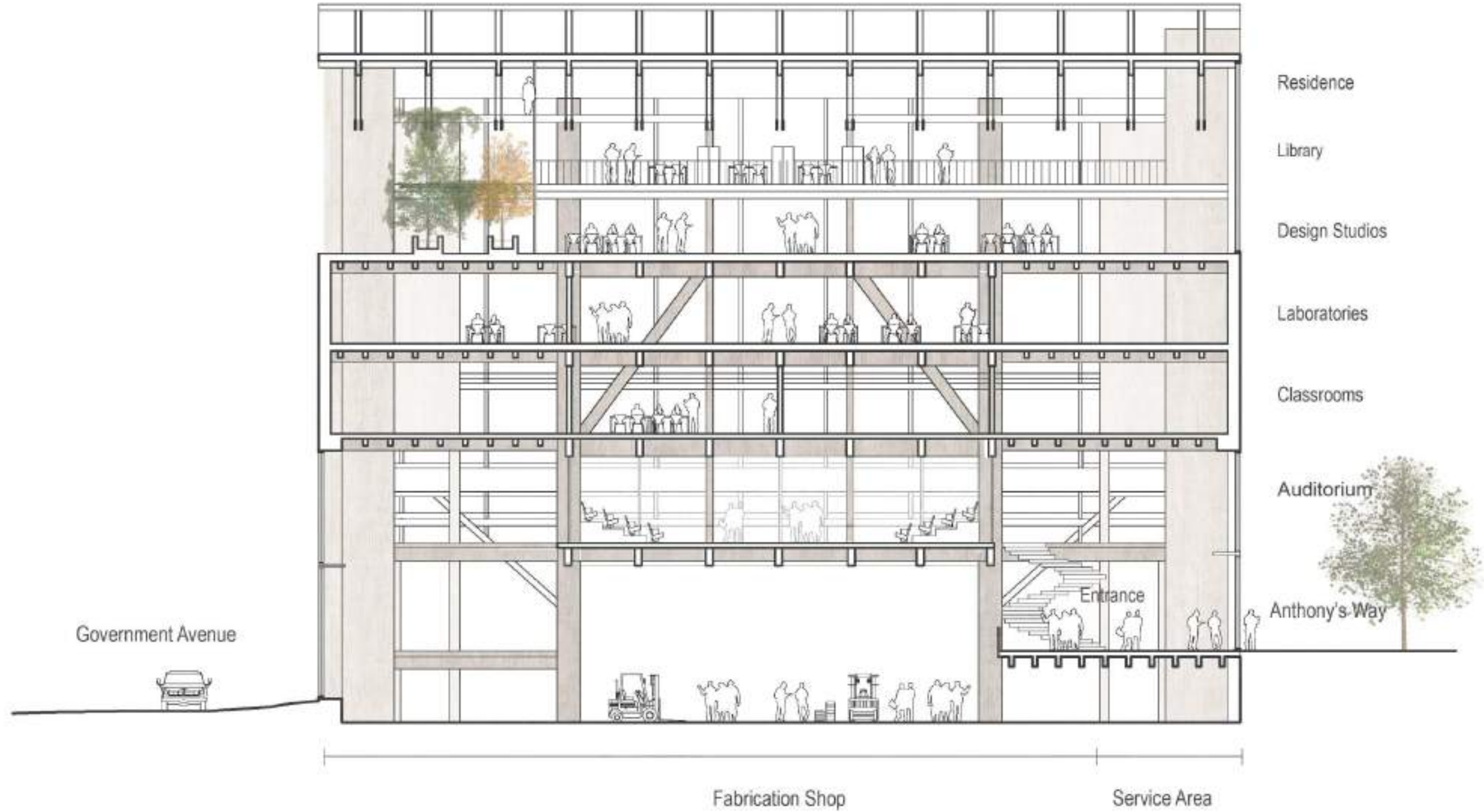
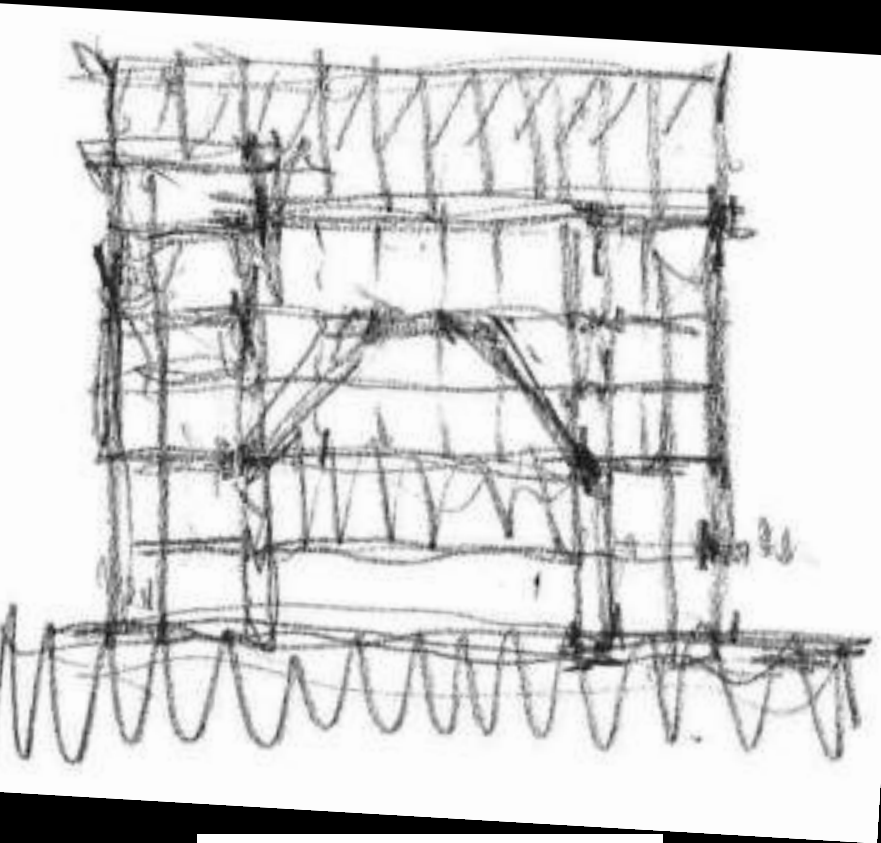
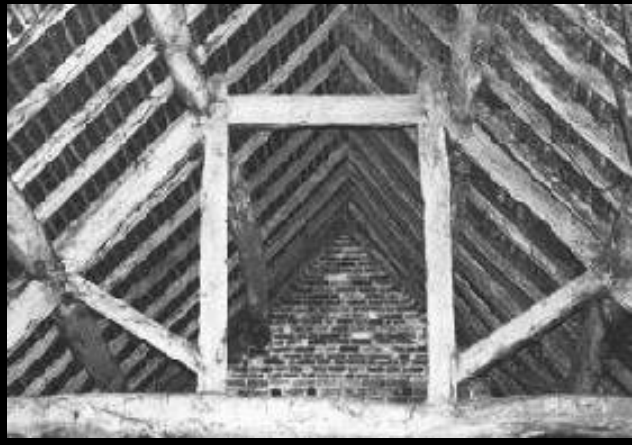
	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F	88	86	81	73	65	56
Average low in °F	59	58	53	47	38	29
Avg. precipitation in inch	3.22	3.01	4.67	4.08	4.21	3.21
Days with precipitation	-	-	-	-	-	-
Hours of sunshine	-	-	-	-	-	-
Average snowfall in inch	0	0	0	0	0	0

Fayetteville Climate Graph - Arkansas Climate Chart



1. White Oak Columns
2. Hickory, Pecan Butterlint, Beams
3. Glulam Beams to Gutters
4. Soft Wood Trusses
5. White Ash Beams
6. White Oak, Bur Queen Trusses





