Pragmatic Preservation:
Stocktaking Oslo's Unlisted Buildings

The practice of architecture is faced with an unprecedented dilemma: How can we design new buildings, when construction has become a main contributor to the parallel crises of biodiversity loss and climate change? The economy of obsolescence, which dictates that demolition and new construction is the core of architecture, has become increasingly difficult to subscribe to. Each year we demolish around 22 000 buildings in Norway, which amounts to 60 buildings per day. The building mass which falls outside the scope of antiquarian building preservation represents a substantial amount of embodied energy, and preservation of existing buildings is the most effective measure the industry can take in order to reduce its climate gas emissions and environmental impact.

The way building preservation has been practiced in Oslo has been described as "narrative preservation." Instead of focusing on urban structure, type or characteristics, preservation has been concerned with protecting and recounting specific histories and anecdotes. In Oslo, the municipal preservation authority, Byantikvaren, has developed a "yellow list" of the 11% of the total building mass which currently is under some form of heritage protection. These approximately 10 000 buildings have been recognised as having "cultural values worth preserving," leaving the remaining 89% of buildings unlisted and unprotected. This thesis is an attempt to highlight the potentials of the unlisted, unprotected building mass in Oslo. Through different scales, from the city, via the neighbourhood, to the building, the project aims to challenge antiquarian building preservation, and suggest an architectural praxis underpinned by a pragmatic form of preservation. Three primary research questions underlie the project: what are the characteristics of buildings that fall outside the scope of current heritage praxis; how can one assess the potential of this building mass; and what would a new form of pragmatic preservation mean for architectural production?

The method and outcome differ between the scales we are working in and the questions we are attempting to answer. At the scale of the city, we have defined a "green list," as opposed to the yellow list of Byantikvaren. This list is not a selection of buildings, but includes the entirety of Oslo's unlisted building stock. Using tools ranging from GIS-mapping to 1:15 physical models, we have attempted to shed light on some of the characteristics of this building mass. At the scale of the neighborhood, we have proposed a method of building condition assessment which goes beyond the scope of the established standard, as defined by NS:3424. We have then used our method of building analysis to assess the potential of the existing building mass of an area which is currently facing plans for redevelopment, and to see what a pragmatic preservation would imply for the ongoing plans in terms of carbon emissions and programme. Finally, at the scale of the building, we have developed an architectural proposal for the adaptive refurbishment of an existing 5-storey office building from 1974, which is facing demolition. This last part of the project is developed through conventional architectural drawings and physical models. By developing schematic counter-proposals for the ongoing development of a neighborhood and a building, we have tried to show how a pragmatic preservation could maintain qualities otherwise lost, and how it would have an effect on the environmental and social impact of the realised projects.

Diploma project
Spring 2022
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Reference values for climate gas emissions, per m² gross floor area:

	Office	Housing block	School	Commerce	House	Nursing home
Material production (A1-A3)	261	323	263	226	144	285
Transportation (A4)	40	62	42	41	30	48
Total A1-A4:	301	385	305	267	174	333

Building categorisation:

OFFICE:
311 Kontor- og adm.bygning, rådhus
312 Bankbygning, posthus
313 Mediabygning
319 Annen kontorbygning

HOUSING BLOCK:
141 Stort frittliggende bol.bygg på 2 etasje
142 Stort frittliggende bol.bygg på 3 og 4 etasje
143 Stort frittliggende på 5 etasje el. mer
144 Store sammenbygde på 2 etasje
145 Store sammenb. på 3 og 4 etasje
146 Store sammenb. på 5 etasje el. mer
151 Bo- og servicesenter
152 Studentheim/studentboliger
159 Annen bygning for bofellesskap
511 Hotellbygning
512 Motellbygning
519 Annen hotellbygning
521 Hospits, pensjonat
522 Vandrer -feriehjem
523 Appartement
524 Camping/-turistehytte
529 Annen bygning for overnatting

SCHOOL:
821 Politistasjon
822 Brannstasjon, ambulansestasjon
823 Fyrstasjon, losstasjon
824 Stasjon for radarovervåkning av fly og/ eller skipstrafikk
825 Tiltukstrom/bunker
829 Annen beredskapsbygning
641 Museum, kunstgalleri
642 Bibliotek, mediatek
643 Zoologisk/botanisk hage (bygninger)
649 Annen museum/bibliotekbygning
661 Kino/teater/opera/konserthygning 662 Samfunnshus, grendehus
663 Diskotek
669 Annet kulturhus
671 Kirke, kapell
672 Bedehus, menighetshus
673 Krematorium, gravkapell, bårehus 674 Synagoge, moskè
675 Kloster
679 Annen bygning for religiøse aktiviteter
612 Barnehage
613 Barneskole
614 Ungdomsskole
615 Kombinert barne- og ungdomsskole
616 Videregående skole
619 Annen skolebygning
621 Univ./høgskole m/auditorium, lesesal
623 Laboratoriebygning
629 Annen universitet/høgskole og forskningsbygning

