

## ABSTRACT

### Exploring a High-Tech Approach to Subterranean Dwelling Environments for Commercial Implementation

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People are always looking to experience something interesting and unique when on vacation. What could be more unique than staying in a hotel that is completely underground? While people have always been amazed at natural caves and other subterranean structures, the idea of spending the night in one of these is a somewhat untried area, although it could be quite the selling point. This being the case, the idea of a subterranean hotel is not so farfetched, however there are a number of issues that arise with this project. These issues include construction and selecting the proper site and building materials to ensure strength, issues of humidity and lighting, as well as simply getting people to make this a destination on their vacation. This paper addresses these issues and discusses composition of materials and the use of a steel and concrete mixture to ensure strength and rigidity. Lighting issues are also solved using reflectively coated light tubes to gather sunlight and heat from the outside. The biggest internal issue of humidity is solved through the use of energy recovery ventilation. Finally, the cost of the hotel and the cost of operation are justified in the final section. With the ideas presented in this paper, forward thinking hoteliers could see how a property of this nature could indeed be possible and profitable.