Residence

Library

Design Studios

Laboratories

Classrooms

Auditorium

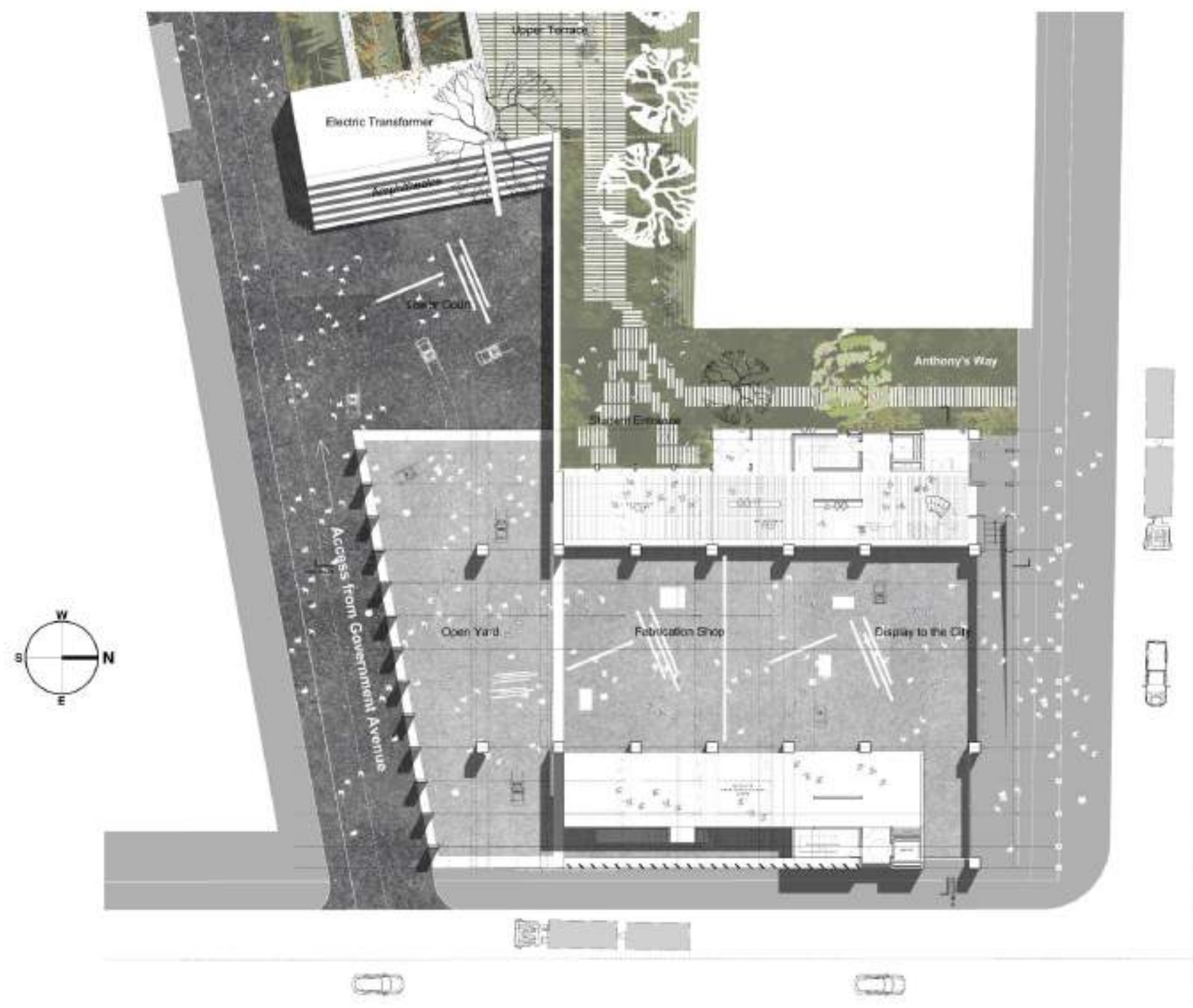
Government Avenue

Entrance

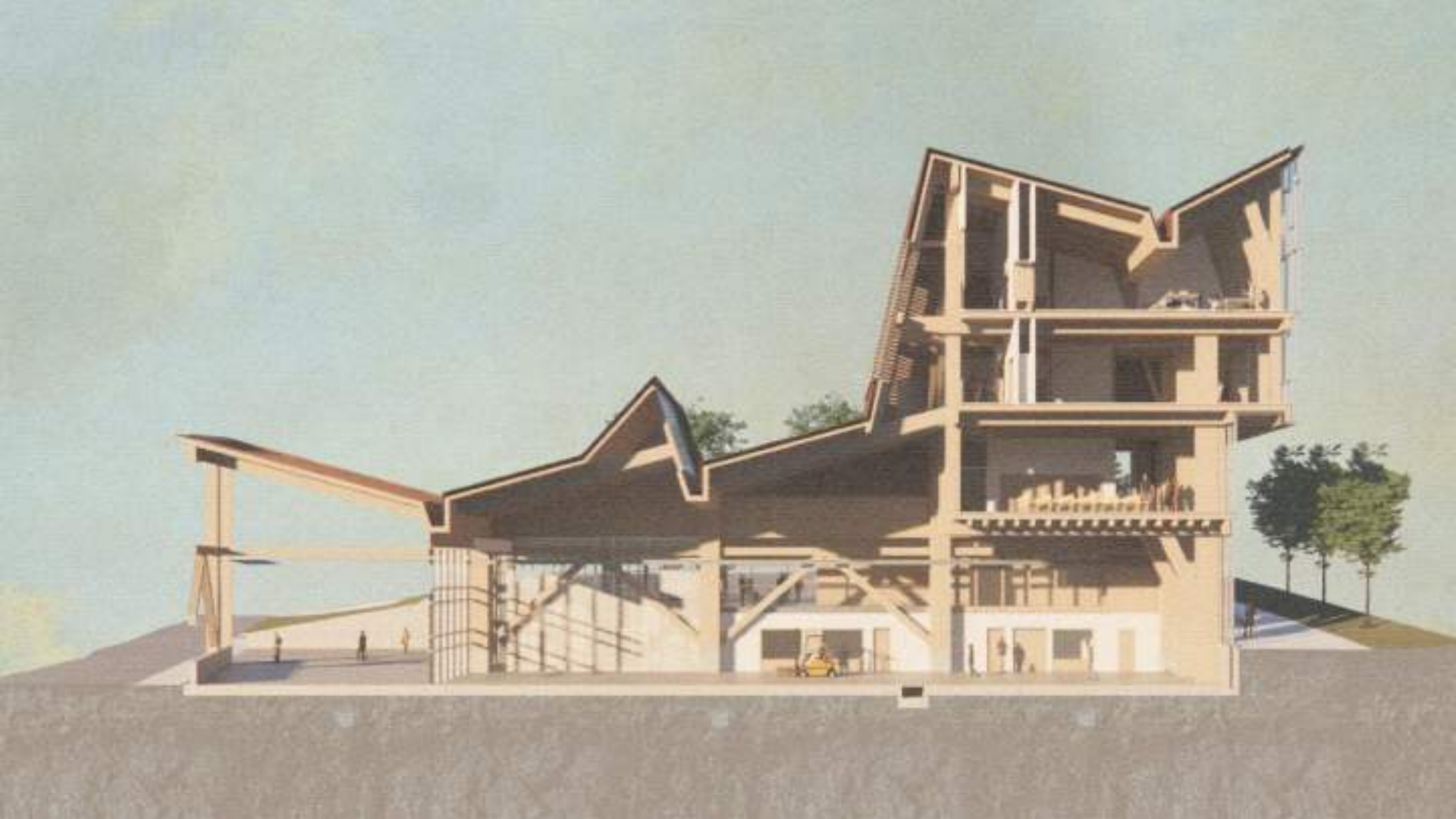
Anthony's Way

Fabrication Shop

Service Area











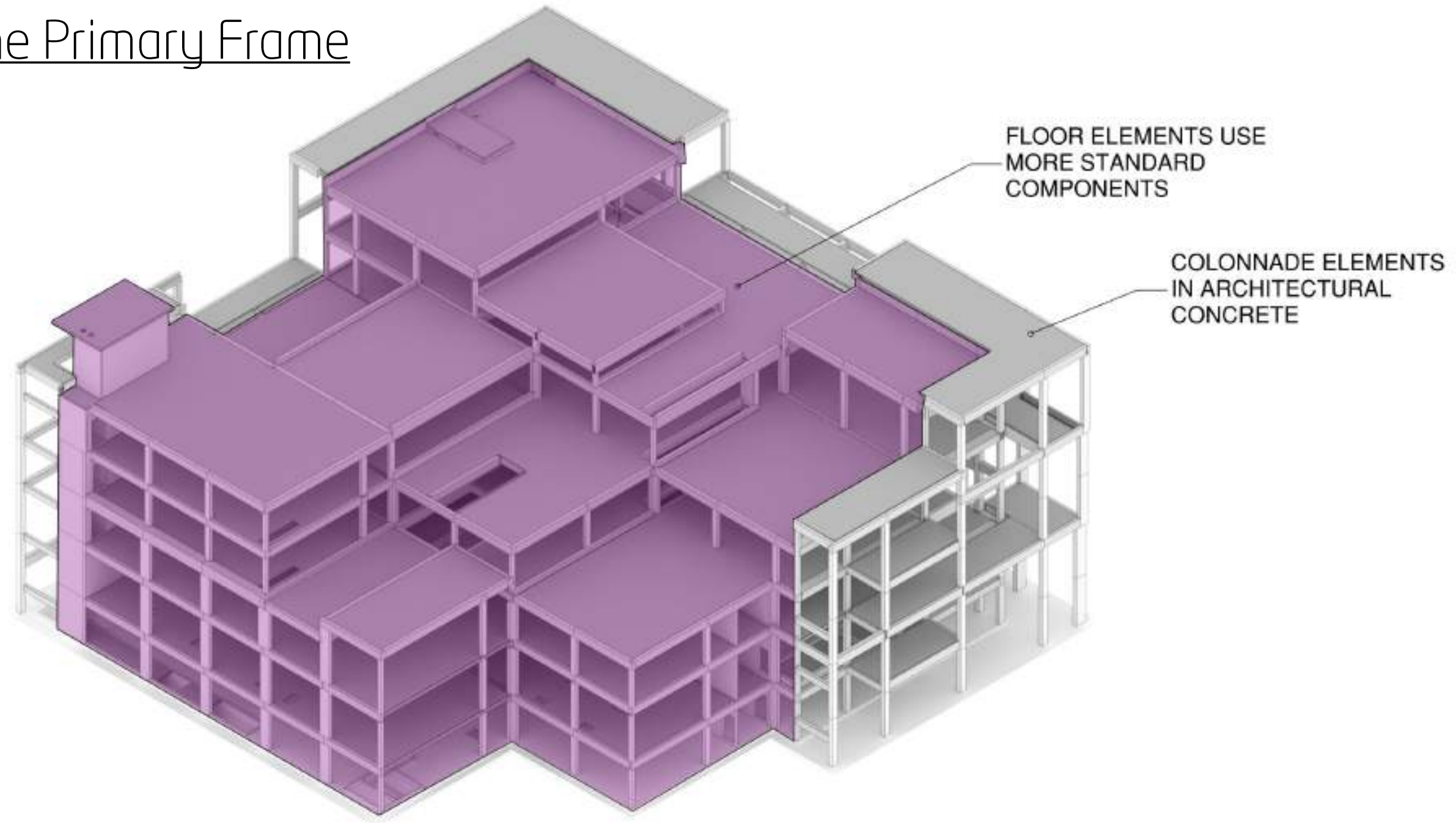




Kingston Townhouse

01 October 2022

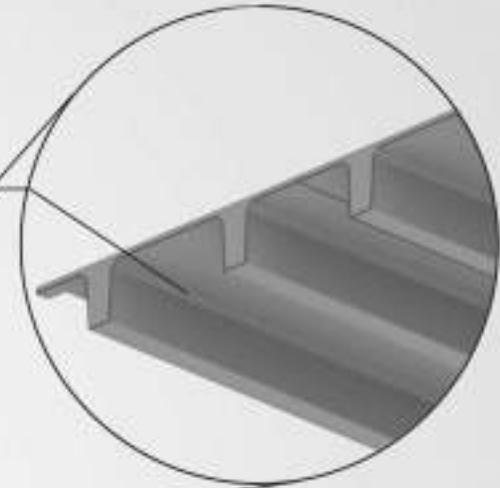
The Primary Frame



Typical bay

Precast secondary beam

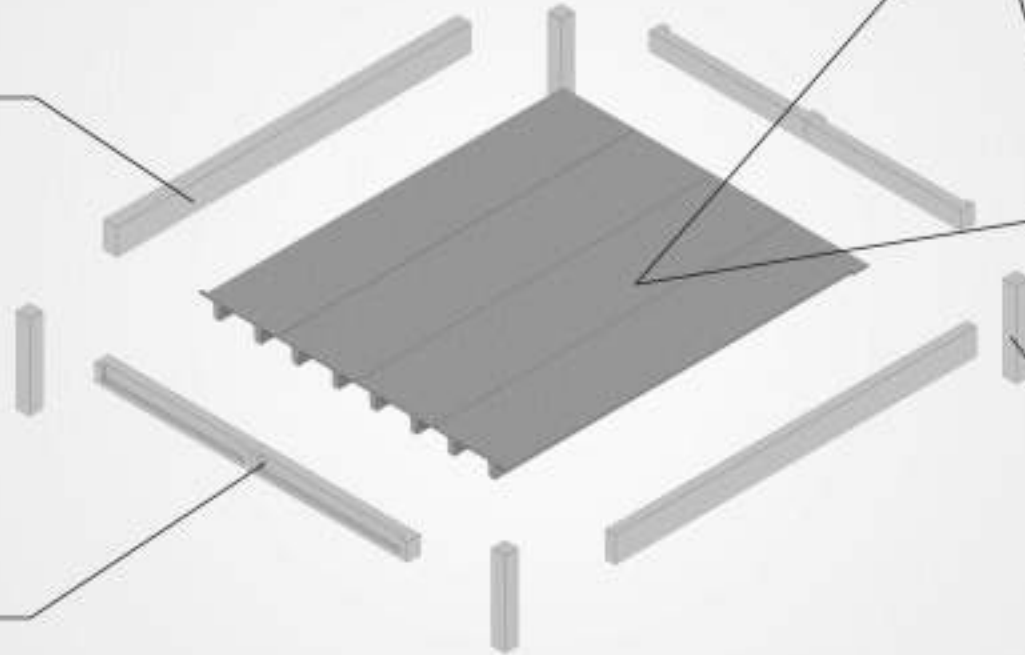
Exposed soffits



Precast prestressed double-T floor units

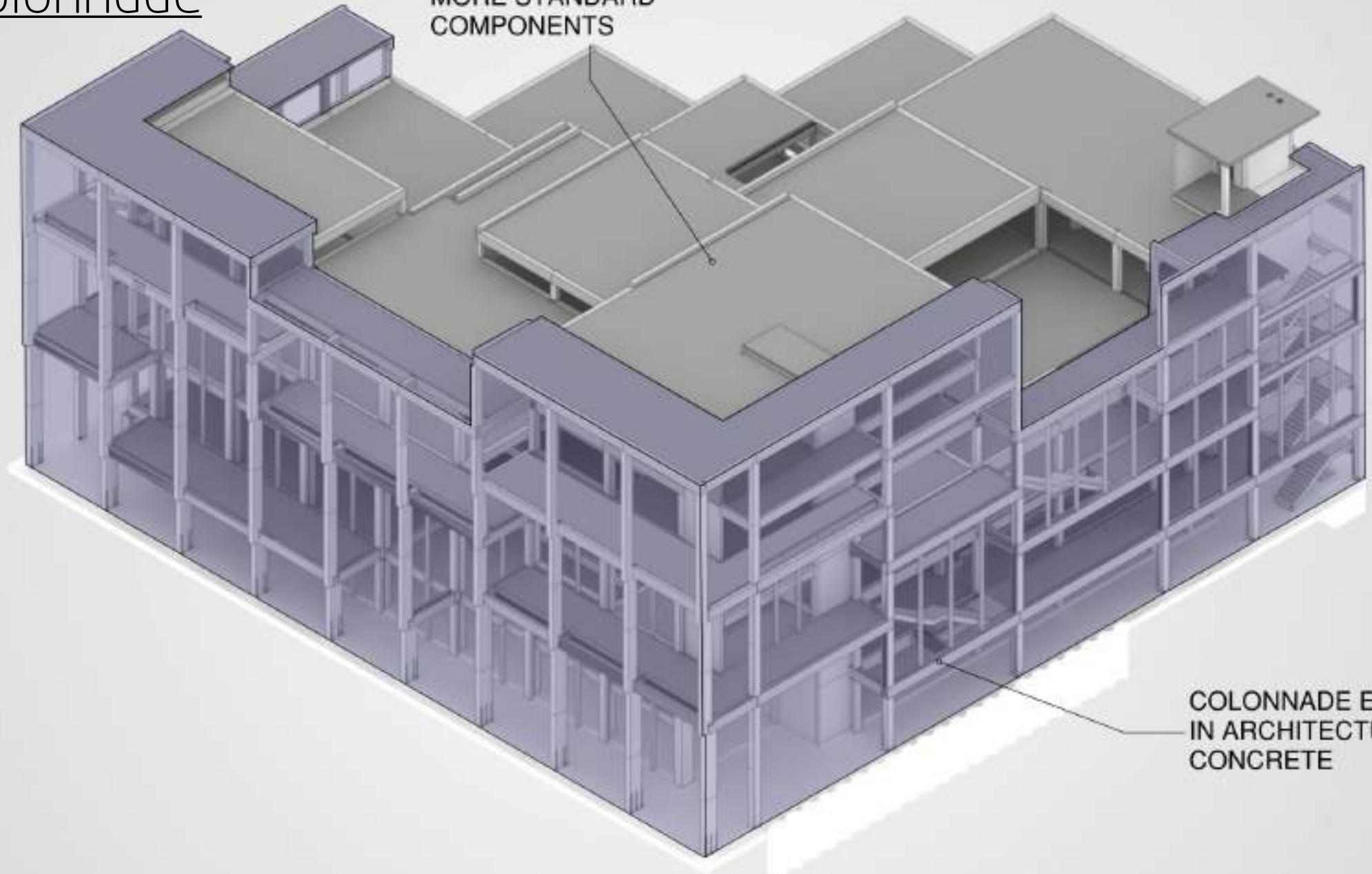
Precast primary beam

Precast columns



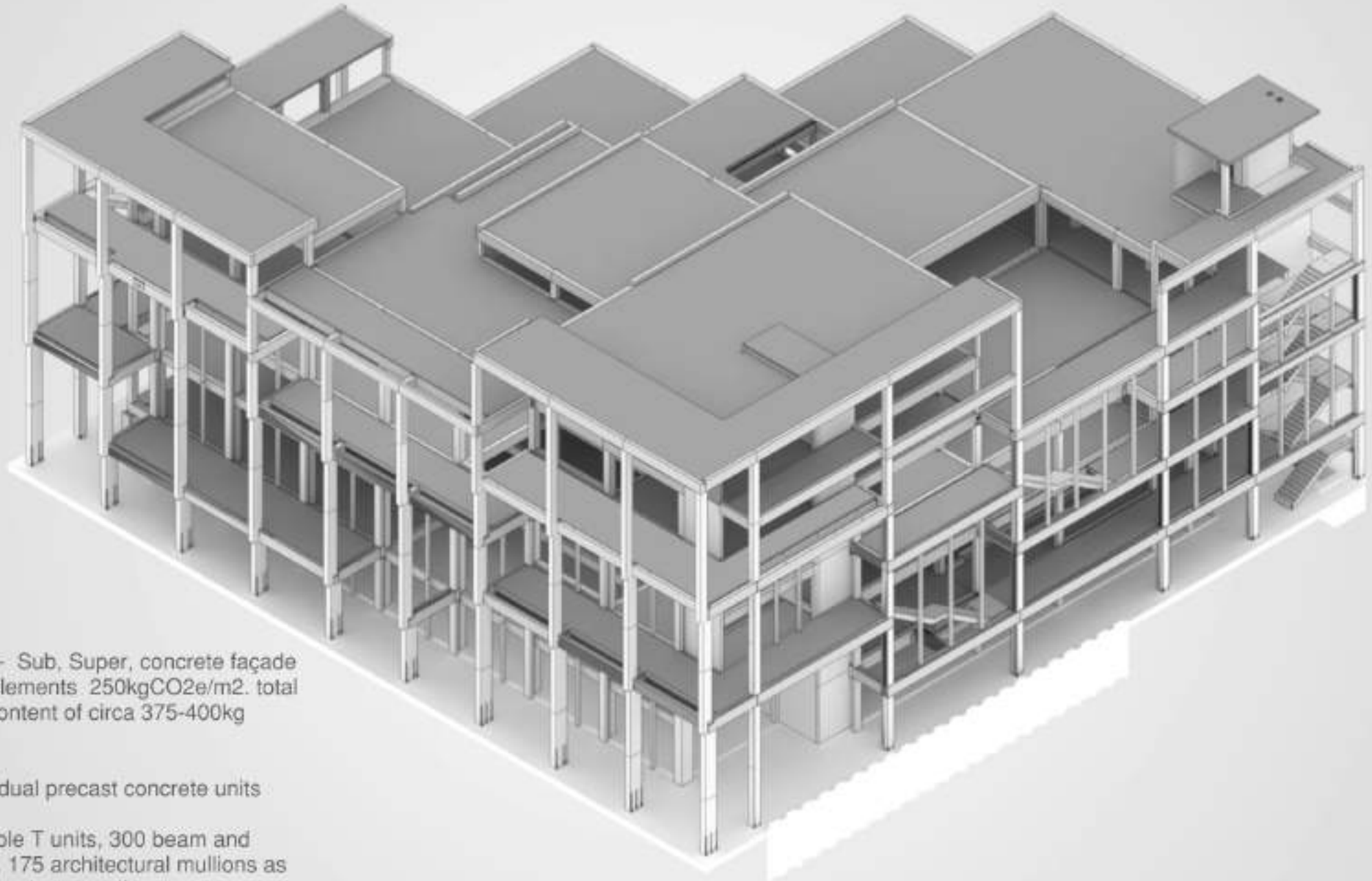
The Colonnade

FLOOR ELEMENTS USE
MORE STANDARD
COMPONENTS



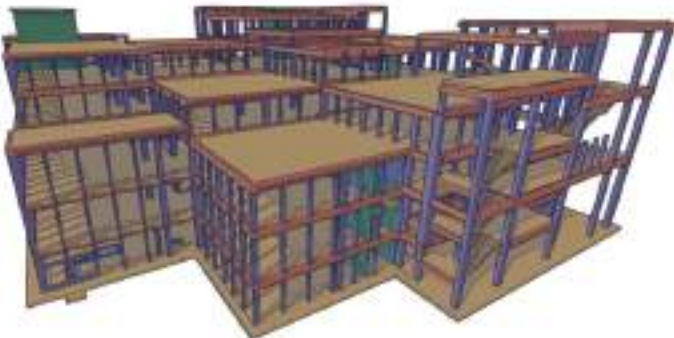
COLONNADE ELEMENTS
IN ARCHITECTURAL
CONCRETE

Offsite and Carbon Stats

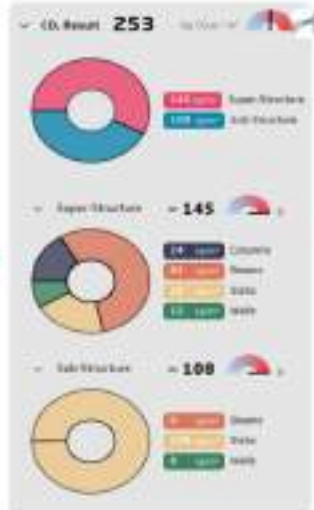


- Carbon efficient - Sub, Super, concrete façade and colonnade elements 250kgCO₂e/m². total upfront carbon content of circa 375-400kg CO₂e/m²,
- over 1,900 individual precast concrete units