COMMERCE:
211 Fabrikkbygning
212 Verkstedbygning
214 Bygning for renseanlegg
216 Bygn. for vannfors. blant annet pumpest.
219 Annen industribygning
221 Kraftstasjon
223 Transformatorstasjon
229 Annen energiforsyningsbygning
231 Lagerhall
232 Kjøle- og fryselager
233 Silobygning
239 Annen lagerbygning
241 Hus for dyr/landbr.lager/silo
243 Veksthus
244 Drifttib. fiske/fangst/oppdr.
245 Naust/redskapshus for fiske
248 Annen fiskeri- og fangstbygn.
249 Annen landbrukbygning
651 Idrettshall
652 Ishall
653 Svømmehall
654 Tribune og idrettsgarderobe
655 Helsestudio
659 Annen idrettsbygning
531 restaurantbygning, kafébygning
532 Sentralkjøkken, kantinebygning
533 Gatekjøkken, kioskbygning
539 Annen restaurantbygning
321 Kjøpesenter, varehus
322 Butikk/forretningsbygning
323 Bensinstasjon
329 Annen forretningsbygning /i
330 Messe- og kongressbygning
411 Eksp.bygn. flyterm., kontrtårn
412 Jernbane- og T-banestasjon
415 Godsterminal
416 Postterminal
419 Annen eksp. og terminalbygning
429 Telekommunikasjonsbygning
431 Parkeringshus
439 Annen garasje-/hangarbygning
441 Trafikklislysnebygning
449 Annen veg- og trafikklislysnebygning

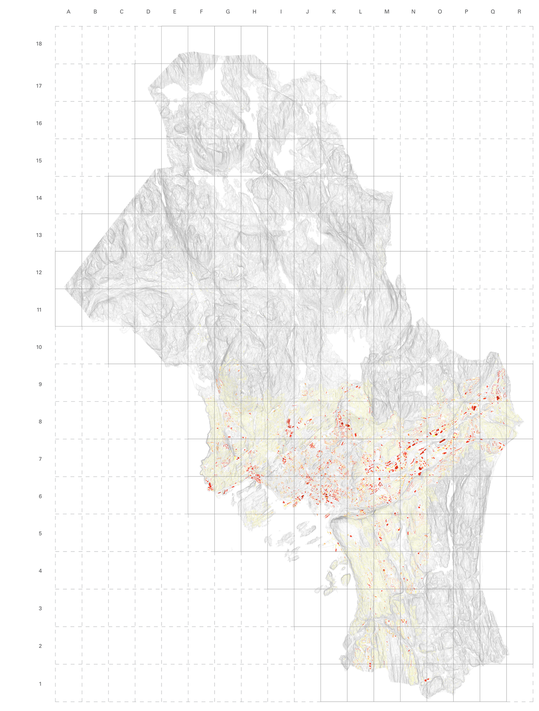
HOUSE:
111 Enebolig
112 Enebolig m/hybel/sokkelleilighet
113 Våningshus
121 Tomannsbolig, vertikaldelt
122 Tomannsbolig, horisontaldelt
123 Våningshus, tomannsbolig, vertikaldelt
124 Våningshus, tomannsbolig, horisontaldelt
131 Rekkehus
133 Kjede/atriumhus
135 Terrassehus
136 Andre småhus med 3 boliger eller flere
161 Hytter, sommerhus, fritidsbygg
162 Heilårsbolig benyttet som fritidsbolig
163 Våningshus benyttet som fritidsbolig
171 Setterhus, sel, rorbu o.ì.
172 Skogs- og utmarksskise, gamme
181 Garasje, uthus, anneks knyttet til bolig
182 Garasje, uthus, anneks knyttet til fritidsbolig
183 Naust, båthus, sjøbu
Annen boligbygning
193 Boligbrakker
199 Annen boligbrakke (Eks. sekundærbolig reindrift)

NURSING HOME:
819 Fengselsbygning
710 Sykehus
719 Sykehus
721 Sykehjem
722 Bo- og behandlingssenter, aldershjem
723 Rehabiliteringsinstitusjon, kurbad
729 Annet sykehjem
731 Klinikk, legekontor/-senter/-vakt
732 Helse- og sosialsenter, helsestasjon
739 Annen primærhelsebygning

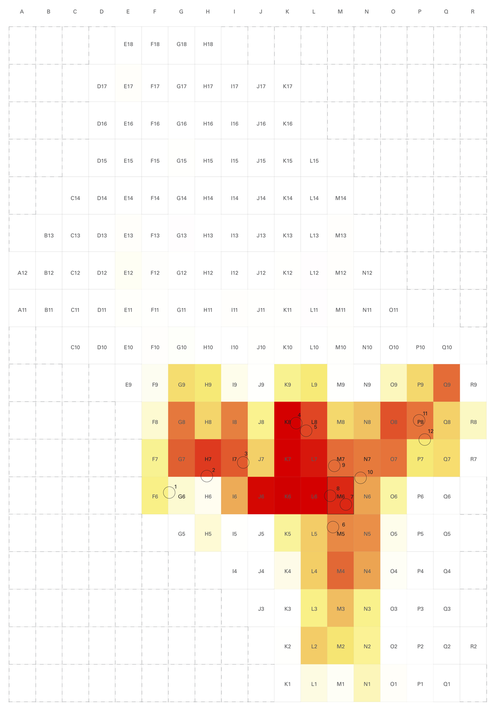
Embodied energy-mapping:

