MAISON LATAPIE

Individual Technical Contributions

Architectural Documentation · Building Performance · Climate Resilience



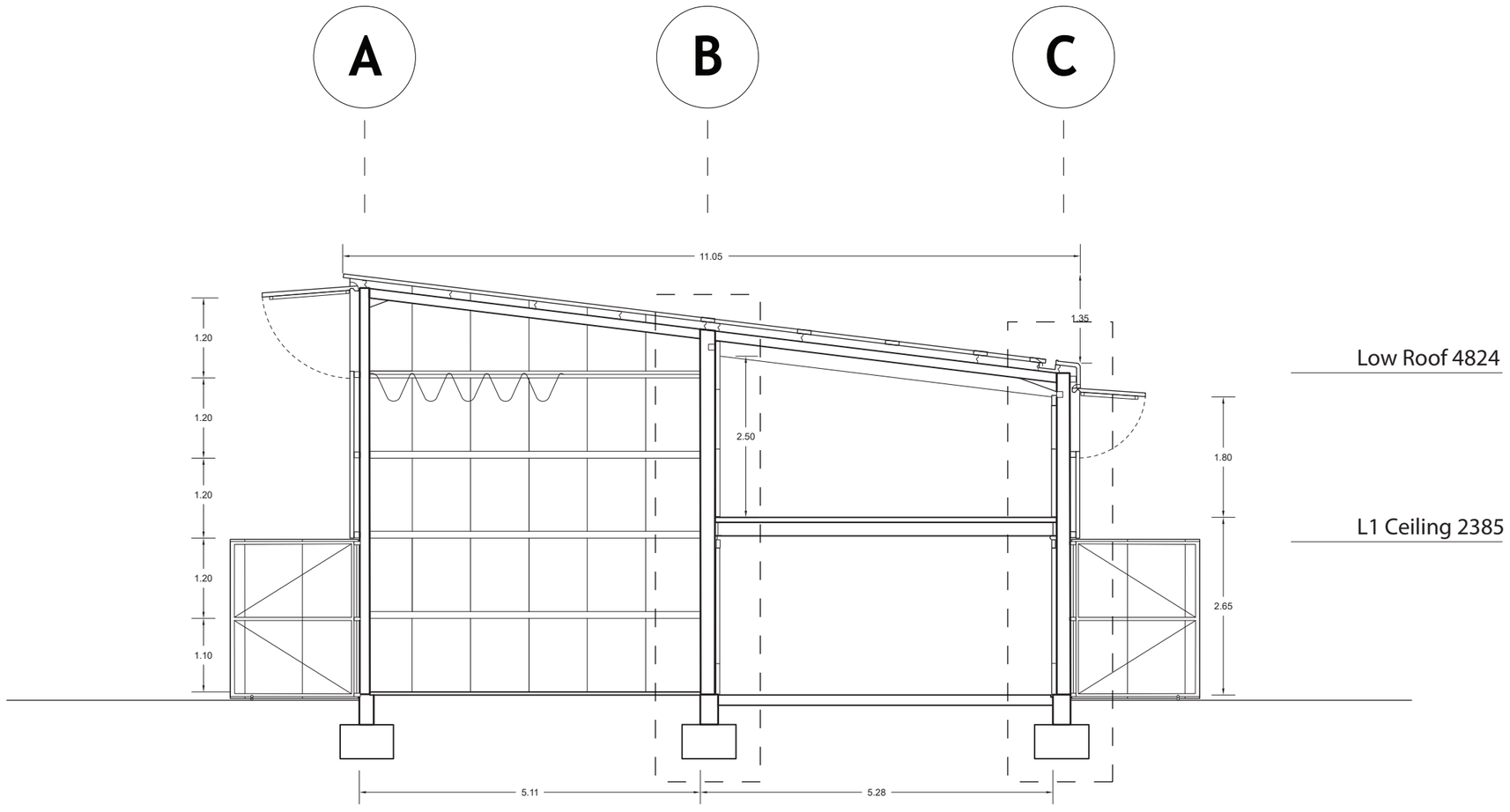
COVER PAGE

Group 03 - ARCC 2203

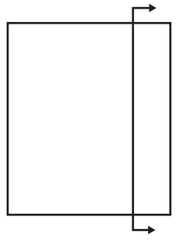
Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-101
Revision Number -	04
Date -	21-10-2026
Drawn By -	Jillian F.
Checked By -	Jillian F.



Section Cut

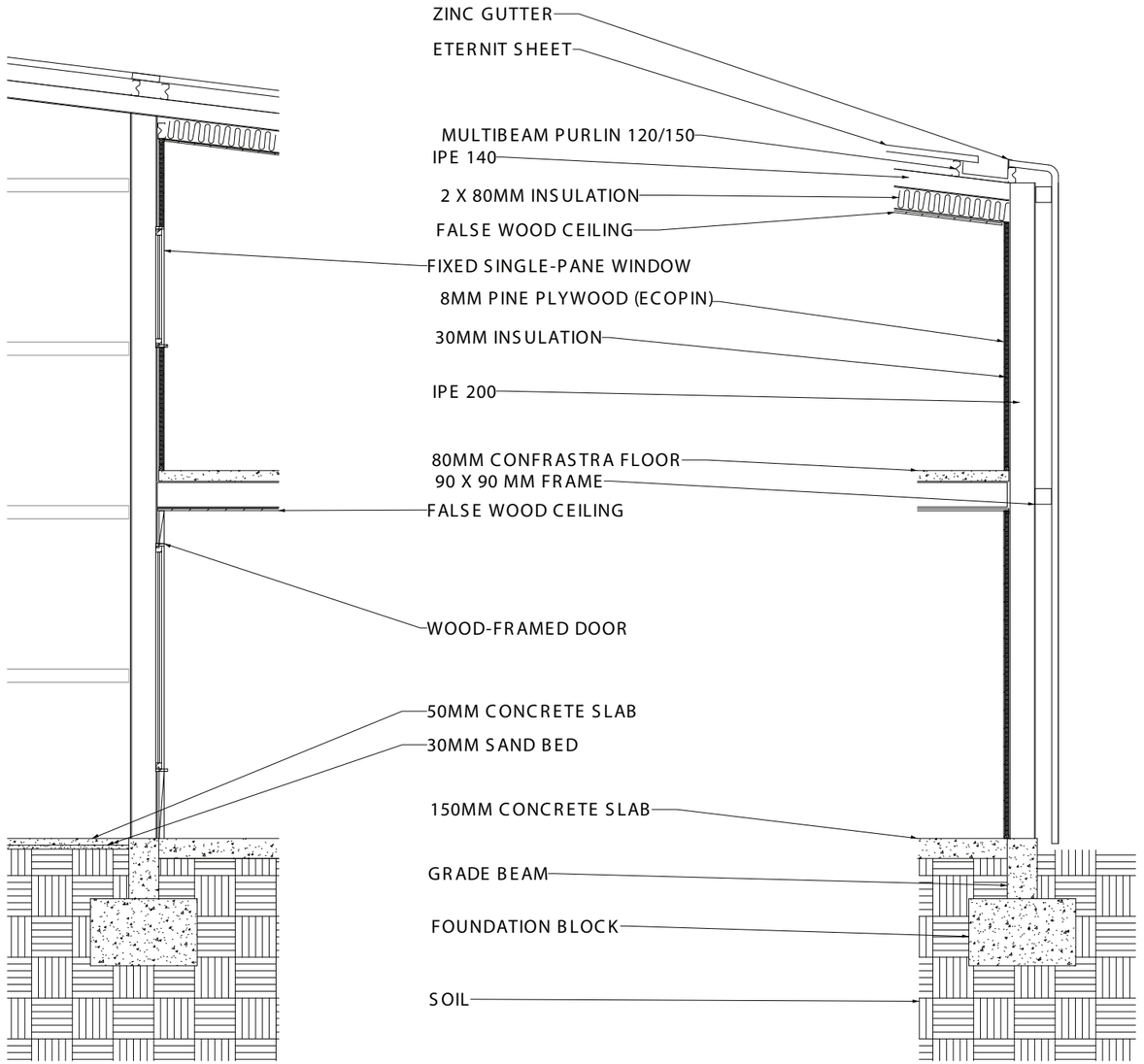


Group 03 - ARCC 2203

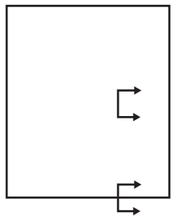
Maison Latapie

Transverse Section

Sheet Number -	A-302
Revision Number -	03
Date -	30-09-2026
Drawn By -	Jillian F.
Checked By -	Alex S.
Scale -	1:50



Section Cut



Group 03 - ARCC 2203

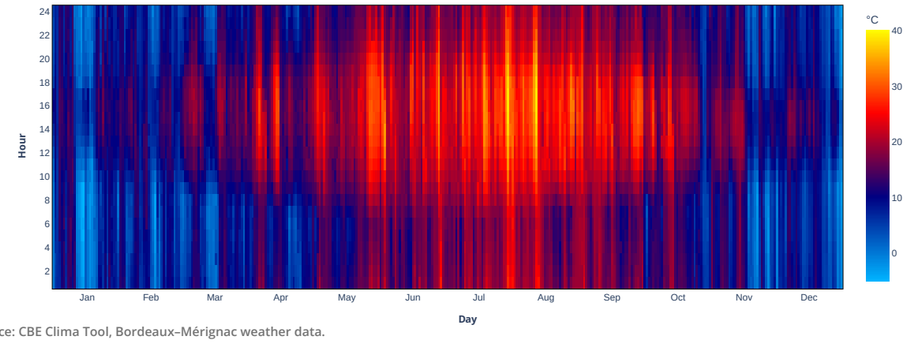
Maison Latapie

Existing Wall Sections

Sheet Number -	A-303
Revision Number -	05
Date -	18-10-2026
Drawn By -	Jillian F.
Checked By -	Alex S.
Scale -	1:30

TEMPERATURE PATTERNS

Annual Outdoor Temperature Patterns

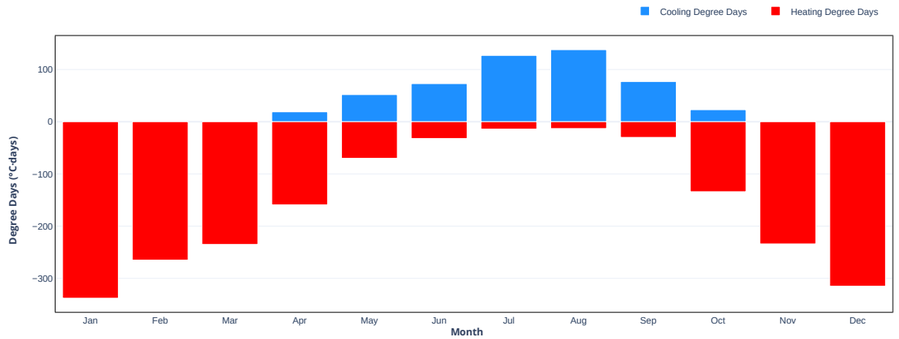


Source: CBE Clima Tool, Bordeaux–Mérignac weather data.

KEY POINT | Cool winters (7–9°C average) increase heating needs, while warm summers (19–22°C average) bring occasional extremes up to 38.7°C that raise overheating risks. Cooler nights offer opportunities to release built-up heat through ventilation.