- 229 precast double T units, 300 beam and column sections, 175 architectural mullions as well as solid precast core walls

CARBON ANALYSIS OF KINGSTON TOWNHOUSE



Stage 3



Stage 4 - refining procurement



Future Low-Carbon concretes

CarbonACT | 1.0.0 beta

Visualization

Color: [dropdown]

Structure By: [dropdown]

View: [dropdown]

Global Settings

View Toggle

Geometry Toggle

CO2 Result: 253

CO2 Target: 500

Super Structure = 145

Concrete = 108

Sub-Structure = 108

Final AECO: 18210 10700

CO2 Result: 211

CO2 Result: 218

The Marshall Institute

01 October 2022

Competition Entry



5. Complete simple 7.2x7.2m column grid + flat slab



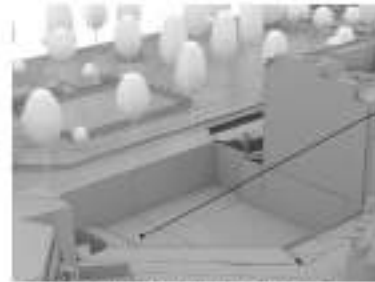
4. Construct second order trees



3. Construct first floor

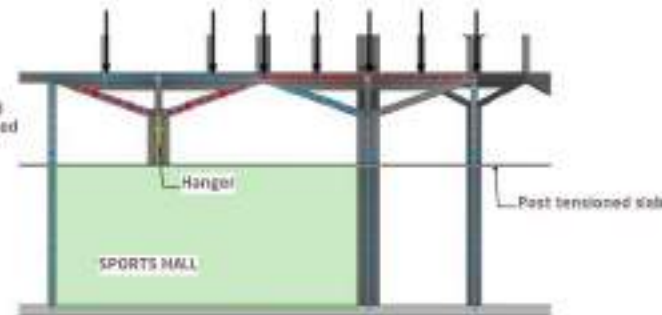
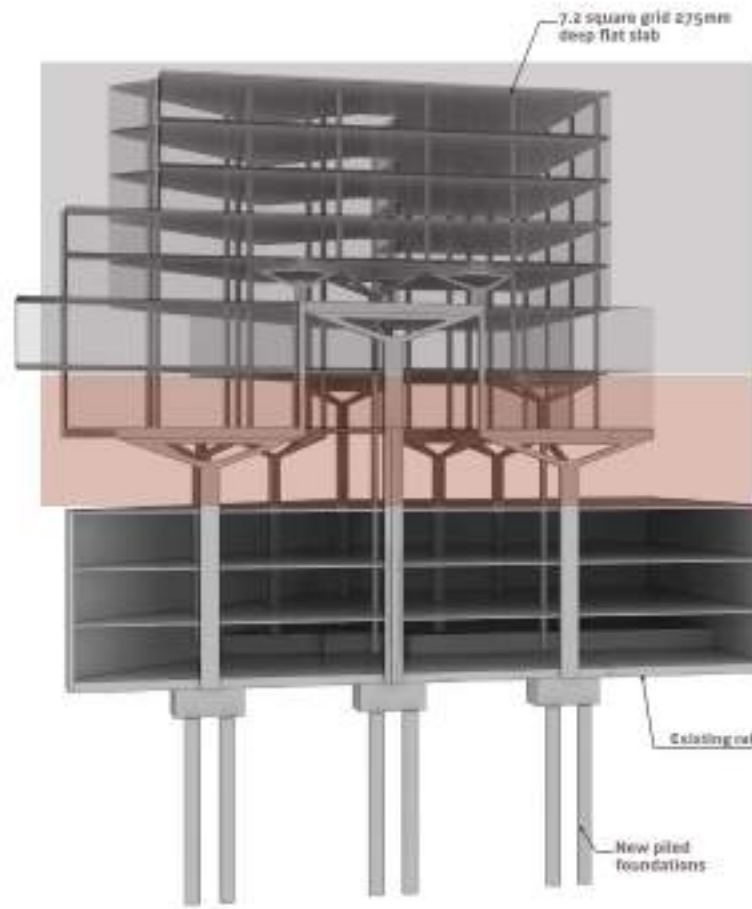


2. Construct first order trees



1. Clear out existing basement. Prop walls

CONSTRUCTION SEQUENCE



SPORTS HALL TRANSFER SYSTEM



Column above rotated 45 degrees



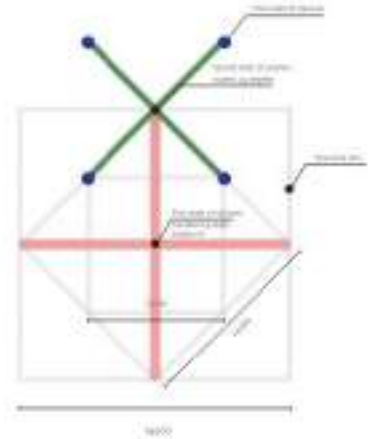
Concrete cast in place



Wood former omitted for clarity

Formwork (additional structure removed for clarity)