Amount of embodied energy 0 t CO_2e — 30 000 t CO_2e

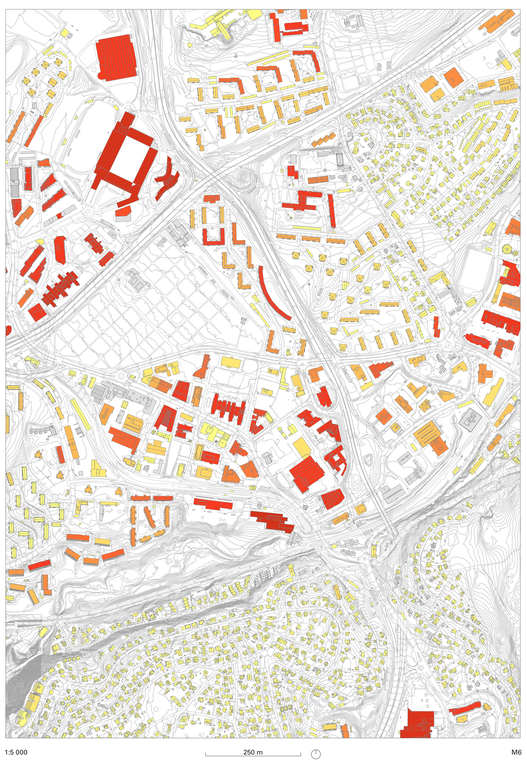
Colour range



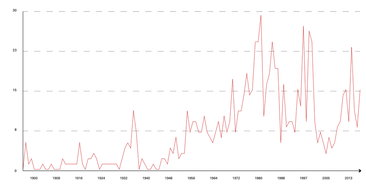
1:100 000 — 5 000 m — Index



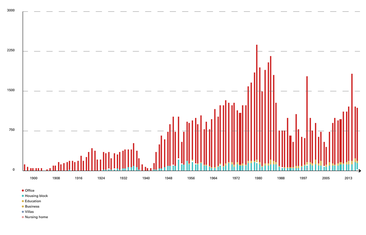
1:100 000 — 5 000 m



1:5 000 — 250 m — M6



CO2-emissions 1.30e+10 per year.



M² 3.86e+07 built per year.

Office

Hallway and meeting room

Ground floor entry

Stairs

Loading-deck

Meeting room

Ground floor entry

1. ØSTENSJØVEIEN 18
Grnr./Brnr.: 137/135
Zoning: S-3918
Architect: Lorentz Eger
Client: G. F. Gundersen
Year of construction: 1960
Built-up area: 1165 m² / GFA: 5307 m²
Construction: Concrete columns in grid, load-bearing walls in facade and core.
Embodied energy: 1 171 329 kg CO_2e
Circulation: Core with main staircase and elevator in center of plan.
Owner: Bryn Eiendom AS

2. TVETENVEIEN 6
Grnr./Brnr.: 137/69
Zoning: S-3918
Architect: H. O. Elgethun
Client: Aslaug Marion Nielsen
Year of construction: 1967
Built-up area: 753 m² / GFA: 1606 m²
Construction: Load-bearing concrete walls, columns in facade.
Embodied energy: 447 225 kg CO_2e
Circulation: Core with main staircase and elevator towards the facade.
Owner: Maya Eiendom AS

3. BRYNSVEIEN 2-4
Grnr./Brnr.: 137/28
Zoning: S-3441
Architect: Asbjørn Stein
Client: Olav Jahre
Year of construction: 1968
Built-up area: 578 m² / GFA: 2037 m²
Construction: Concrete columns in grid, concrete core.
Embodied energy: 167 958 kg CO_2e
Circulation: Primary and secondary stairs and elevator towards facade.
Owner: Entra ASA

4. NILS HANSENS VEI 20
Grnr./Brnr.: 137/224
Zoning: S-4297
Architect: Haakon Sverre
Client: Oslo Tegilverker AS
Year of construction: 1974
Built-up area: 722 m² / GFA: 3149 m²
Construction: Concrete columns in grid, slabs without beams, concrete core towards facade.
Embodied energy: 801 000 kg CO_2e
Circulation: Core with main staircase, escape staircase and elevator towards facade.
Owner: Entra ASA

5. ØSTENSJØVEIEN 29
Grnr./Brnr.: 137/25
Zoning: S-3441
Architect: Blakstad Munthe-Kaas
Client: Bruksmetall Jernvarefabrikk
Year of construction: 1975
Built-up area: 511 m² / GFA: 1924 m²
Construction: Concrete columns and beams in grid, load-bearing columns in facade.
Embodied energy: 548 952 kg CO_2e
Circulation: Main staircase and elevator towards facade, and escape staircase towards opposite facade.
Owner: Østensjøveien 29 ANS

