



## **Study on the applicability of BIM software in architectural practice and education in Brazil – Milan Residence, Marcos Acayaba – Archicad 27**

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### **Objective**

This project is part of a broader research initiative focused on the applicability of BIM (Building Information Modeling) software in architectural practice and education in Brazil. Therefore, the specific objective was to study the use of Archicad 27 (Graphisoft) in the modeling process of the Milan Residence, designed by architect Marcos Acayaba. The research sought to verify the software's capacity to meet Brazilian regulatory requirements (especially NBR 15965 and related standards), to coherently reproduce the design stages of the architectural project, and to assess its contribution both to professional practice and to the creation of didactic material for architectural education at FAUUSP.

### **Materials and Methods**

The study was grounded in a literature review of national and international works on BIM, addressing concepts, classifications, and standards (Eastman et al., 2011; Succar, 2009; ABNT, 2011–2022). Following this, a BIM model of the Milan Residence was developed in Archicad 27, based on original executive drawings provided by the architect.

The adopted methodology followed previous undergraduate research, consisting of a comparison between the architectural elements (plans, sections, construction details) and the

resources available in the software at each design stage. Interoperability tests were also conducted using the neutral IFC (Industry Foundation Classes) format, analyzed with complementary software. Additionally, the PQTO software, developed by the advisor, was employed to extract quantities and detect modeling inconsistencies.

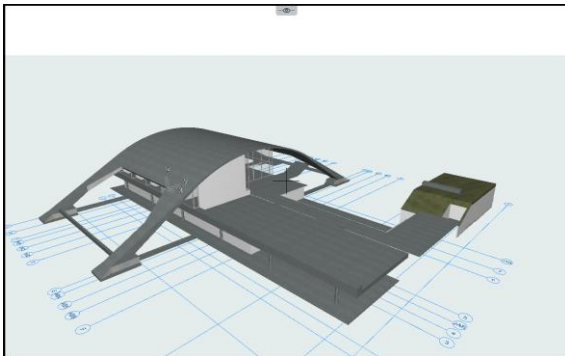
### **Results**

Preliminary results indicate that Archicad 27 can faithfully represent the Milan Residence, including the terrain (Picture 1), its unique concrete arch structure and specific constructive solutions (Picture 2). The BIM model met, in general, Brazilian normative requirements, although limitations were observed in the classification of information according to NBR 15965, particularly regarding standardization of elements and interoperability with other software.

Another relevant outcome was that the use of PQTO allowed the identification of modeling errors that could compromise the correct reading of the model in external platforms, highlighting the importance of early quality control in digital modeling. Furthermore, the research produced systematized didactic material that can be incorporated into both mandatory and elective undergraduate courses. It is worth noting that the produced materials will be made available online on the LabBIM website – <https://labbim.fau.usp.br>.



Picture 1: Modeled terrain.



Picture 2: Concrete arch structure and other constructive solutions modeled.

## Conclusions

The research confirmed the feasibility of applying Archicad 27 to projects representative of Brazilian architecture, contributing to both professional practice and teaching. The study emphasized the need for greater dissemination and implementation of NBR 15965 within academic and professional contexts, as its adoption remains limited in the AECO sector.

It was also demonstrated that the development of tutorials based on real projects, such as the Milan Residence, is more effective for learning than manufacturer-provided materials, as it brings students closer to the realities of professional practice.

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## References

ABNT. **NBR 15965 - Sistema de classificação da informação da construção - Parte 5: Resultados da construção**. Rio de Janeiro, 2021b.

ABNT. **NBR 15965 - Sistema de classificação da informação da construção - Parte 6: Unidades e espaços da construção**. Rio de Janeiro, 2021c.

EASTMAN, C. et al. **BIM Handbook: A Guide to Building Information Modeling**. Wiley, 2011.

SALMAZO, V. C. **Estudo de aplicabilidade de software BIM na prática e ensino da arquitetura no Brasil – Casa Olga Baeta – Projeto de Arquitetura – Graphisoft Archicad** (Relatório Final de Pesquisa – PUB 2019-20). São Paulo: Pró-Reitoria de Pesquisa, 2020. Orientador: Marcelo Eduardo Giacaglia.

SUCCAR, B. **Building Information Modeling Framework. Automation in Construction**, v. 18, p. 357–375, 2009.