HEATING AND COOLING DEMANDS

Seasonal Heating and Cooling Requirements, with HDD and CDD Setpoints as 18°C

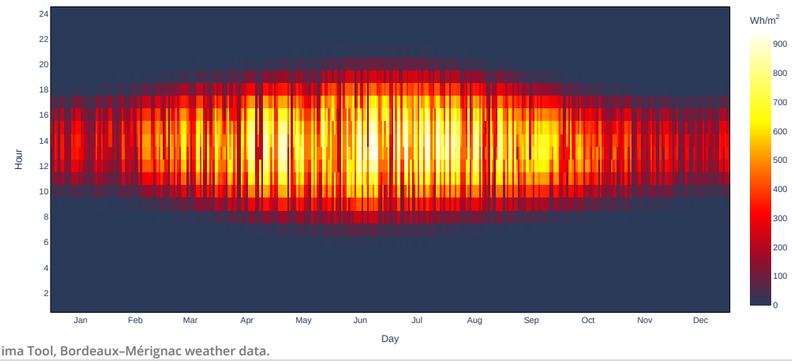


Source: CBE Clima Tool, Bordeaux–Mérignac weather data.

KEY POINT | Bordeaux's climate indicates roughly 3.6 times greater heating than cooling needs (1,839 vs. 509 heating and cooling degree days, a measure of energy demand), making winter heat retention the priority while summer overheating remains a concern.

SOLAR RADIATION PATTERNS

Global Horizontal Radiation (Wh/m²)

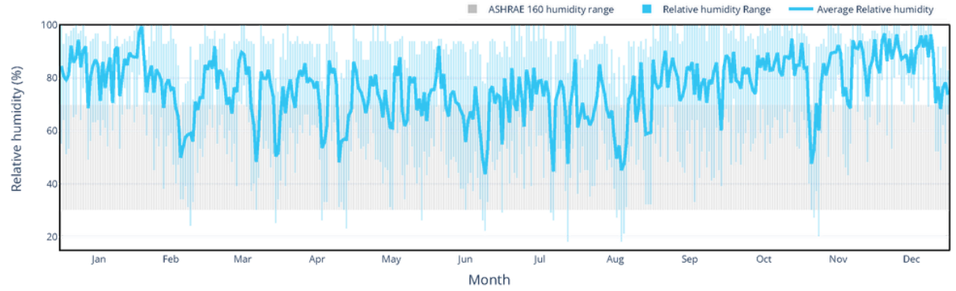


Source: CBE Clima Tool, Bordeaux–Mérignac weather data.

KEY POINT | Stronger solar radiation and longer summer days increase potential heat gains, making shading and ventilation important for limiting overheating. Lower winter radiation offers a shorter period for useful passive solar warming.

HUMIDITY CONDITIONS

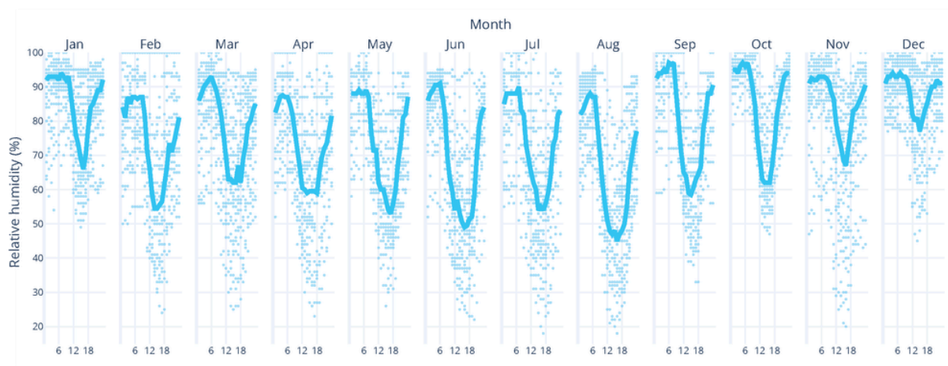
Annual Relative Humidity Patterns



Source: CBE Clima Tool, Bordeaux–Mérignac weather data

KEY POINT | With moderate-to-high annual relative humidity levels, the region experiences damp winters and moderate summers due to its proximity to the Atlantic Ocean. Outdoor humidity stays well above safe building thresholds for much of the fall and winter, putting continuous pressure on the building envelope.

Annual Hourly Relative Humidity Patterns

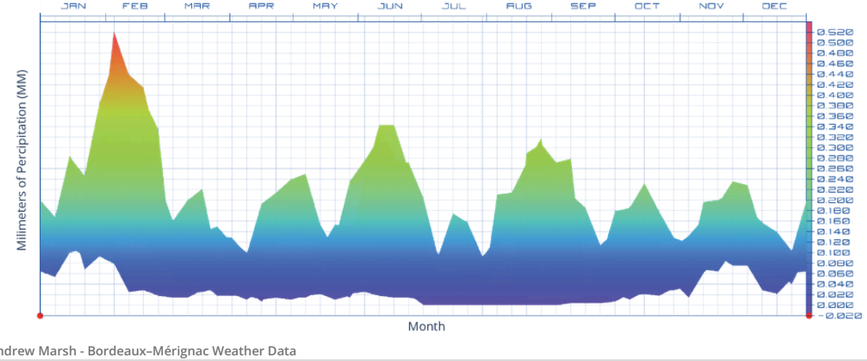


Source: CBE Clima Tool, Bordeaux–Mérignac weather data

KEY POINT | Daily relative humidity drops during peak afternoon temperatures, but winter nights consistently push humidity levels above 80-90%, creating a high risk of overnight surface condensation and leaving minimal daily recovery time for building materials to dry out.

PRECIPITATION CONDITIONS

Precipitation Depth (mm)



Source: Andrew Marsh - Bordeaux–Mérignac Weather Data

KEY POINT | Bordeaux experiences distributed rainfall throughout the year, with major intensity peaks in February and secondary surges in June and August. Precipitation spikes place maximum waterproofing demand on the building exterior when temperatures are low and drying potential is minimal.

01

CLIMATE & ENVIRONMENTAL CONDITIONS

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 10	Generate climate graphs for temperature patterns, and heating and cooling degree days, and analyze results	JF
02	Oct.14	Analyzed humidity and precipitation conditions	AS
03	Oct. 14	Analyze a solar radiation diagram for seasonal patterns and its impact on building performance	CY
04	Oct. 21	Reorganized document for consistency and clarity	CY

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Maison Latapie
Bordeaux, France

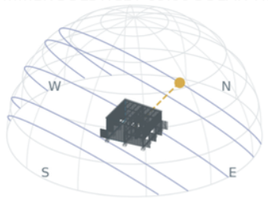
Architectural Sections

Sheet Number -	B-101
Revision Number -	04
Date -	21-10-2026
Drawn By -	Jillian F., Alex S., Crystal Y.
Checked By -	Jillian F.

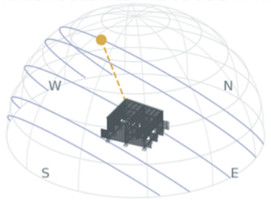
SEASONAL SUN PATH ANALYSIS

Seasonal Sun Paths - Summer and Winter Solstice

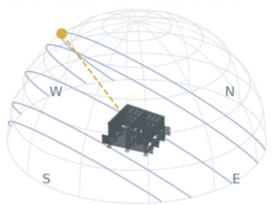
SUMMER SOLSTICE / 09:00 SOLAR TIME



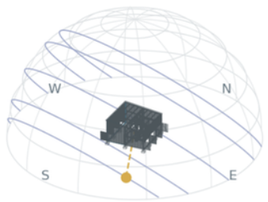
SUMMER SOLSTICE / 12:00 SOLAR TIME



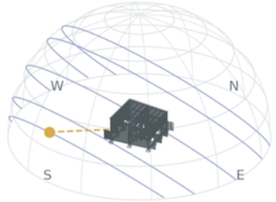
SUMMER SOLSTICE / 15:00 SOLAR TIME



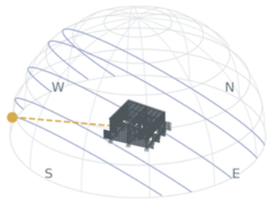
WINTER SOLSTICE / 09:00 SOLAR TIME



WINTER SOLSTICE / 12:00 SOLAR TIME



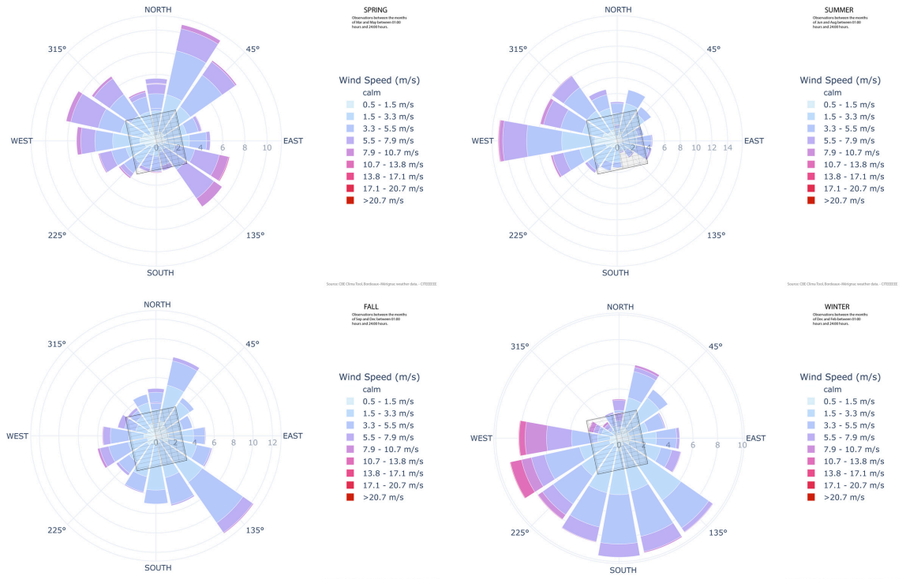
WINTER SOLSTICE / 15:00 SOLAR TIME



Source: Andrew Marsh - Bordeaux–Mérignac Weather Data

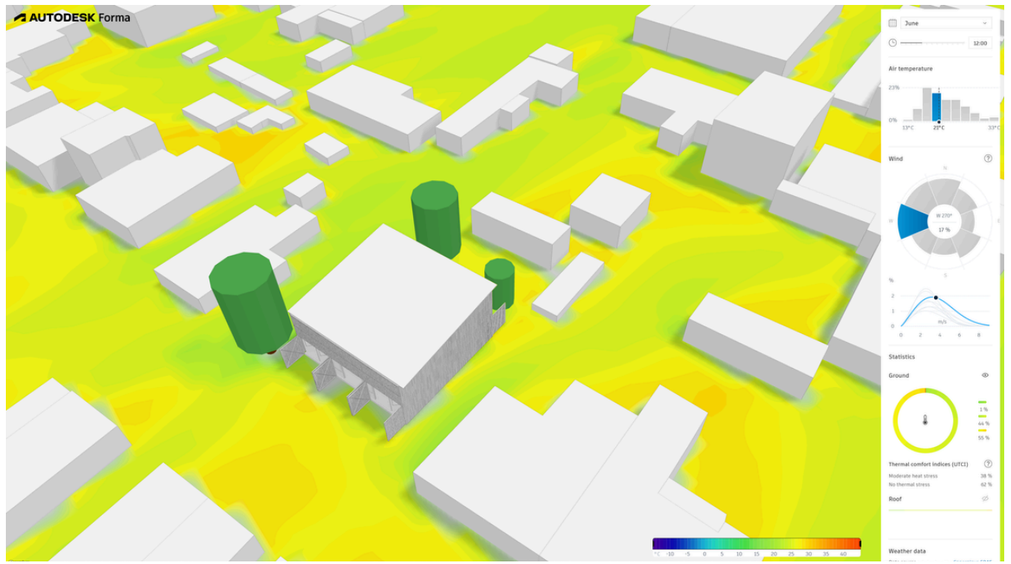
KEY POINT Higher summer sun and lower winter sun change the angle of sunlight reaching Maison Latapie throughout the day, informing seasonal shading and passive solar warming strategies.