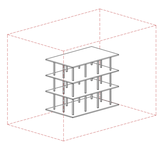
6. BRYNSENGVEIEN 5
Grnr./Brnr.: 137/228
Zoning: S-4789
Architect: Geir Grung
Client: C. M. Mathiesen & Co
Year of construction: 1977
Built-up area: 929 m² / GFA: 3600 m²
Construction: Concrete columns and beams in grid, concrete core.
Embodied energy: 2 729 769 kg CO_2e
Circulation: Main staircase and elevator towards main facade, escape staircase towards opposite facade.
Owner: Mathiesen C M & Co AS

7. BRYNSHØGDA 9
Grnr./Brnr.: 137/81
Zoning: S-5035
Architect: Ola Natvig
Client: Martin Olsen & Sønner AS
Year of construction: 1981
Built-up area: 395 m² / GFA: 1122 m²
Construction: Concrete columns and beams in grid, concrete core.
Embodied energy: 409 845kg CO_2e
Circulation: Core with main staircase and elevator towards facade.
Owner: Oslo kommune

8. BRYNSENGVEIEN 2
Grnr./Brnr.: 137/74
Zoning: S-3249
Architect: Tegnekoltet
Client: A/S Idenas
Year of construction: 1985
Built-up area: 1010 m² / GFA: 7093 m²
Construction: Concrete columns in facade, concrete core and load-bearing walls.
Embodied energy: 2 078 405 kg CO_2e
Circulation: Core with main staircase and two elevators towards main facade, espace staircases towards each short facade.
Owner: Bryn Eiendom AS

9. TVETENVEIEN 20
Grnr./Brnr.: 137/47
Zoning: S-5035
Architect: IKO Bygg AS
Client: Oslo kommune
Year of construction: 1986
Built-up area: 370 m² / GFA: 1267 m²
Construction: Load-bearing concrete facade.
Embodied energy: 330 197 kg CO_2e
Circulation: Internal staircase in center of plan, external escape staircase.
Owner: Oslo kommune

1:5 000 — 250 m — M6



A – Site utilization

Percentage of utilization of existing building in relation to zoning regulations.

ASSESSMENT	VALUES	DESCRIPTION
A.1 % BRA Gross area	*A* < 25 % utilization *B* 25 - 50 % utilization *C* 51 - 75 % utilization *D* 76 - 100 % utilization	Percentage of utilized gross area within the regulation limit.
A.2 % BYA Built-up area	*A* < 25 % utilization *B* 25 - 50 % utilization *C* 51 - 75 % utilization *D* 76 - 100 % utilization	Percentage of utilized space within the volume of the plot.
A.3 Utilization in height	*A* < 25 % utilization *B* 25 - 50 % utilization *C* 51 - 75 % utilization *D* 76 - 100 % utilization	Percentage of utilized height within the regulation limit of the maximum cornice height.

B – Construction

Potential for alterations and adaptations of existing load-bearing structure to fit extentions or new programmatic requirements.

ASSESSMENT	VALUES	DESCRIPTION/GUIDE
B.1 Construction	*A* Free plan with construction that ranges from facade to facade *B* Column grid *C* Load-bearing walls in plan *D* Load-bearing walls that divide the plan in two or more sections	Percentage of utilized load-bearing capacity in main structure.
B.2 Utilized load-bearing capacity	*A* < 25 % utilization *B* 25 - 50 % utilization *C* 51 - 75 % utilization *D* 76 - 100 % utilization	Percentage of utilized space within the volume of the plot.
B.3 Possibility of making holes in slabs	*A* Good opportunity for holes. For example in situ flat slabs. *B* Possibility of holes. For example, two-way plates on beams. *C* Some possibility of holes. For example, one-way plates between walls. *D* Slabs without the possibility of holes. For example, pre-stressed concrete slabs.	Suitableness of making holes in slabs between floors.

C – Programmatic flexibility

Spatial and structural characteristics that determine the degree of flexibility in relation to different programs.

ASSESSMENT	VALUES	DESCRIPTION/GUIDE
C.1 Width of plan	*A* ≥ 18 m *B* > 15 - 18 m *C* > 10 - 14 m *D* < 10 m	Distance from facade to facade in the shortest span of the plan.
C.2 Ceiling heights	*A* ≥ 3,0 m *B* 2,7 - 3,0 *C* 2,4 - 2,6 m *D* < 2,4 m	Min. requirement for permanent work in office buildings 2.7 m Min. requirement in residential buildings 2.4 m.
C.3 Load-bearing capacity of slabs	*A* ≥ 5 kN/m² *B* 3 - 5 kN/m² *C* 2 - 3 kN/m² *D* < 2 kN/m²	Load-bearing capacity warehouse / industry 5 kN/m² Load-bearing capacity office building 3 kN/m² Load-bearing capacity housing 2kN/m²
C.4 Largest possible continuous space	*A* > 45 m² *B* > 31 - 45 m² *C* > 15 - 30 m² *D* < 15 m²	Largest interconnecting room without load-bearing walls.