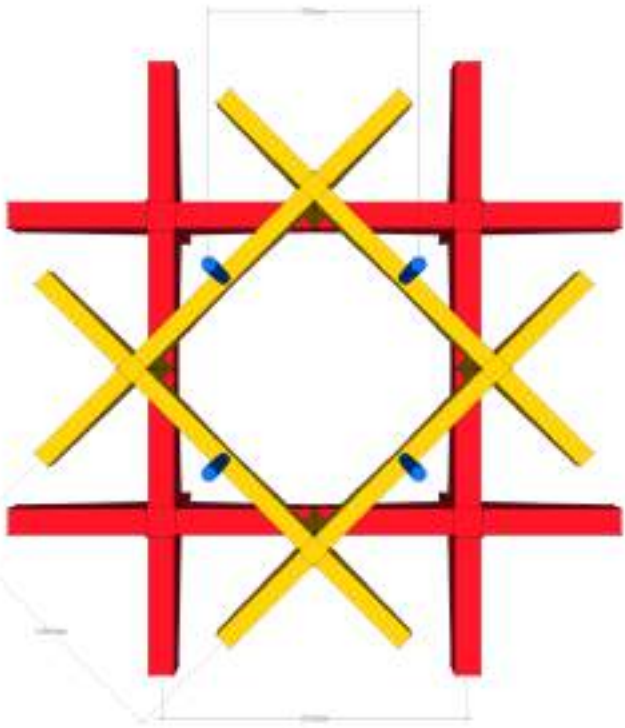
SIMPLE WALL FORMWORK TO FORM TREE+ COLUMN



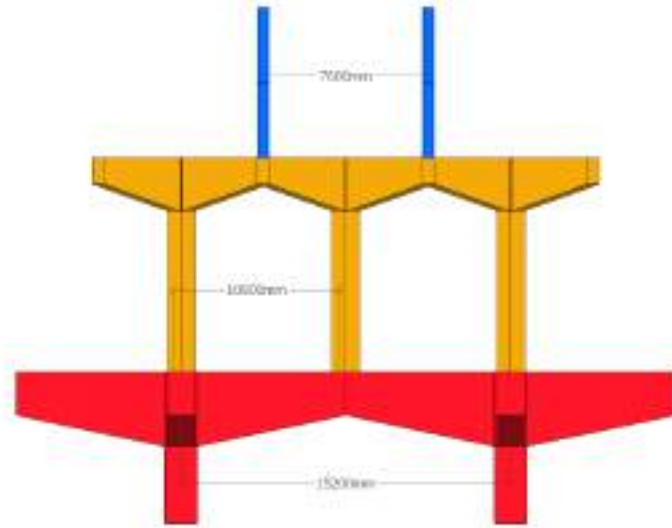
COLUMN GRID TRANSPOSITION

Design Development

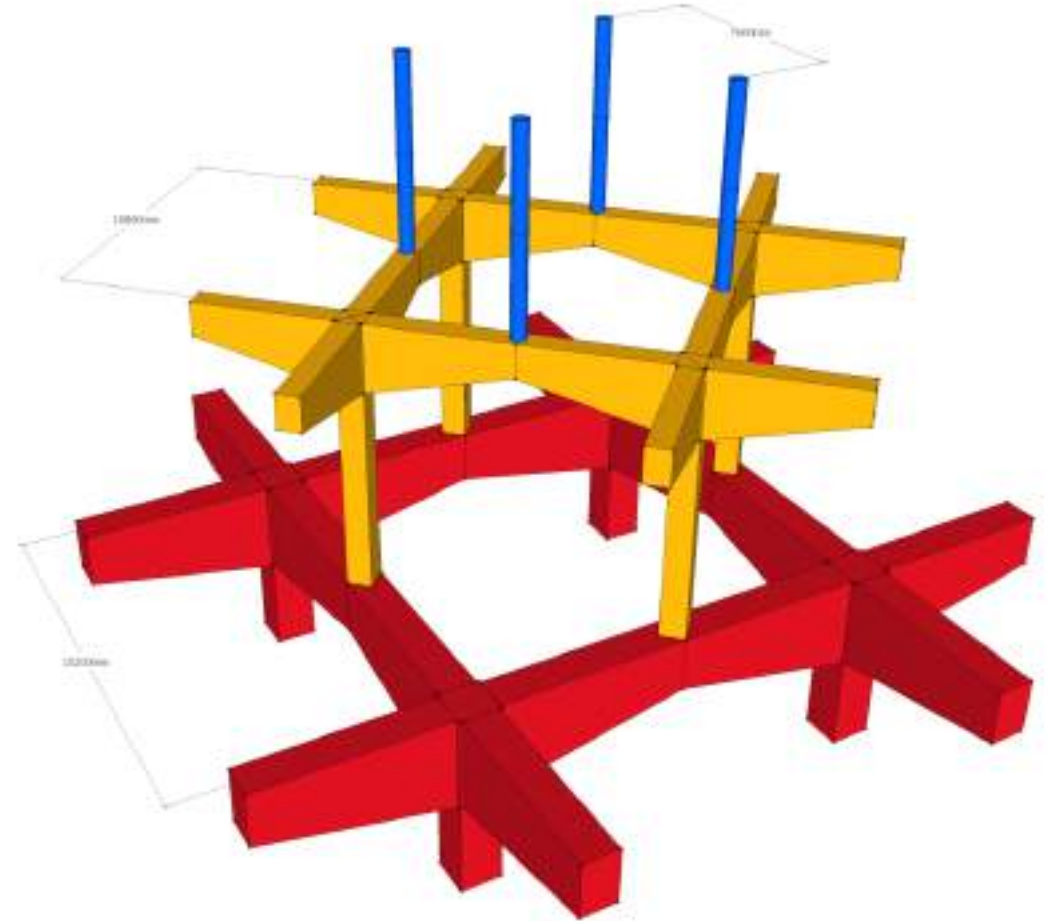
GRID / TREE STRUCTURES



TOP VIEW



ELEVATION



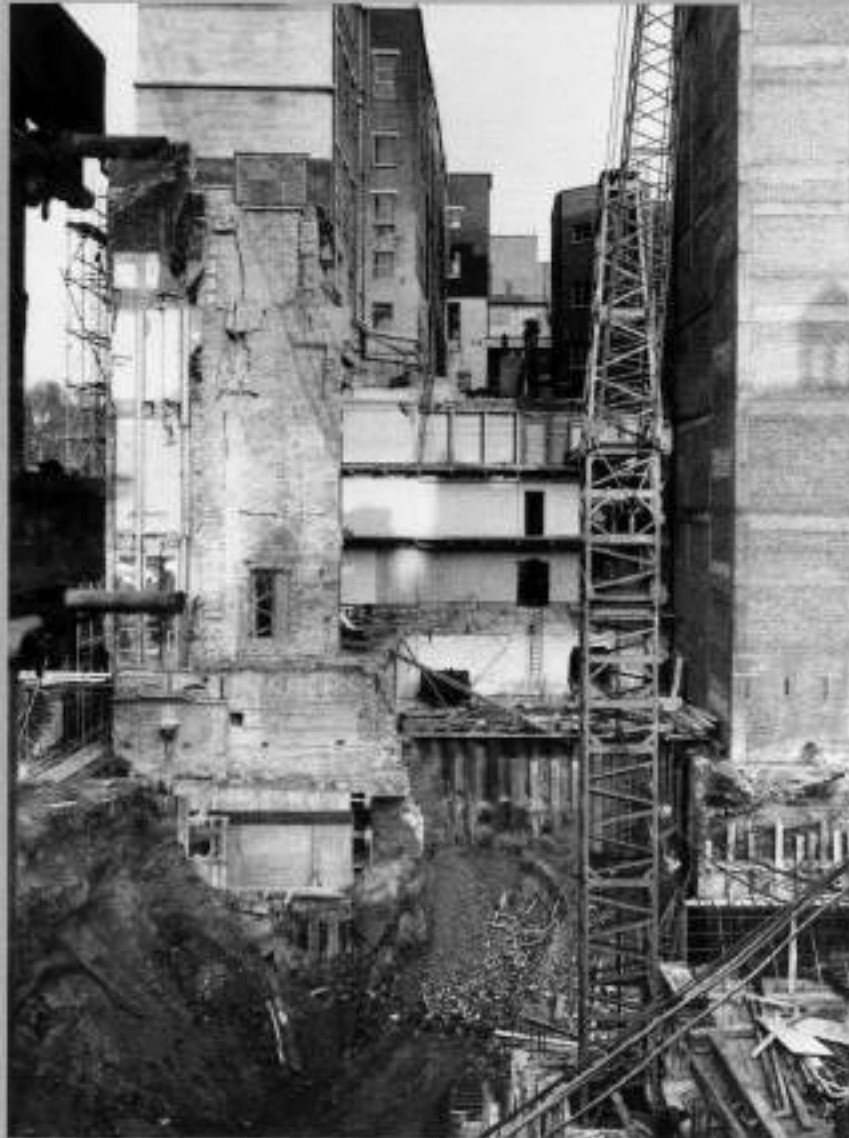
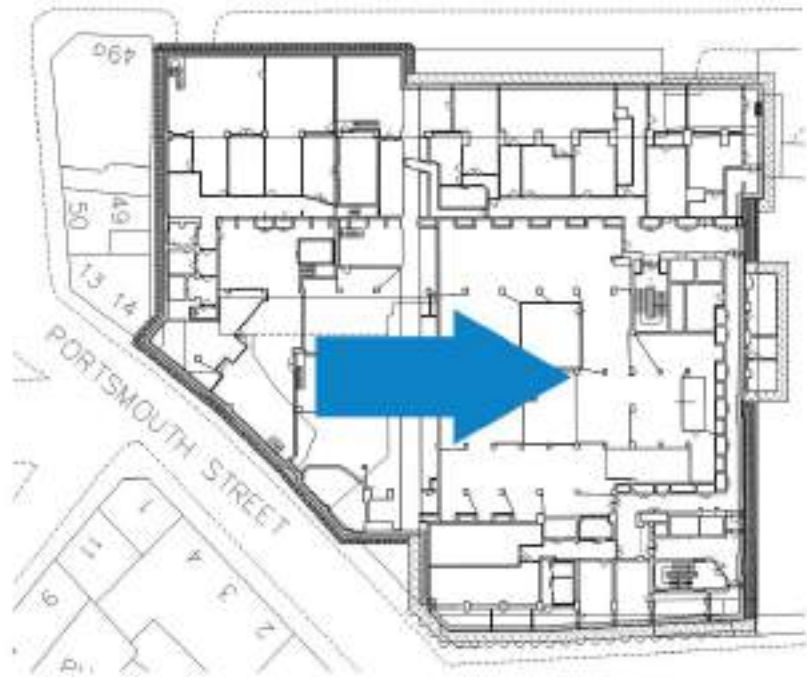
Competition Entry



