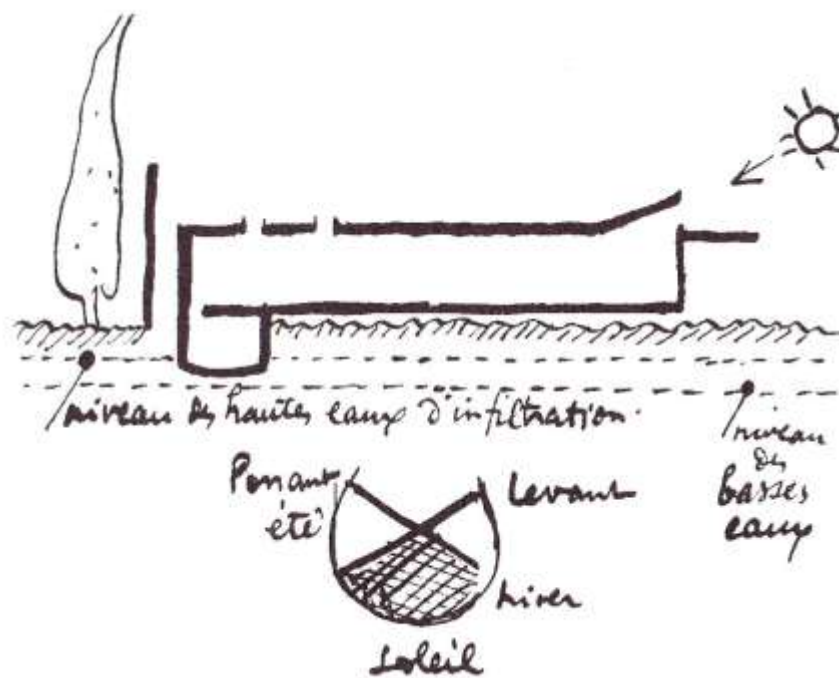
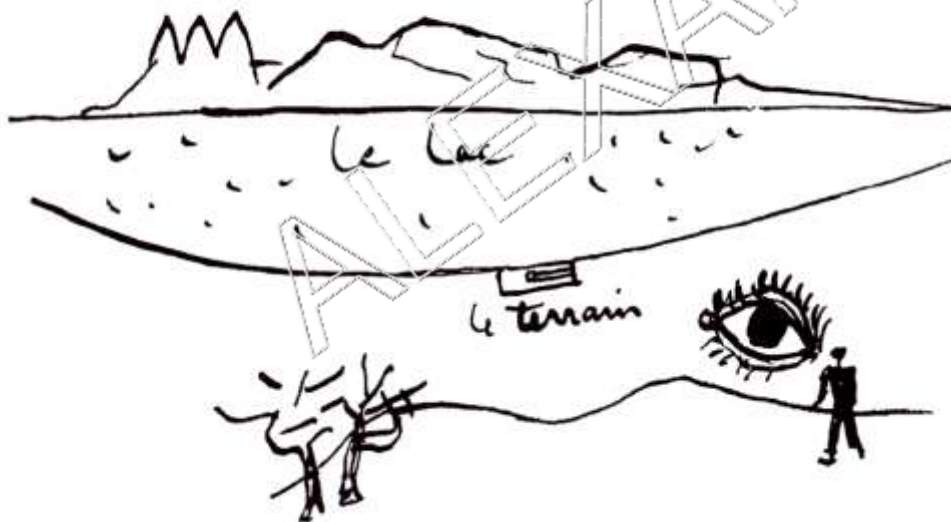
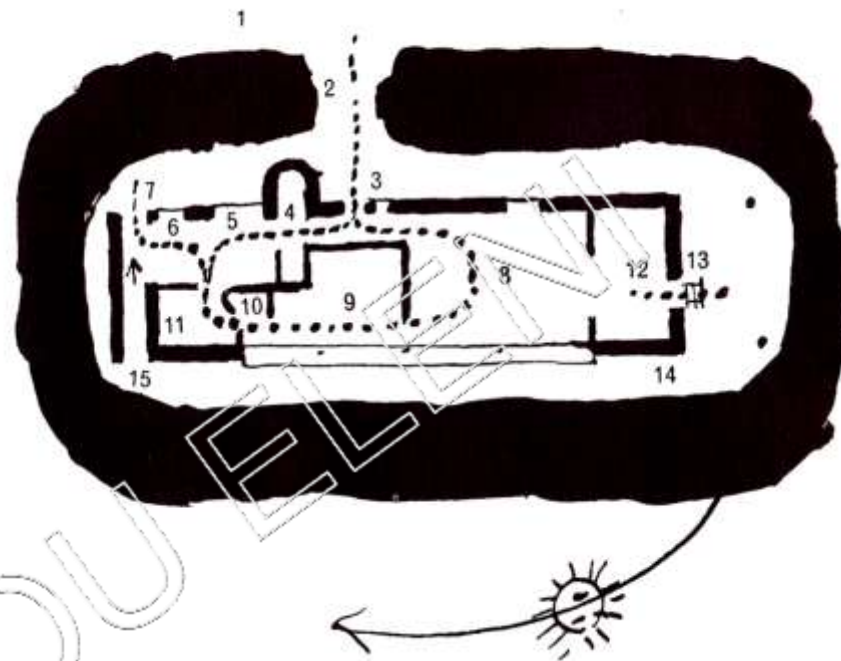
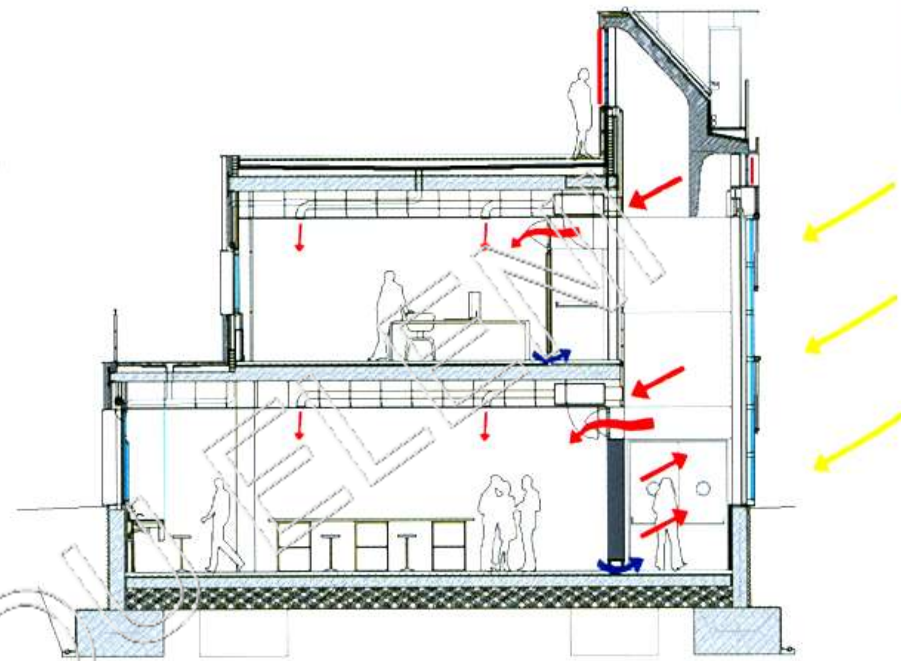


Η ΠΑΡΑΜΕΤΡΟΣ ΤΗΣ ΘΕΡΜΙΚΗΣ ΚΑΙ ΒΙΟΚΛΙΜΑΤΙΚΗΣ ΣΥΜΠΕΡΙΦΟΡΑΣ ΣΤΟΝ ΑΡΧΙΤΕΚΤΟΝΙΚΟ ΣΧΕΔΙΑΣΜΟ.

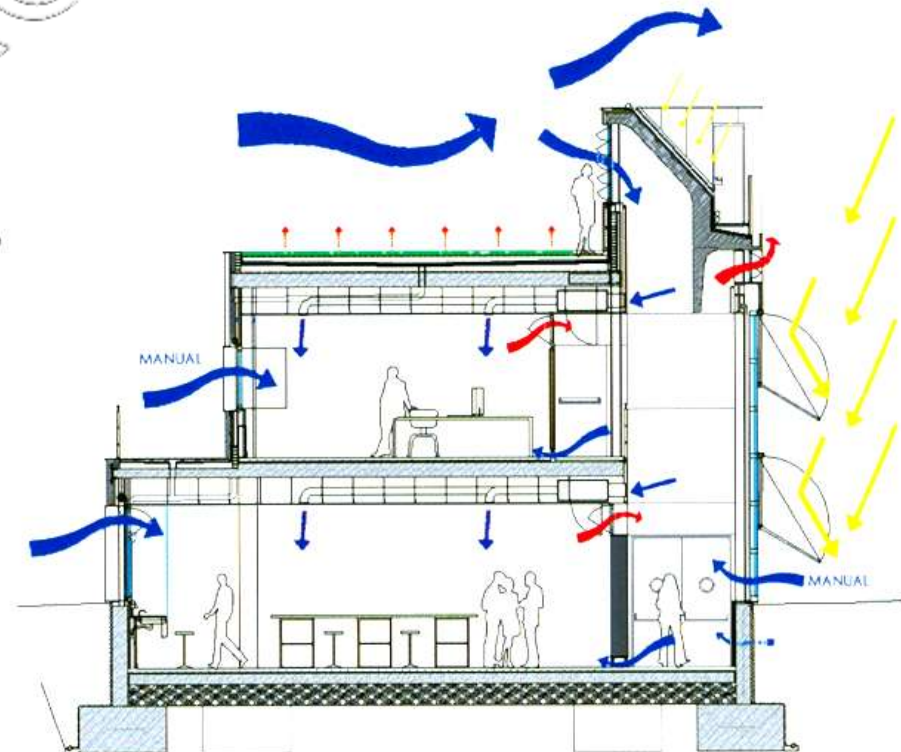
*ΕΛΕΝΗ ΑΛΕΞΑΝΔΡΟΥ Αρχιτέκτων Μηχανικός ΕΜΠ, MArch II UCLA,
Αναπληρώτρια Καθηγήτρια Σχολής Αρχιτεκτόνων ΕΜΠ*



- **ΗΛΙΟΣ**
 - + ηλιακή ενέργεια
 - + θερμική ενέργεια
 - + φυσικός φωτισμός
 - υπερθέρμανση

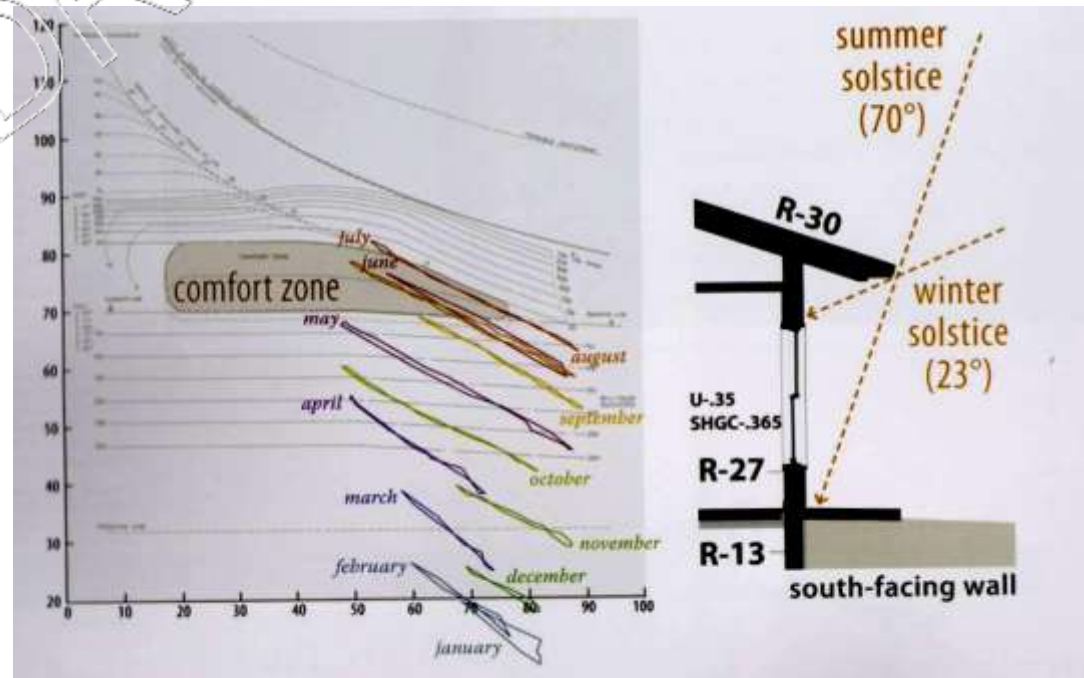
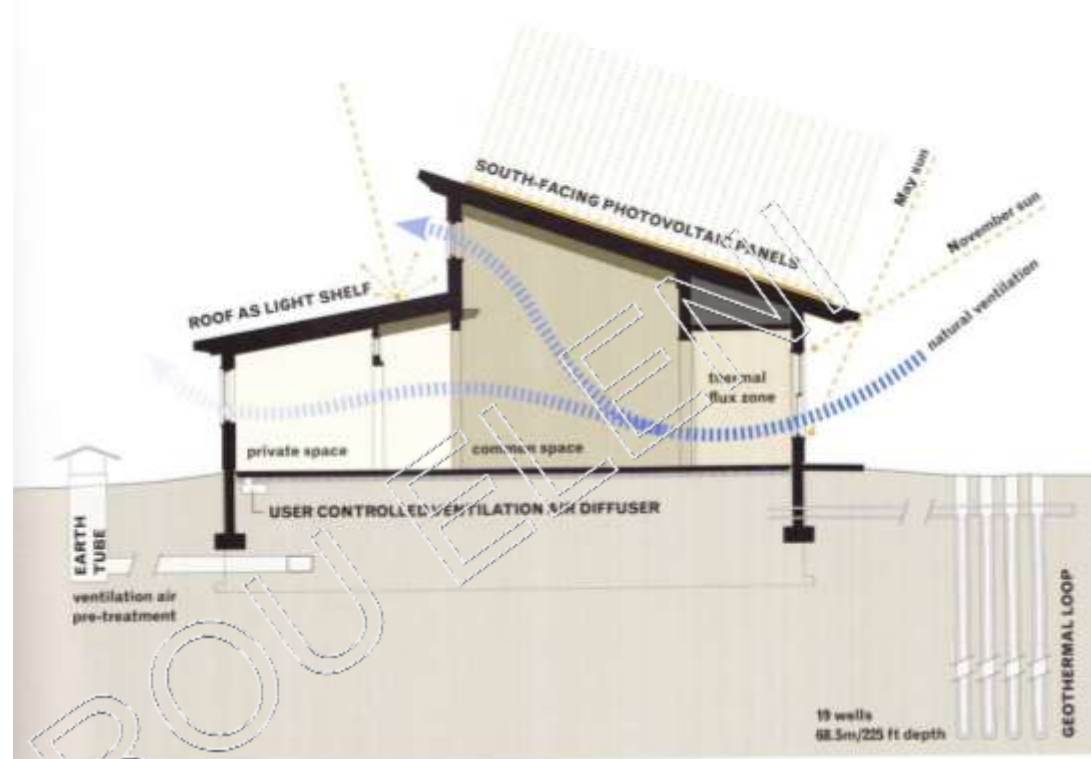
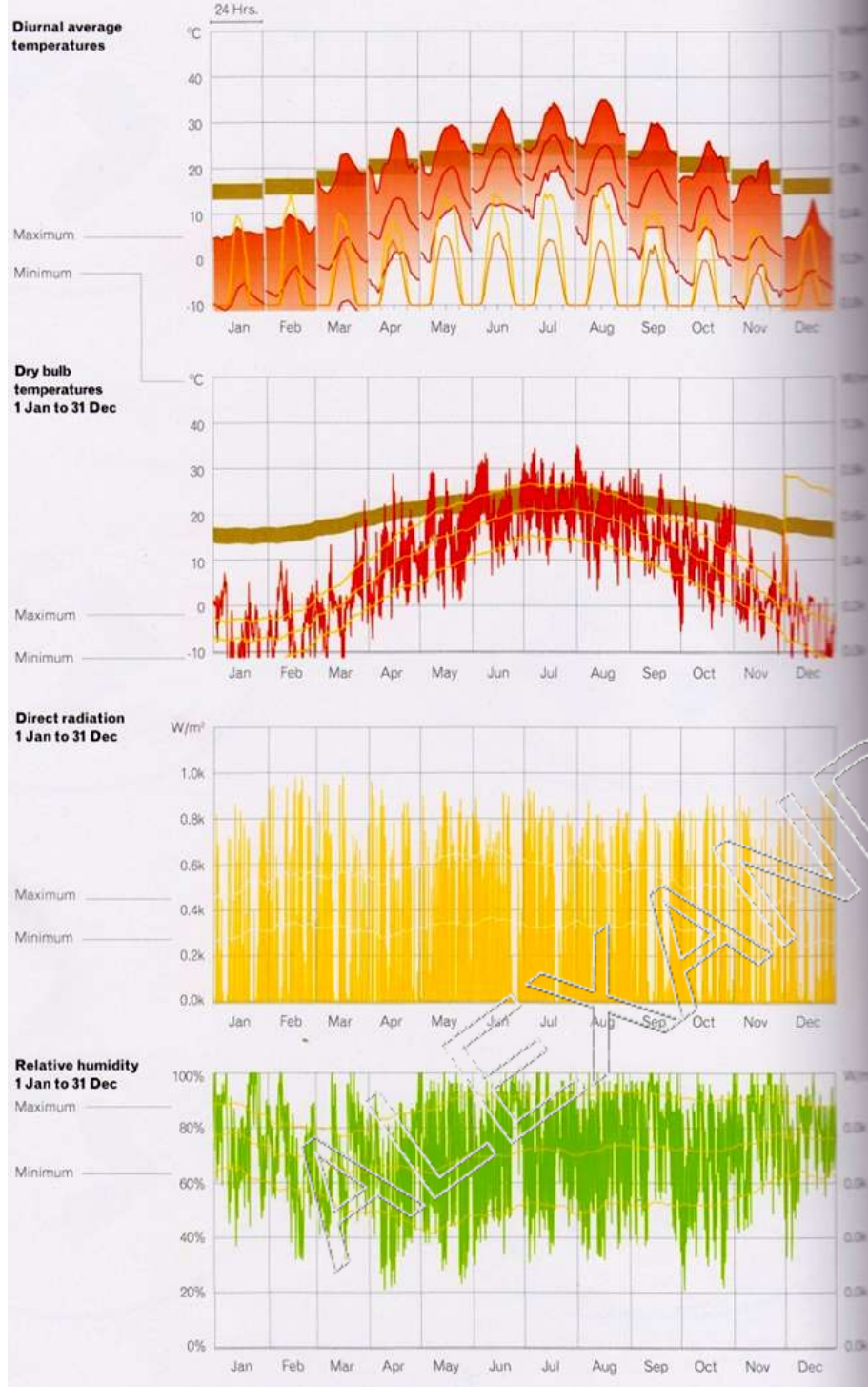