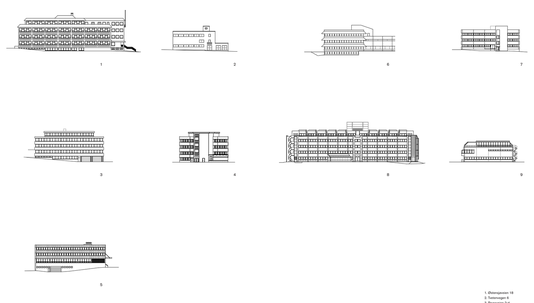
D – Vertical connections and circulation

Degree to which existing circulation is adapted to new or increased requirements and the possibility for adding new vertical shafts.

ASSESSMENT	VALUES	DESCRIPTION/GUIDE
D.1 Number of and width of stairs	*A* Two or more main staircases *B* A main staircase and an escape staircase *C* A main staircase D No stairs above escape requirements	Main staircase, secondary staircase with straight runs < 1.20 m, not straight runs < 1.30 m. Secondary stairs only to escape / operation with straight runs < 0.9 m. not straight runs < 1.0 m.
D.2 Elevators	*A* 2 or more lifts, at least one above minimum requirements *B* One lift above minimum requirements *C* One lift below minimum requirements *D* No elevators	NS-EN 81-70:2021 In buildings with three floors or more, at least one elevator car must have an interior size of minimum 1.1 m x 2.1 m.
D.3 Vertical shafts	*A* Space for plumbing and electrical ducts in center or evenly distributed *B* Space for plumbing and electrical ducts unevenly distributed *C* Space for electrical ducts *D* No space for plumbing or electrical ducts	Space in existing shafts for same or new use.