SEASONAL WIND PATTERNS



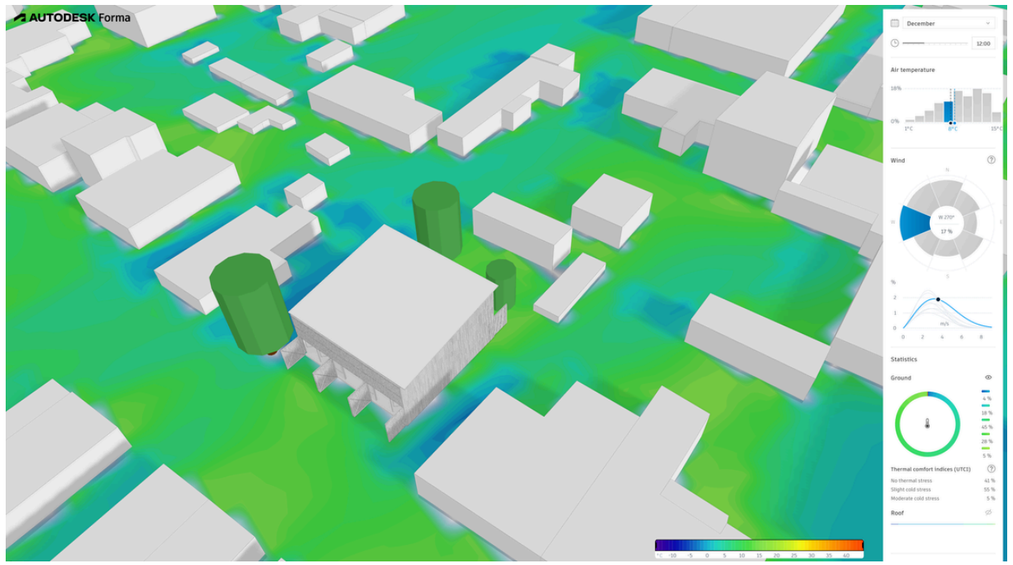
KEY POINT Seasonal wind patterns vary in direction and intensity, providing opportunities for natural ventilation during warmer months while highlighting the need to minimize cold drafts and heat loss during winter.

ENVIRONMENTAL CONTEXT USING MICROCLIMATE



Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT June – 12:00 PM (21°C): Summer microclimate has warmer temperatures and stronger sunlight heat the site, while trees provide localized shade and nearby buildings affect wind exposure.



Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT December – 12:00 PM (8°C): Winter microclimate has lower sun angles which create longer building shadows, reducing sunlight across the site. Colder temperatures and winter winds contribute to cooler outdoor conditions.

01

CLIMATE & ENVIRONMENTAL CONDITIONS

Revision Schedule

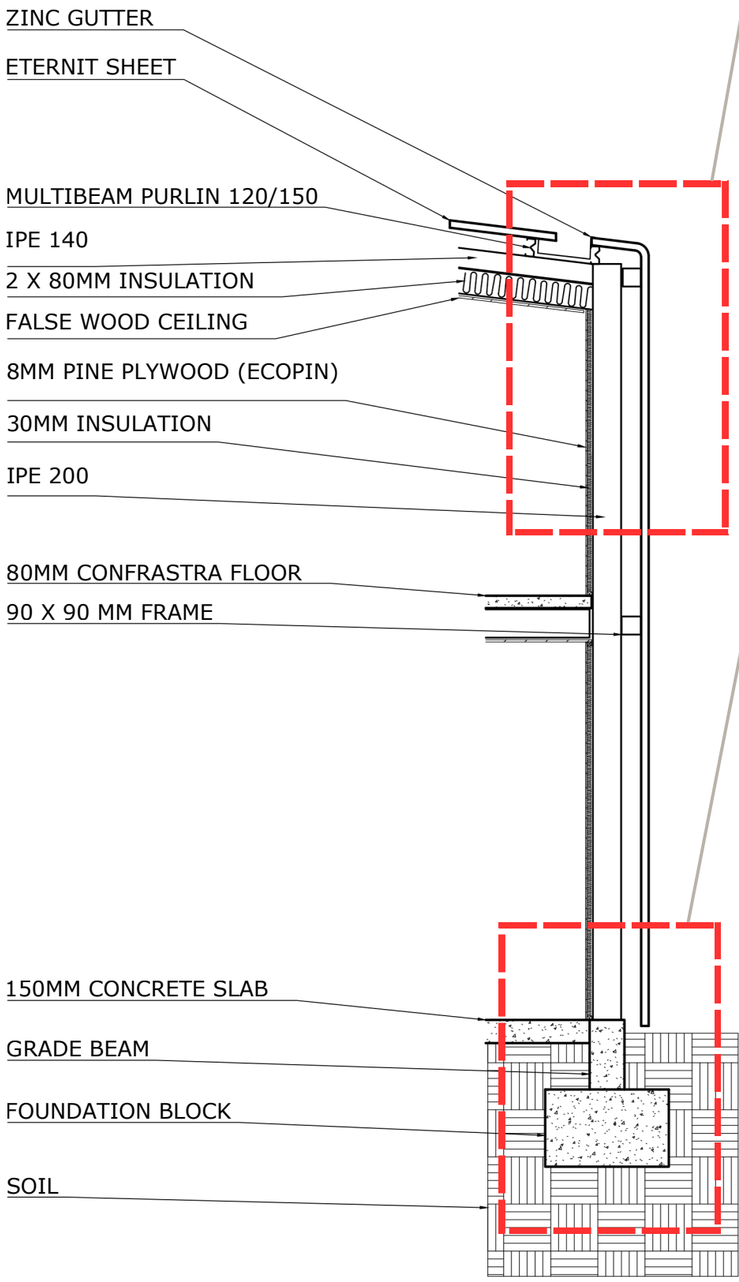
Rev.	Date.	Description	By
01	Oct. 14	Complete 3D seasonal solar sun paths	CY
02	Oct. 20	Complete microclimate analysis with Revit geometry	JF
03	Oct. 21	Created wind roses with a house footprint overlay for each season	SS
04	Oct. 21	Reorganized document for consistency and clarity	CY

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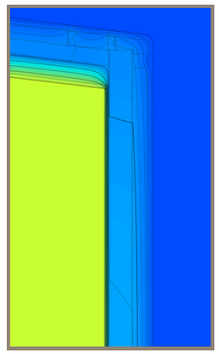
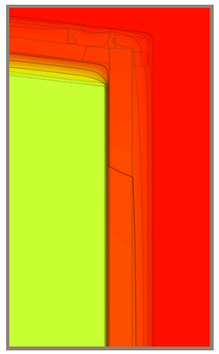
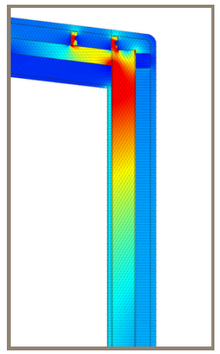
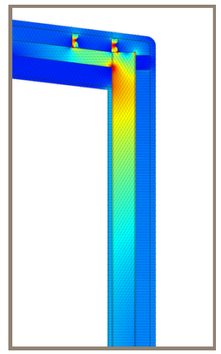
Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-102
Revision Number -	04
Date -	21-10-2026
Drawn By -	Jillian F., Serenity S., Crystal Y.
Checked By -	Jillian F.

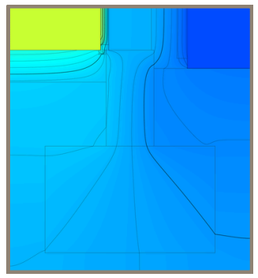
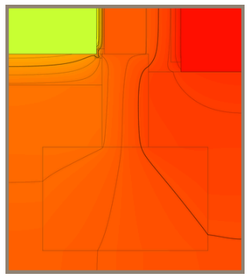
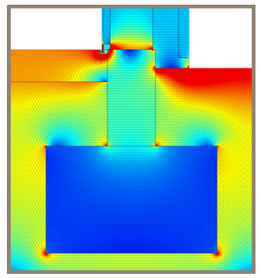
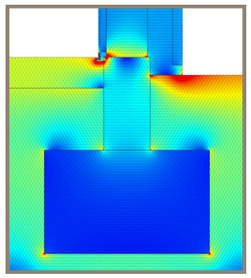


ROOF AND WALL

Winter Temperature Distribution (°C)	Summer Temperature Distribution (°C)	Winter Heat Flux Distribution (W/m^2)	Summer Heat Flux Distribution (W/m^2)
			

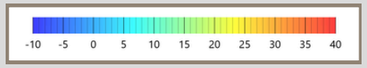
KEY POINT Steel framing creates thermal bridges in both the roof and wall by bypassing the insulation. The roof's 160 mm insulation limits the effect, but the wall's 30 mm offers less resistance, so heat transfer is higher, especially in Bordeaux's heating-dominated winters.

FOUNDATION

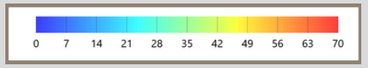
Winter Temperature Distribution (°C)	Summer Temperature Distribution (°C)	Winter Heat Flux Distribution (W/m^2)	Summer Heat Flux Distribution (W/m^2)
			

KEY POINT The concrete slab and foundation lack continuous insulation, creating a thermal bridge at the slab edge. This increases winter heat loss into the ground, while cooler ground temperatures may help dissipate heat in summer. Overall, the foundation is a greater concern during Bordeaux's heating-dominated winters.

TEMPERATURE (°C)



HEAT FLUX (W/m^2)



Simulation Conditions: Winter: 20°C indoors, −5°C outdoors; Summer: 20°C indoors, 38.7°C outdoors. Steady-state HTflux simulations used constant indoor temperatures and Bordeaux's outdoor temperature extremes from the Temperature Patterns chart to assess performance.

Overall Thermal Assessment: Roof insulation limits heat transfer, but steel thermal bridges, limited wall insulation, single-pane glazing, and a foundation without continuous insulation weaken the building's thermal performance, particularly in Bordeaux's heating-dominated winters.

Source: HTflux, using custom CAD geometry and assigned material properties.

02

ENVIRONMENTAL PERFORMANCE ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 10	Apply P1A redlines to wall section used for analysis	JF
02	Oct. 11	Run thermal simulations using HTflux software, implementing wall section geometry and materials, and analyze results	JF

