

Application of Adaptive Architecture in Building Technologies: A Case Study of Neuhoff Site in Nashville, Tennessee

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Abstract : Building construction has a great impact on climate change. Adaptive design strategies were developed to provide new life and purpose to old buildings and create new environments with economic benefits to meet resident needs. The role of smart material systems is undeniable in providing adaptivity of the architectural environments and their effects on creating better adaptive building environments. In this research, a case study named Neuhoff site located near Cumberland River in the Germantown neighborhood in the city of Nashville, Tennessee, was considered. This building in the early 1920s was constructed as a meat-packing facility and then served as a mixed-use space; however, New City has partnered with world-class architects to reinvent this site to be changed to mixed-use waterfront development. The future office space will be designed with LEED certification as a goal. Environmentally friendly sensitive materials and designs will offer for all adaptive reuse of the building. The smart materials and their applications, especially in the field of building technology and architecture, were emphasized in providing a renovation plan for the site. The advantages and qualities of smart material systems were targeted to explore in this research on the field of architecture. Also, this research helps to understand better the effects of smart material systems on the construction and design processes, exploration of the way to make architecture with better adaptive characteristics, plus provide optimal environmental situations for the users, which reflect on the climatic, structural, and architectural performances.

Keywords : adaptive architecture, building technology, case study, smart material systems

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