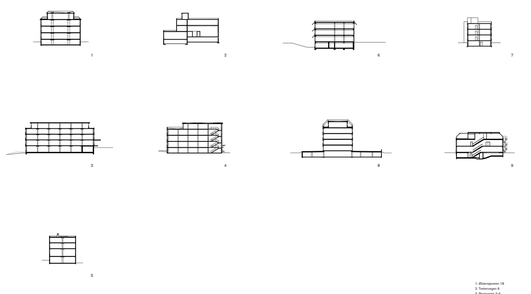
Site plan model, existing

Facade photos

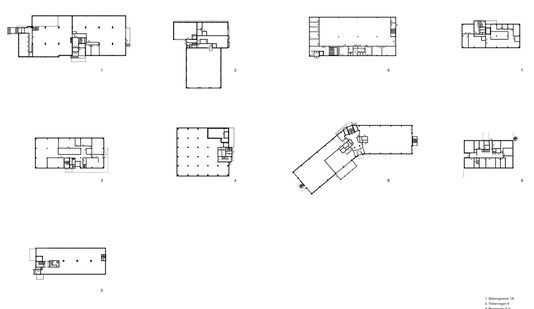


Structure 40 m 1:1000

Site section existing building 1:500

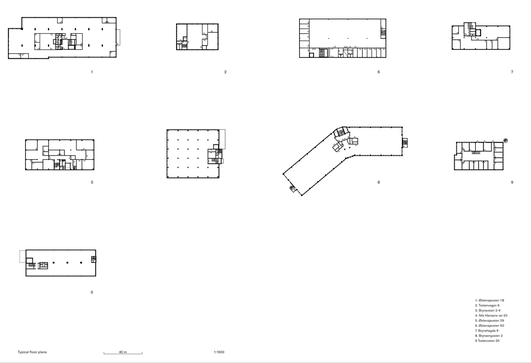


Cross sections 40 m 1:1000

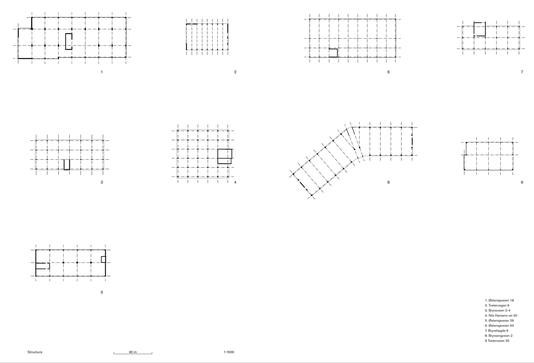


Ground floor plans 40 m 1:1000

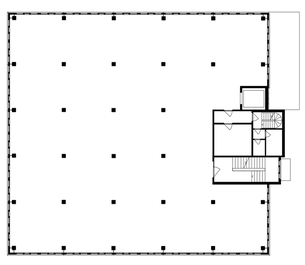
Site section existing building 1:500



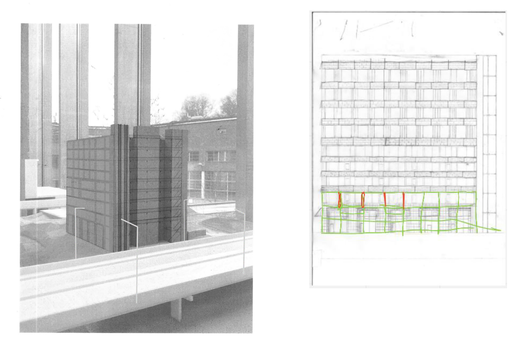
Typical floor plans 40 m 1:1000



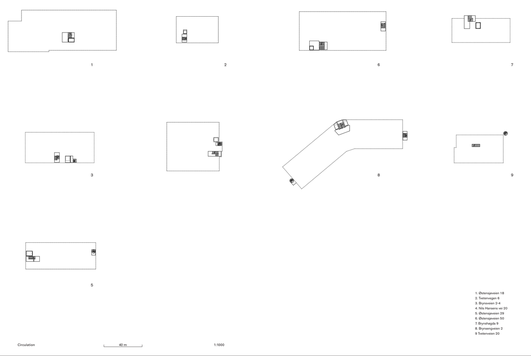
Structure 40 m 1:1000



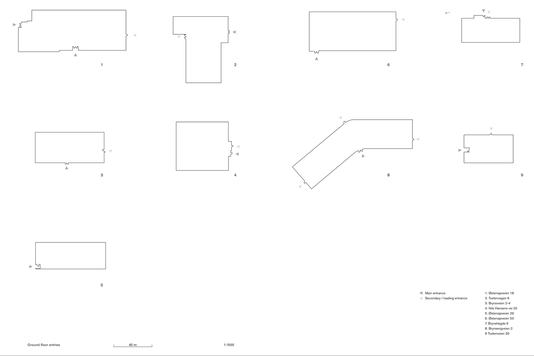
Plan existing building 10 m 1:200



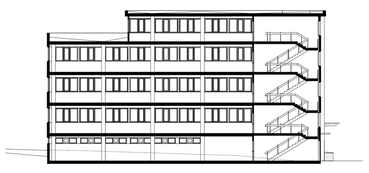
Sketches



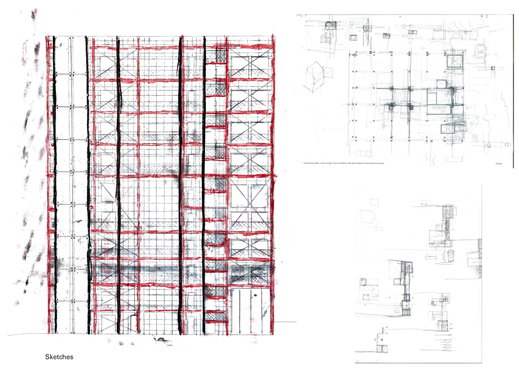
Circulation 40 m 1:1000



Ground floor entries 40 m 1:1000



Section existing building 10 m 1:200



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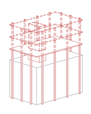
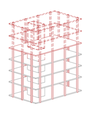


1. Vertical addition

Vertical addition with new construction outside existing facade.

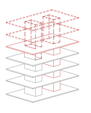
	STRUCTURAL PRINCIPLE	DESCRIPTION
1.1	Columns outside existing facade	Columns with new foundations placed outside existing building perimeter carry new slabs which span from facade to facade.
1.2	Load-bearing walls outside existing facade	Walls with new foundations placed outside existing building perimeter carry new slabs which span from facade to facade.



2. Vertical addition

Vertical addition with new facade which includes new construction.

	STRUCTURAL PRINCIPLE	DESCRIPTION
2.1	Load-bearing columns in new facade	Existing facade removed, new columns placed along existing building perimeter as a part of new facade, which carries new slabs spanning from facade to facade.
2.2	Load-bearing walls in new facade	Existing facade removed, new walls placed along existing building perimeter as a part of new facade, which carries new slabs spanning from facade to facade.



3. Vertical addition and added circulation core

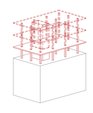
Vertical addition with new core in plan.

	STRUCTURAL PRINCIPLE	DESCRIPTION
3.1	New core in plan which works together with reinforced existing core	Reinforcement of existing core with vertical expantion, hole cut in slabs to retrofit new core.
3.2	Several new cores that carries superstructure	Holes cut in slabs to retrofit two or more cores that carry new floors.

4. Vertical addition with reinforced structure

Vertical addition which only reinforces existing load-bearing elements.

	STRUCTURAL PRINCIPLE	DESCRIPTION
4.1	Reinforced columns	Reinforcement of existing columns which allow for addition of new floors.
4.2	Reinforced load-bearing walls	Reinforcement of existing load-bearing walls which allow for addition of new floors.



5. Vertical addition on top of existing structure

Vertical addition without reinforcing or adding new structural elements.

	STRUCTURAL PRINCIPLE	DESCRIPTION
5.1	Vertical addition	Existing building is capable of carrying extra weight, and new floors can be added directly ontop as exentions of existing load-bearing walls or columns.

6. Increased ceiling heights

Increased utilization in height by lifting existing floor slabs.

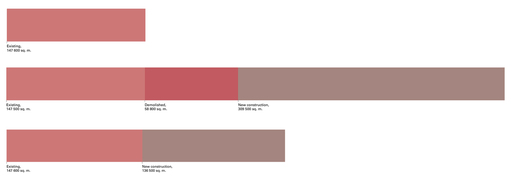
	STRUCTURAL PRINCIPLE	DESCRIPTION
6.1	Increased ceiling heights	Existing slabs are lifted up, while existing columns and walls are prolonged vertically to increase ceiling heights.