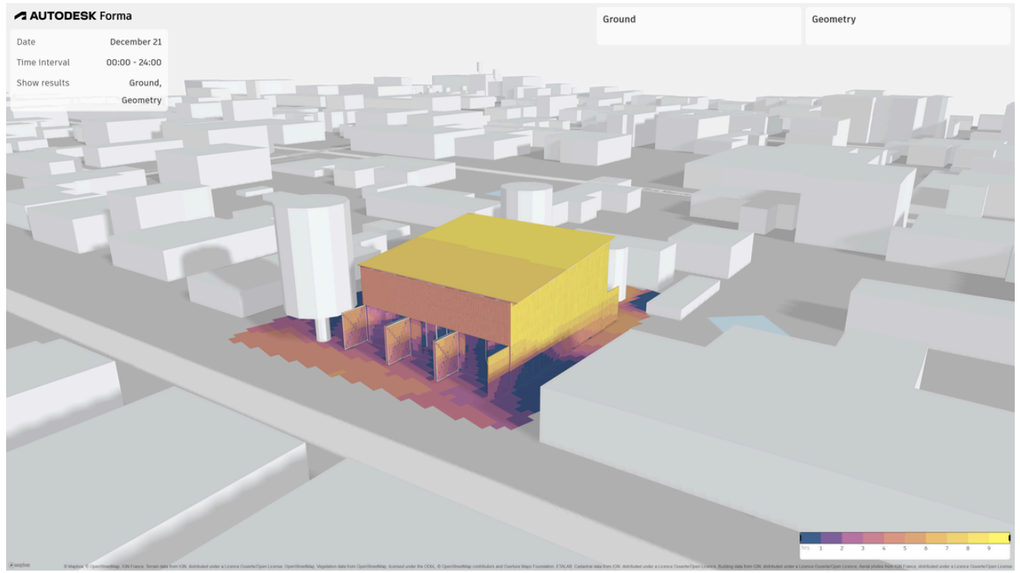
Group 03 - ARCC 2203

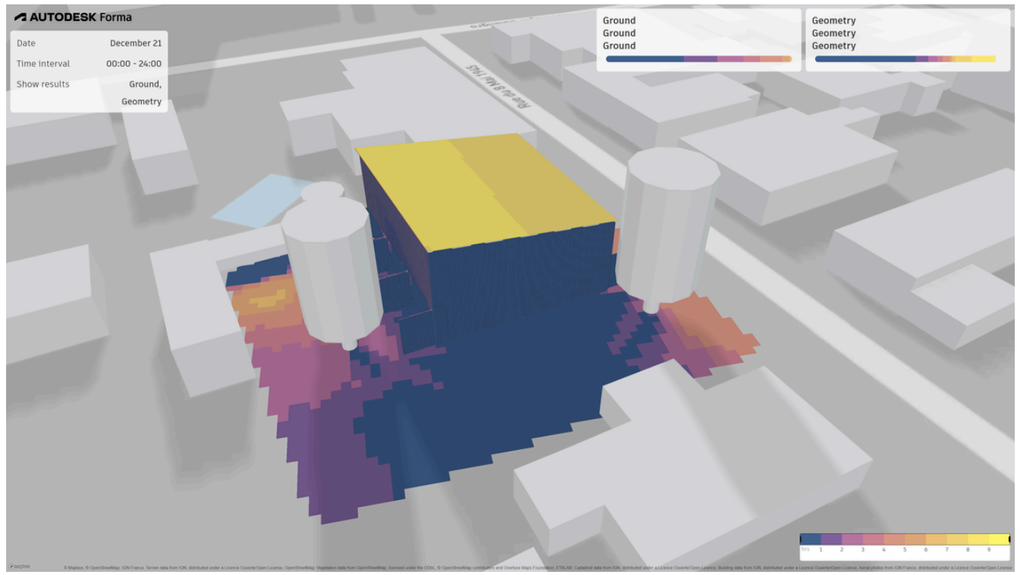
Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-201
Revision Number -	02
Date -	21-10-2026
Drawn By -	Jillian F.
Checked By -	Jillian F.

WINTER SUN HOURS | DECEMBER 21 (WINTER SOLSTICE)

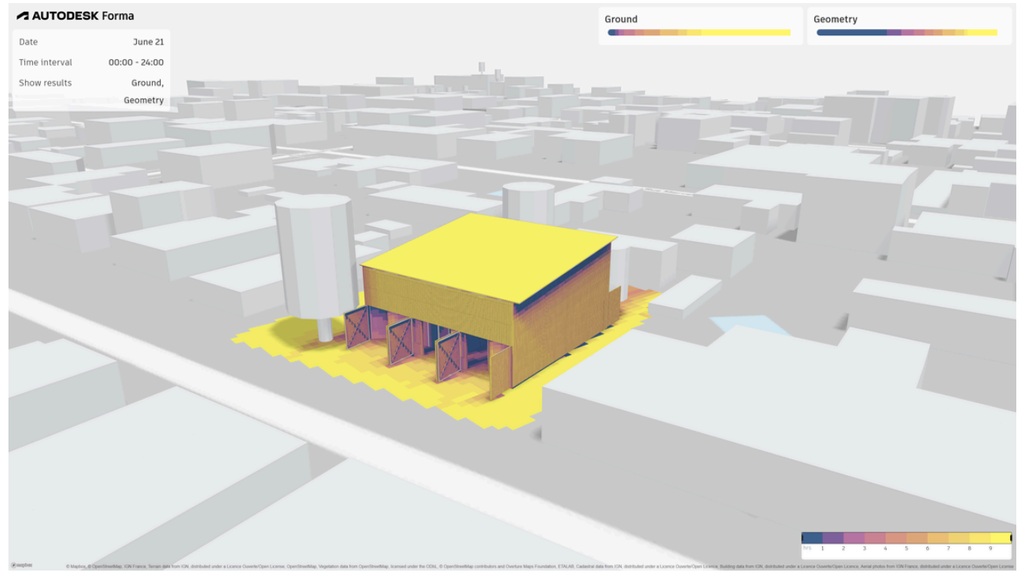


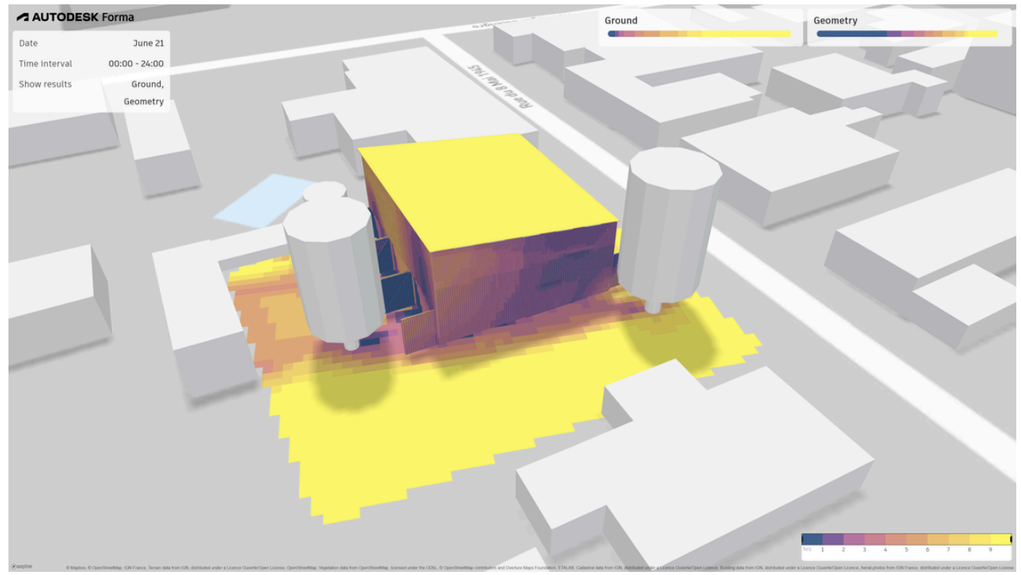


Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT | Shorter daylight hours and a lower sun angle create extensive shading around Maison Latapie. Surrounding buildings and trees further reduce direct sunlight, limiting passive solar heating.

SUMMER SUN HOURS | JUNE 21 (SUMMER SOLSTICE)





Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT | Longer daylight hours and a higher sun angle increase solar exposure, particularly on the roof and surrounding open ground. Trees and buildings provide shading, but a lot of the site remains exposed to direct sunlight, increasing summer heat gain.

02

ENVIRONMENTAL PERFORMANCE ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 20	Complete sun hours analysis with imported Revit geometry	JF

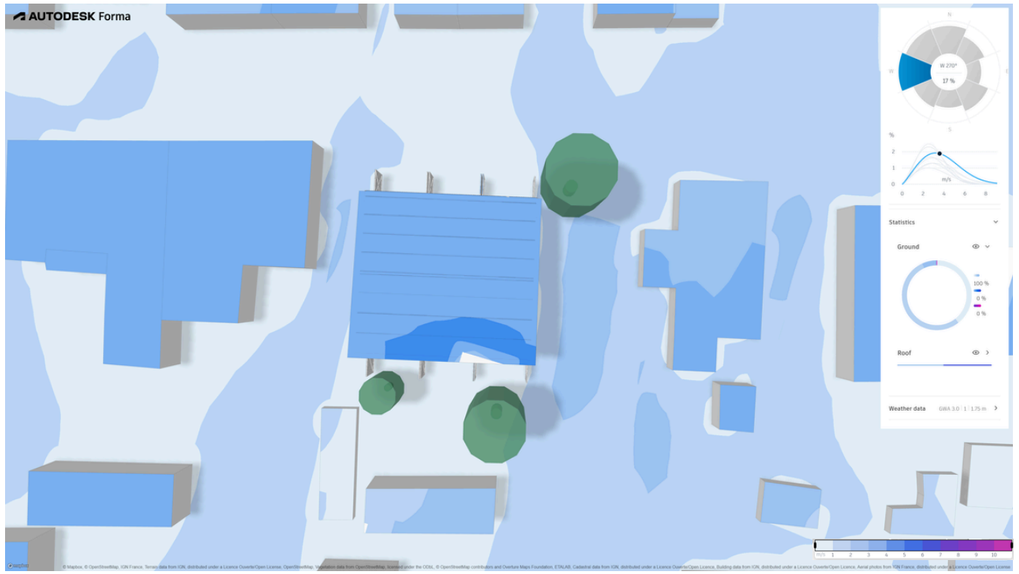
Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-203
Revision Number -	01
Date -	21-10-2026
Drawn By -	Jillian F.
Checked By -	Jillian F.

WIND ANALYSIS – PLAN VIEW

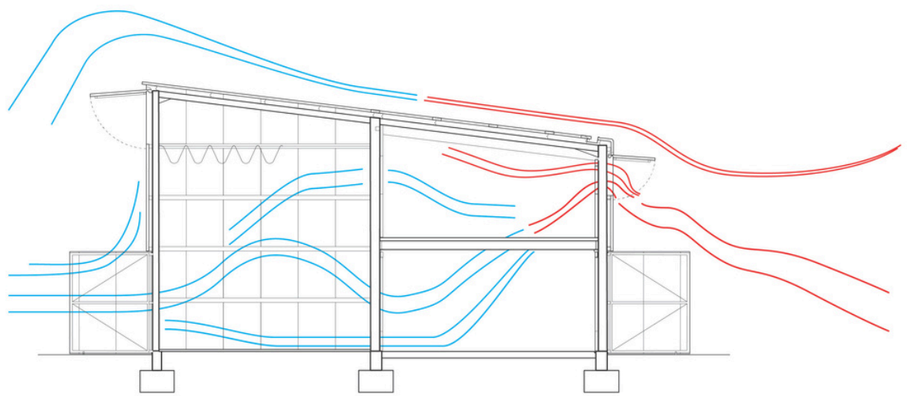


Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT

Wind speeds are generally low (1–4 m/s), with surrounding buildings and trees creating sheltered areas. More open spaces experience slightly higher wind speeds.

