

# Architectural design vision for sustainable and energy efficient tourism developments in the Mediterranean climate

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## The Project and Research Reflection

The focus of the graduation project aims to influence the energy demand of hotels by integrating passive design strategies. This is done through various energy simulations, architectural analysis, case studies and architectural interpretations. The architectural engineering studio in its essence aims to allow opportunities for innovative, technical, and architectural ideas to synthesize and result in a complete project. So, the graduation project thrives as the studio allows these themes to come together and be guided by experts in the topic. When it comes to the master track architecture and the master program, the study offers a detailed vision for creating an all-around architect by focusing on technical, societal, aesthetic, and functional themes. The architectural engineering course therefore holds qualities from the AUBS programme as the student is expected to consider variety of stakeholders, themes, and concerns. Considering the complexity of the topic, sustainable tourism, the themes can range from design to entrepreneurial to local communities. These complexities are highly relevant for the ecosystem of AUBS and AE studio creates an essential location to explore these.

The conclusions of the research highlighted the energy performance of different hotel typologies and morphologies and provided a design manual to assist during the design phase. These conclusions established a vision for the project since typologies and morphologies are fundamental themes for architectural expression. However, it was also challenging to directly implement these conclusions because the chosen site (Malta, Marsaskala) contained an abandoned hotel. This required adapting the existing building to meet the social and technical goals outlined in the research and minimizing the demolition of the structure. Therefore, the transformation of the existing building into the suggested typologies and morphologies required nuance and flexibility. Throughout the design phase, the research goals and conclusions guided decision-making processes for designing typologies and redefining the form and the design manual was used to understand which strategies would be most effective.

The design goals focused on social and ethical issues such as the negative dominance and extreme privatization of hotel developments. This was addressed by integrating a variety of typologies, programs, building and urban strategies and redefining the role of accommodation-based tourism developments. During this adaptation, specific solar and ventilation-based strategies evolved in a way to deepen the application of the passive design vision which was left general in the research phase. Architectural components like corridors and terraces, open plinth, lobby, façade, and shading elements added the desired social and aesthetic quality to the project while deepening the implementation of the research. The design manual's general approach was complemented by the design phase, which added depth and detail to the strategies mentioned in the manual.

The research methodology balanced theoretical and technical research to suggest a harmony between form and function. This balanced approach proved highly useful due to its integration of technical aims and aesthetic considerations. The theoretical information at the beginning of the research, which provided an overview of available passive design strategies, served as a significant design tool. This section of the research guided decisions regarding façade openings, wall orientations, and hotel room typologies. However, it could have been further supported with additional case studies and examples to better aid the design phase. The second part of the research, which investigated the energy performance of different forms and typologies, was beneficial towards the end of the design phase to evaluate the success of the implementation. This section helped to understand whether the combination of design and sustainability was effective. The conclusions of this part showed that it was possible to improve efficiency by 20% only through solar and natural ventilation passive design.

Given the negative social, environmental, and ethical impacts of hotel and tourism developments, the project closely investigated solutions considering these aspects. A key aspect of the project was the adaptive reuse of the existing building, showing the potential for developing sustainable tourism projects through the adaptation of existing structures. Choosing a bottom-up sustainability approach such as passive design illustrates the potential for design-based sustainable buildings within both academic and professional contexts.

The Mediterranean context, as an important location for tourism, is significant for implementing socially aware and energy-efficient hotel developments. Considering these locations have limited natural resources to support tourism, passive design and an all-year tourism focus address common issues related to tourism. The project also proposes a shift in vision for accommodation in tourism, incorporating social and environmental roles and redefining the role of accommodation-based tourism. This change is crucial within an industry characterized by a "consume as much as you want" mentality for many decades. Thus, the successful implementation of this project serves as an example of achieving sustainability without additional investments or inconveniences from the perspective of the developer. Since the research focuses on contexts with a Mediterranean climate, its content and conclusions are also relevant to other locations with similar climate characteristics. Additionally, the conclusions of the research and the design manual's general approach makes it applicable in various design contexts since it is not bound to specific cultural or vernacular methods. The project shows the potential for existing buildings to be redeveloped into all-year tourism projects, suggesting that development areas near settlements can benefit from the conclusions and strategies proven in this project.

Future research could explore the implementation of materialization and its impact on energy efficiency, providing a detailed architectural vision for passive design strategies considering the thermal mass and reuse potential of materials. Additionally, including other hotel programs (such as lobby, SPA or event spaces) and performing a complete energy analysis would be beneficial to have a detailed overview of the improvement. Therefore, addressing these further research questions could deepen the applicability of passive design strategies in Mediterranean climates.