Site plan model

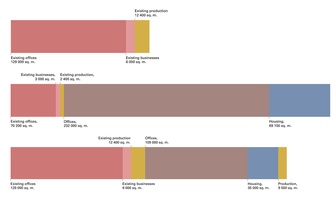
Bryn 2022

Bryn 2035

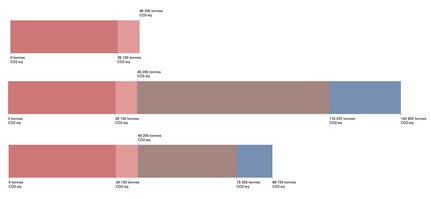
2.7 Compilation of projects



Total gross floor area of Bryn today, in the planned project and counter proposal.

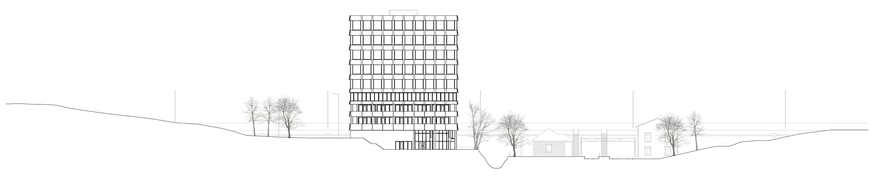


Programme in Bryn today, in the planned project and counter proposal.



CO2-eq emitted upon construction of Bryn today, the planned project and counter proposal.

Site plan 25 m



Site section 1:500

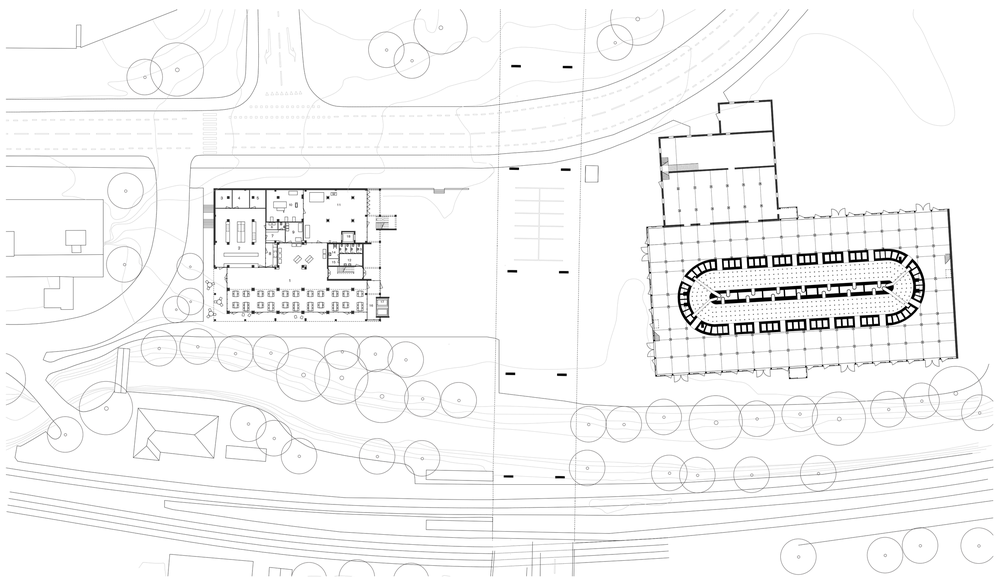
Building towards south east

4th floor in use

Site section 1:500

Gallery

1st floor



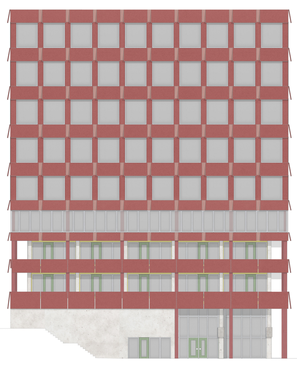
1. Canteen – 298 m²
2. Kitchen – 105 m²
3-5. Storage (dried, cooled, frozen) – à 13 m²
6. Cupboard kitchen – 4 m²
7. Wardrobe with toilet – 12 m²
8. Scullery – 12 m²
9. Cleaning central – 16 m²
10. Workshop wood – 51 m²
11. Indoor gallery – 18 m²
12. Bathroom – 12 m²
13. WC – 2,3 m²
14. HCWC – 7 m²
15. Cupboard – 3 m²
16. Indoor gallery / entrance – 18 m²
17. Lifts – 4,5 m²
18. Freight elevator – 5,5 m²