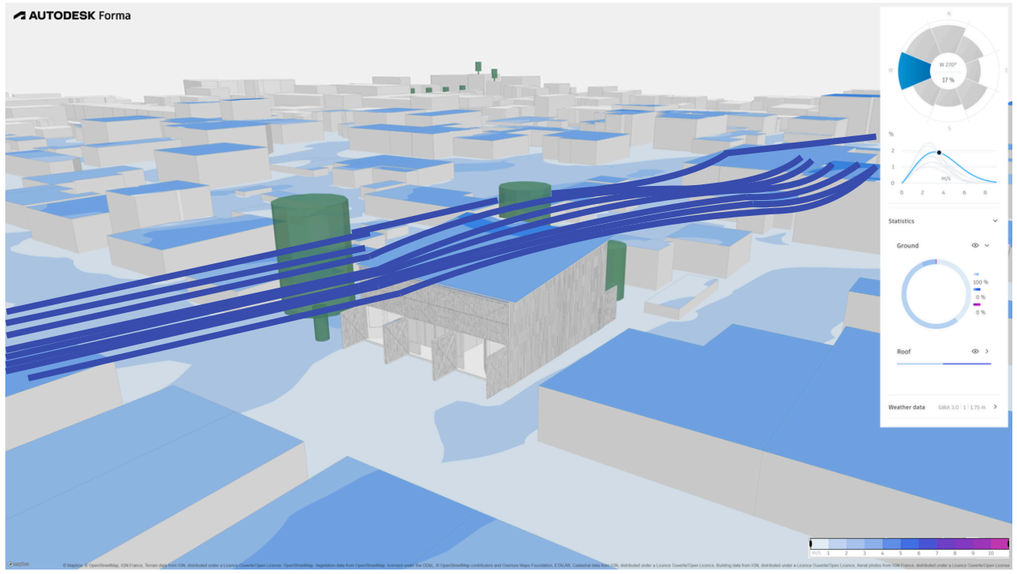
WIND FLOW ANALYSIS – INTERIOR SECTION VIEW

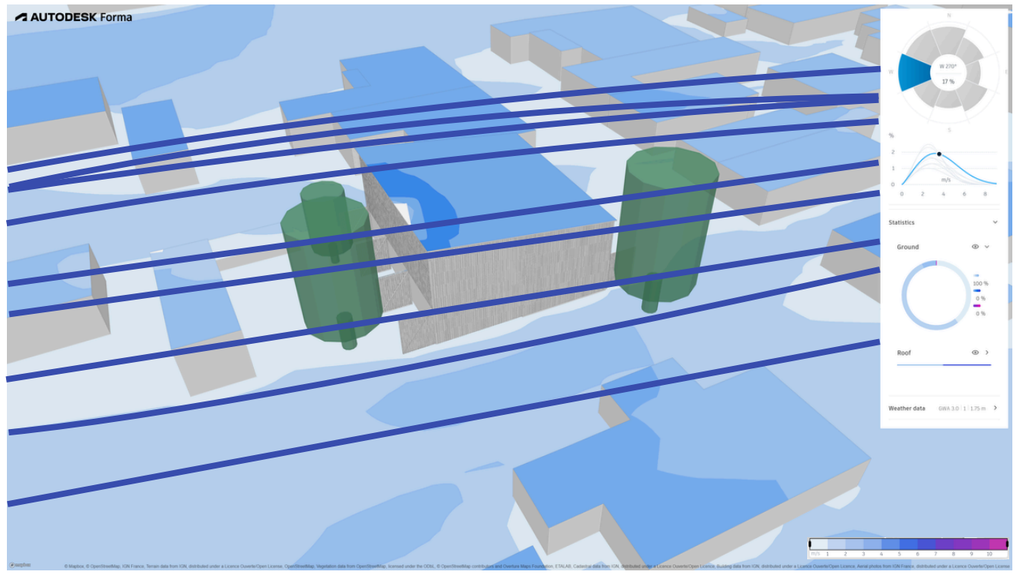


KEY POINT

Wind circulates above and through the house. Cross ventilation from the interior flows from the bottom-left moving its way up to the top-right window. The roof experiences and upward flow from the left and proceeds to make its way down the slope.

WIND ANALYSIS – PERSPECTIVE VIEWS





Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT

Wind flows around Maison Latapie and nearby obstacles, with most areas experiencing low to moderate wind speeds (1–5 m/s). Buildings and vegetation redirect airflow, creating variations in wind exposure.

02

ENVIRONMENTAL PERFORMANCE ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 21	Complete wind analysis with imported Revit geometry	JF
02	Oct.21	Added streamlines to graphs	TM
03	Oct. 21	Created wind flow analysis in section	SS

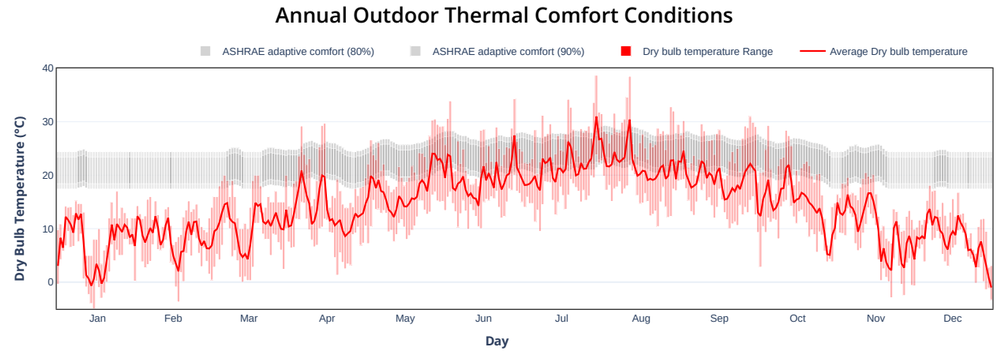
Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-204
Revision Number -	03
Date -	21-10-2026
Drawn By -	Jillian F., Serenity S., Tefia M.
Checked By -	Jillian F.

THERMAL COMFORT CONDITIONS

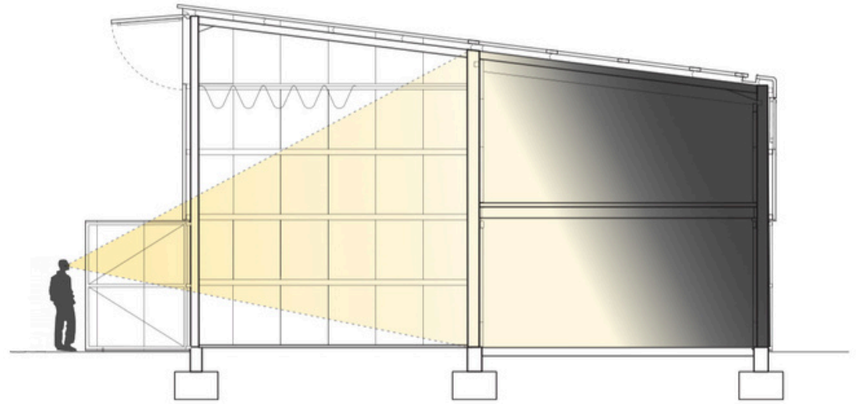


Source: CBE Clima Tool, Bordeaux–Mérignac weather data.

KEY POINT

Outdoor temperatures fall below the comfort range for much of October to April, making winter warmth the main challenge. Summers are generally comfortable, while milder spring and autumn conditions offer opportunities for natural ventilation and passive comfort.

PRIVACY AND EXPOSURE DIAGRAM

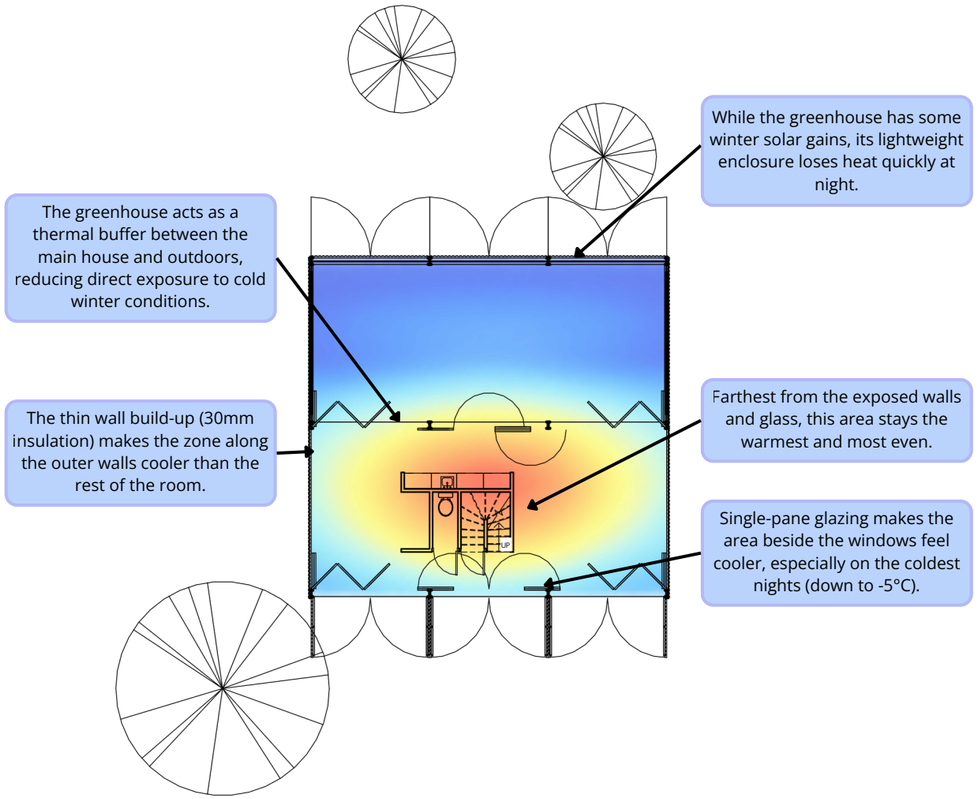


KEY POINT

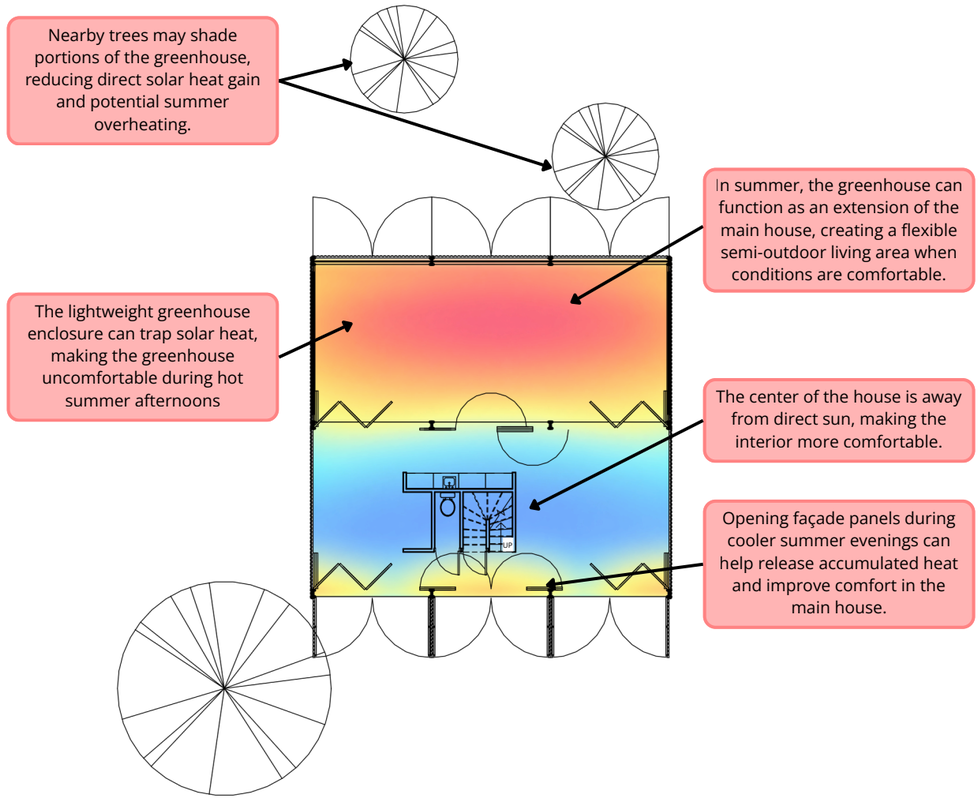
This diagram shows how much a person can see from outside the house. The greenhouse side has the most transparency, so the inner part of the house is more likely to be visible from the outside. The darker area represents the privacy that the residents have when the windows are closed. For privacy to happen, the space becomes dark.