Competition Entry

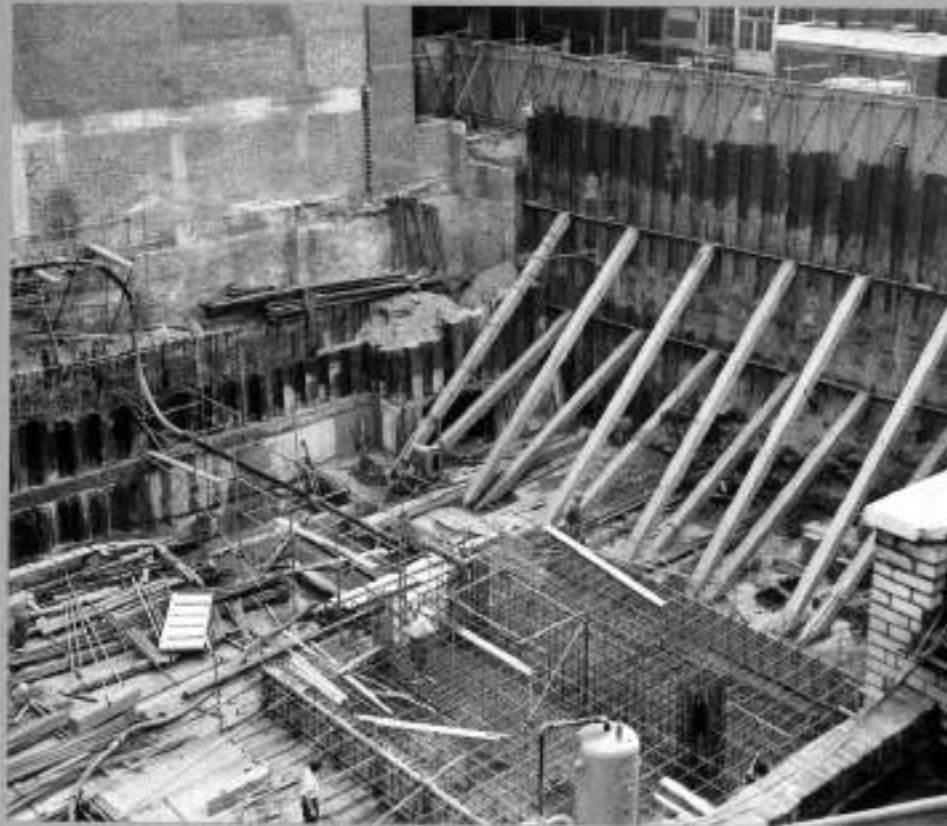


Keeping the Basement



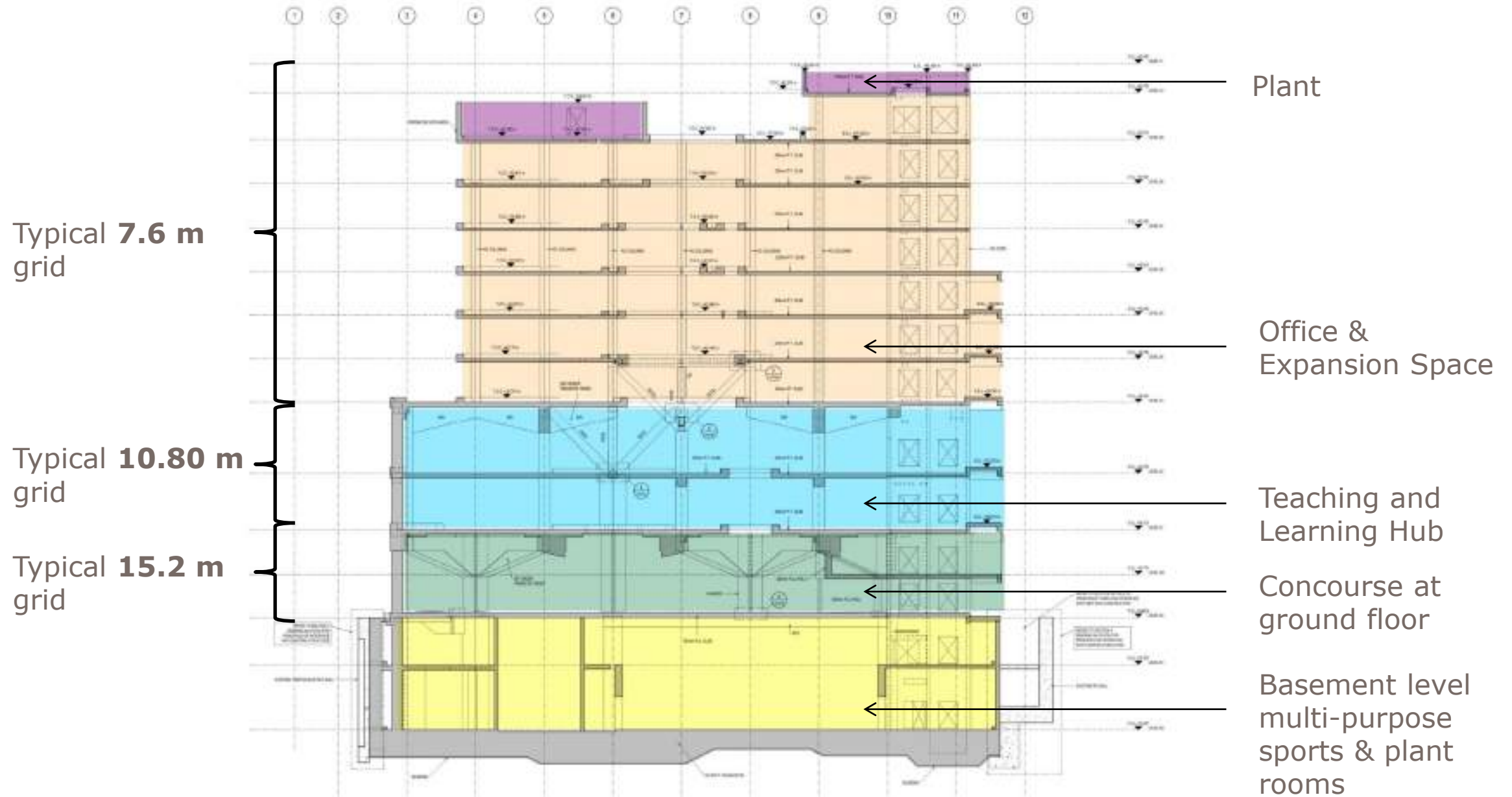
December 9th, 1959 ~ Looking eastward across the site.

Keeping the Basement

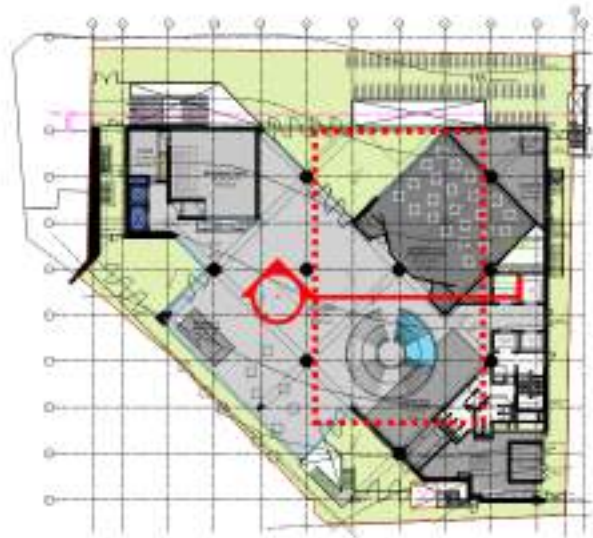


September 25th, 1959.

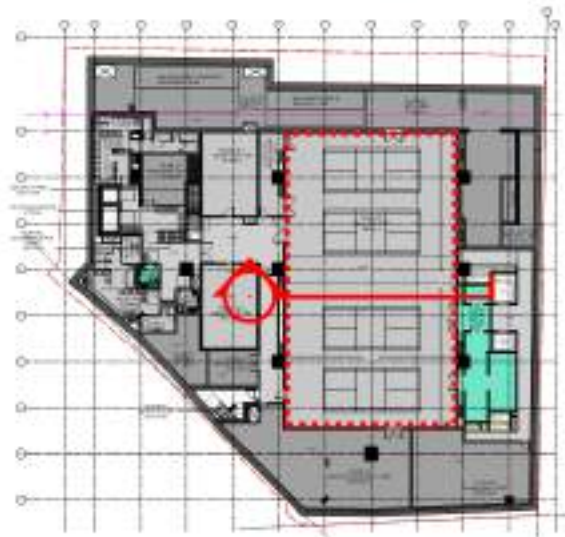
Layer Cake



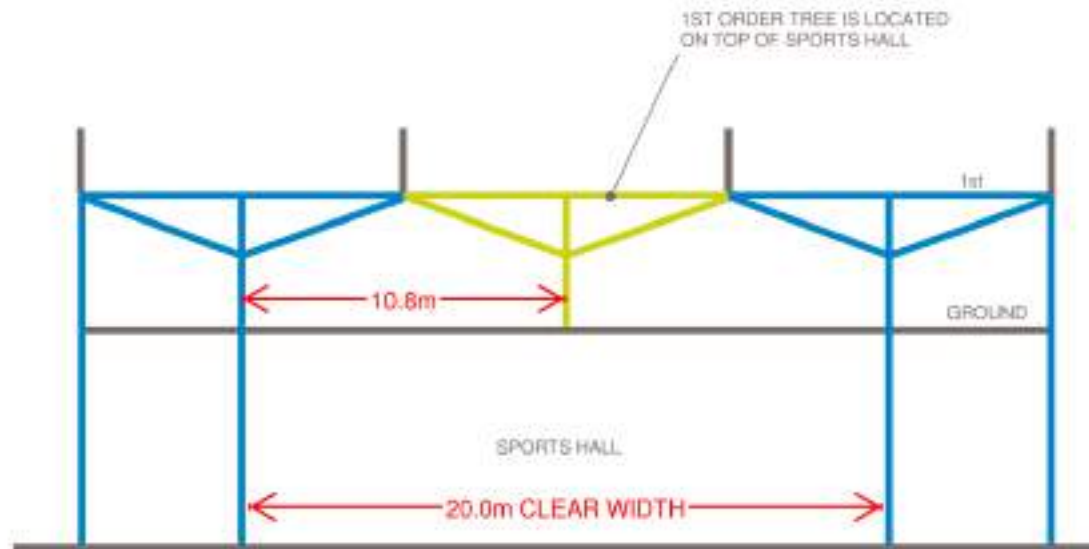
Design Development



GROUND FLOOR GA PLAN

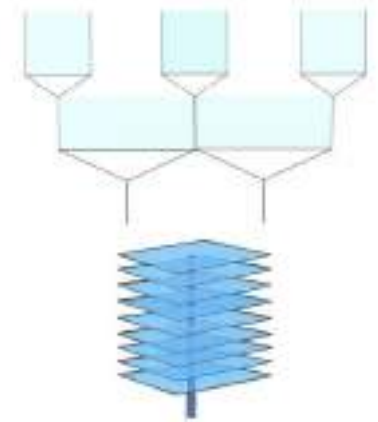


BASEMENT GA PLAN

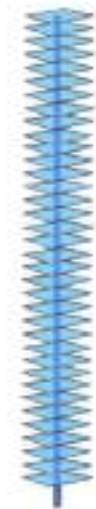


SECTION THROUGH SPORTS HALL

LSE grid vs. Typical office grid

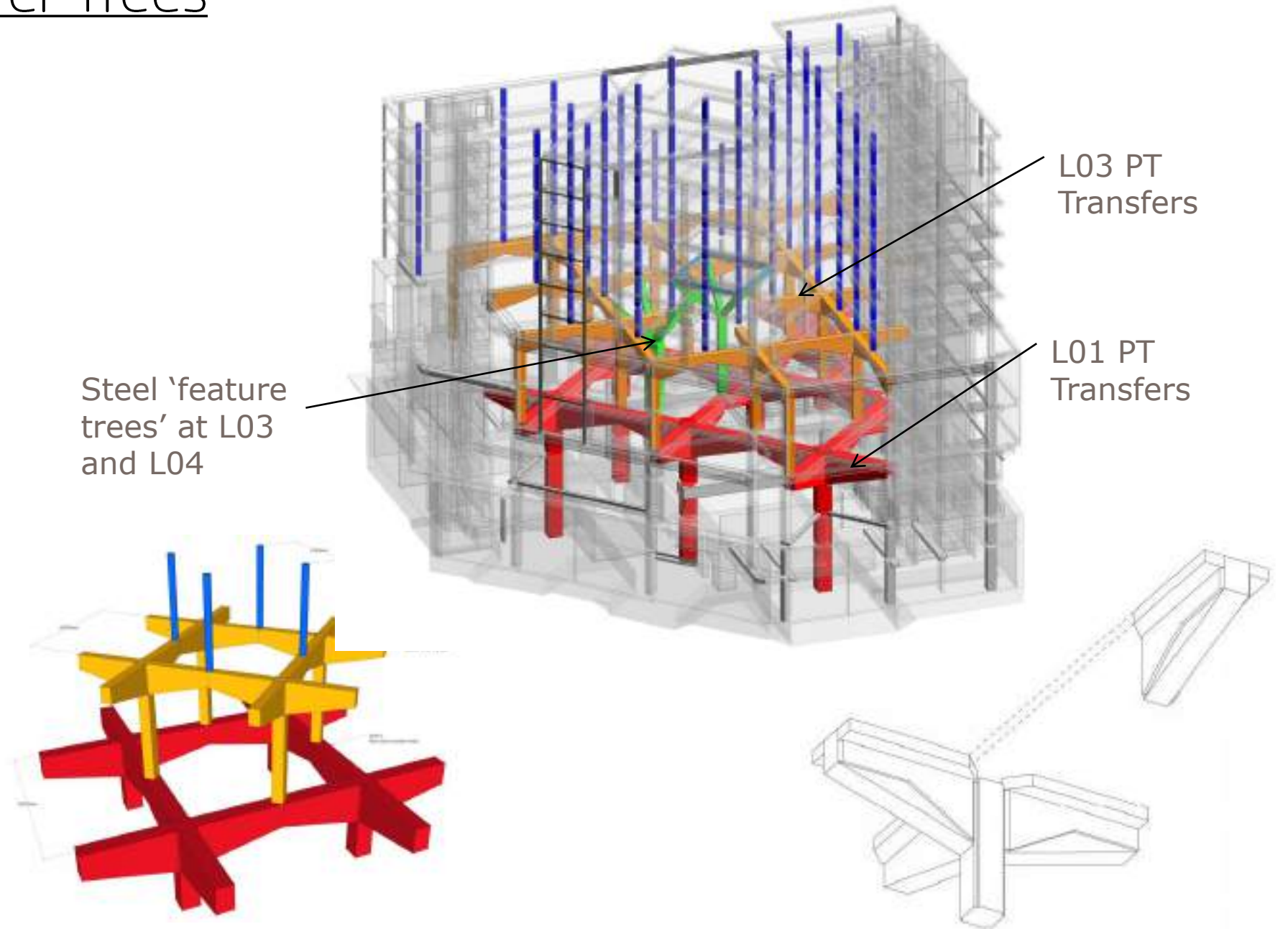


Single column supporting 9 storeys on 15m x 15m grid (+ additional hanger load)

