

# Building specifications

## 1. Concept and Vision

This project stands as a landmark of sustainable architecture—a high-performance villa where contemporary design meets cutting-edge technology and bioclimatic principles.

The design prioritizes ultimate comfort, ensuring exceptionally low energy consumption and healthy indoor environments tailored for modern well-being. Through elegant volumes and expansive floor-to-ceiling windows, the residence creates a seamless flow between indoor and outdoor living, masterfully integrating natural light and the surrounding landscape.

## 2. Spatial Design

- **Ground floor:** open-plan living room, dining area and kitchen with direct access to terrace and garden; guest suite with private bathroom; utility and technical room.
- **Upper floor:** master suite with walk-in wardrobe and private terrace; two additional bedrooms with shared bathroom; optional office or lounge area.
- **Outdoor areas:** landscaped Mediterranean garden, infinity swimming pool, shaded pergola terrace, and parking for two cars with EV charger pre-installation.

## 3. Construction System

**Structure:** lightweight Steel Frame system with galvanized steel profiles and OSB structural panels, ensuring precision, speed, and durability.

**External walls:** Steel Frame + high-density mineral wool + external SATE (graphite EPS 120–150 mm), acrylic mortar finish.

### **Thermal performance:**

- U-value wall:  $\leq 0.20 \text{ W/m}^2\text{K}$
- Roof and floor insulated to  $\leq 0.18 \text{ W/m}^2\text{K}$
- Airtight envelope meeting Passive House air-tightness levels ( $< 0.6 \text{ ACH @ 50 Pa}$ )

### **Acoustic performance:**

- Internal partitions:  $R_w$  50–54 dB
- Façades:  $R_w$  55–60 dB

**Floors:** composite slab (steel sheet + reinforced concrete) with 10 mm acoustic underlay; ceramic or floating wood floor finishes.

**Roof:** flat, double waterproofed and thermally insulated, ready for solar panel installation.

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## 4. Finishes and Materials

**Exterior joinery:** aluminium with thermal break or multi-chamber PVC, double glazing (4/16/4 mm) with solar and acoustic control ( $U_{\text{window}} \leq 2.2 \text{ W/m}^2\text{K}$ ).

**Interior carpentry:** floor-to-ceiling white lacquered doors, fitted wardrobes with finished interiors, stainless steel handles.

**Flooring:** large-format porcelain tiles in living areas, wood flooring in bedrooms, anti-slip ceramics on terraces.

**Bathrooms:** premium porcelain tiles, walk-in showers with tempered glass, thermostatic mixers.

**Walls and ceilings:** smooth plaster finishes, ecological paint.

**Balustrades:** laminated glass and stainless steel profiles for modern transparency.

## 5. Installations

- **Heating & Cooling:** high-efficiency aerothermal system with ducted air distribution and underfloor heating/cooling.
- **Ventilation:** mechanical ventilation with heat recovery (HRV) ensuring constant fresh air and 90% heat retention.
- **Hot water:** solar-assisted aerothermal unit with storage tank.
- **Lighting & automation:** LED lighting throughout; pre-installation for smart-home control (lighting, temperature, blinds, and security).
- **Water & drainage:** separate networks for rain and wastewater, anti-return valves, and perimeter drainage.
- **Renewables:** photovoltaic system optional for self-consumption.

## 6. Sustainability and Comfort

This architectural design achieves optimal **thermal comfort year-round** with minimal energy consumption, thanks to its optimized orientation, insulation, and airtightness.

The materials are recyclable and have a low environmental impact; the indoor air quality meets Passive House standards for CO<sub>2</sub> and humidity.

Designed for **modern sustainable living**, the villa guarantees exceptional performance, reduced maintenance, and a serene connection with nature.

# PROJECT DISTRIBUTION SUMMARY

Total Interior Area: 295 m<sup>2</sup>

Total Terraces: 25 m<sup>2</sup>

## SEMI-BASEMENT – 75 m<sup>2</sup>

- Sauna & wellness area – 12 m<sup>2</sup>
- Shower + bathroom – 6 m<sup>2</sup>
- Multi-purpose room (gym / cinema / lounge) – 25 m<sup>2</sup>
- Laundry & technical room – 10 m<sup>2</sup>
- Storage – 8 m<sup>2</sup>
- Circulation & stairs – 14 m<sup>2</sup>

## GROUND FLOOR – 110 m<sup>2</sup>

- Living – dining area – 35 m<sup>2</sup>
- Open kitchen with island – 18 m<sup>2</sup>
- Bedroom / office – 12 m<sup>2</sup>
- Full bathroom – 6 m<sup>2</sup>
- Entrance, stairs & circulation – 39 m<sup>2</sup>

## FIRST FLOOR – 110 m<sup>2</sup>

- Master bedroom – 18 m<sup>2</sup>
- Walk-in closet – 10 m<sup>2</sup>
- En-suite bathroom – 8 m<sup>2</sup>
- Bedroom 2 – 14 m<sup>2</sup>
- Bedroom 3 – 12 m<sup>2</sup>
- Shared bathroom – 6 m<sup>2</sup>
- Circulation & storage – 42 m<sup>2</sup>

## TERRACES – 25 m<sup>2</sup>

- Main terrace (ground floor) – 18 m<sup>2</sup>
- Private terrace (master bedroom) – 7 m<sup>2</sup>