THERMAL COMFORT ASSESSMENTS

Winter Thermal Comfort Assessment



Summer Thermal Comfort Assessment



03

OCCUPANT COMFORT ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 10	Research climate thermal comfort and analyze graphs	JF
02	Oct. 11	Create and annotate thermal comfort diagrams (plan views) for winter and summer conditions	JF
03	Oct. 19	Created privacy and exposure diagram (section view)	TM

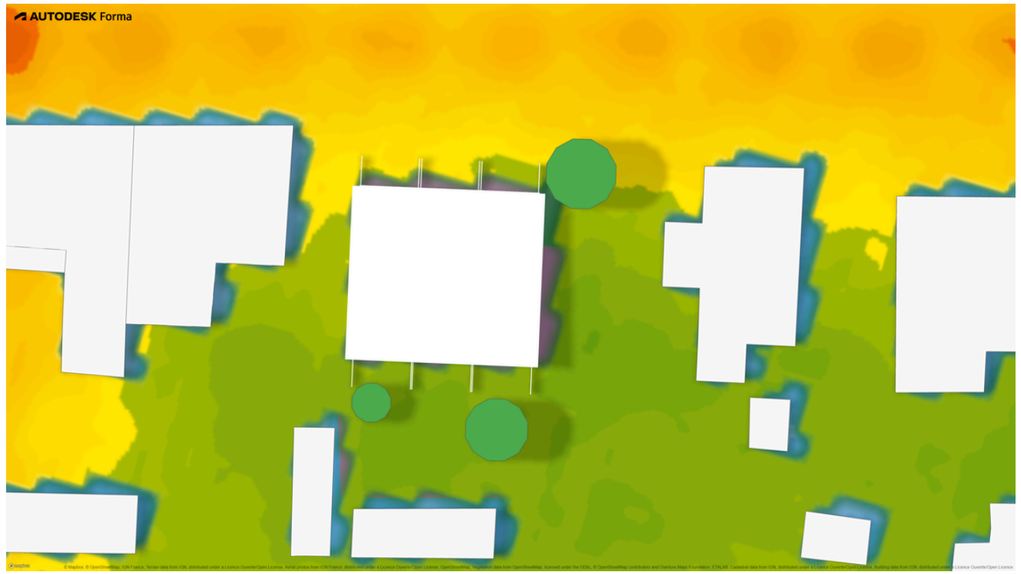
Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number - B-301
Revision Number - 03
Date - 21-10-2026
Drawn By - Jillian F., Tefia M.
Checked By - Jillian F.

ACOUSTIC COMFORT ANALYSIS – PLAN VIEW

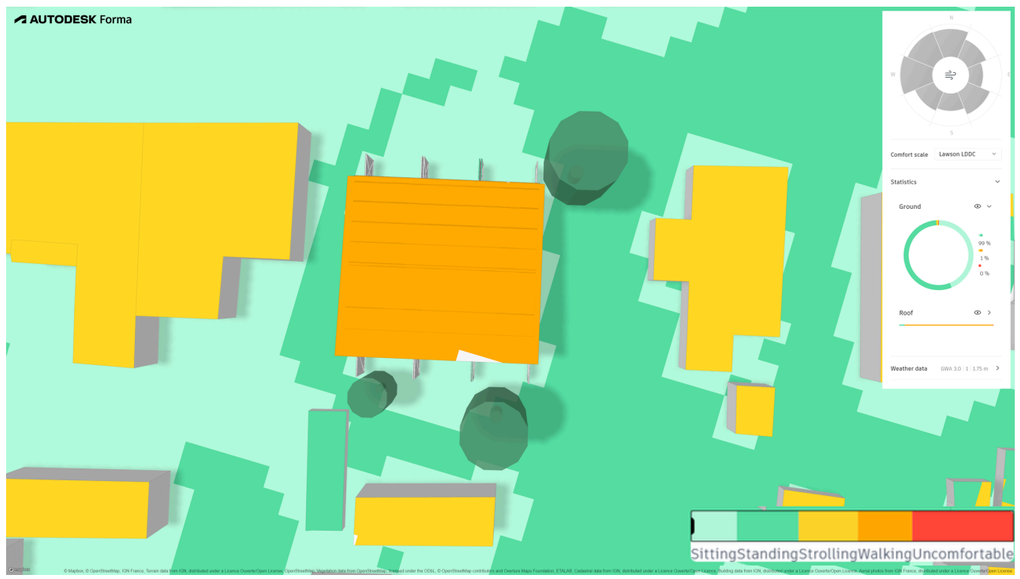


Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT

Surrounding buildings help block noise, creating quieter areas away from the roads. Bedrooms and other noise-sensitive rooms would benefit from these sheltered locations.

ACOUSTIC COMFORT ANALYSIS – PLAN VIEW

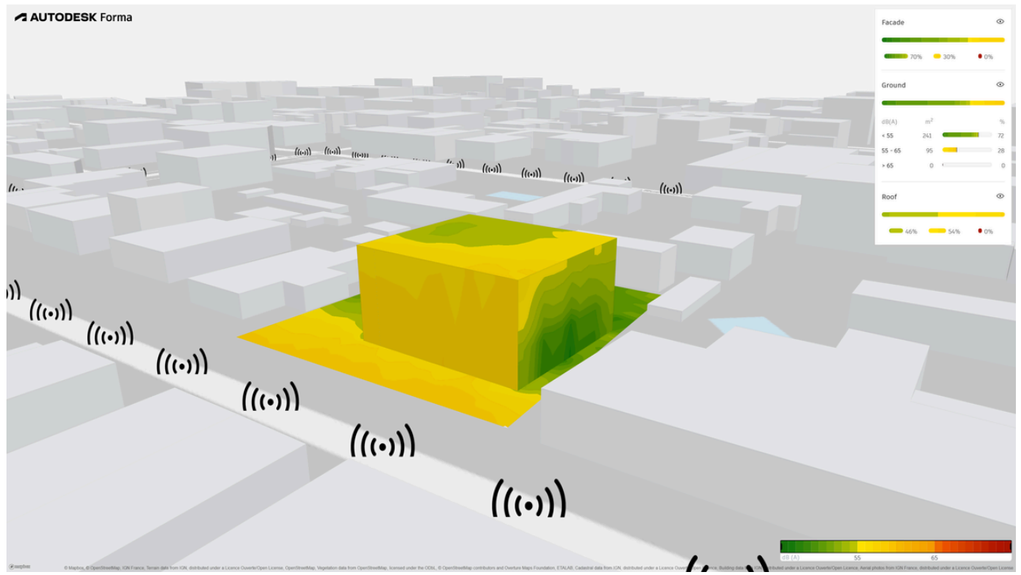


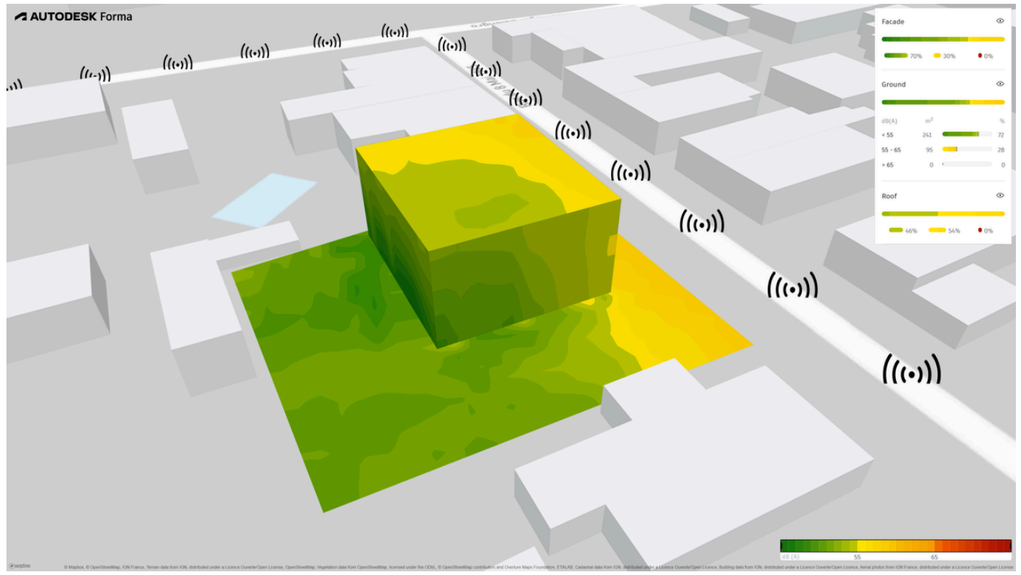
Source: Autodesk Forma, using an imported Revit model and France traffic data.

KEY POINT

Surrounding buildings provide shelter from wind, making the site comfortable, but also reduce natural airflow. Cross-ventilation and shading should offset summer overheating risk.

ACOUSTIC COMFORT ANALYSIS – PERSPECTIVE VIEWS





Source: Autodesk Forma, using an imported Revit model and France traffic data.

KEY POINT

Road-facing façades experience higher noise levels, especially on lower floors. Placing sensitive rooms on quieter sides and improving window insulation could increase indoor comfort.

03

OCCUPANT COMFORT ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 21	Complete wind comfort analysis	JF
02	Oct. 21	Completed noise analysis using local traffic research to assess occupant comfort	JF

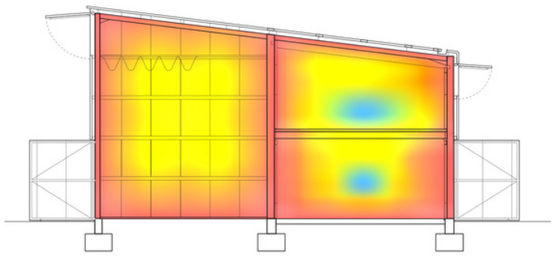
Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

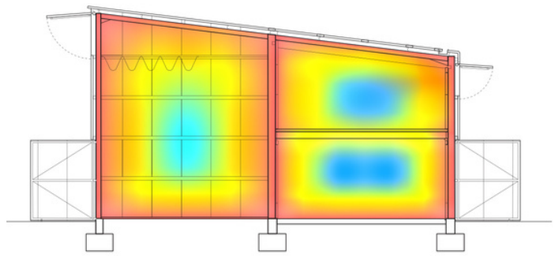
Architectural Sections

Sheet Number -	B-302
Revision Number -	02
Date -	21-10-2026
Drawn By -	Jillian F.
Checked By -	Jillian F.

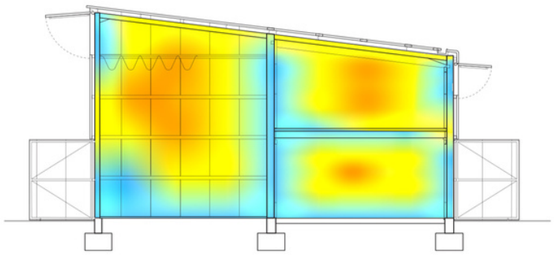
THERMAL ZONING ASSESSMENTS



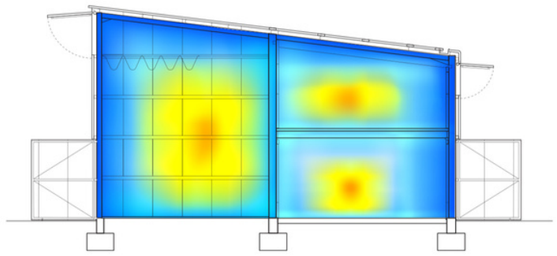
Summer Thermal Comfort Assessment (Noon)



Summer Thermal Comfort Assessment (Evening)



Winter Thermal Comfort Assessment (Noon)



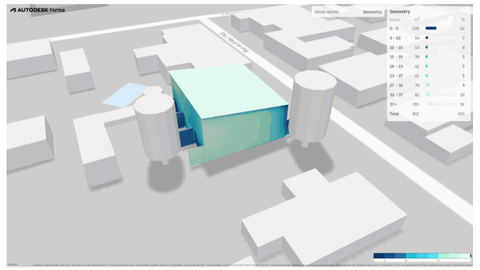
Winter Thermal Comfort Assessment (Evening)

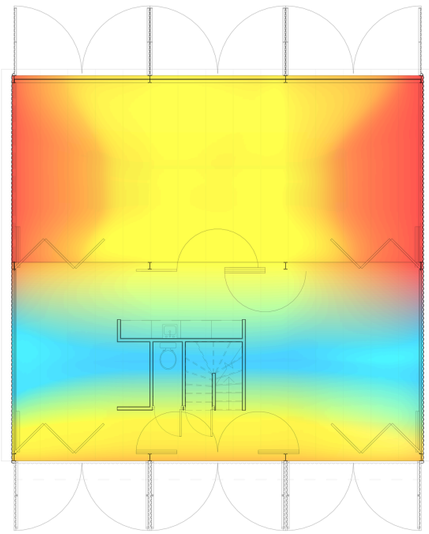
KEY POINT

Temperatures within the house can be assessed through the use of warm and cool tones, where red represents the warm areas, and blue represents the colder areas. Using summer and winter, as well as noon and evening, as the two extremes, the four diagrams display the thermal comfort levels inside the house. At noon, both summer and winter visually express large amounts of heat produced naturally (by the sun) and artificially (through heating systems) because of direct sunlight. Meanwhile, in the evenings, cooling comes into effect, and there is an increasing amount of blue compared to noon, especially in the winter due to colder temperatures and lack of solar exposure.