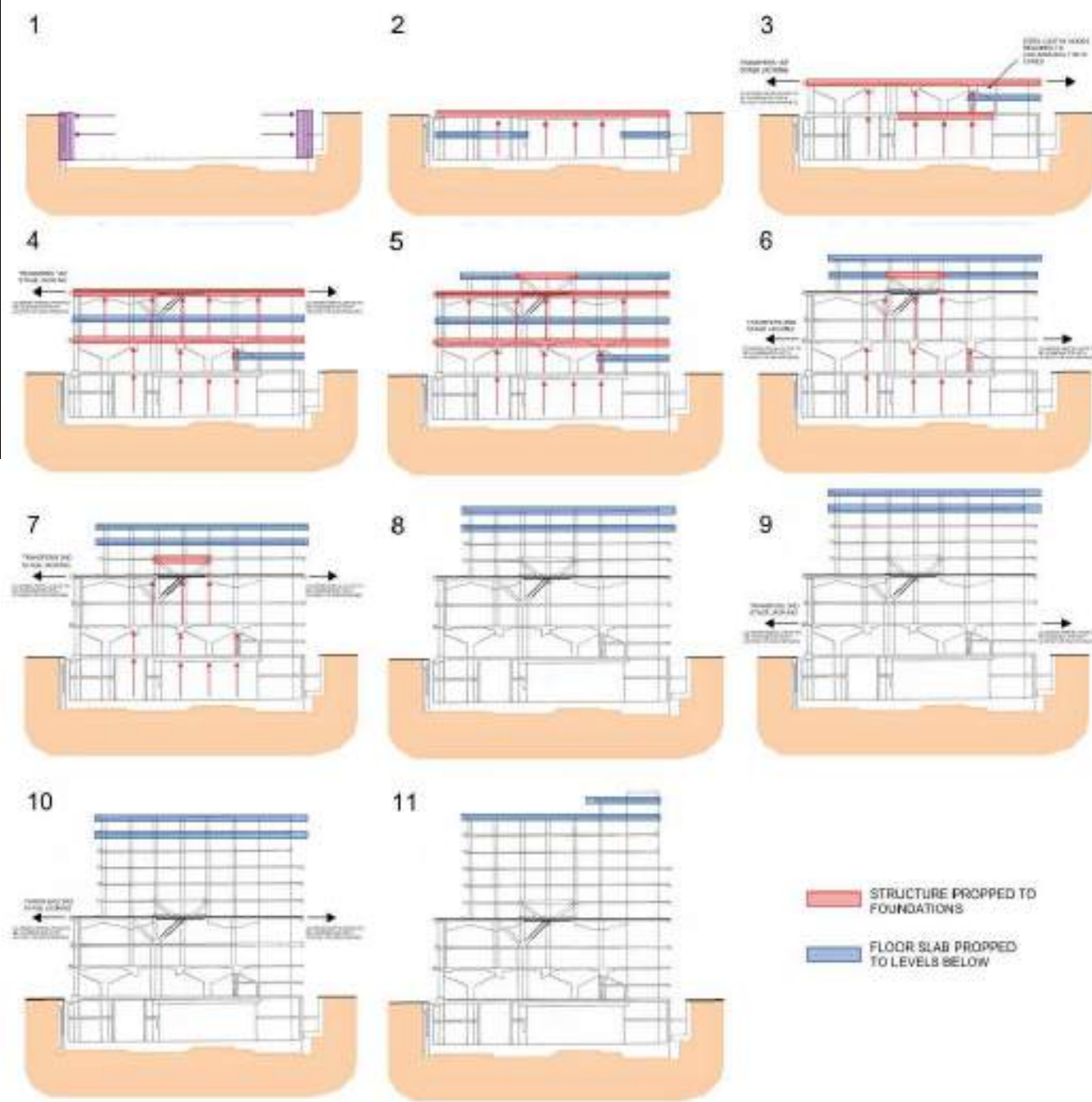
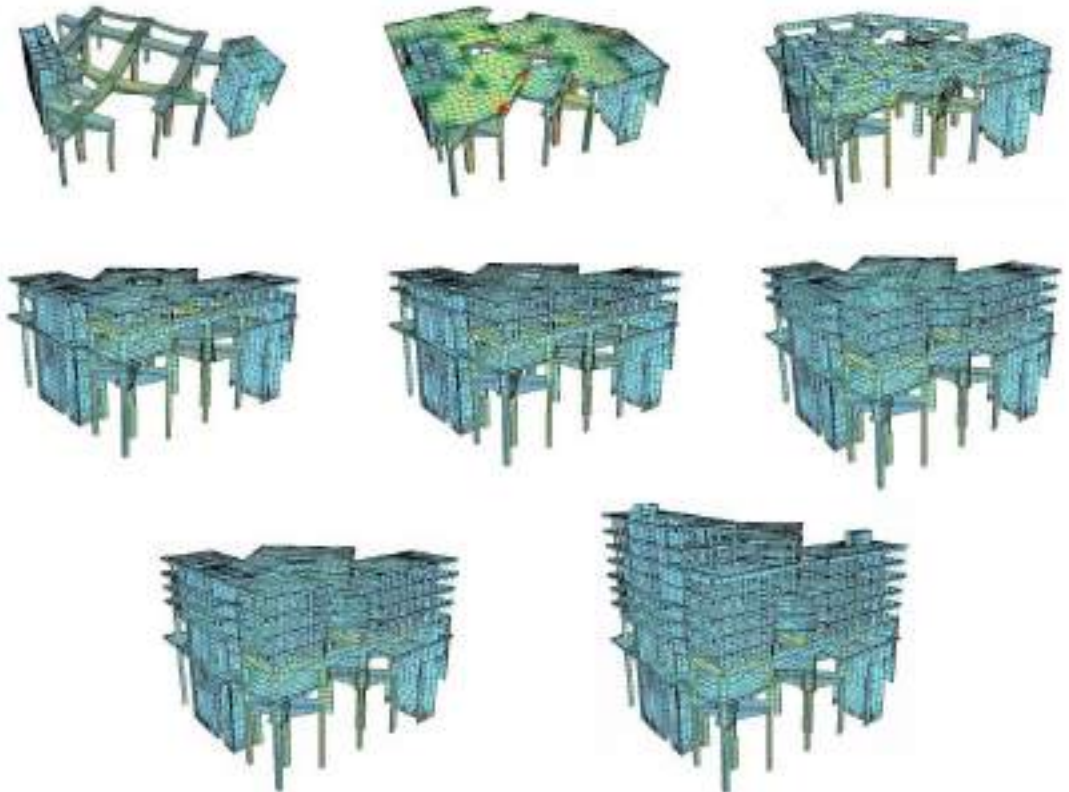


Single column supporting 36 storeys on 7.5m x 7.5m grid TOWER

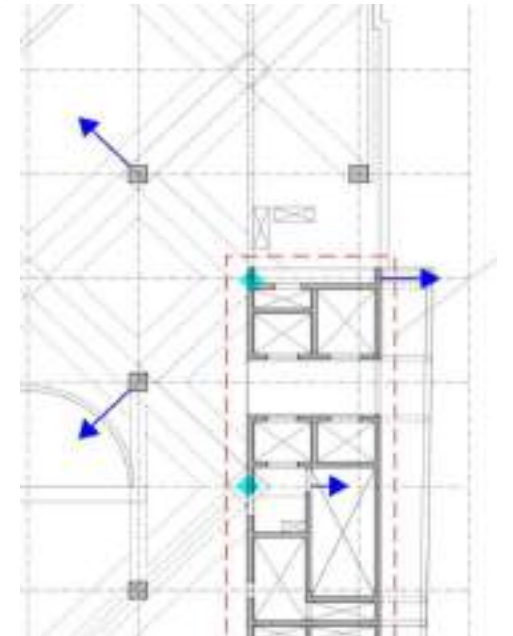
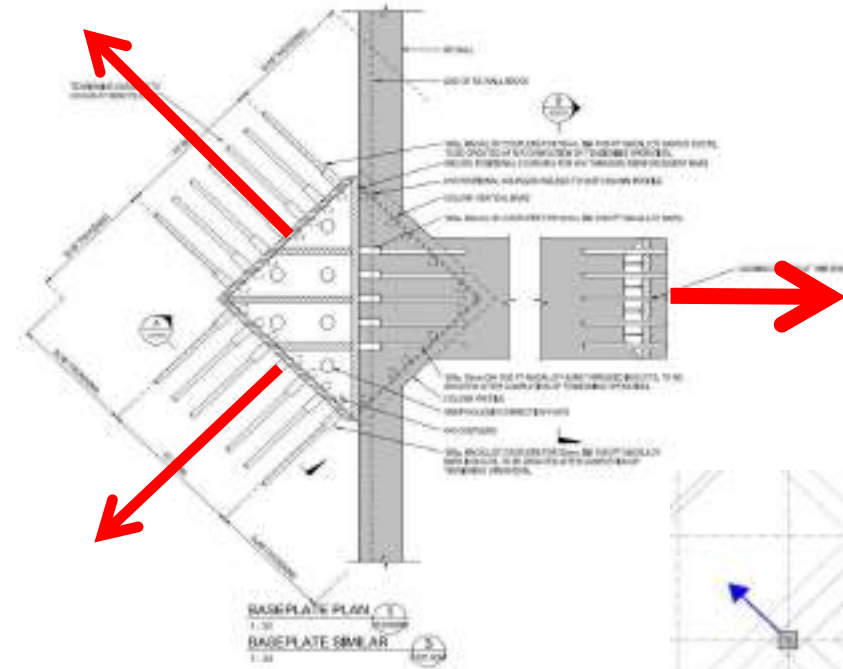
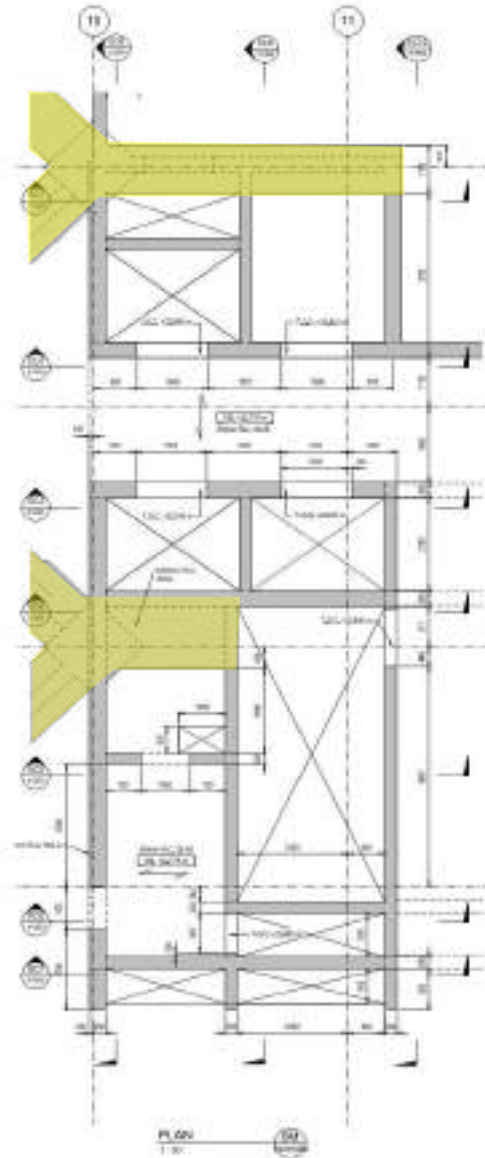
Multi Layer Transfer Trees