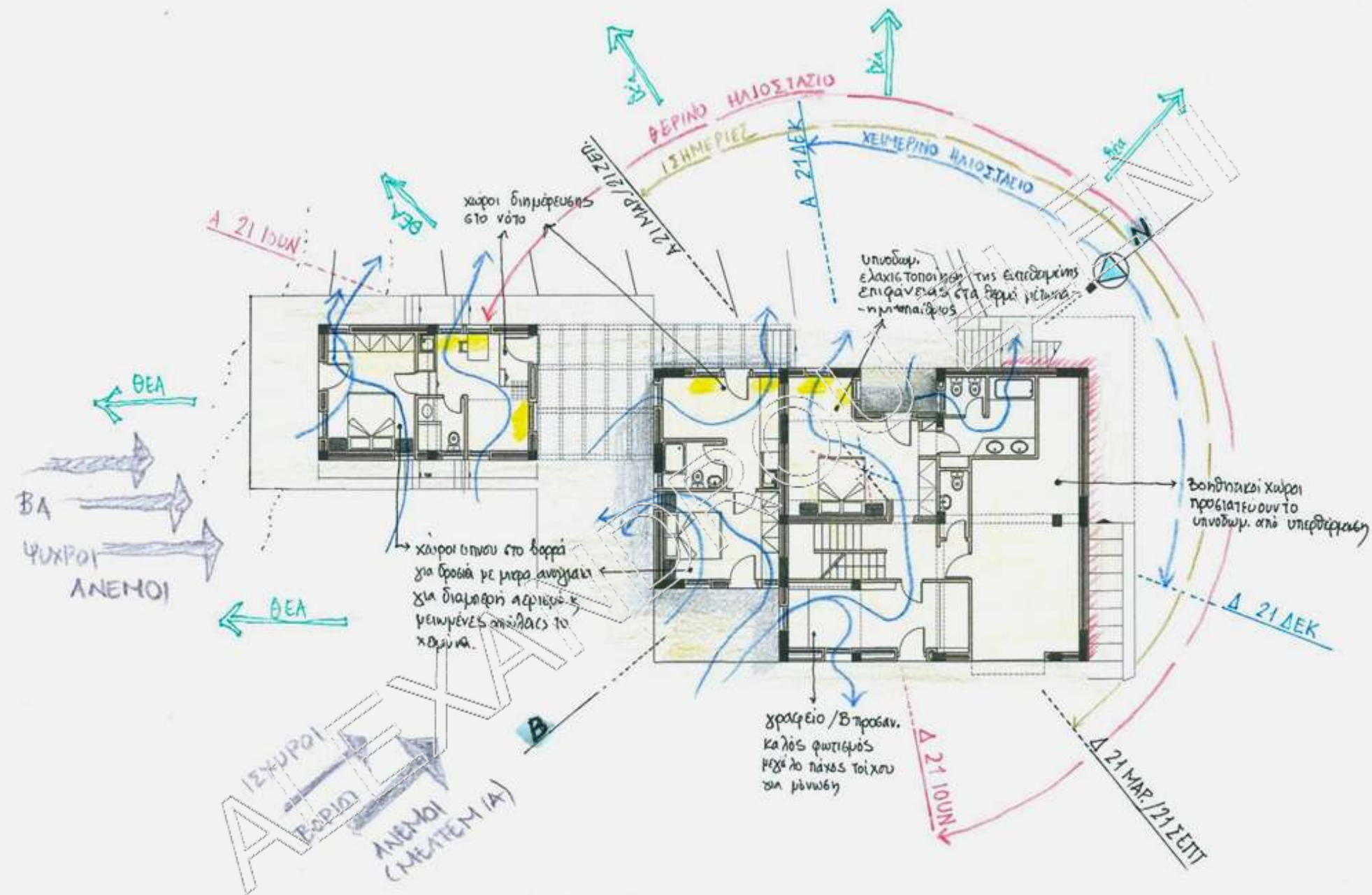
- **ΑΝΕΜΟΣ**
 - + φυσικός δροσισμός
 - ψύχος

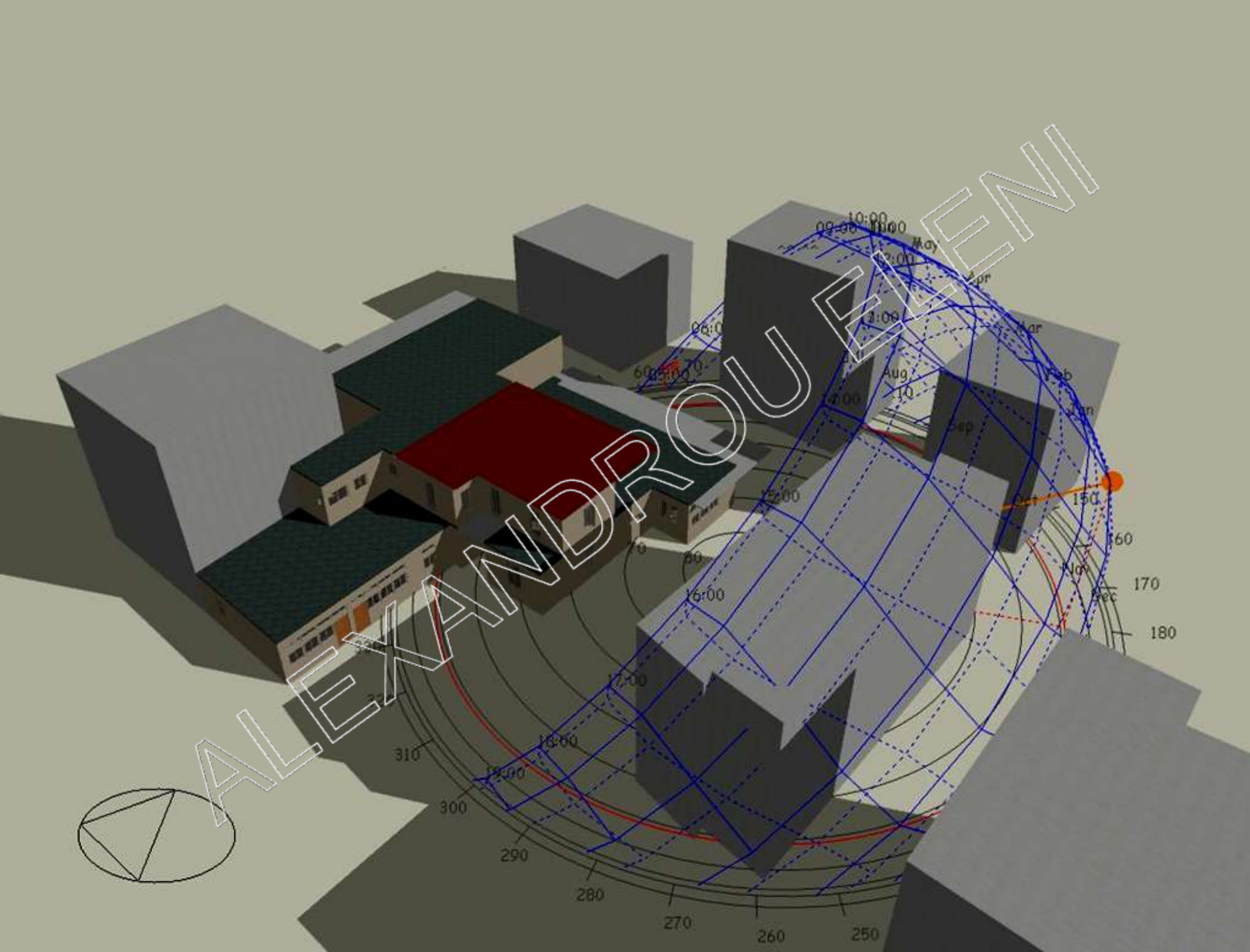


- **ΒΡΟΧΗ**
 - υγρασία

- **ΧΙΟΝΙ**





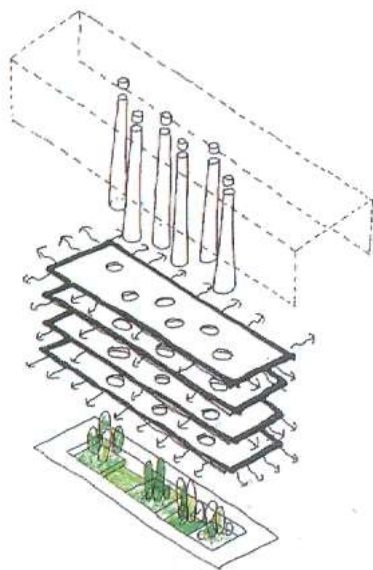


ΒΙΟΚΛΙΜΑΤΙΚΟΣ ΣΧΕΔΙΑΣΜΟΣ

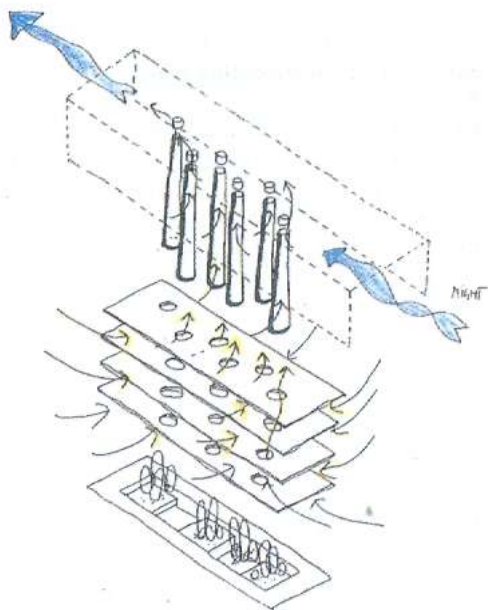
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 - ΑΜΕΣΟ ΔΙΑΜΟΡΦΩΜΕΝΟ ΠΕΡΙΒΑΛΛΟΝ (ΦΥΣΙΚΟ & ΔΟΜΗΜΕΝΟ)
 - ΠΡΟΣΑΝΑΤΟΛΙΣΜΟΣ ΚΑΙ ΑΞΙΟΠΟΙΗΣΗ ΦΥΣΙΚΩΝ ΑΝΑΝΕΩΣΙΜΩΝ ΠΟΡΩΝ
 - ΧΡΗΣΗ – ΛΕΙΤΟΥΡΓΙΚΕΣ ΑΠΑΙΤΗΣΕΙΣ
- 
- ΣΧΕΔΙΑΣΜΟΣ ΚΤΙΡΙΟΥ ΚΑΙ ΥΠΑΙΘΡΙΩΝ ΧΩΡΩΝ
 - ΣΧΕΔΙΑΣΜΟΣ ΚΕΛΥΦΟΥΣ - ΘΕΡΜΙΚΗ ΘΩΡΑΚΙΣΗ
 - ΣΚΙΑΣΜΟΣ
 - ΦΥΤΕΥΣΗ
 - ΗΛΙΑΣΜΟΣ
 - ΑΕΡΙΣΜΟΣ



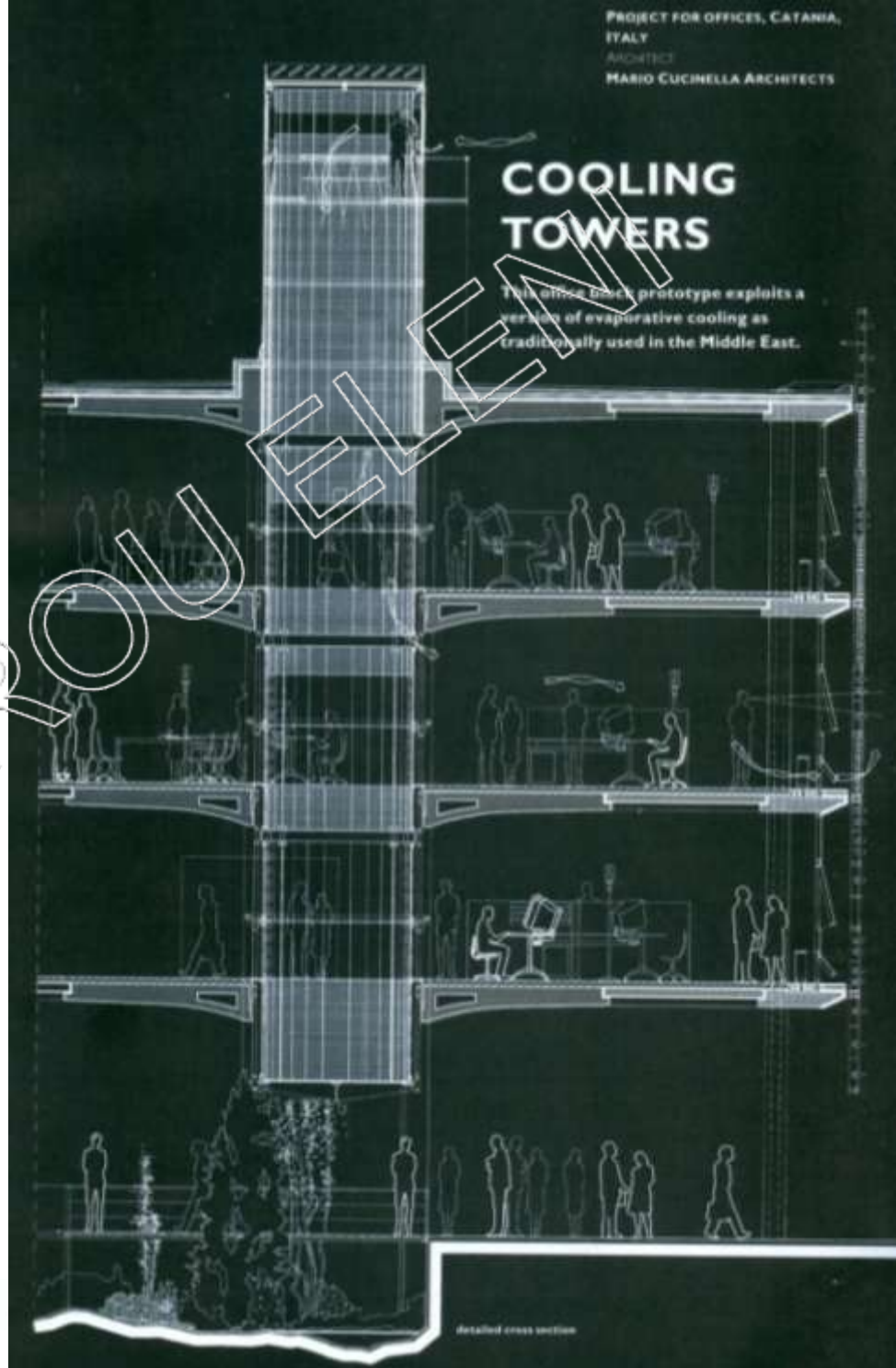
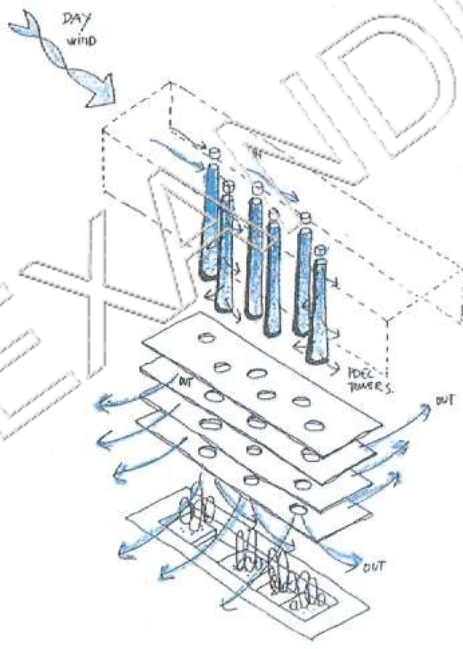
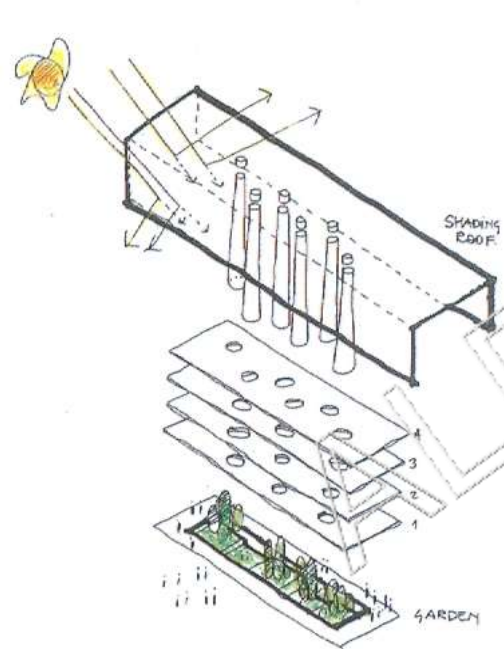


