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**Assignment 2: Problems with Building Life Cycles**

The purpose of this assignment is to find problems within a building’s life cycle and address these problems using Intelligent Building techniques. A building’s life cycle includes design, construction, operation, occupancy, and modification. For this project I have addressed the design, construction, and operation phases of the cycle pointing out situations and options to improve both efficiency and costs.

During the design phase of a building, there is a plethora of time and resources wasted using traditional methods. The traditional methods include printing many drawings, printing perspective views, and manually detailing schedules. This method wastes hundreds of square feet of paper due to revisions and modifications to the project and also wastes many hours of time, both of which add to the overall cost of the design phase. Also, with each change issued, there is a schedule of the details to manually fix and count using labor hours that could be put to better use.

Using a Building Information Model, BIM, all three components are automatically coordinated within a single software program, Autodesk’s Revit. Using the AutoCAD-like drawing feature, the software operator draws the plans and sections while simultaneously creating a 3D model and schedule. Changes made to either the model or drawings will automatically make appropriate changes the other two in real time. The BIM method saves both time and paper which ultimately cuts down on design costs.

Throughout history, the construction of a new building has always produced waste materials. Studies have shown that for every square foot of new construction, two and a half pounds of waste is created. With this average, one could argue that the twin towers created about 12,500 tons of waste during construction. One way to cut down on the waste is to recycle materials from old buildings and the current new building under construction. Materials including appliances, fixtures, windows, and doors can all be refurbished and reused in new and old construction. Roofing, lumber, masonry, metals, and plastics can all be recycled into new building materials.

Depending on the type, during its operation, a building will use many kilowatts of electricity. This electricity is often made using nonrenewable resources which have a negative impact on the environment. While it usually costs more money upfront to install a renewable energy resource or more efficient appliance, often the operational savings will pay out in the long run of a building or company’s life.

Renewable resources are an important part of the future of power. Some of the most popular types are hydroelectric, geothermal, photovoltaic, wind, and biomass. For this study, sources that are easily built or placed on or near the building site are the most useful. Although there may be an option to uses methane from a local landfill or electricity from a local dam, most construction sites will not have this option.

Photovoltaic panels, wind farms, and geothermal heating may all be integrated within the design and operation of the building.