Construction Managed Design

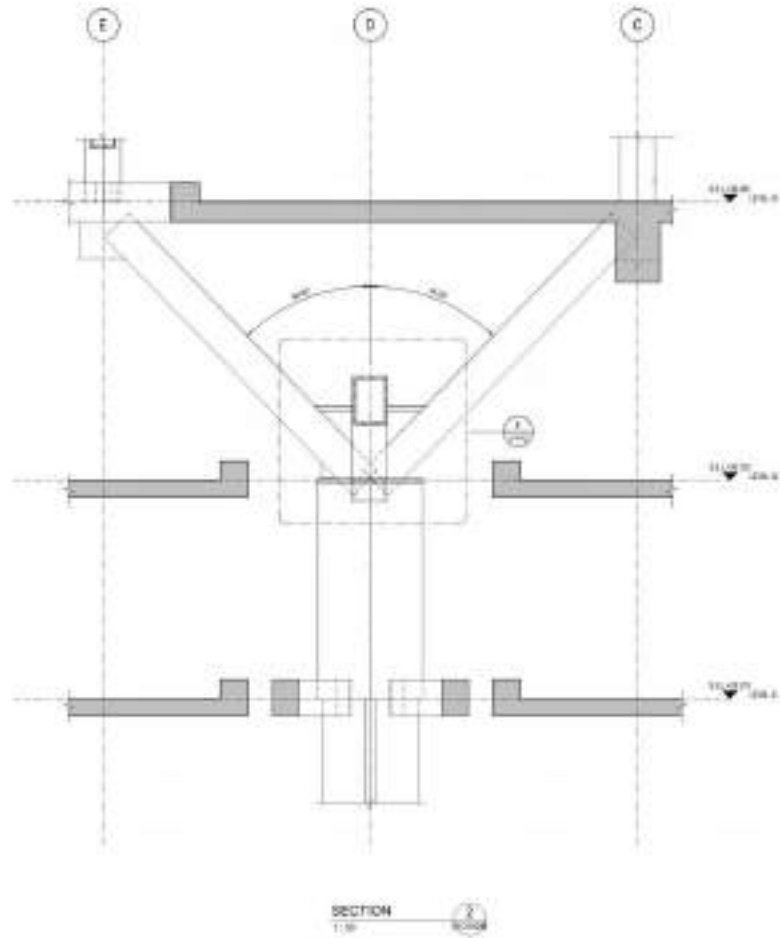
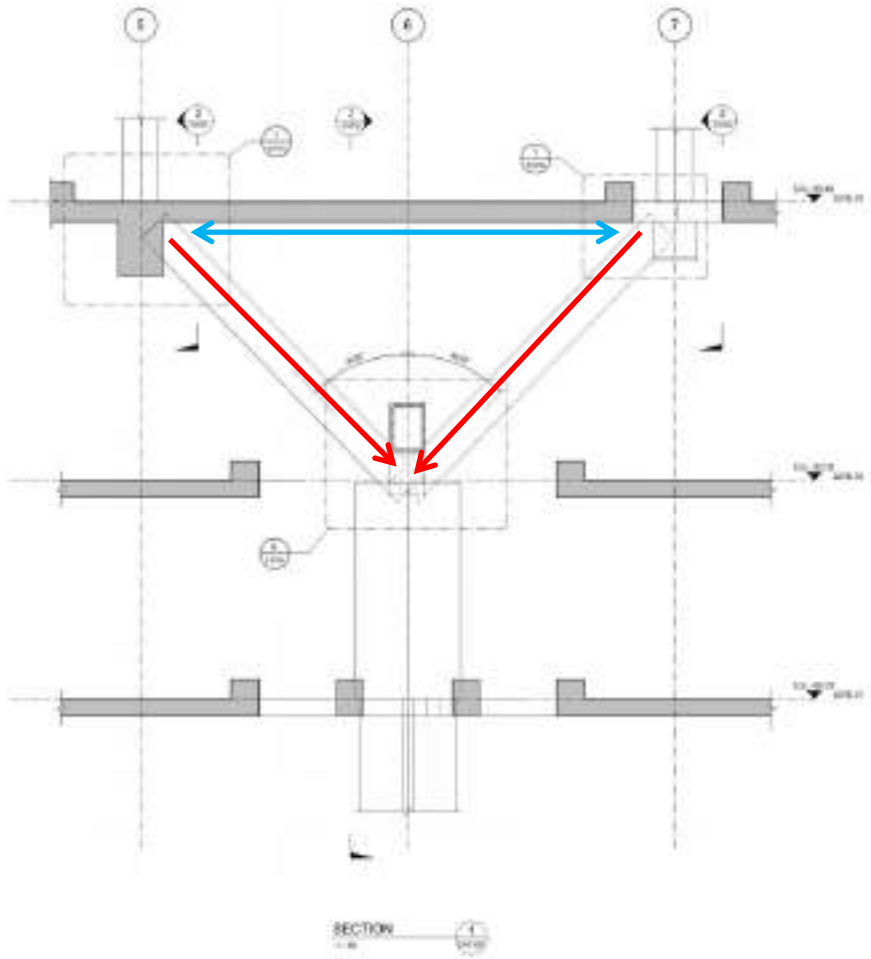