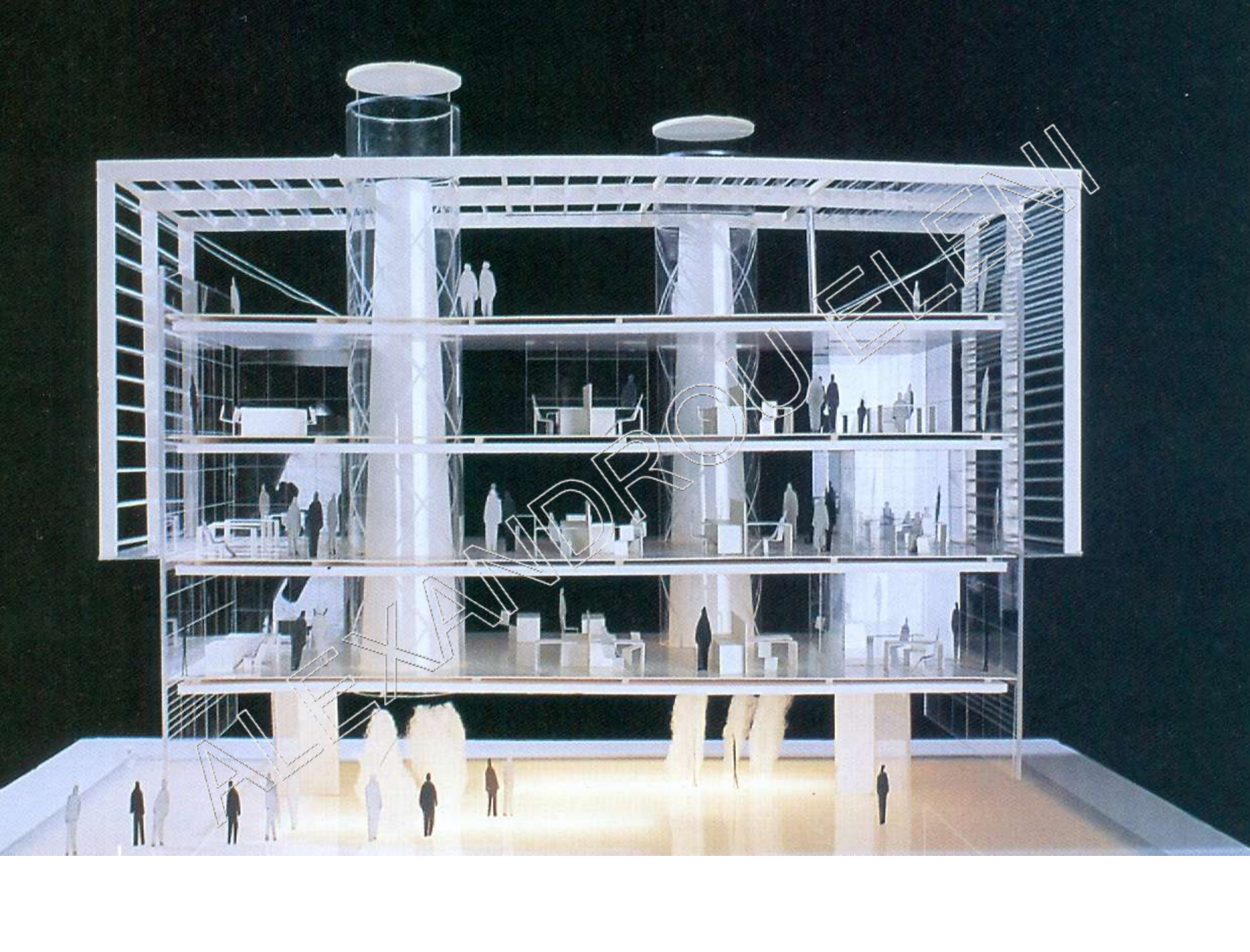


thermal mass study



night ventilation through stack effect

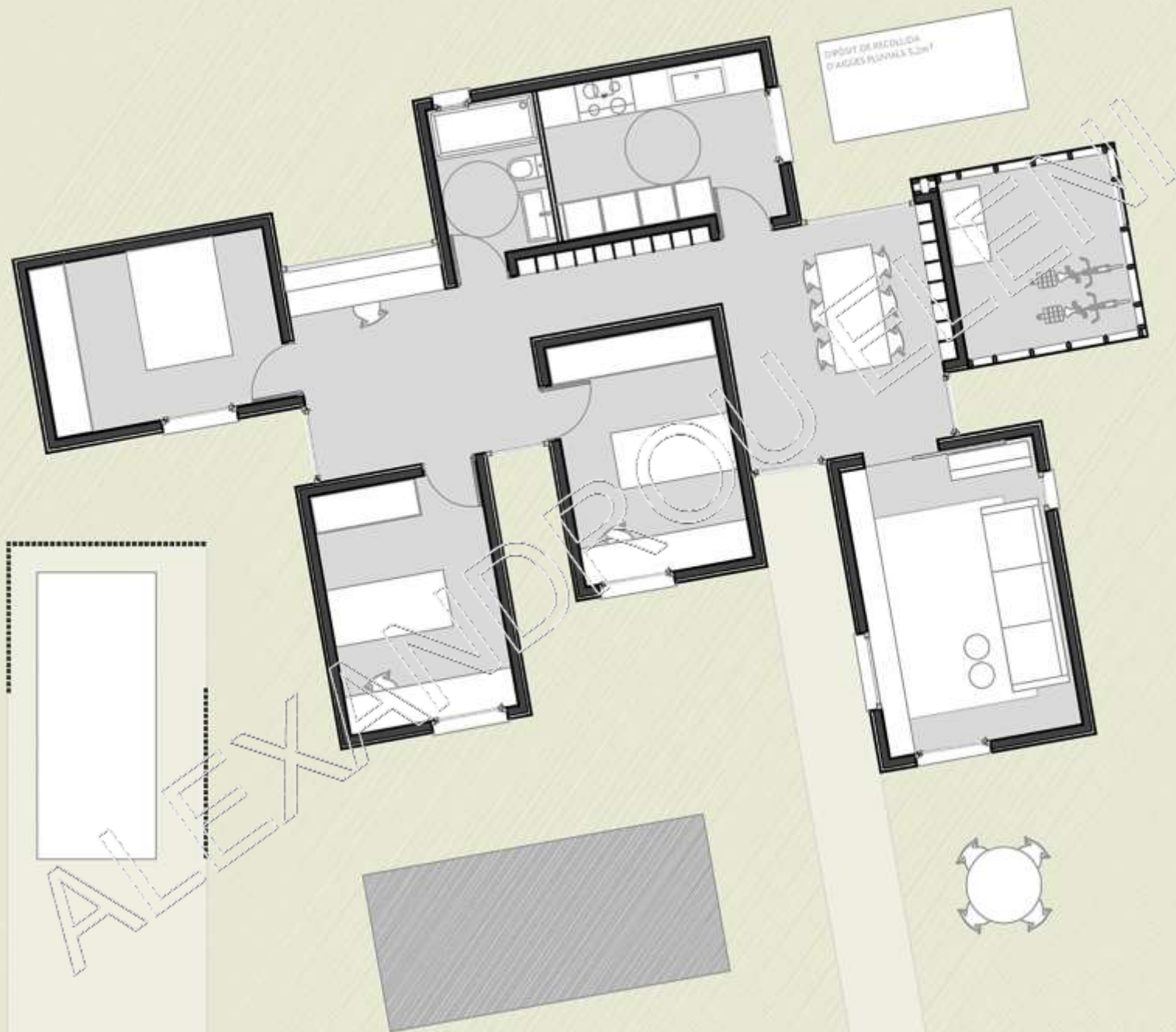




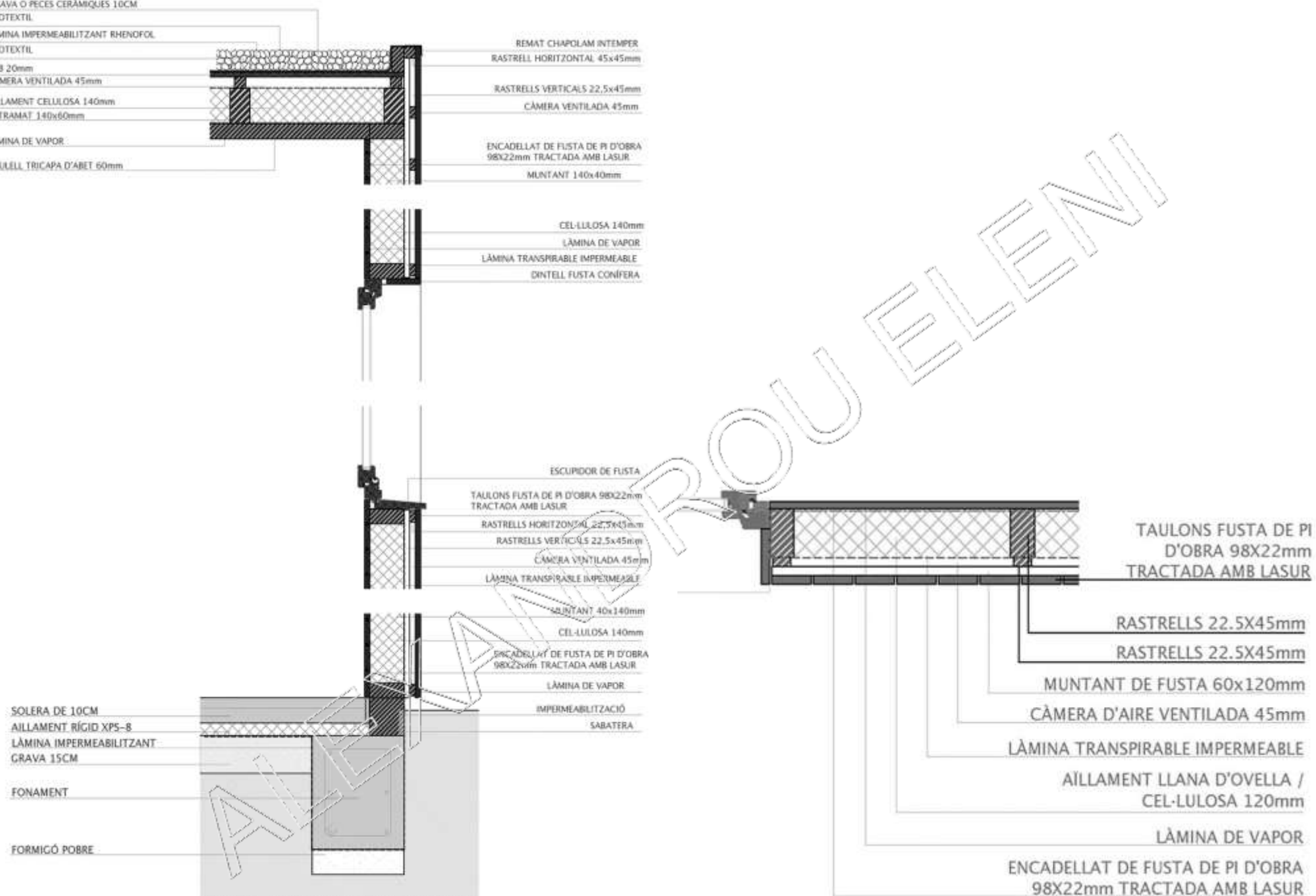
BIOCLIMATIC HOUSE - SPAIN

AR.. ALVENTOSA MORELL



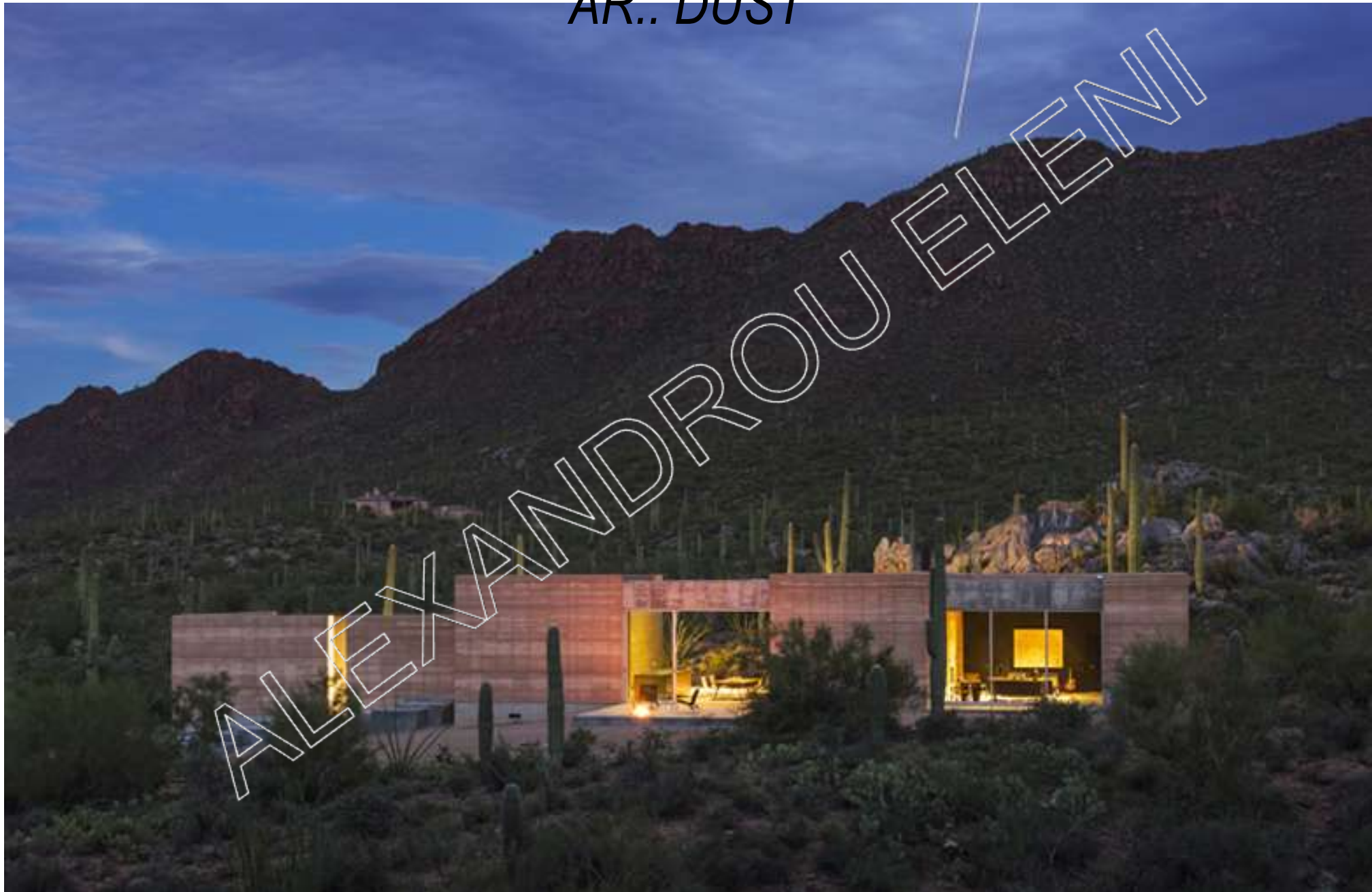


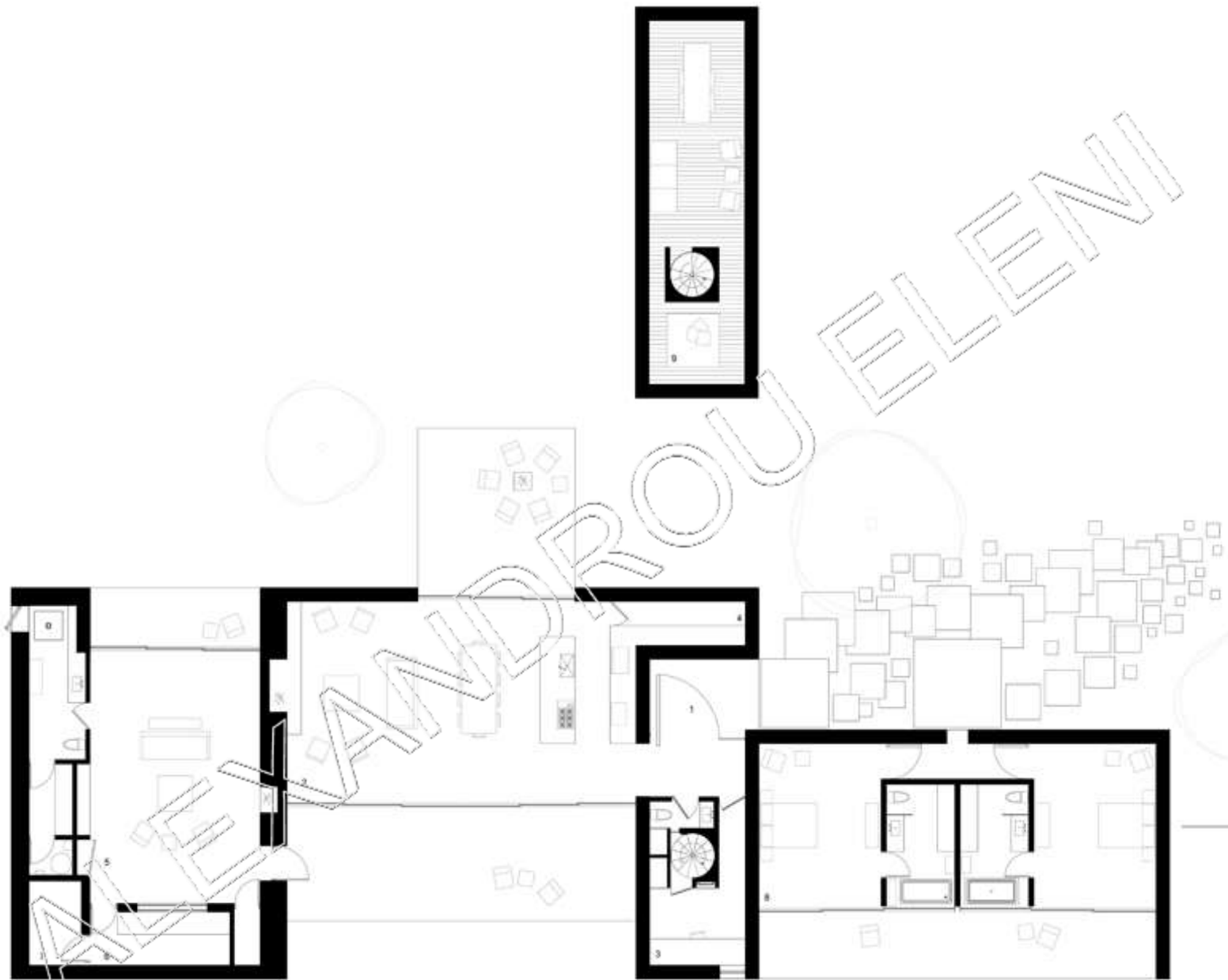




MOUNTAIN RETREAT– ARIZONA, USA

AR.. DUST





1. Entry
2. Living
3. Office
4. Pantry
5. Music Studio
6. Control Booth
7. Vocal Booth
8. Bedroom
9. Roof Deck



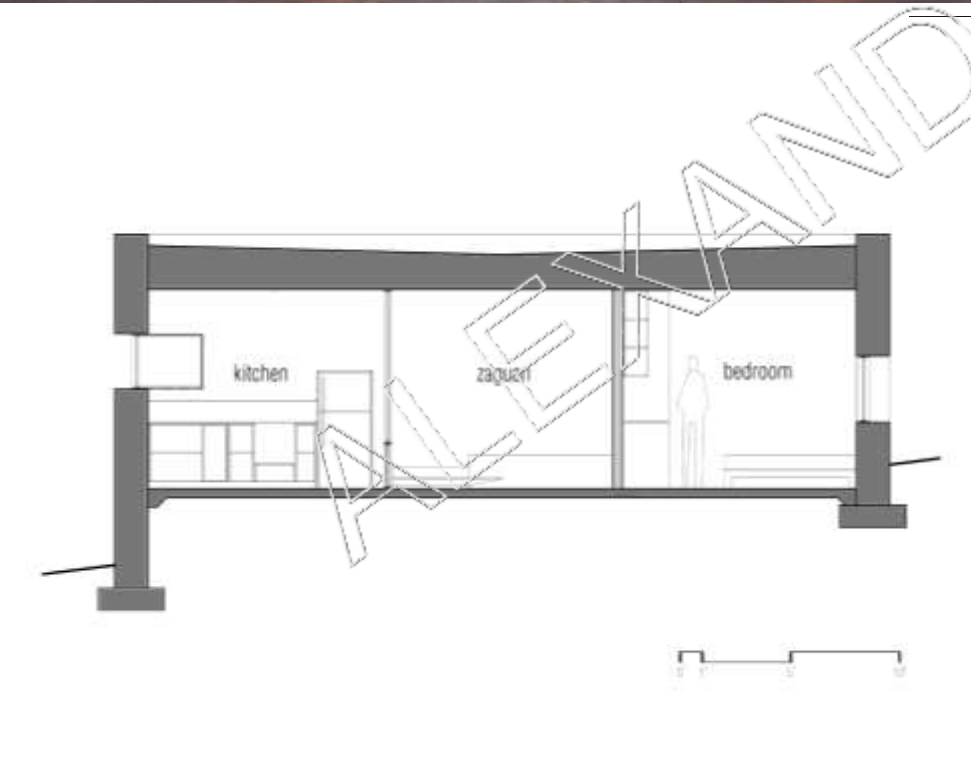
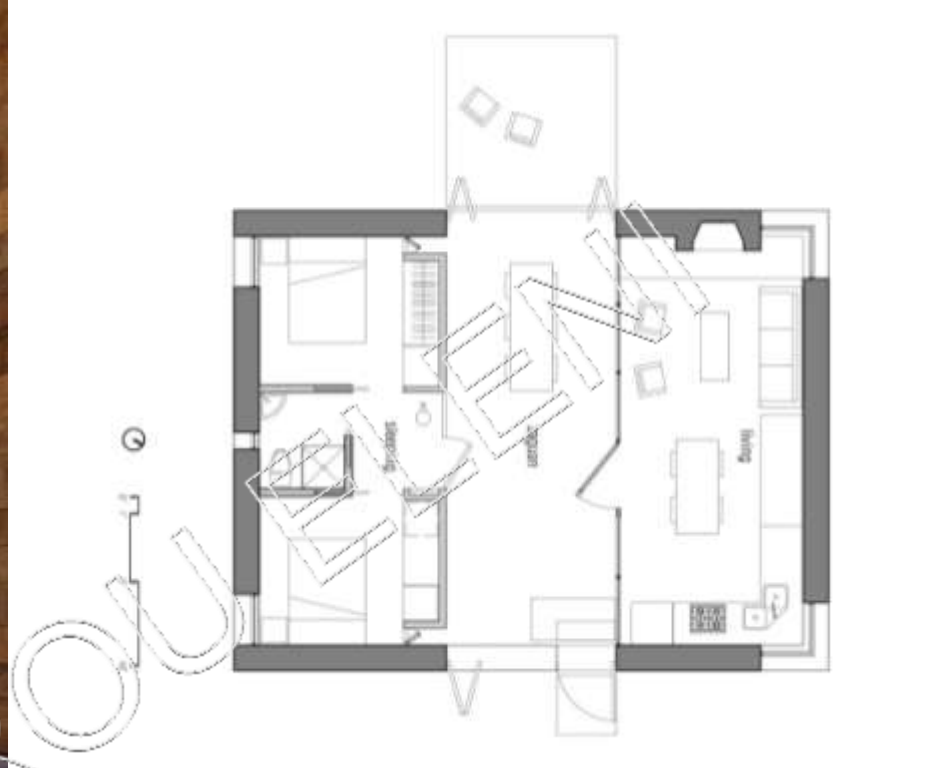