DAYLIGHT DISTRIBUTION & VISUAL COMFORT ASSESSMENT







Relative Daylight Level

High
(Bright/potential glare)

Moderate
(Adequate daylight)

Low
(Insufficient daylight)

Source: Autodesk Forma, using an imported Revit model and Bordeaux–Mérignac weather data.

KEY POINT

Solar exposure is fairly evenly distributed across the building, with reduced sunlight primarily occurring in areas shaded by surrounding trees. The transparent garden enclosure in the upper portion lets in a lot of sunlight, creating very bright conditions and potential glare. In contrast, the lower enclosed portion receives much less daylight, creating a poorly lit zone with reduced visual comfort and less evenly distributed natural light.

03

OCCUPANT COMFORT ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 21	Created daylighting diagrams of house exterior using Revit geometry	JF
02	Oct. 21	Added daylight distribution analysis, visual comfort diagrams, and highlighting glare, uneven lighting, and insufficient daylight	CY
03	Oct. 21	Added Summer and Winter thermal zoning assessments during noon and evening	TM

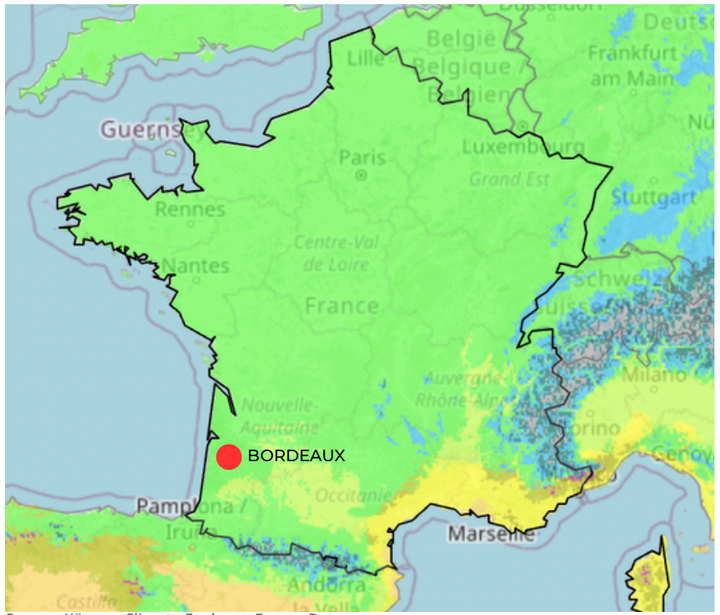
Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-303
Revision Number -	03
Date -	21-10-2026
Drawn By -	Jillian F., Tefia M., Crystal Y.
Checked By -	Jillian F.

CURRENT CLIMATE ZONES IN FRANCE



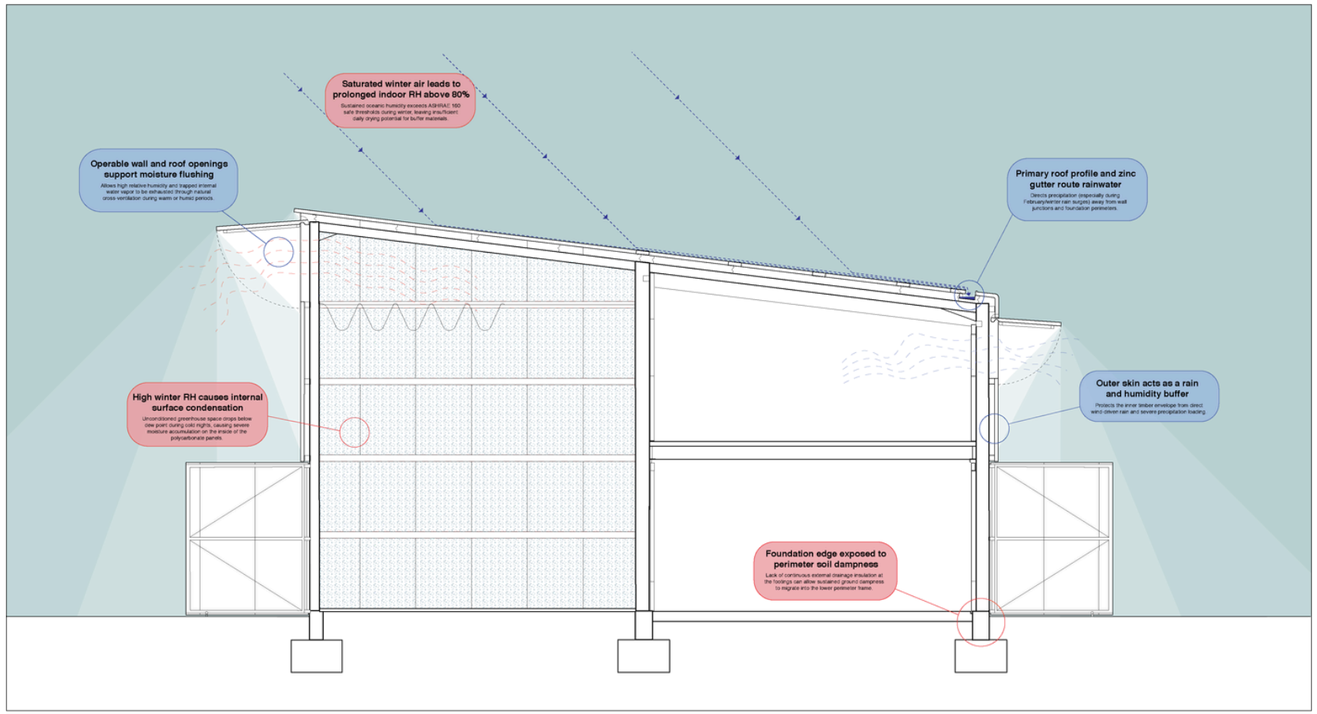
Source: Köppen Climate Explorer, France Data

- Arid, steppe, cold (BSk)
- Temperate, dry summer, hot summer (Csa)
- Temperate, dry summer, warm summer (Csb)
- Temperate, no dry season, hot summer (Cfa)
- Temperate, no dry season, warm summer (Cfb)
- Temperate, no dry season, cold summer (Cfc)
- Cold, dry summer, warm summer (Dsb)
- Cold, dry summer, cold summer (Dsc)
- Cold, no dry season, warm summer (Dfb)
- Cold, no dry season, cold summer (Dfc)
- Polar, tundra (ET)
- Polar, frost (EF)

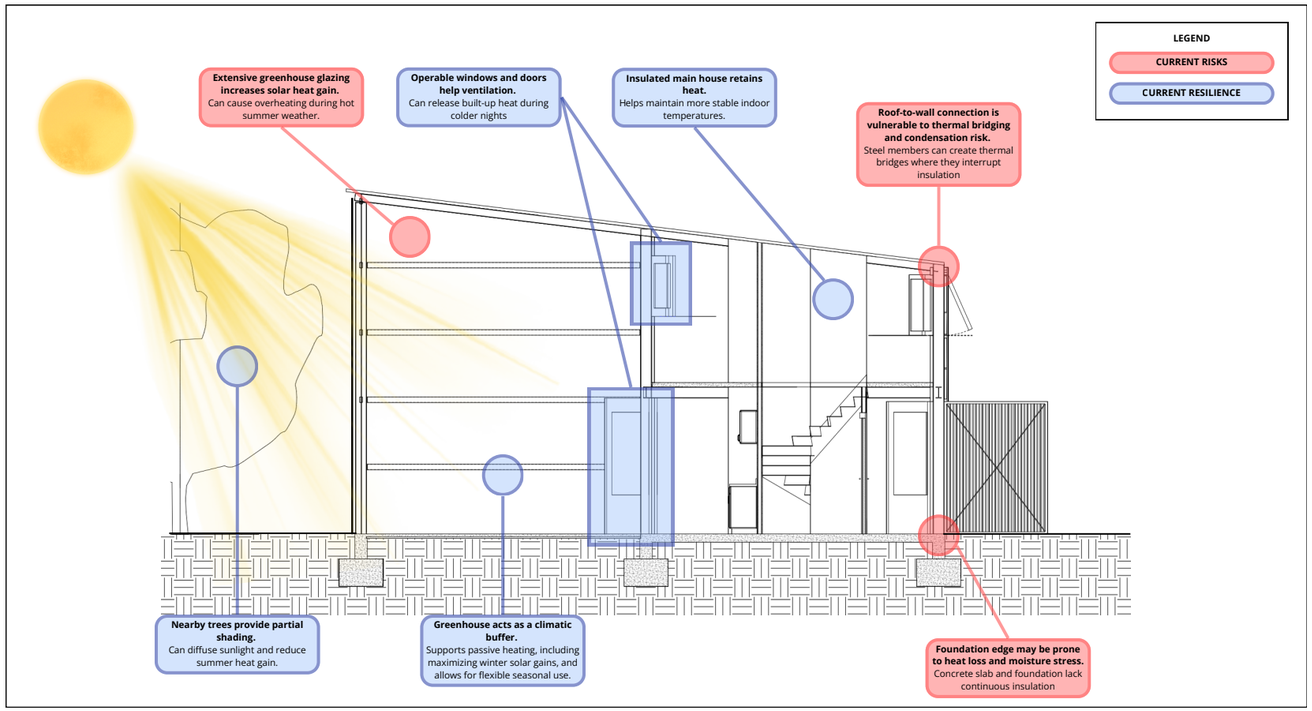
KEY POINT

The majority of France, including Bordeaux, has a temperate oceanic climate (Cfb). This means that there are no dry seasons and have warm summers.

RAINFALL SECTION - RISK ASSESSMENT



CURRENT RESILIENCE & VULNERABILITY DIAGRAM



04

RESILIENCE & VULNERABILITY ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 10	Create current resilience and vulnerability diagram with annotations	JF
02	Oct. 17	Added current climate zones in France	TM
03	Oct. 17	Added rainfall risk assessment with annotations	AS

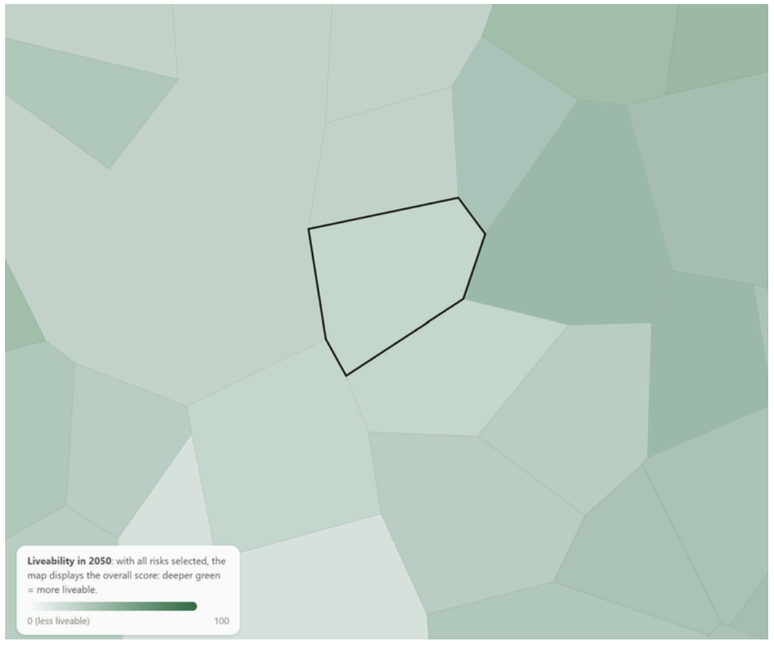
Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B -401
Revision Number -	03
Date -	21-10-2026
Drawn By -	Jillian F., Tefia M., Alex S.
Checked By -	Jillian F.