Expanded ground floor plan

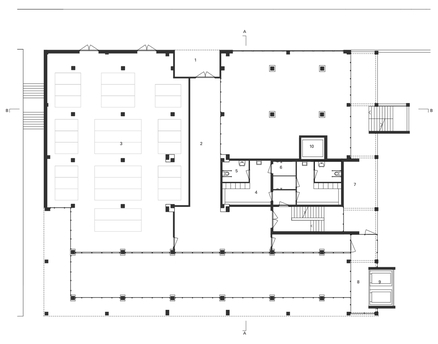
20 m

1:400

South west elevation 1:100



North east elevation 1:100

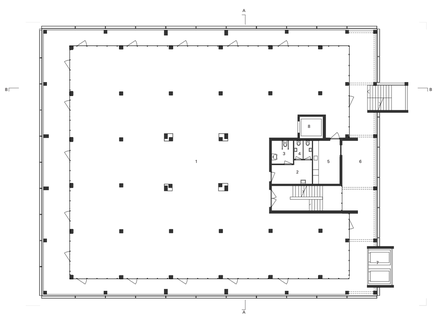


1. Vindfang – 13 m²
2. Entrance hall – 105 m²
3. Bicycle parking – 283 m²
4. Wardrobe – 17 m²
5. HCWC – 6 m²
6. Shower – 3,5 m²
7. Outdoor gallery with fire escape – 65 m²
8. Indoor gallery / entrance – 18 m²
9. Lifts – 4,5 m²
10. Freight elevator – 5,5 m²

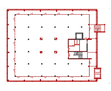
1:200

10 m

Plan 2



1. Office / production – 607 m²
2. Bathroom– 12 m²
3. HCWC – 5,5 m²
4. WC – 1,8 m²
5. Kitchen – 13 m²
6. Outdoor gallery with fire escape – 257 m²
7. Lifts – 4,5 m²
8. Freight elevator – 5,5 m²



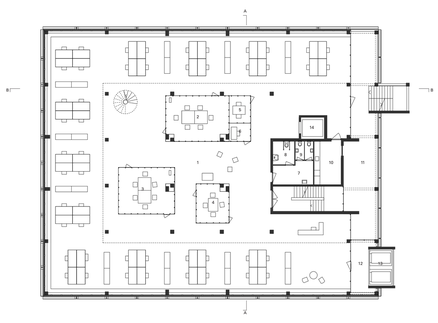
Plan 3-4

10 m

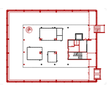
1:200

Third floor rehabilitation

Mezzanin meeting room



1. Office – 800 m²
2. Meeting room – 30 m²
3. Meeting room – 30 m²
4. Meeting room – 14 m²
5. Quiet room – 7 m²
6. Quiet room – 5 m²
7. Balcony – 8 m²
8. HCWC – 5,5 m²
9. WC – 1,8 m²
10. Kitchen – 13 m²
11. Outdoor gallery with fire escape – 70 m²
12 Indoor gallery / entrance – 11 m²
13. Lifts – 4,5 m²
14. Freight elevator – 5,5 m²



Plan 5

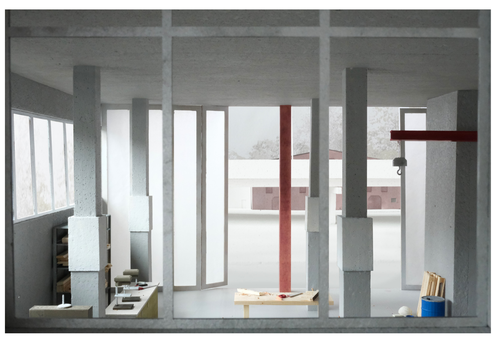
10 m

1:200

Workshop

Third floor

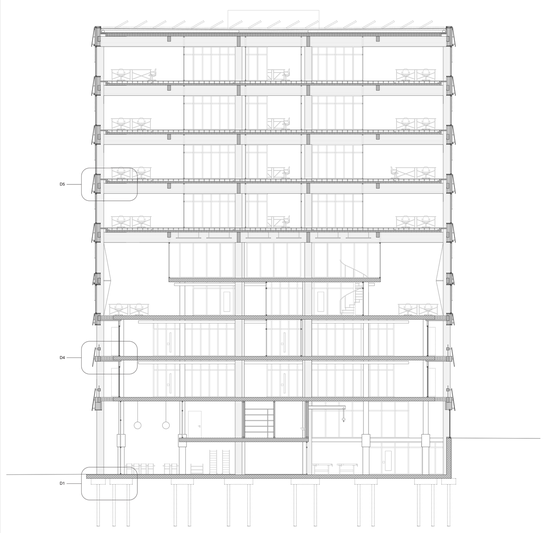
Workshop



Workshop from entrance

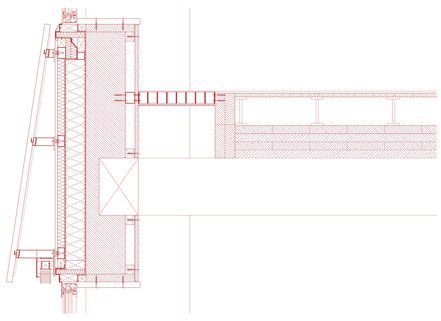
5th floor

Detail D1 1:20

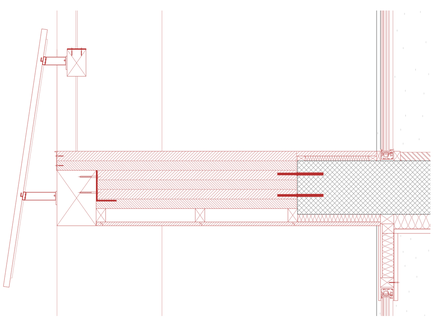


Section A 1:100

Cafeteria



Detail D5 1:10



Detail D4 1:10