© JEFF GOLDBERG / ESTO

CASA CALDERA – ARIZONA, USA

AR. DUST





ΣΧΟΛΕΙΟ – LADAKH, ΙΝΔΙΑ

AR. ARUP ASSOCIATES





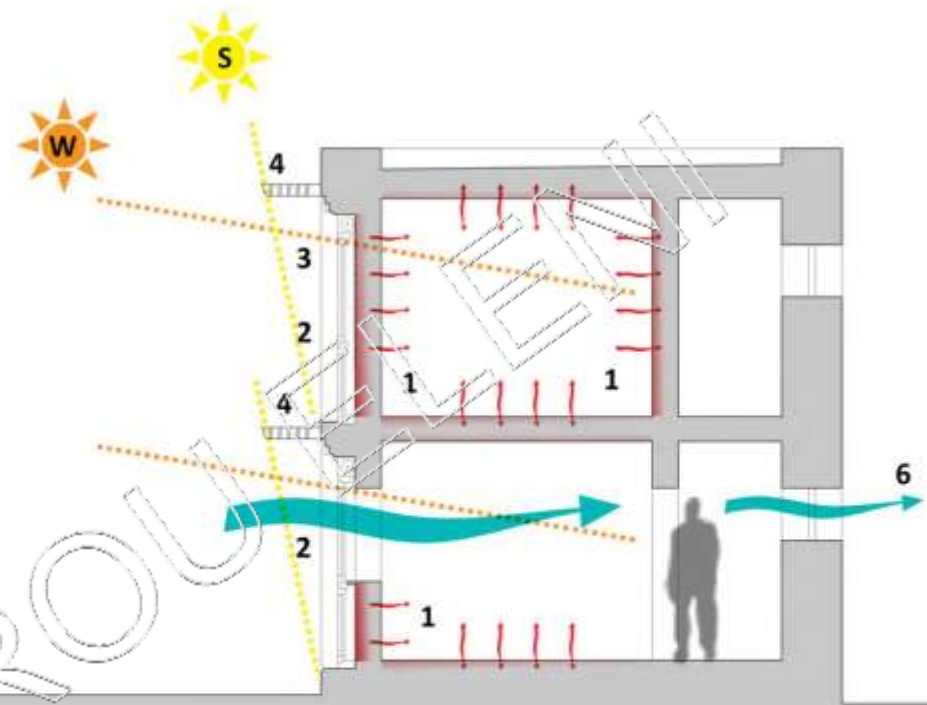
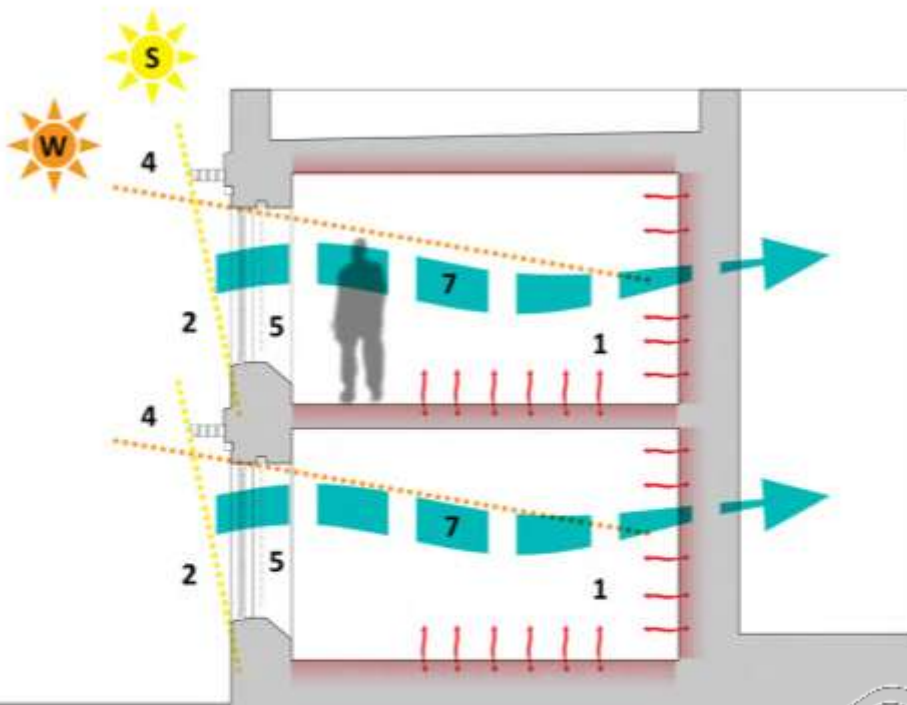
Copyright 2012 Martin Knap



Copyright 2012 Martin Knap

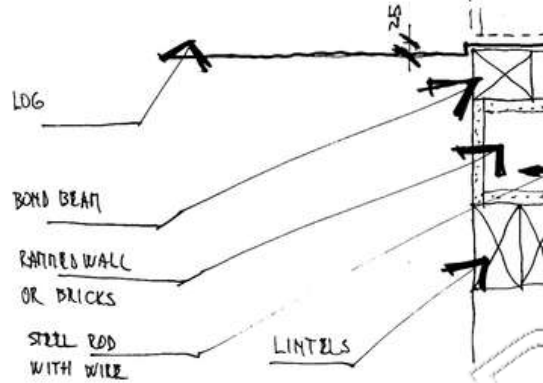


Copyright 2012 Martin Knap



ALEXANDROU

WOODEN FLOOR
JOISTS 75x75 @ 600
SAND/ SOIL
INSULATION
TWIX



WOODEN FLOOR

BEAM

WOODEN BEAM/
LINTEL/
BOND BEAM

ENHANCED
LADAKHI
WINDOW/
DECORATION

CURTAIN

COLUMN
BEYOND

WOODEN SILL

WOODEN FLOOR

WINDOW

RAINED EARTH
WALL

AIR GAP

MUD BRICKS

ALEXANDR

UNIVERSITY BUILDING IN NORWICH– UK

AR.. ARCHITYPE







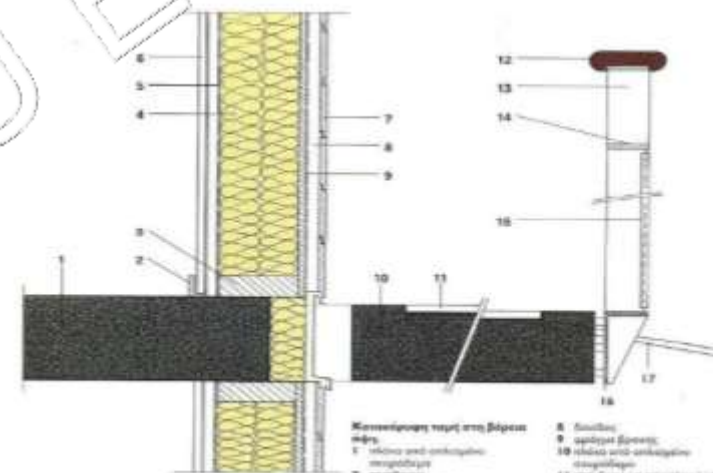
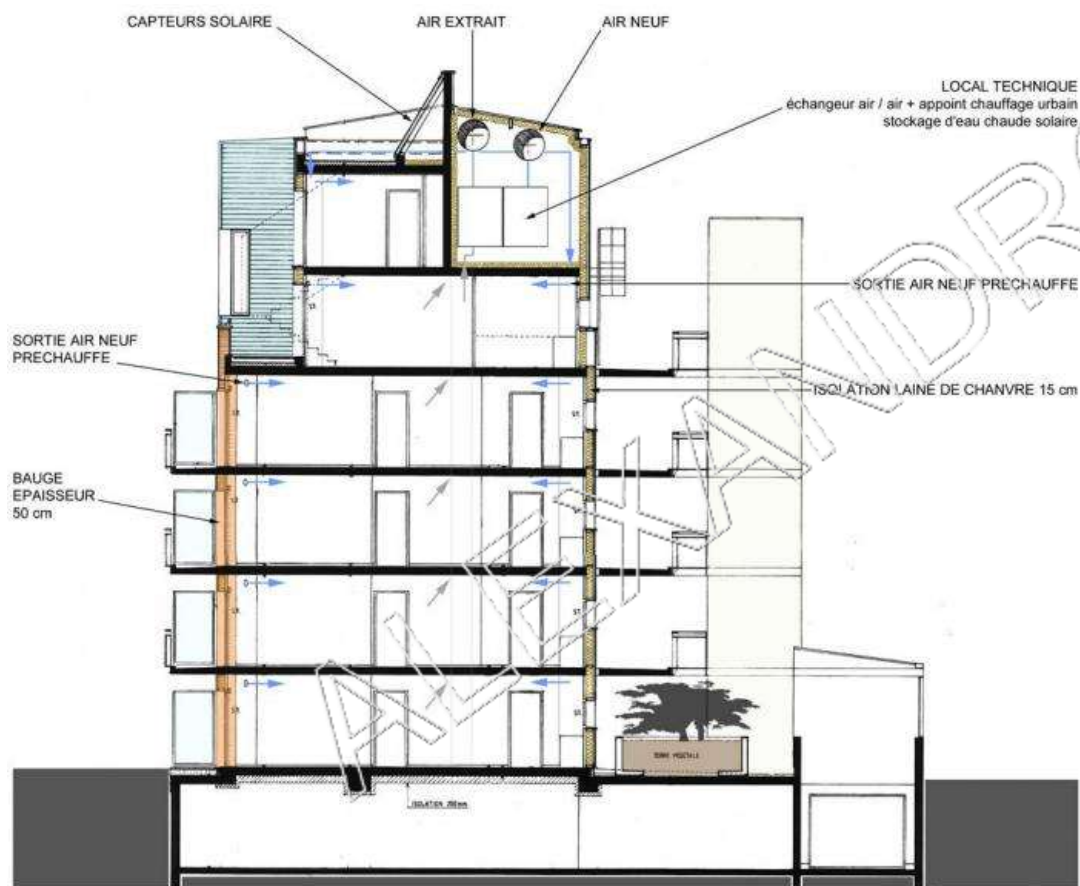


SALVATIERRA – REN ΓΑΛΛΙΑ

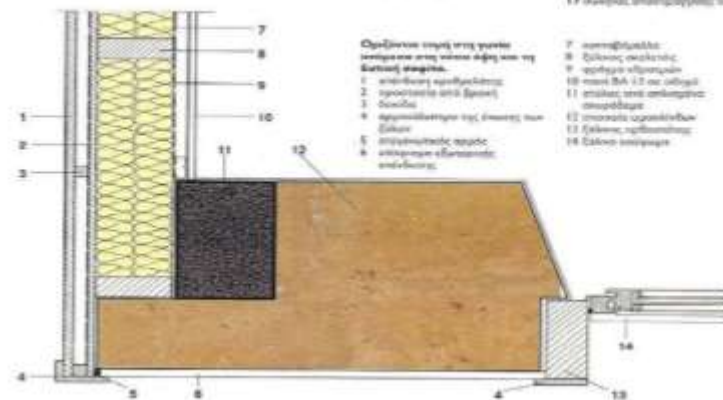
AR.. JEAN YVES BARRIERS







- Κατασκευές τοιχίου στην βόρεια όψη**
1. σιμεντοκονία από αντιστάσεις
 2. σιμεντοκονία
 3. ξύλινη σκελετοειδής
 4. υδροαπορροφητική
 5. αεριοαπορροφητική
 6. γυψοσανίδες 12,5 mm
 7. αεριοαπορροφητική από βελούδο
 8. ξύλινη
 9. αεριοαπορροφητική
 10. σιμεντοκονία από αντιστάσεις
 11. σιμεντοκονία από αντιστάσεις
 12. σιμεντοκονία από αντιστάσεις
 13. σιμεντοκονία από αντιστάσεις
 14. σιμεντοκονία από αντιστάσεις
 15. σιμεντοκονία από αντιστάσεις
 16. σιμεντοκονία από αντιστάσεις
 17. σιμεντοκονία από αντιστάσεις



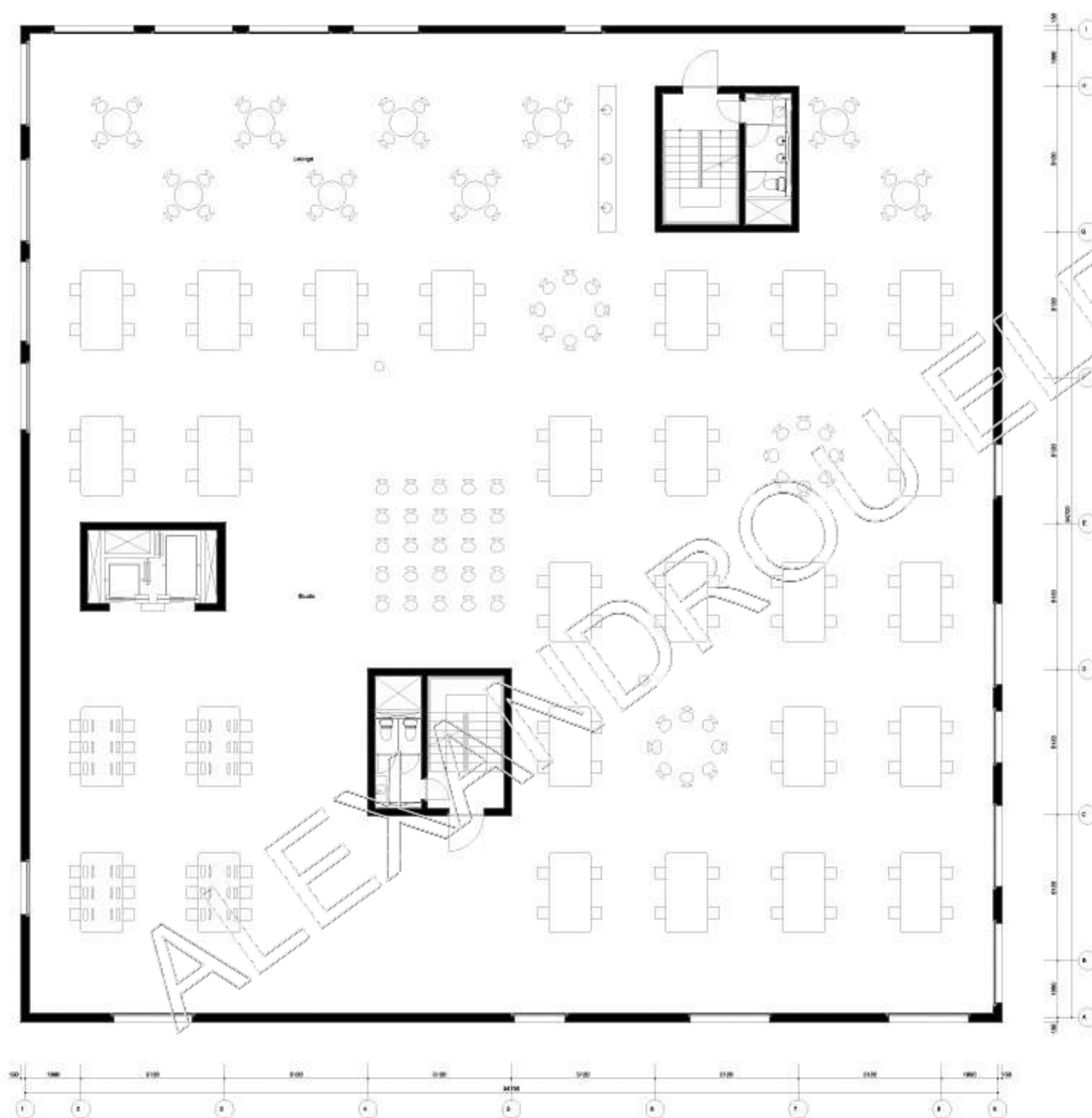
- Οροφή στην βόρεια όψη του κτιρίου**
1. σιμεντοκονία από αντιστάσεις
 2. σιμεντοκονία
 3. ξύλινη σκελετοειδής
 4. υδροαπορροφητική
 5. αεριοαπορροφητική
 6. γυψοσανίδες 12,5 mm
 7. αεριοαπορροφητική από βελούδο
 8. ξύλινη
 9. αεριοαπορροφητική
 10. σιμεντοκονία από αντιστάσεις
 11. σιμεντοκονία από αντιστάσεις
 12. σιμεντοκονία από αντιστάσεις
 13. σιμεντοκονία από αντιστάσεις
 14. σιμεντοκονία από αντιστάσεις

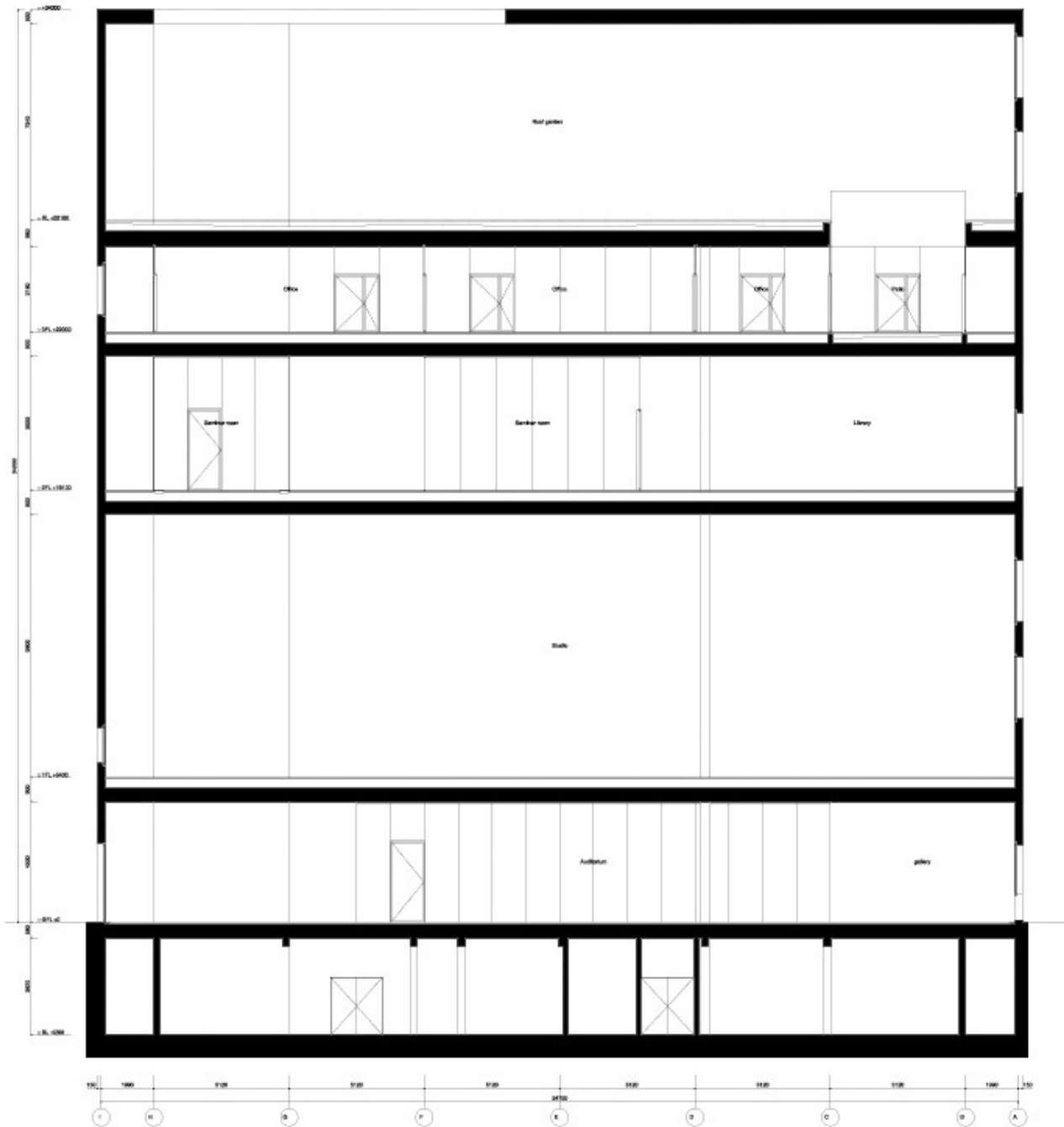
ZOLLVEREIN SCHOOL OF MANAGEMENT – ESSEN

AR.. SANNA













Zollverein School of Management and Design

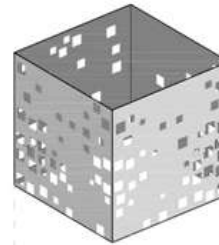
Essen, Alemania

Kazuyo Sejima y Ryue Nishizawa / Sanaa

Año 2006

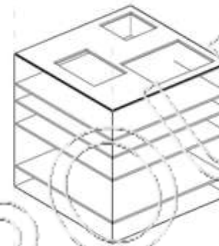
Envoltura

La envoltura del edificio funciona a su vez como estructura. Las aberturas de las fachadas crean una inusual interacción entre interior-externo. El tamaño y la posición se estudiaron en función de la orientación del edificio, así como la altura de las plantas y su uso.