LIVABILITY IN FLOIRAC, FRANCE | 2050

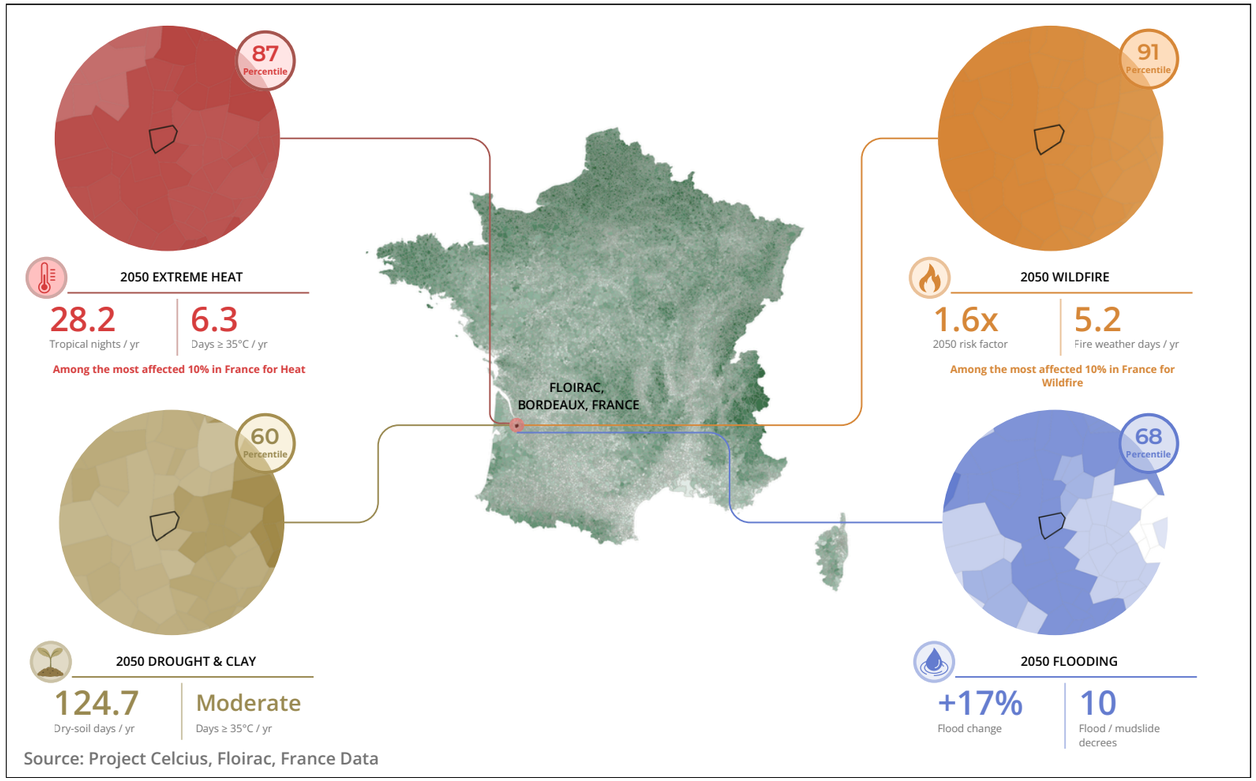


Source: Project Celcius, Floirac, France Data

KEY POINT

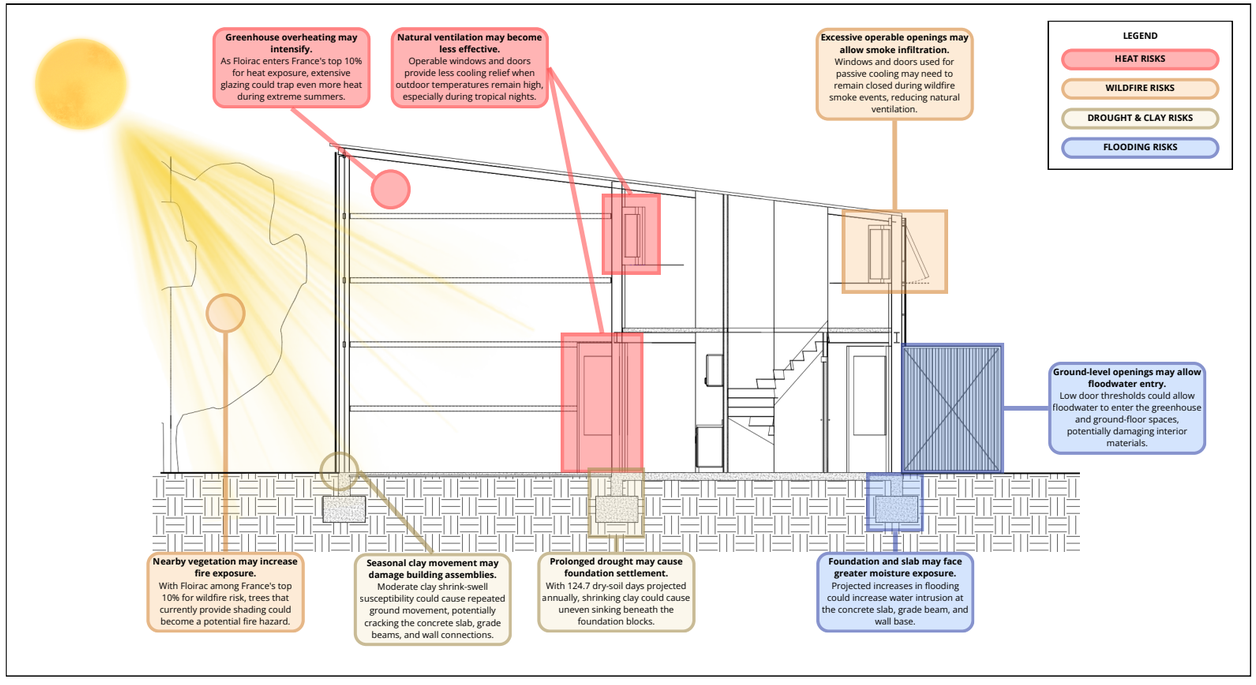
By 2050, Floirac is projected to have a livability score of 42/100, indicating reduced climate suitability. Increasing heat, wildfire risk, flooding, and drought may affect outdoor comfort, building performance, and long-term resilience.

PROJECTED CLIMATE RISKS IN FLOIRAC, FRANCE | 2050



Source: Project Celcius, Floirac, France Data

2050 VULNERABILITY DIAGRAM USING PROJECTED CLIMATE RISKS



04

RESILIENCE & VULNERABILITY ASSESSMENT

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 14	Research the house's projected climate in 2050, and create the Projected Climate Risks and Liveability diagrams	JF
02	Oct. 14	Create an annotated 2050 Vulnerability diagram for the house using the Projected Climate Risks diagram	JF

Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number -	B-402
Revision Number -	02
Date -	21-10-2026
Drawn By -	Jillian F.
Checked By -	Jillian F.

ISSUE	EVIDENCE	IMPACT	POTENTIAL RESPONSE
Heat escapes through thermal bridges in the roof-to-wall and slab-to-foundation assemblies, where steel members and uninterrupted concrete bypass the insulation.	HTflux simulations (indoor 20°C, outdoor -5°C) show concentrated heat flow, or thermal bridging, through the steel connections in the roof-to-wall assembly and through the concrete at the slab edge and grade beam, bypassing the insulation.	Bordeaux needs about 3.6 times more heating than cooling (see Component 1), so winter heat loss at these points matters most. It also creates colder surfaces near the perimeter of the house, which reduces comfort (see Component 3), and may raise condensation risk.	Install thermal breaks and continuous insulation at roof-to-wall and slab-to-foundation connections. Thermal breaks are low-conductivity layers that interrupt heat flow through steel and concrete, reducing winter heat loss and keeping interior surfaces warmer.
The concrete foundation edge and lower perimeter frame are directly exposed to ground moisture, rain splashback, and perimeter soil dampness due to a lack of continuous external drainage and moisture protection.	Section risk assessments and local precipitation data show peak rainfall surges in late winter, causing perimeter soil saturation. Field observations indicate potential capillary moisture draw near exposed concrete-to-timber junctions.	Sustained ground dampness and rain splashback increase the risk of moisture migration into the lower timber framing, potentially causing structural timber decay, mold growth at the floor-to-wall interface, and reduced indoor durability during wet oceanic winters.	Install a perimeter land drainage system with a continuous gravel splash skirt around the footings, combined with an exterior damp-proofing membrane on the concrete grade beam to channel surface water away and protect base timber from moisture draw.
Solar heat may accumulate in the garden when existing ventilation openings are not operated effectively.	Bordeaux weather file analysis shows approximately 190 kWh/m² of global horizontal solar radiation in June, compared with 40 kWh/m² in December. The translucent garden enclosure admits solar energy, which can warm interior surfaces and the surrounding air. Although the house includes ventilation openings, heat may accumulate if these remain closed or provide insufficient airflow during sunny periods. These findings indicate a potential overheating risk.	Accumulated solar heat may make the winter garden uncomfortable during warm, sunny periods, reducing its usefulness for sitting, dining and other daytime activities. When connections to the enclosed living spaces are open, heat may also transfer into those rooms, increasing discomfort and potential cooling needs. More responsive ventilation control could help release excess heat when outdoor conditions permit, while retaining useful solar warmth during colder periods.	Upgrading existing ventilation openings with temperature-controlled actuators and manual override. Open when indoor conditions are warm and outdoor air can provide cooling, close during cold periods to retain useful solar warmth.
The translucent polycarbonate garden façade is admirable for its daylighting, but the domestic privacy it provides is debatable.	Lacaton & Vassal chose corrugated polycarbonate for its ability to admit light while blurring views through reflection and surface texture. The house also uses movable façade elements between the interior, garden, and exterior. This means visual privacy is dependent partly on the material properties and their degree of openness.	When the façade is open, so is the occupants' privacy. Depending on viewing angles, lighting and sightlines, this could reduce the perceived privacy during domestic activities. However, the architects intended the material's filtering effect to help preserve interior privacy, but to what degree?	Introduce adjustable screening, curtains, or strategically placed privacy panels where needed. Locate these interventions according to sightline analysis, maintaining daylight and the adaptable relationship between the house and garden.

05

ADAPTATION STRATEGY FRAMEWORK

Revision Schedule

Rev.	Date.	Description	By
01	Oct. 10	Write a thermal adaptation based on evidence from prior analysis	JF
02	Oct. 16	Write an adaptation for moisture penetration around foundational elements.	AS
03	Oct. 18	Added solar overheating concerns, evidence, impacts, and potential ventilation strategies	CY
04	Oct. 21	Write privacy and exposure issues, evidence, impacts, and potential responses	TM

Group 03 - ARCC 2203

Maison Latapie
Bordeaux, France

Architectural Sections

Sheet Number - B-501
Revision Number - 04
Date - 21-10-2026
Drawn By - Jillian F., Tefia M., Alex S., Crystal Y.
Checked By - Jillian F.