Complex Nodes

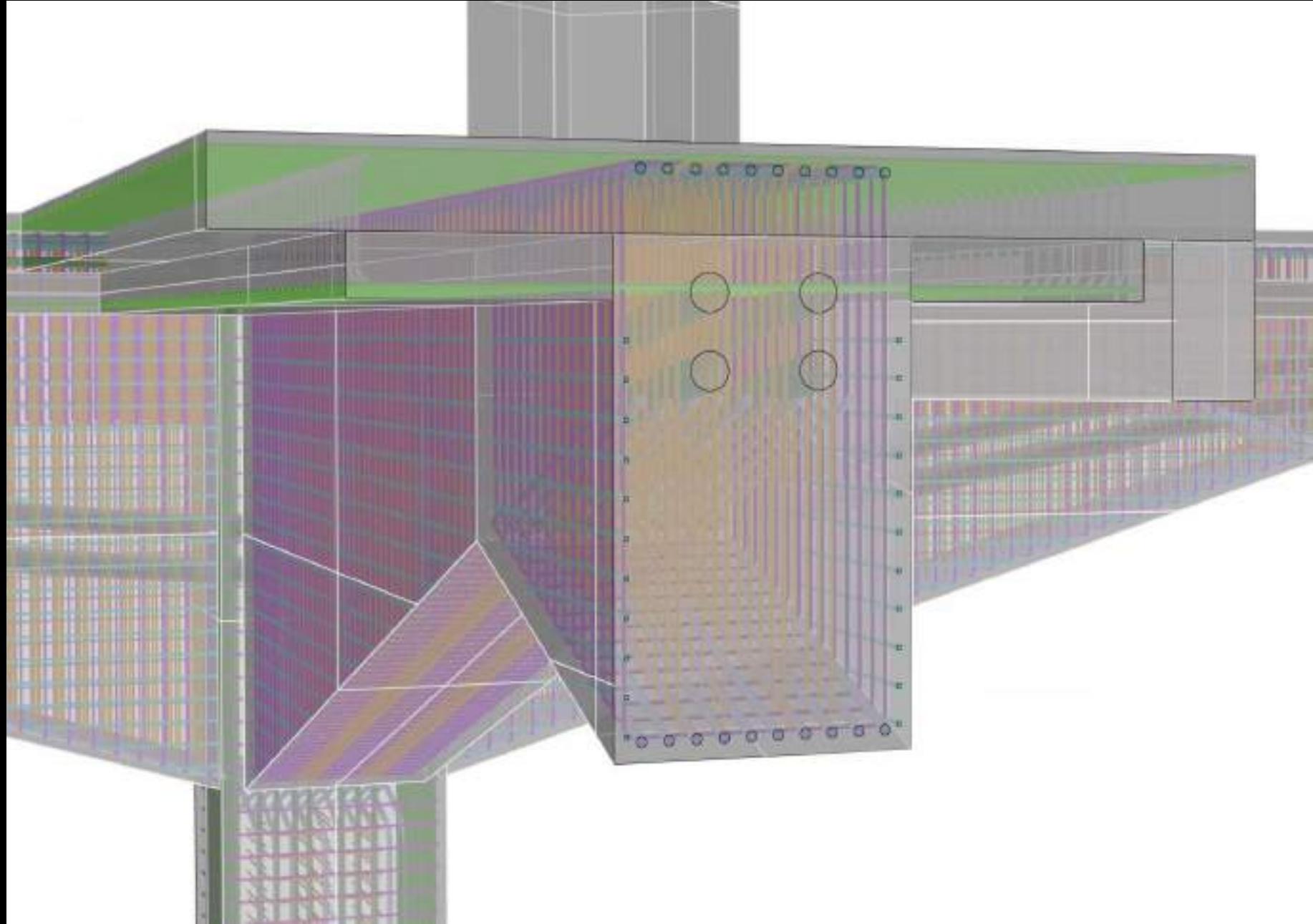


Stressing Locations

In-Plane Tree Ties



Design Development



Basement Construction



Basement Construction



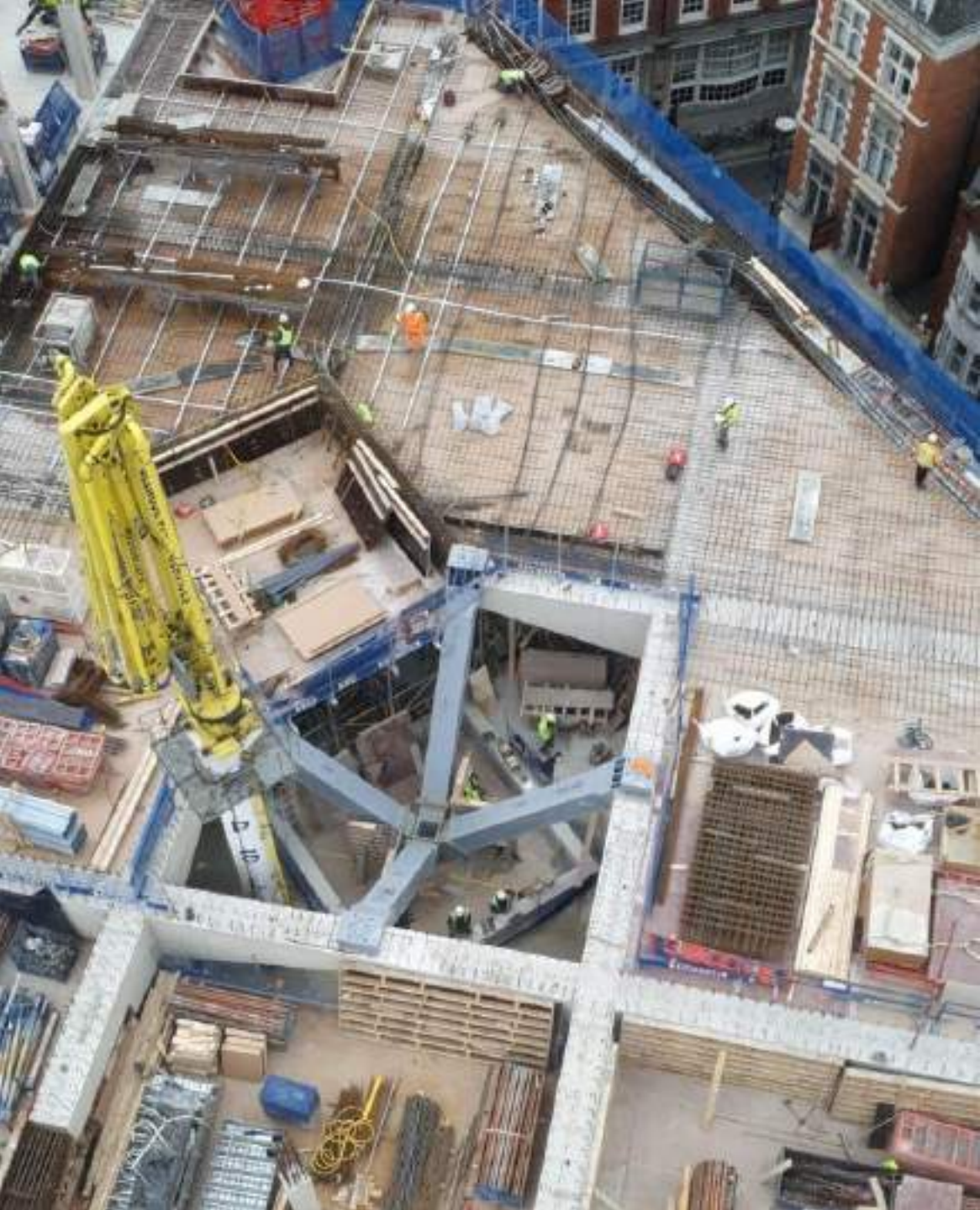
First Order Transfer Trees



Prestressing the Trees



Third Order Steel Trees



Design Development





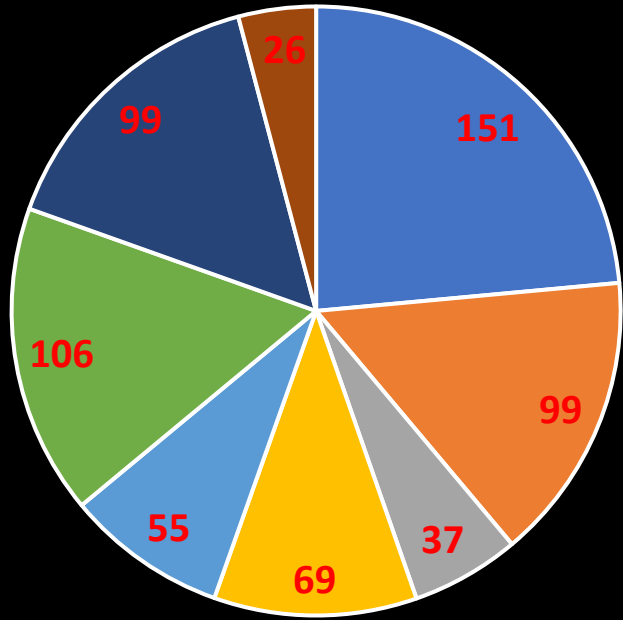






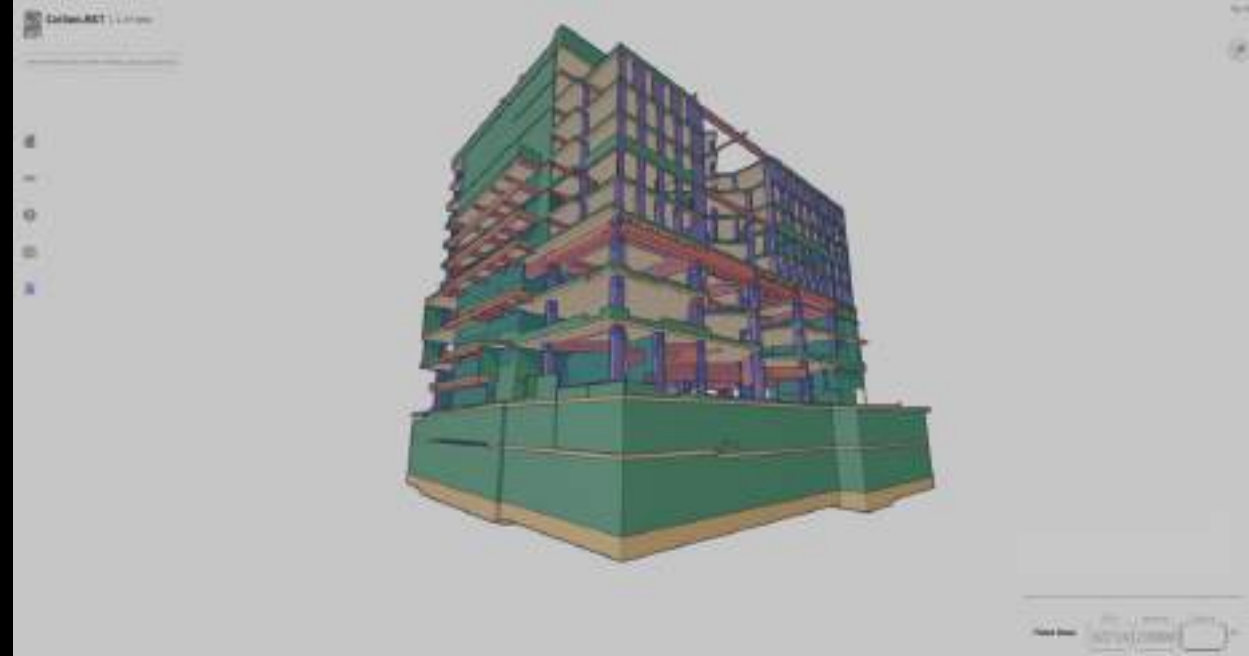
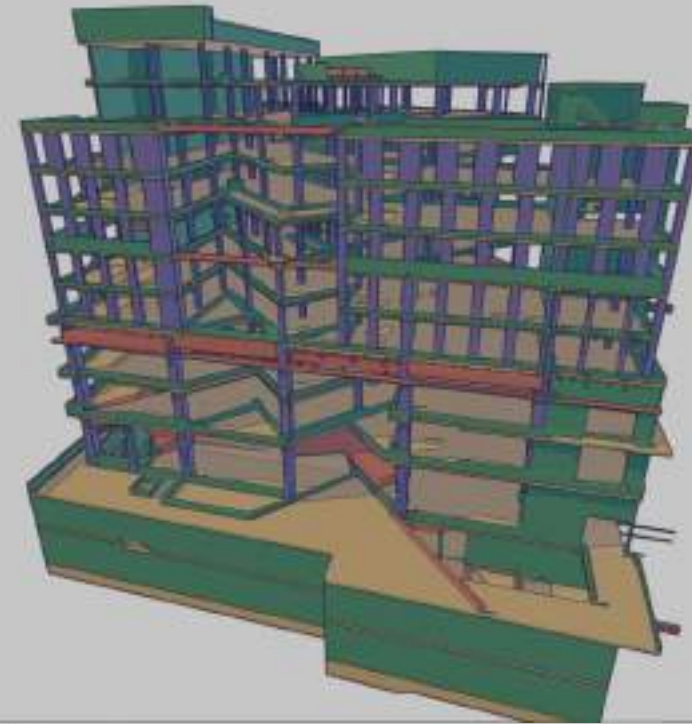


Upfront Embodied Carbon kg CO2e/m2



- Conc. superstructure
- Conc. substructure
- Rebar superstructure
- PT strand
- Superstructure
- Rebar substructure
- Façade
- MEP
- Internal finishes

TOTAL = 660 kgCO2e/m2 approx



Upfront Carbon, A1-5 [exc. sequestration]

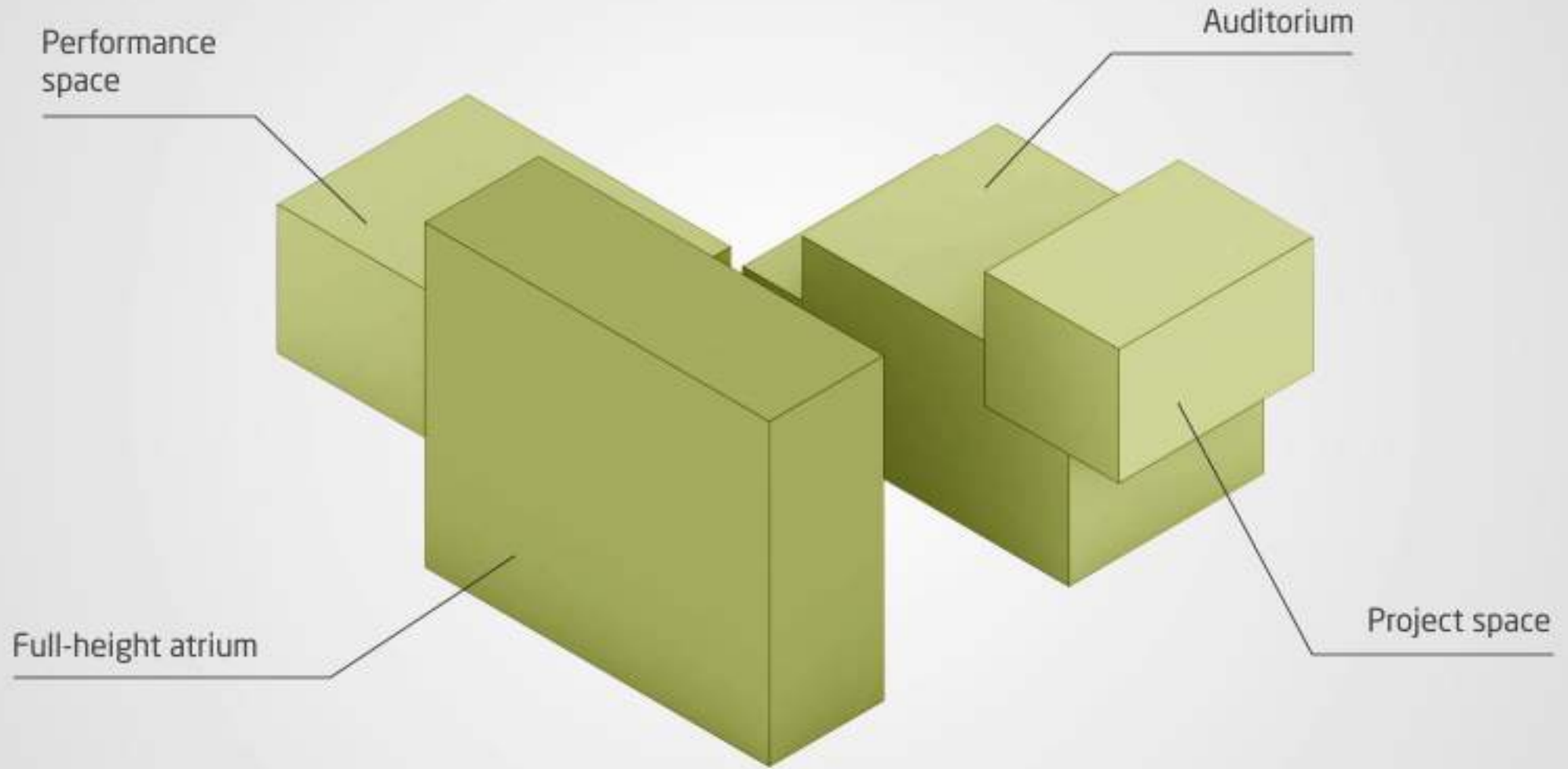
Band	Office	Residential	Education	Retail
A++	<100	<100	<100	<100
A+	<225	<200	<200	<200
A	<350	<300	<300	<300
B	<475	<400	<400	<425
C	<600	<500	<500	<550
D	<775	<675	<625	<700
E	<950	<850	<750	<850
F	<1100	<1000	<875	<1000
G	<1300	<1200	<1100	<1200

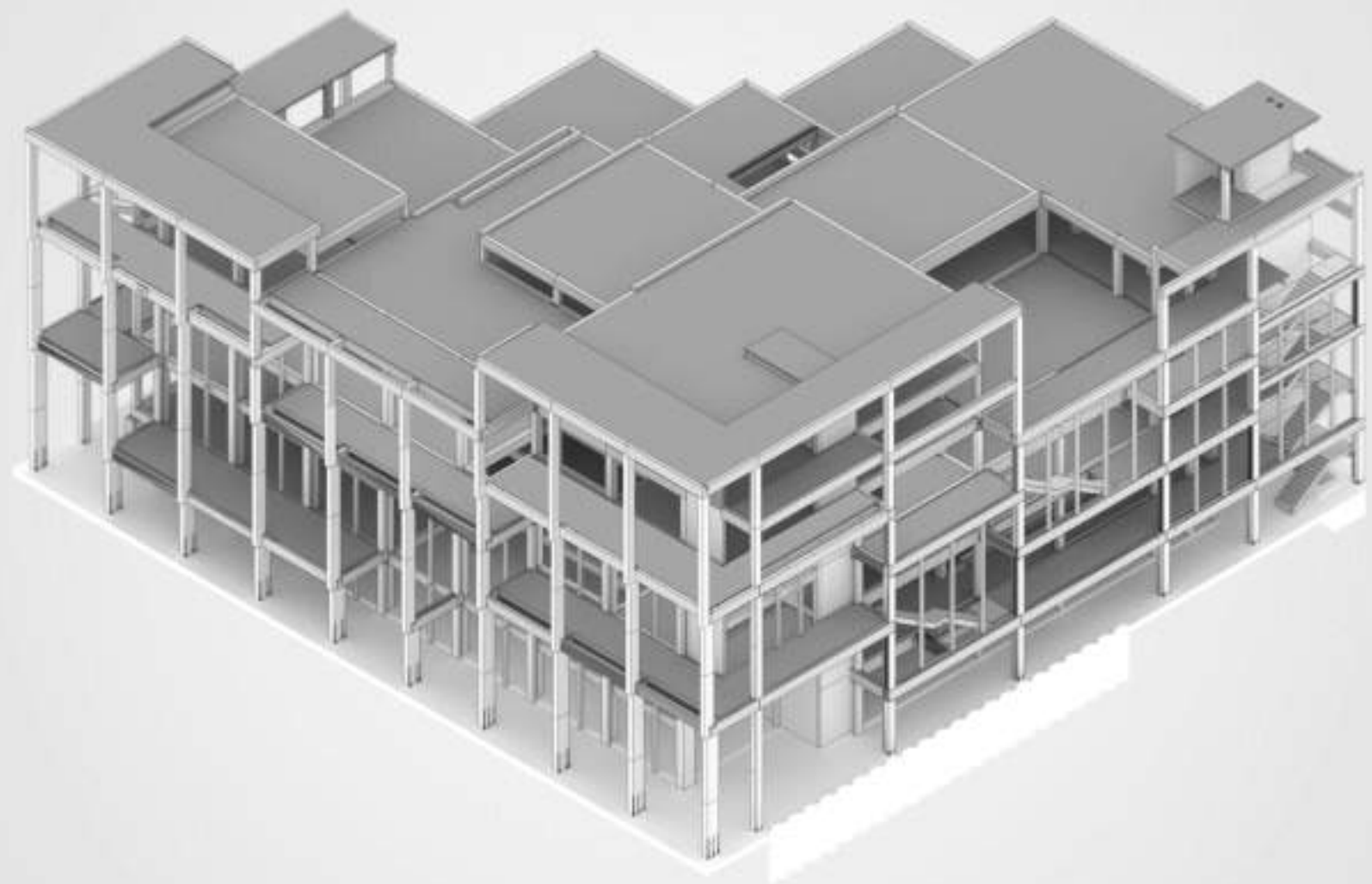
LEED 2030 Design Target
LEED 2009 Design Target





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Typical bay