Estructura

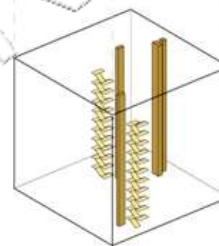
Las losas se apoyan en el perímetro del edificio y en los tres núcleos de comunicaciones. Las fachadas y los núcleos son de hormigón.



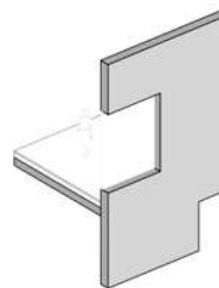
Circulaciones

El edificio consta de tres núcleos de comunicación. Dos de ellos son iguales, del mismo tamaño y con un ascensor y unas escaleras, y el otro tiene dos montacargas y espacio para almacenamiento.

Escaleras
Ascensores



Detalle de fachada

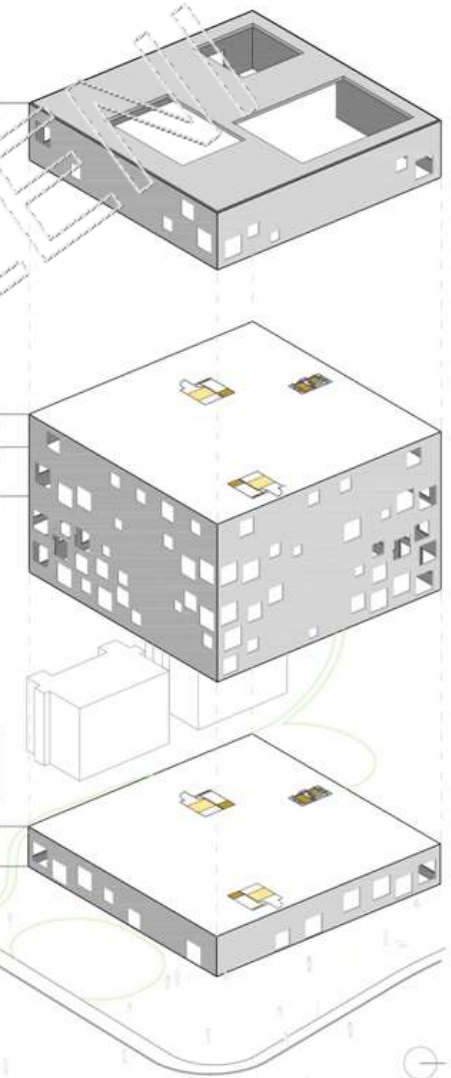


Esquema del conjunto

Cubierta
+ 34.00 m

P. 4
+ 27.20 m
P. 3
+ 22.70 m
P. 2
+ 16.70 m

P. 1
+ 5.50 m
P. Baja
+ 0.00 m



KARELA OFFICE PARK- ΑΘΗΝΑ

AR. M. KOKKINOY + A. ΚΟΥΡΚΟΥΛΑΣ







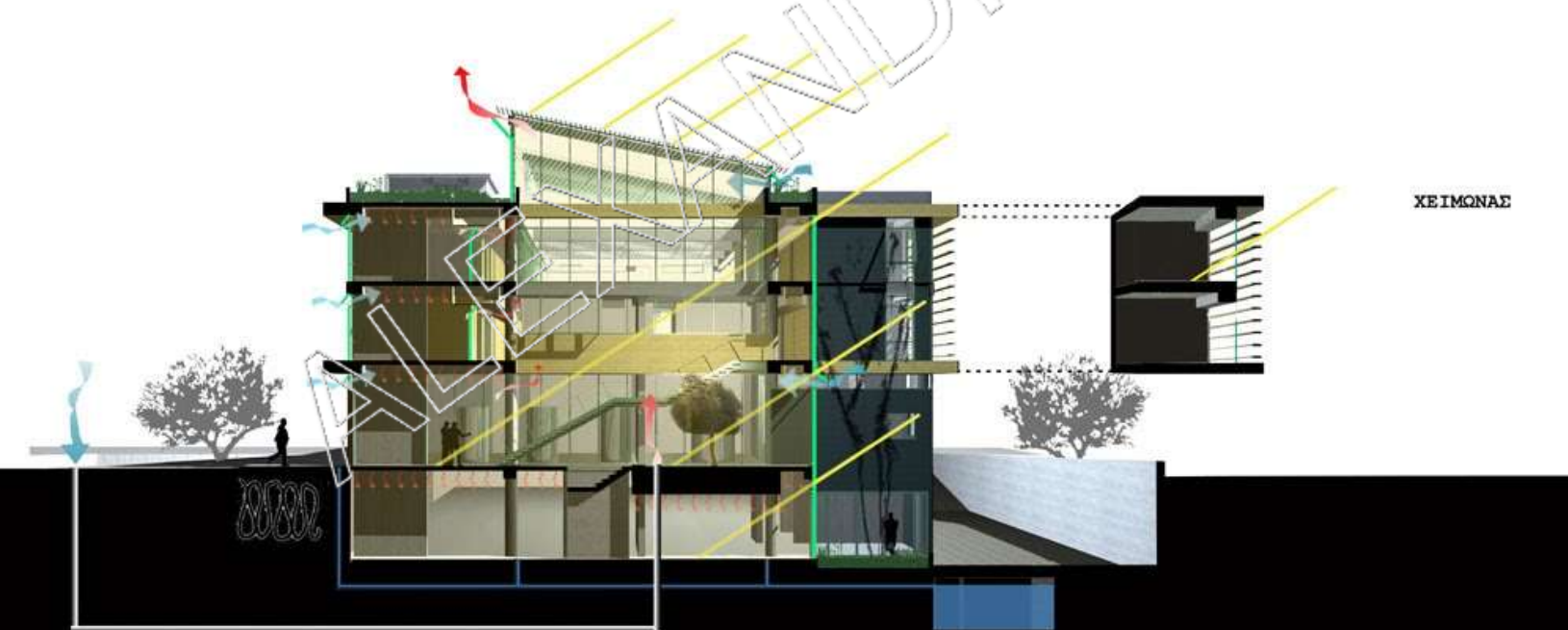
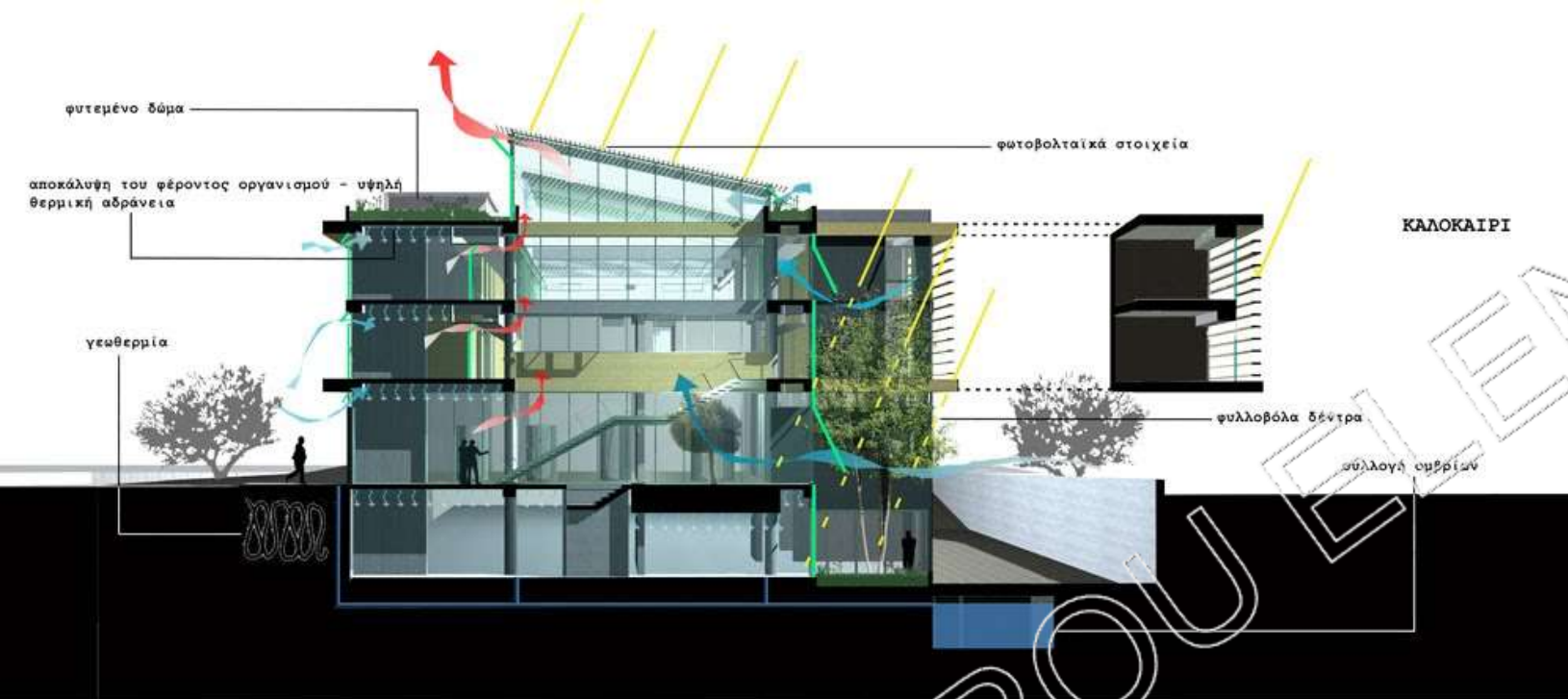


ΒΙΟΜΗΧΑΝΙΚΟ ΚΤΙΡΙΟ – ΑΤΤΙΚΗ

ΑΡ. Σ. ΠΑΝΤΕΛΙΑ, Ζ. ΜΠΑΛΑΜΠΑΝΗ, Ν. ΓΕΩΡΓΟΥΣΗΣ







ICTA-ICP UAB RESEARCH CENTER- BARCELONA

AR. H ARQUITECTES

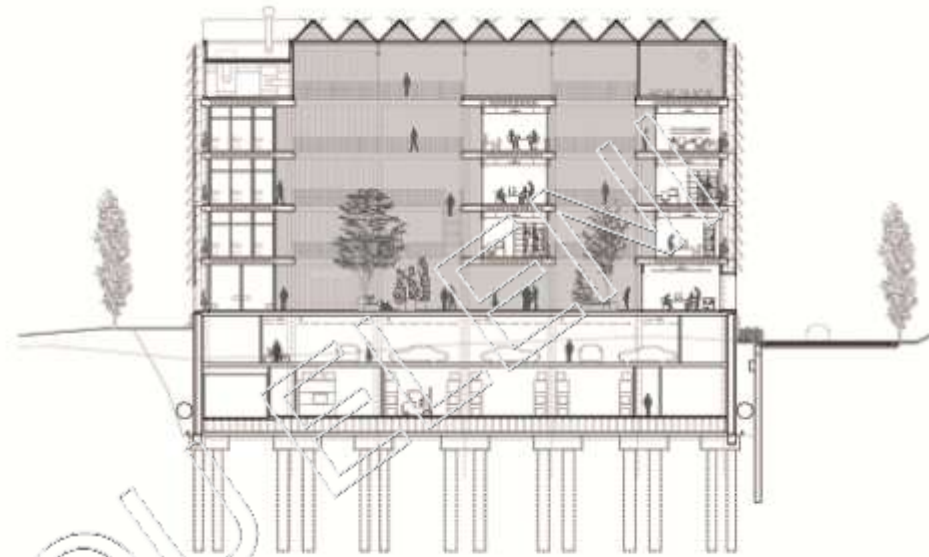






FIRST FLOOR / PLANTA PRIMER

1:100



SECTION 1-1

1:100



SECOND FLOOR / PLANTA SEGON

1:100

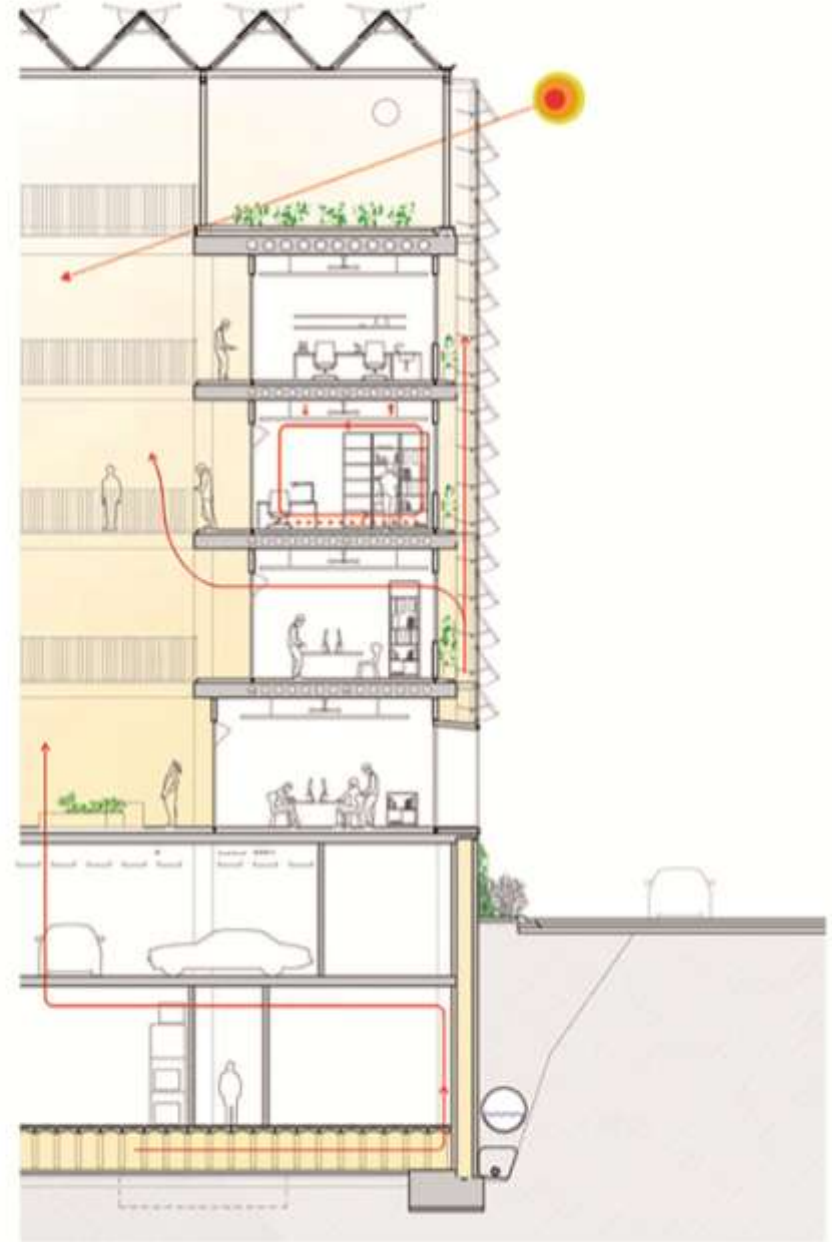


ELEVATION 2-2

1:100



SUMMER | ESTIU

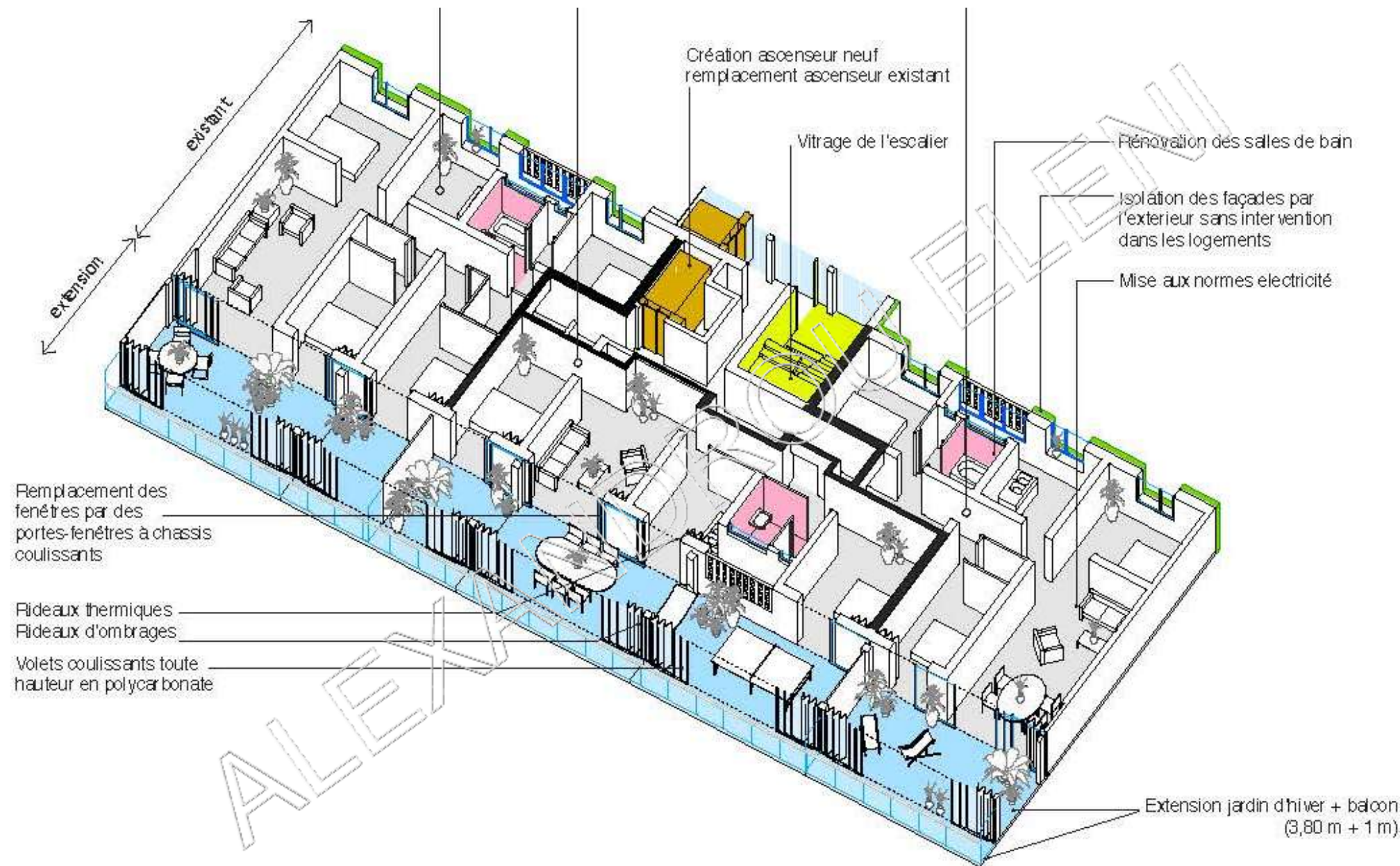


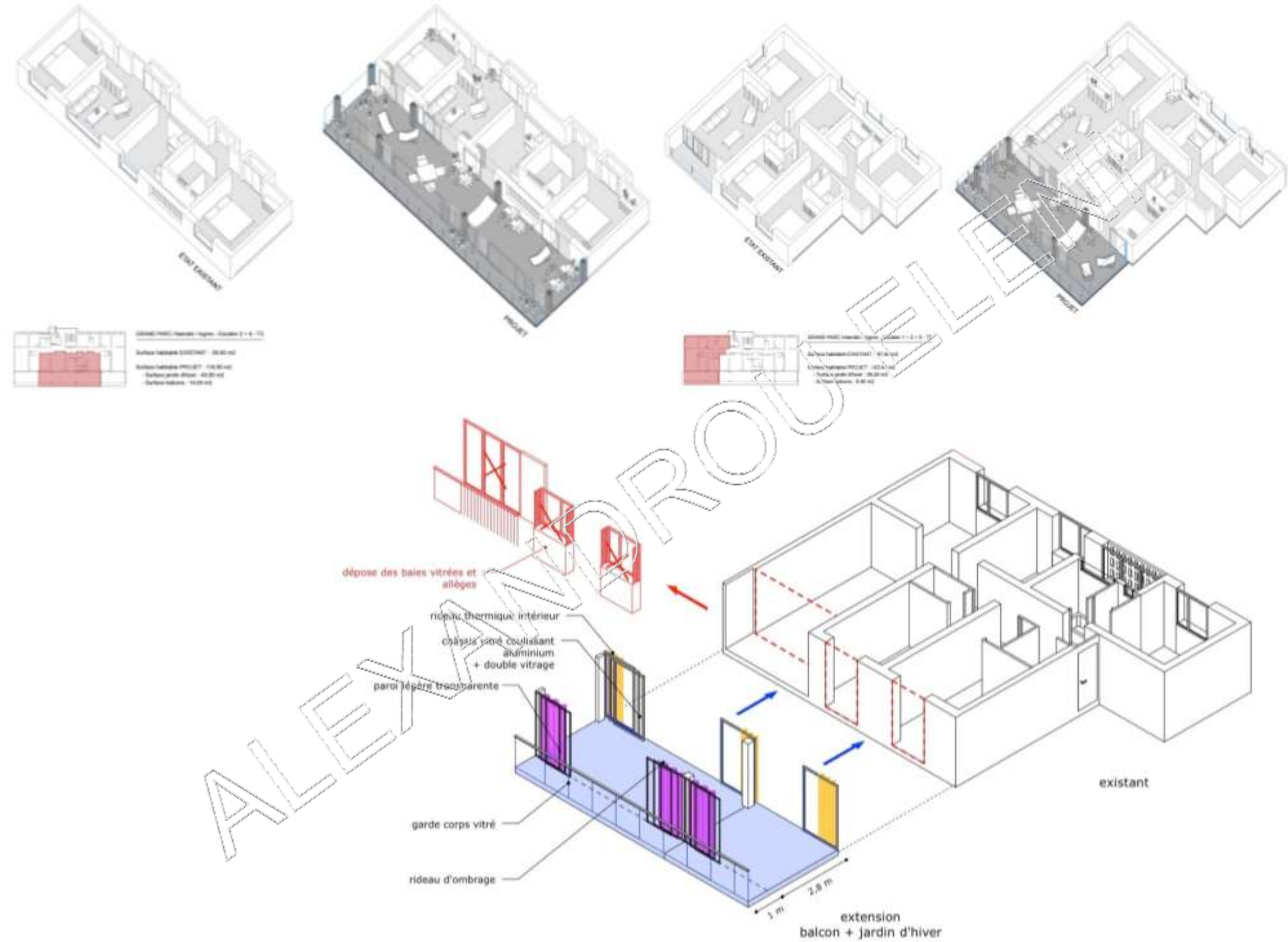
WINTER | HIVERN

LE GRAND PARC, BORDEAUX - ΓΑΛΛΙΑ

AR.. F. DRUOT & LACATON - VASSAL



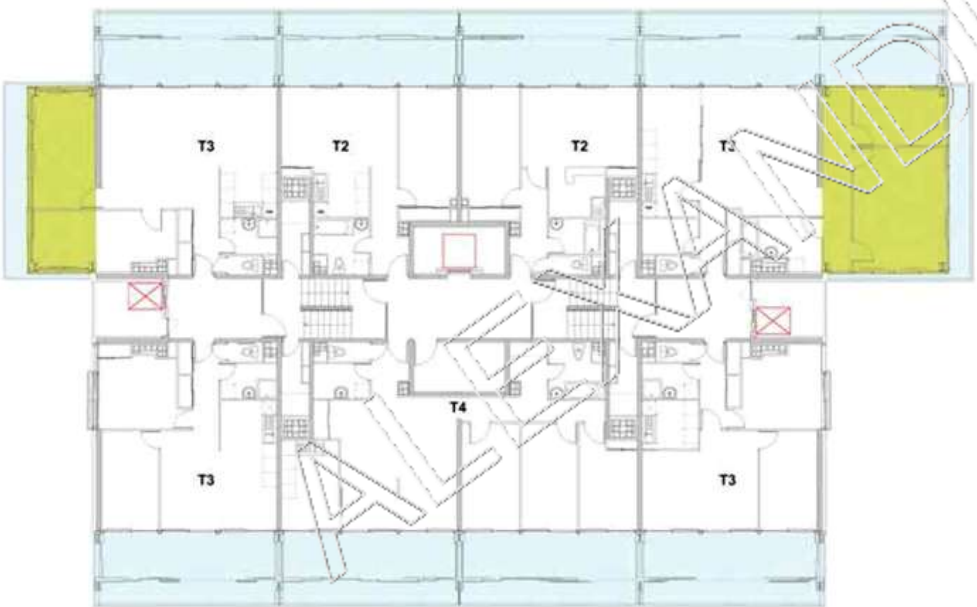




TOUR BOIS LE PRETRE, PARIS - ΓΑΛΛΙΑ

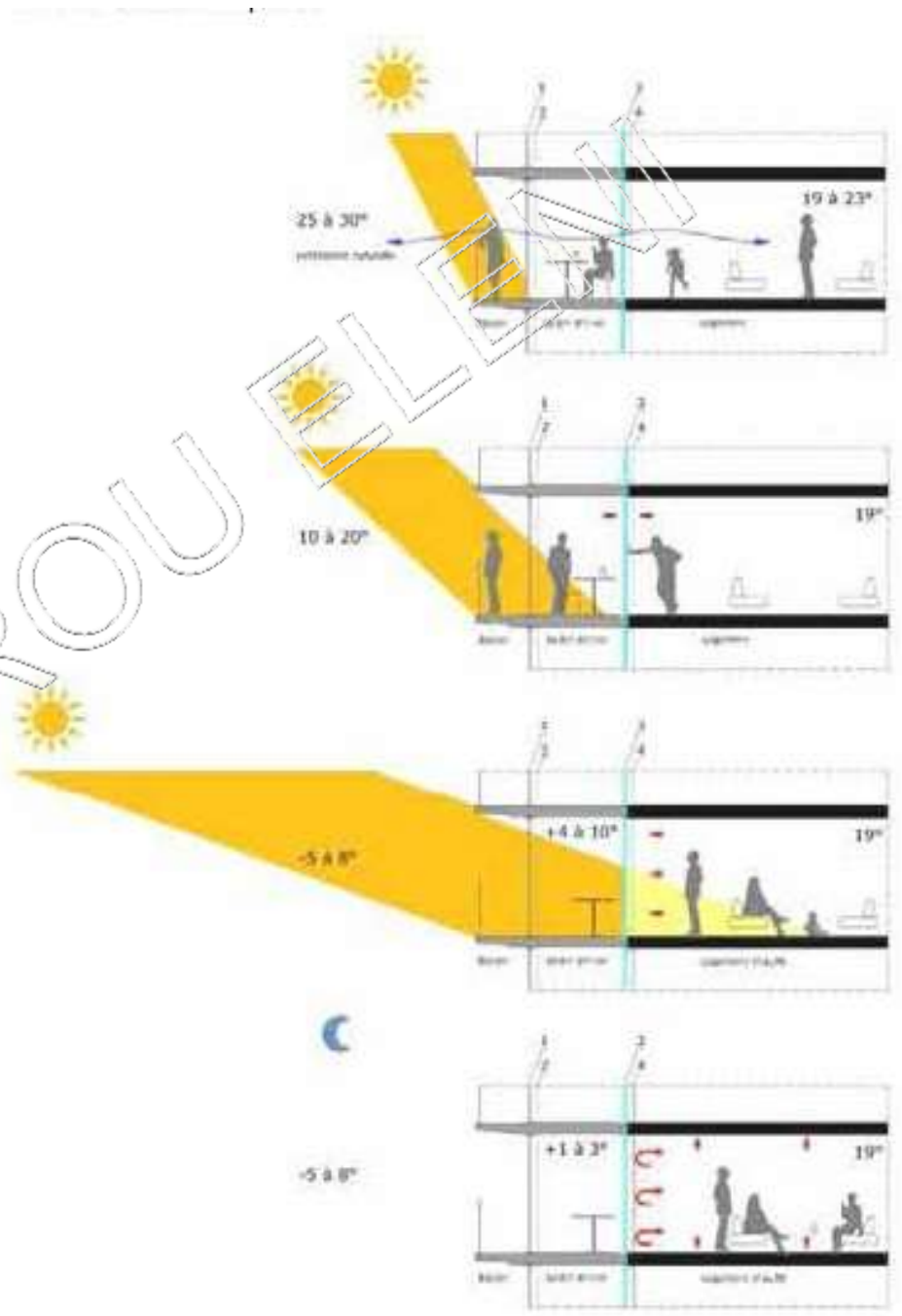
AR.. F. DRUOT & LACATON - VASSAL

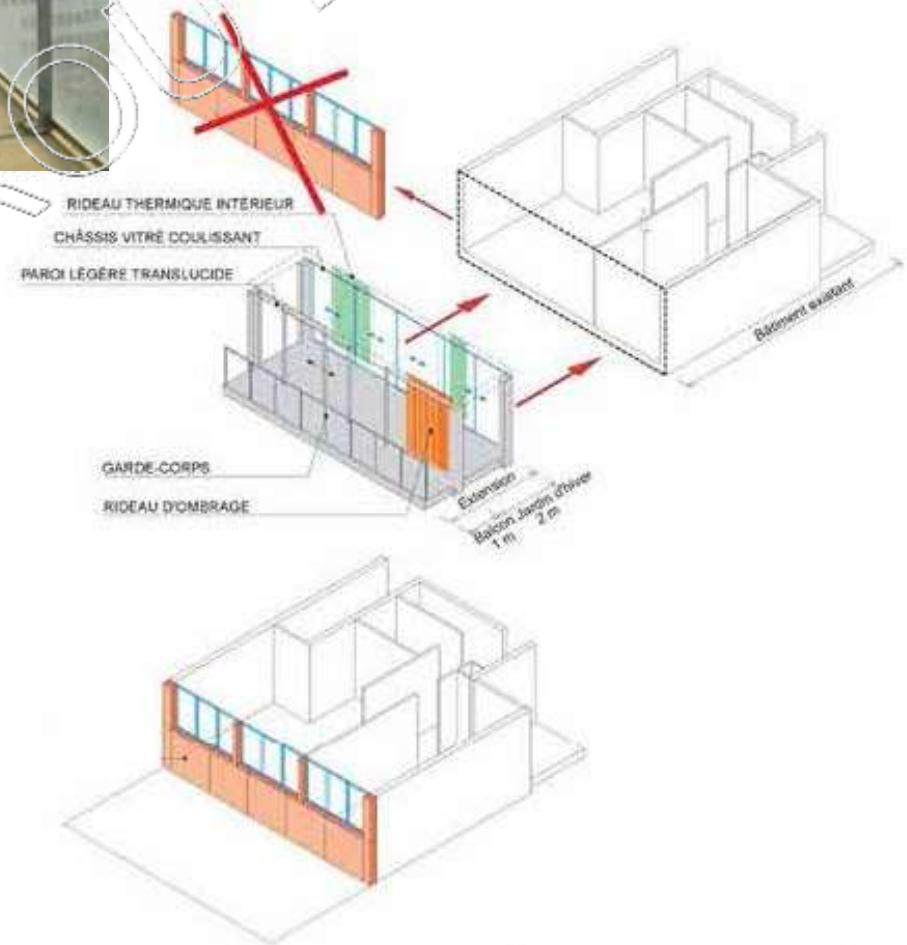


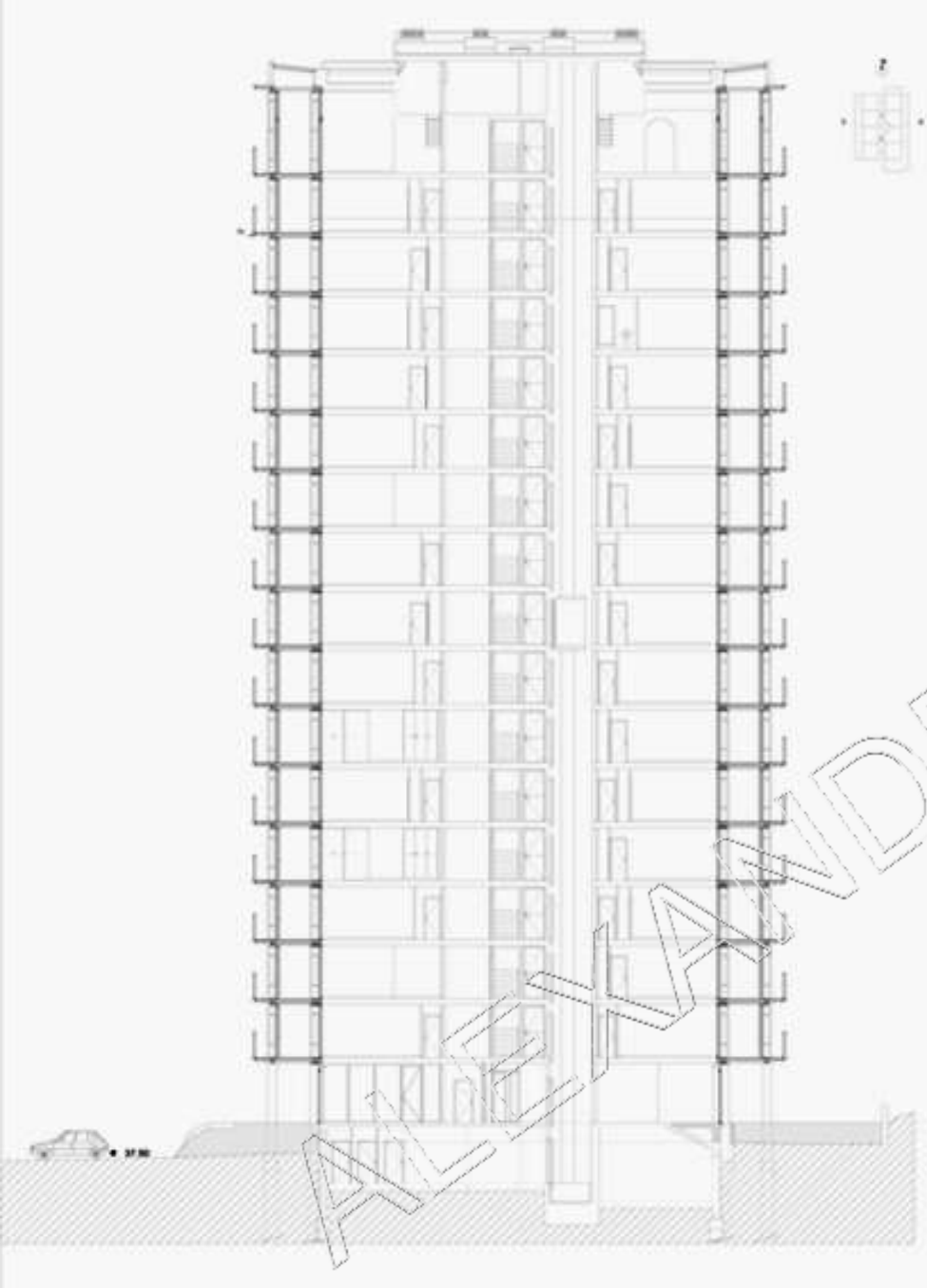


EXTENSIONS: jadis d'hiver
EXTENSIONS: extensions chauffées
ASCENSEURS CREES: pignon nord pignon sud

0 15 30







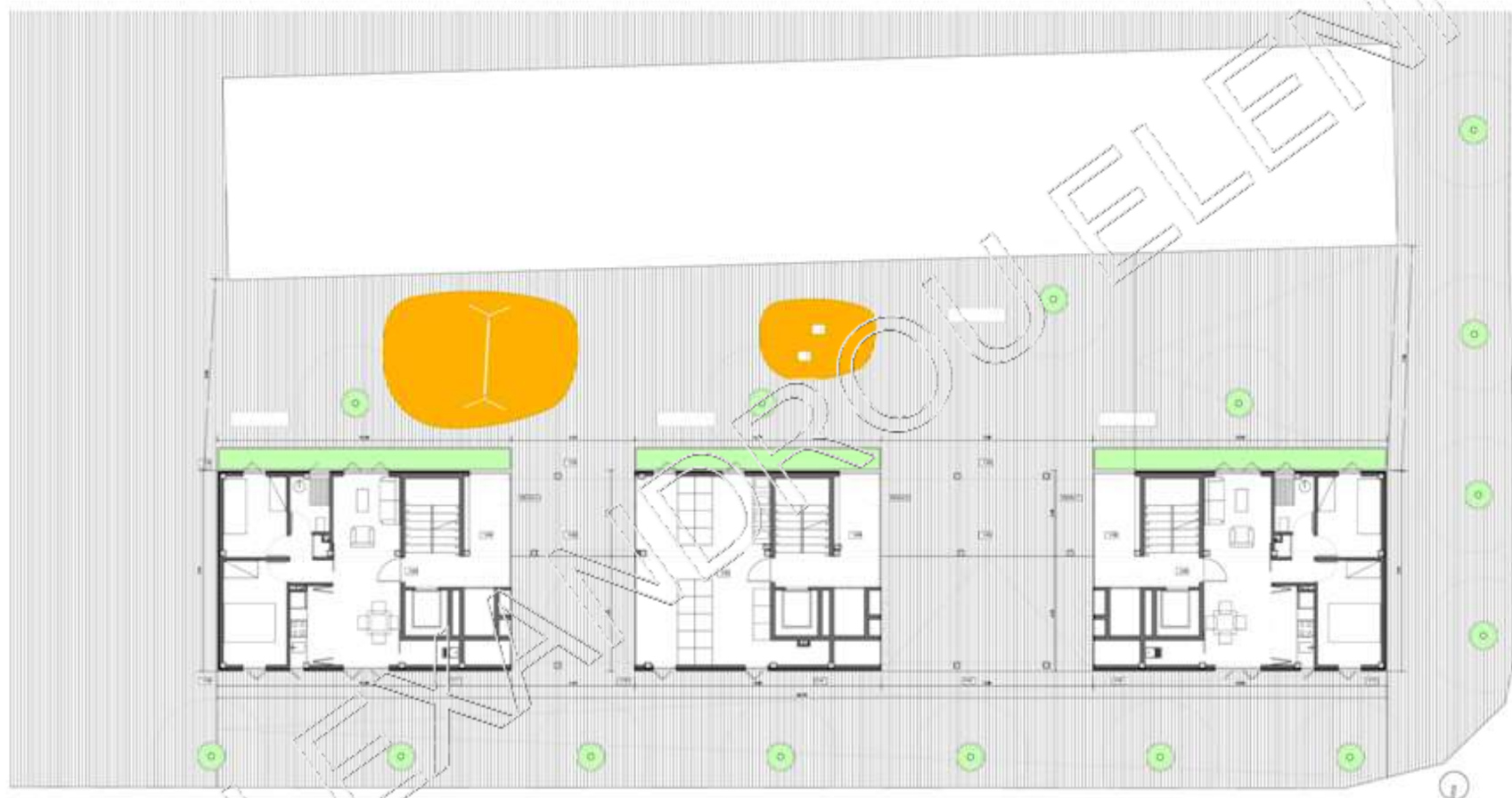
CAMP REDO HOUSING - MALLORCA

AR. NIU ARQUITECTURA



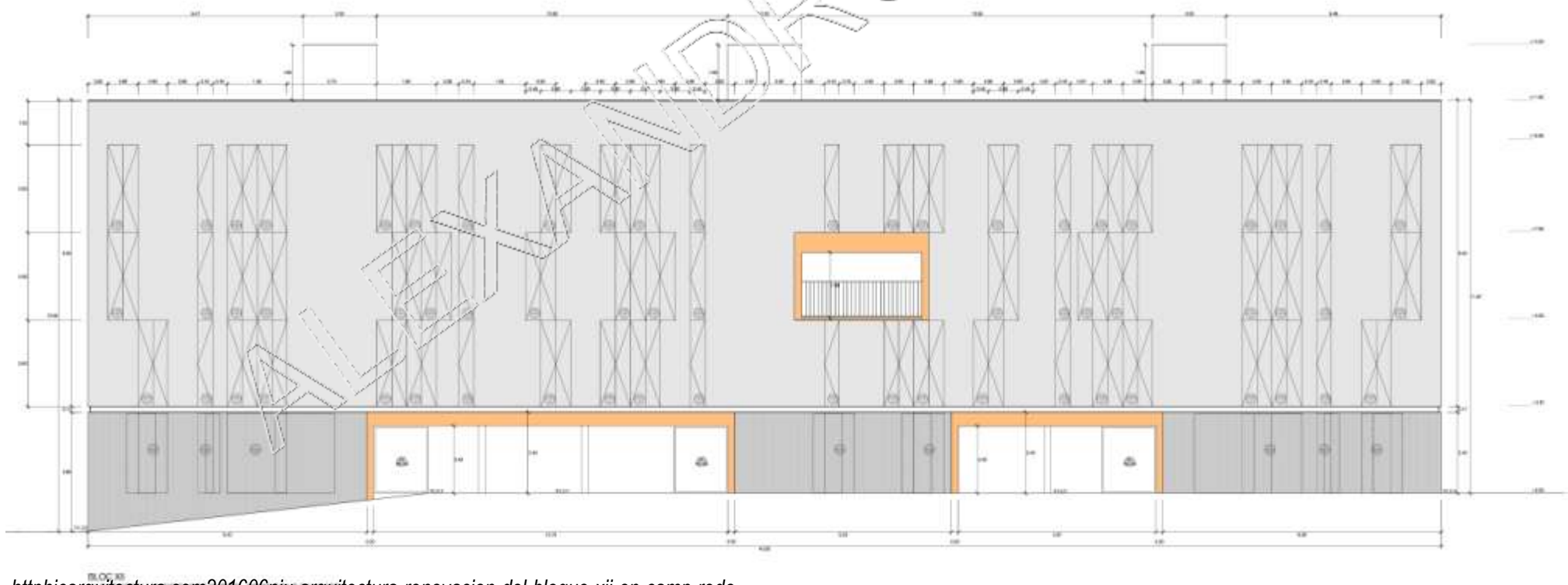
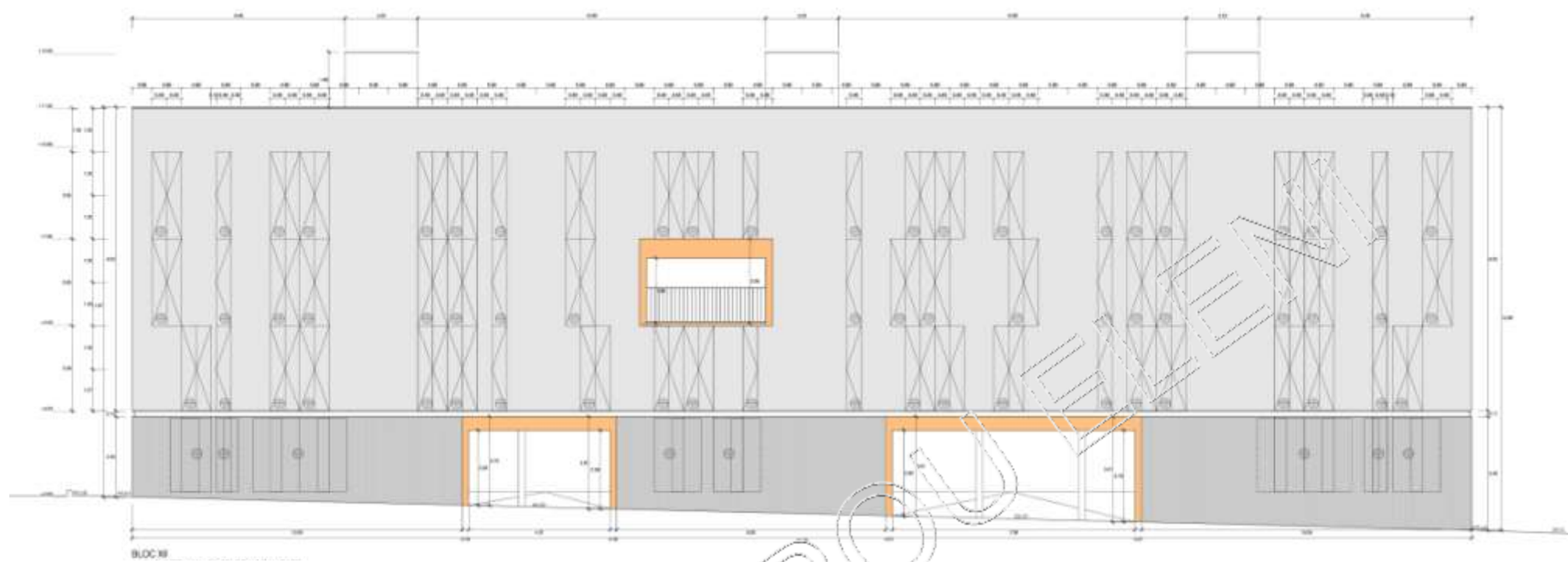


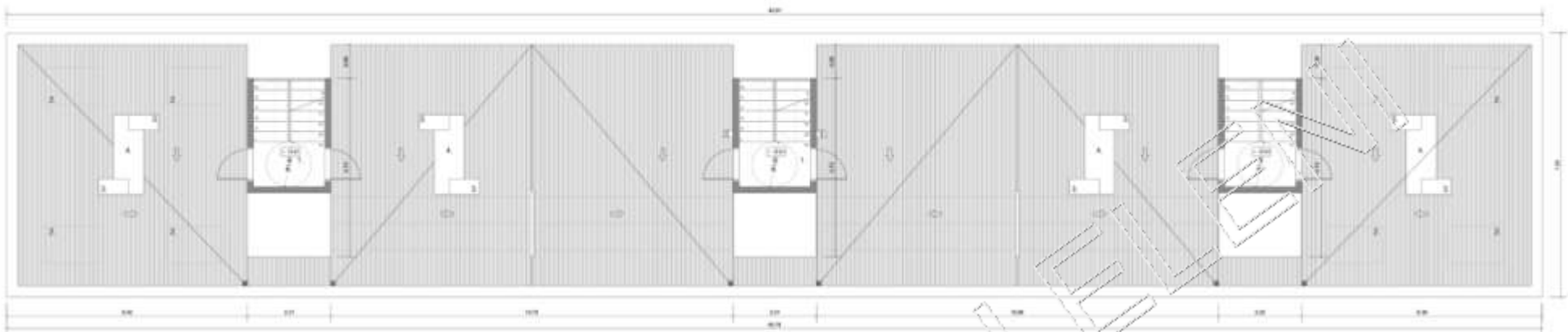




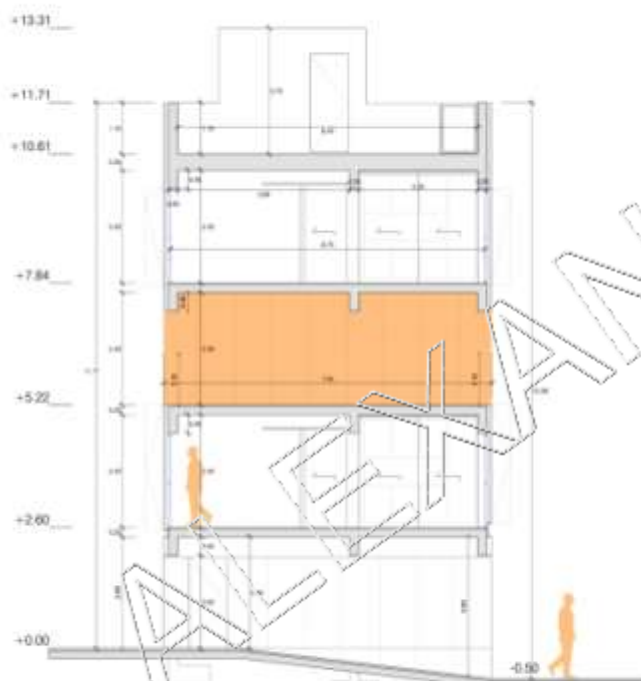
PLANTA URBANIZACIÓ ESP. PÚBLIC. E 1/100

CAMP REDÓ 800 PROJECTE DE PLÀN DE RENOVACIÓ DEL BLOQUE XII DE L'EDIFICI DE L'ESP. PÚBLIC DE CAMP REDÓ DE PALMA		PROYECTO PLAN DE RENOVACIÓN DEL BLOQUE XII DEL EDIFICIO DE ESP. PÚBLIC. DE CAMP REDÓ DE PALMA	
AUT. URBANÍSTICA 2004/10		2004/10	
PROYECTO BÁSICO		PB14	
PLANO URBANIZACIÓ		PROYECTO URBANIZACIÓ DE PALMA	
PLANO URBANIZACIÓ ESP. PÚBLIC.		PLANO DE CAMP REDÓ URBANIZACIÓ	
PLANO URBANIZACIÓ ESP. PÚBLIC.		Ayuntamiento de Palma Ayuntamiento de Palma	

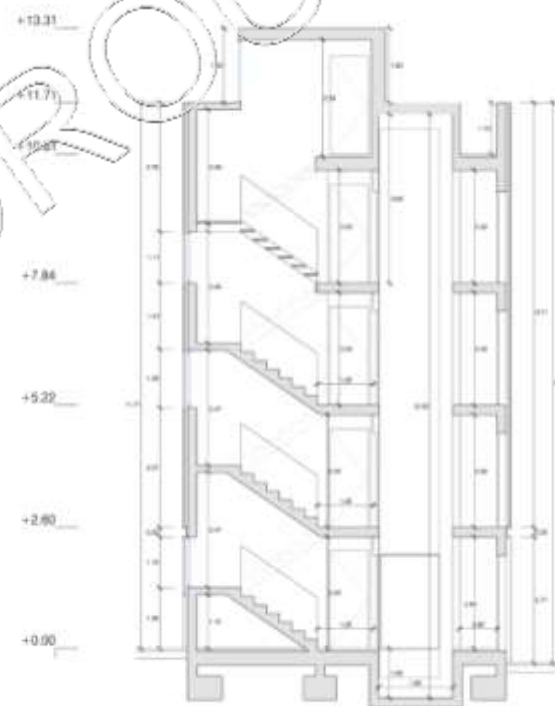




PLANO GENERAL - 1:100



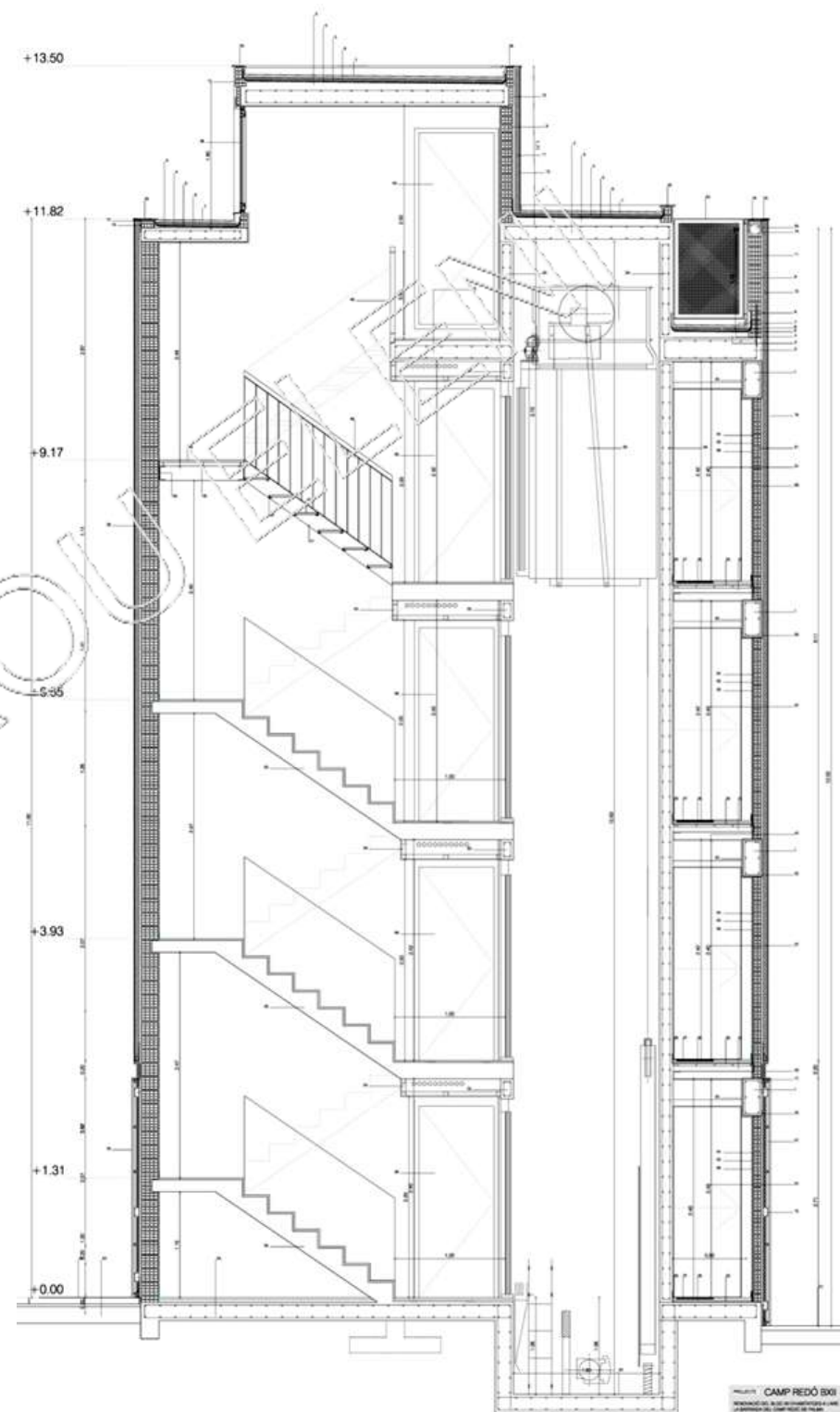
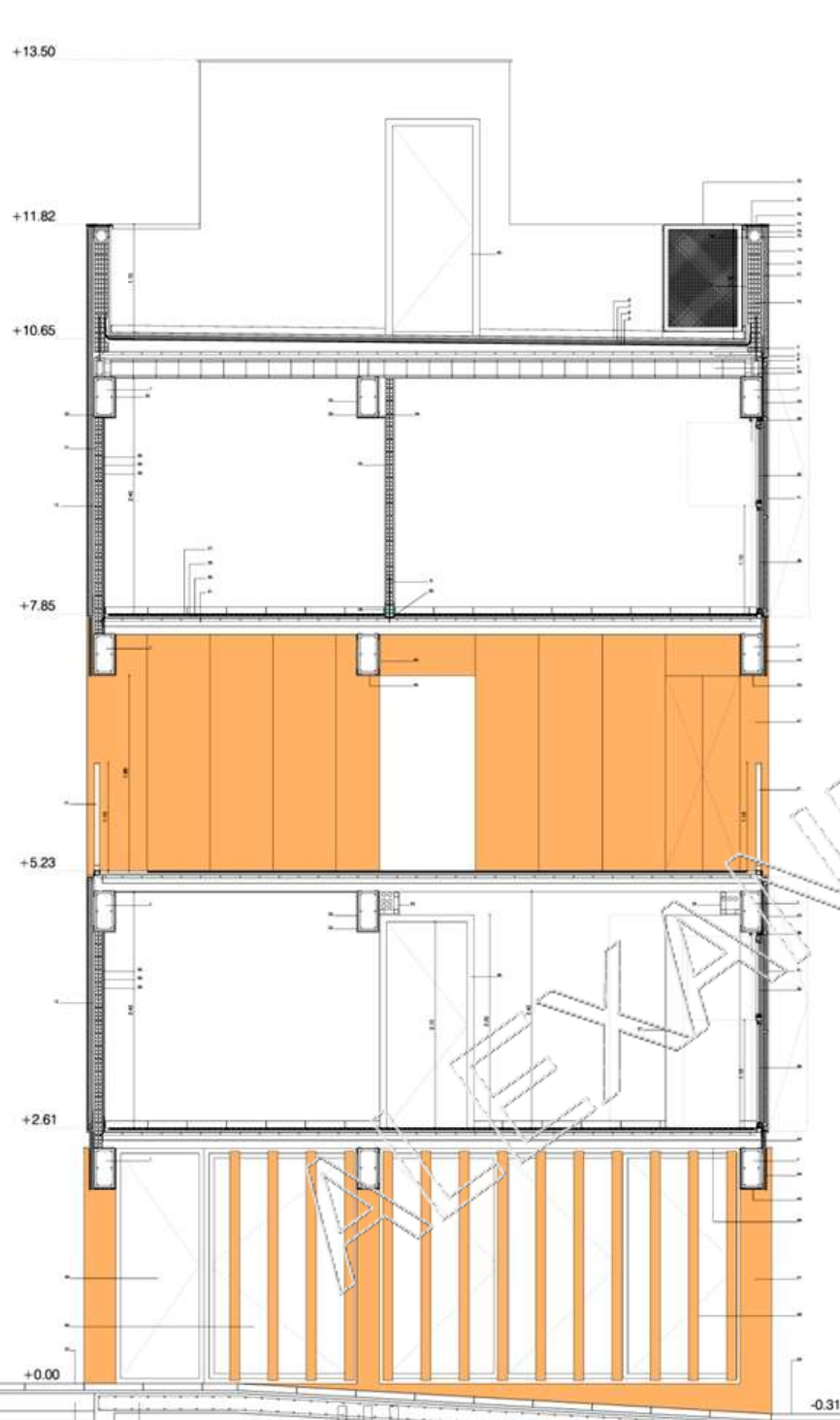
SECCION TRANSVERSAL 1 - 1:100



SECCION TRANSVERSAL 2 - 1:100

LEYENDA GENERAL
1. DADA ESCALA - ASCENSOR
2. ESPAL FRIGOS SOLARS
3. JANTS

CAMP REDO SXI PROJECTE D'ACTUACIÓ D'EDIFICI D'USOS MIXTOS (RENOVACIÓ I RECONSTRUCCIÓ)		PROJECTE 1 2016-2017 2018-2019 2020-2021 2022-2023 2024-2025 2026-2027 2028-2029 2030-2031 2032-2033 2034-2035 2036-2037 2038-2039 2040-2041 2042-2043 2044-2045 2046-2047 2048-2049 2050-2051 2052-2053 2054-2055 2056-2057 2058-2059 2060-2061 2062-2063 2064-2065 2066-2067 2068-2069 2070-2071 2072-2073 2074-2075 2076-2077 2078-2079 2080-2081 2082-2083 2084-2085 2086-2087 2088-2089 2090-2091 2092-2093 2094-2095 2096-2097 2098-2099 2100-2101 2102-2103 2104-2105 2106-2107 2108-2109 2110-2111 2112-2113 2114-2115 2116-2117 2118-2119 2120-2121 2122-2123 2124-2125 2126-2127 2128-2129 2130-2131 2132-2133 2134-2135 2136-2137 2138-2139 2140-2141 2142-2143 2144-2145 2146-2147 2148-2149 2150-2151 2152-2153 2154-2155 2156-2157 2158-2159 2160-2161 2162-2163 2164-2165 2166-2167 2168-2169 2170-2171 2172-2173 2174-2175 2176-2177 2178-2179 2180-2181 2182-2183 2184-2185 2186-2187 2188-2189 2190-2191 2192-2193 2194-2195 2196-2197 2198-2199 2200-2201 2202-2203 2204-2205 2206-2207 2208-2209 2210-2211 2212-2213 2214-2215 2216-2217 2218-2219 2220-2221 2222-2223 2224-2225 2226-2227 2228-2229 2230-2231 2232-2233 2234-2235 2236-2237 2238-2239 2240-2241 2242-2243 2244-2245 2246-2247 2248-2249 2250-2251 2252-2253 2254-2255 2256-2257 2258-2259 2260-2261 2262-2263 2264-2265 2266-2267 2268-2269 2270-2271 2272-2273 2274-2275 2276-2277 2278-2279 2280-2281 2282-2283 2284-2285 2286-2287 2288-2289 2290-2291 2292-2293 2294-2295 2296-2297 2298-2299 2300-2301 2302-2303 2304-2305 2306-2307 2308-2309 2310-2311 2312-2313 2314-2315 2316-2317 2318-2319 2320-2321 2322-2323 2324-2325 2326-2327 2328-2329 2330-2331 2332-2333 2334-2335 2336-2337 2338-2339 2340-2341 2342-2343 2344-2345 2346-2347 2348-2349 2350-2351 2352-2353 2354-2355 2356-2357 2358-2359 2360-2361 2362-2363 2364-2365 2366-2367 2368-2369 2370-2371 2372-2373 2374-2375 2376-2377 2378-2379 2380-2381 2382-2383 2384-2385 2386-2387 2388-2389 2390-2391 2392-2393 2394-2395 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2596-2597 2598-2599 2600-2601 2602-2603 2604-2605 2606-2607 2608-2609 2610-2611 2612-2613 2614-2615 2616-2617 2618-2619 2620-2621 2622-2623 2624-2625 2626-2627 2628-2629 2630-2631 2632-2633 2634-2635 2636-2637 2638-2639 2640-2641 2642-2643 2644-2645 2646-2647 2648-2649 2650-2651 2652-2653 2654-2655 2656-2657 2658-2659 2660-2661 2662-2663 2664-2665 2666-2667 2668-2669 2670-2671 2672-2673 2674-2675 2676-2677 2678-2679 2680-2681 2682-2683 2684-2685 2686-2687 2688-2689 2690-2691 2692-2693 2694-2695 2696-2697 2698-2699 2700-2701 2702-2703 2704-2705 2706-2707 2708-2709 2710-2711 2712-2713 2714-2715 2716-2717 2718-2719 2720-2721 2722-2723 2724-2725 2726-2727 2728-2729 2730-2731 2732-2733 2734-2735 2736-2737 2738-2739 2740-2741 2742-2743 2744-2745 2746-2747 2748-2749 2750-2751 2752-2753 2754-2755 2756-2757 2758-2759 2760-2761 2762-2763 2764-2765 2766-2767 2768-2769 2770-2771 2772-2773 2774-2775 2776-2777 2778-2779 2780-2781 2782-2783 2784-2785 2786-2787 2788-2789 2790-2791 2792-2793 2794-2795 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ZARAMAGA SOCIAL HOUSING RENOVATION- MALLORCA

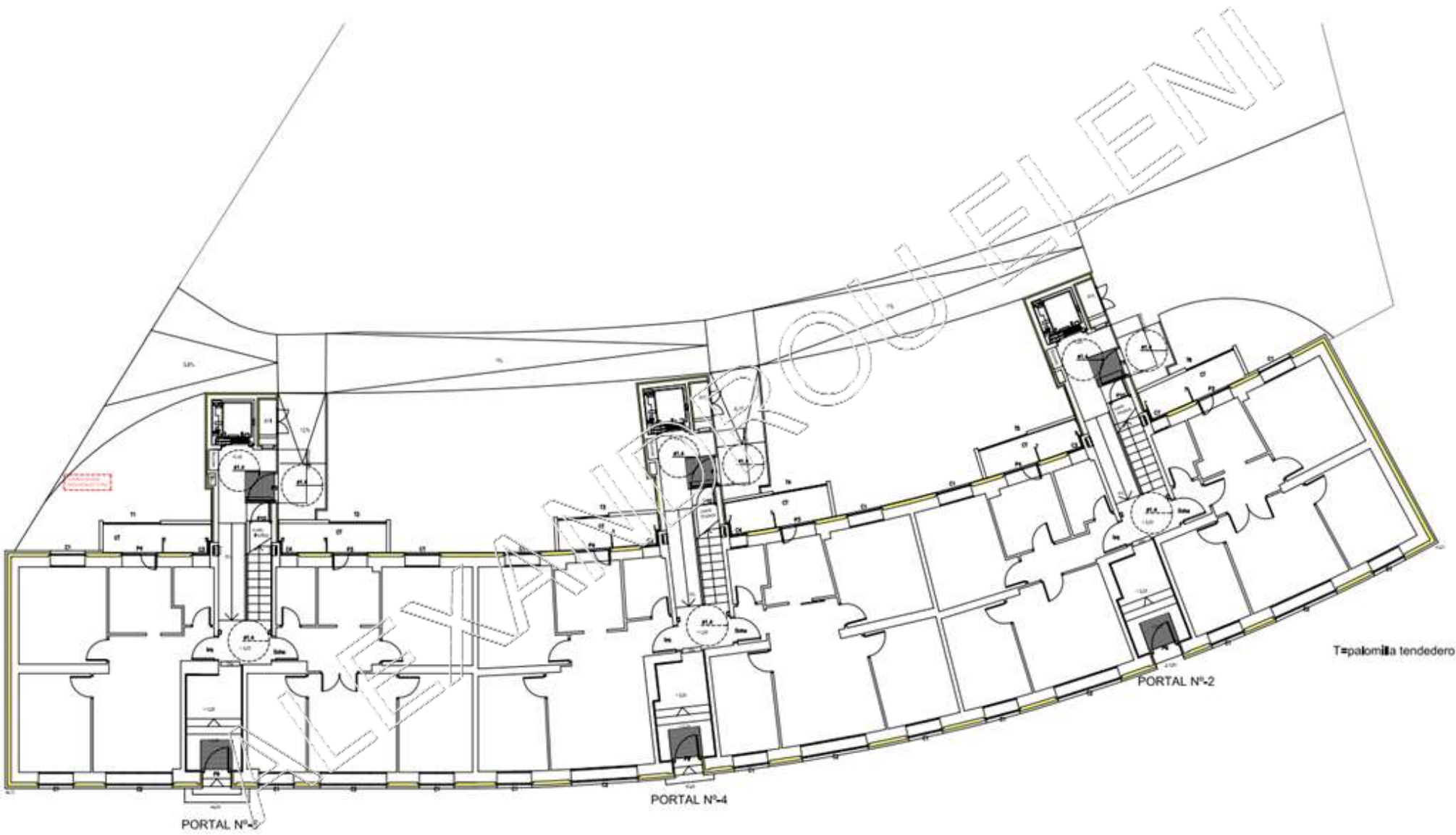


<https://www.premiosdearquitectura.es/premios35-european-responsible-housing-awards-2016obras-presentadas731-renovation-of-30-apartments-in-zaramaga-vitoria-gasteiz>



<httpswww.premiosdearquitectura.es/espremios35-european-responsible-housing-awards-2016obras-presentadas731-renovation-of-30-apartments-in-zaramaga-vitoria-gasteiz>





PLANTA BAJA





MARIAHILFERSTRASSE 182- BIENNH, AYΣTPIA

AR. NIU ARQUITECTURA







Historic Building (19th Century)

Built 1866-1868
Listed 1996

Renov. Phase I 2006
Renov. Phase 2 2008

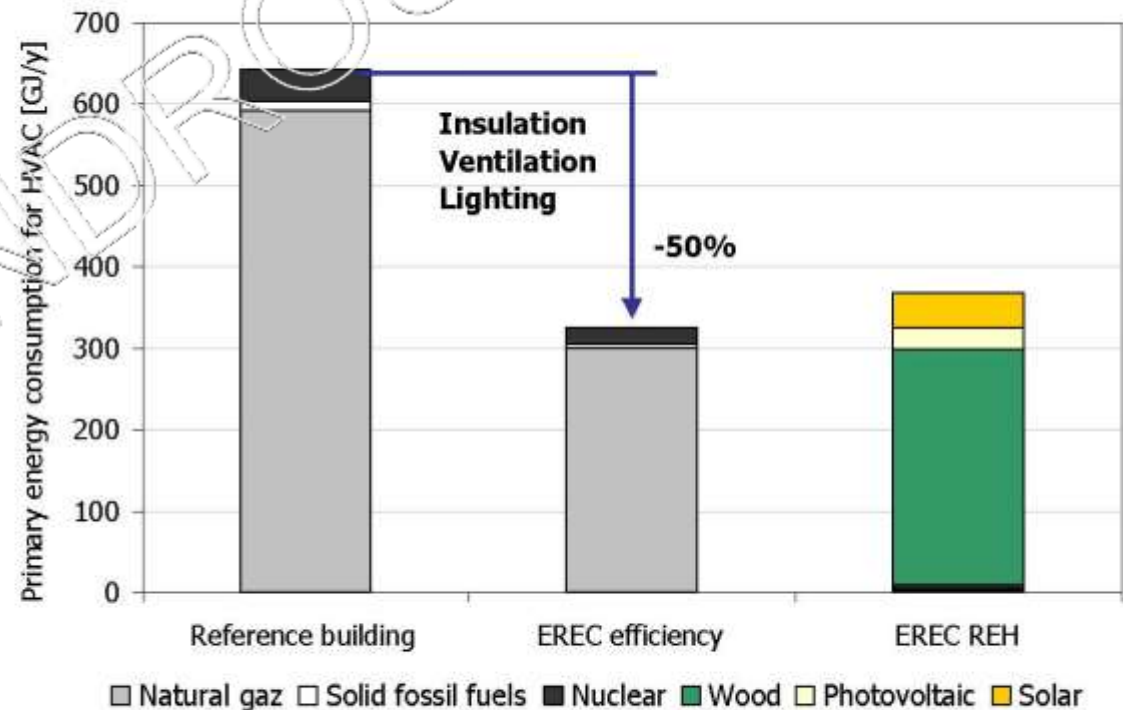


Energy Concept

Approach

- limit thermal exchanges
- heat recovery
- EE
 - building envelope
 - ventilation
 - lighting
- RES
 - Biomass
 - Solar Thermal
 - Geothermal
 - PV

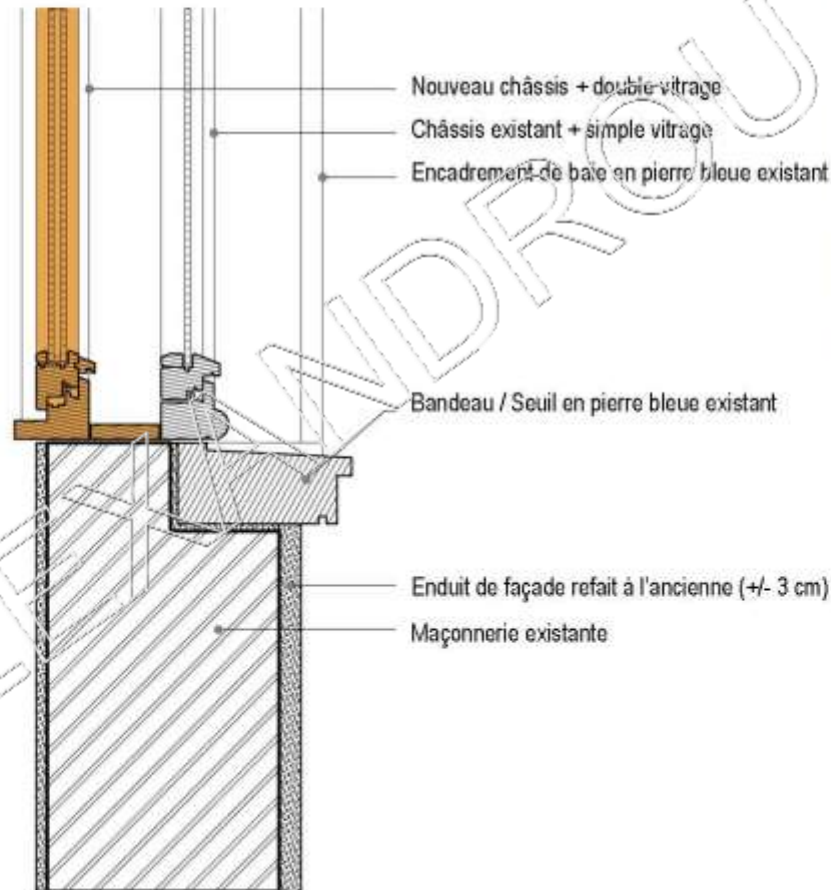
Energy Consumption



BUILDING ENVELOPE

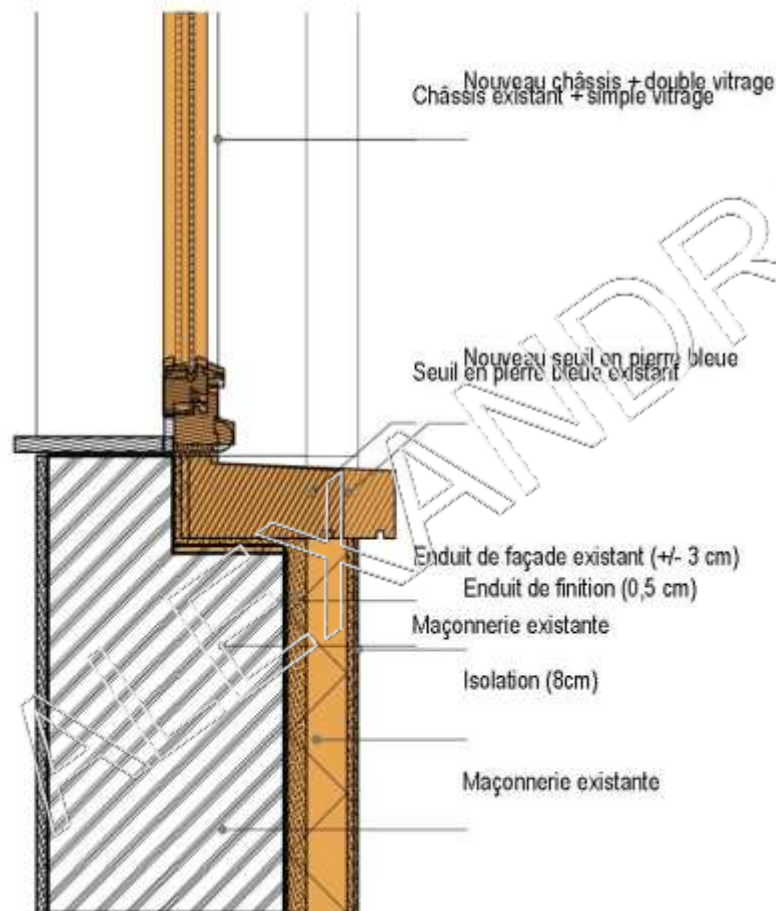
THERMAL INSULATION OF THE FACADES

FRONT FACADE



Back Façade

Outside insulation - 8 cm expanding polystyrene + coating
 vitrage $U=1,1 \text{ W/m}^2 \text{ K}$ $g=0,6$



100% Renewable Energy for Electricity

Green electricity supplier

- Wind 62.96%
- Biomass 35.58%
- Bio-CHP 1.38%
- Small Hydro 0.07%

REH installation

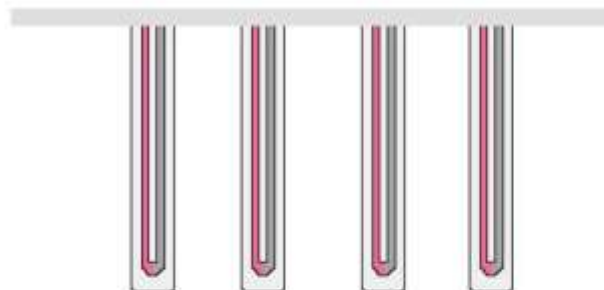
- PV : 3kWc



- *PV : extension*
- *Micro-CHP: in project*

100% Renewable Energy for Cooling

- Solar thermal collectors
 - ▣ 70 m²
- Biomass back-up
 - ▣ 15kW (+80 kW)
- Hot water storage tank
 - ▣ 2 X 2000 l
- Absorbtion chiller
 - ▣ 35 kW cold @ 7/12°C
 - ▣ 50 kW heat input @ 85/80°C
 - ▣ 85 kW condensing heat (waste heat) @ 30/27°C
- Geothermal boreholes
 - ▣ 115m deep



100% Renewable Energy for the Renewable Energy House

☒ 100% RES Heating

- Biomass
- Solar Thermal
- Geothermal

☒ 100% RES Cooling

- Solar Thermal
- Biomass back-up
- Geothermal

☒ 100% RES Electricity

- REH PV installations
- External Supplier Lampiris
(Wind, Biomass, Small Hydro)



