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Redevelopment of the Building and its Estimate and Costing with Validation of NDT Methods

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Abstract: ***Industrial redevelopment involves renovating or repurposing outdated or underutilized industrial properties to make them more efficient, safe, and sustainable for modern manufacturing and other industrial activities. The costs associated with industrial redevelopment can vary greatly depending on factors such as the age and condition of existing structures, infrastructure requirements, environmental remediation needs, and zoning and permitting requirements. Although the cost can be substantial, redeveloped industrial sites have the potential to create new jobs, stimulate economic growth, and promote sustainability in local communities. As a result, despite the cost considerations, industrial redevelopment is often viewed as a valuable investment in the long - term health and prosperity of industrial areas.***

Keywords: Industrial redevelopment, economically viable, overall sustainability

1. Introduction

Industries have been instrumental in the development of societies, contributing to economic growth and employment opportunities. However, redeveloping industrial buildings has become a critical issue due to changing technology, production methods, and market demands. Redevelopment of industrial buildings provides a means to rejuvenate the surrounding area while contributing to sustainable urban development. Estimating and costing the project are critical components of the redevelopment process, along with other factors such as site conditions, regulatory requirements, and stakeholder engagement. Redevelopment projects can create new jobs, attract new businesses and industries, and improve the quality of life for residents. Stakeholder engagement is a crucial component of the redevelopment process, requiring collaboration with residents, businesses, and regulatory bodies to ensure a successful project outcome. Floor Space Index (FSI) is an important measure in urban planning and building design to determine the amount of floor space that can be constructed on a given plot of land. The FSI for industrial buildings is different from other building types due to their unique requirements and characteristics of industrial operations. The FSI is calculated as the ratio of the total floor area of a building to the total area of the plot of land on which it is constructed. In the case of industrial buildings, the FSI can vary based on local regulations and zoning laws, considering various factors such as setbacks, floor area ratio (FAR), and the needs of the industrial operations.

2. Literature Review

The needs for a seamless transition from the building's previous use to its new function while retaining a piece of its past functionality. The paper explores examples of successful revitalization projects, such as the Duisburg Park, and theoretical approaches like the strategic and delicate approach of Latz and Partners Landscape Architects. the moderating role of the goodness of regeneration mode" proposes an expanded theory of planned behavior model to identify the factors that influence public acceptance of these projects. The paper finds that current AIB uses, such as creative/cultural spaces, are a viable option, and highlights the scholarly and managerial implications of the observational results. conserving natural resources is an essential aspect of developed societies and examines various successful projects and scientific research to identify the fundamental principles that contribute to the successful revitalization of abandoned areas. The paper proposes a design for an existing former factory located in Moscow, which aims to effectively rejuvenate the abandoned industrial area while preserving its historical significance. he theoretical and practical bases of redevelopment for industrial zones and develops a concept by considering problem issues, obstacles, and motivational levers in realizing these projects. The paper argues that redevelopment contributes significantly to the rational and sustainable development of a city, creating new spaces for real estate, businesses, and creative areas

3. Methodology

Site analysis: Conducting a thorough site analysis is the first step in the process of redeveloping an industrial building. This involves evaluating the building and its surrounding area to determine its current condition, potential uses, and any challenges or opportunities associated with the project.

The site analysis may include:

Assessing the condition of the building: This involves examining the structural integrity of the building, the condition of the roof, walls, and flooring, and the state of any mechanical, electrical, or plumbing systems. This information helps to determine the feasibility of the project and the scope of work needed for the redevelopment.

Evaluating the site: This involves assessing the location of the building and the surrounding area, including the accessibility of the site, the availability of utilities, and the zoning regulations that may affect the project. The site analysis also considers any environmental concerns, such as the presence of hazardous materials or the potential impact on local wildlife.

Identifying potential uses: The site analysis evaluates the potential uses for the building based on the local market demand, the building's condition and location, and any zoning restrictions or other regulatory requirements. This helps to determine whether the project is financially viable and meets the needs of the community.

Assessing challenges and opportunities: The site analysis identifies any challenges or opportunities associated with the project, such as the need for additional parking or the potential for adaptive reuse of the building. These insights help to inform the project design and development strategy.

Feasibility study: Once the site analysis is complete, a feasibility study is conducted to evaluate the economic viability of the project. This involves analyzing the costs and benefits of the proposed redevelopment, including:
Estimating project costs: The feasibility study estimates the cost of the project, including design, construction, permits, fees, and contingency costs. This information helps to determine whether the project is within budget and financially feasible.

Analyzing the potential return on investment: The feasibility study evaluates the potential revenue that the project can generate, such as rental income or the value of the property once the redevelopment is complete. This helps to determine whether the project is a sound investment.

Assessing demand: The feasibility study evaluates the level of demand for the proposed use of the building based on market research and demographic analysis. This helps to determine whether the construction project is likely to be successful.

Conceptual design: With the site analysis and feasibility study in hand, the next step is to develop a conceptual design for the redevelopment of the industrial building. This involves creating a vision for the project that takes into account the project goals, site analysis, and feasibility study. The conceptual design may include:

Sketches and renderings: The conceptual design may include sketches or 3D renderings that illustrate the proposed redevelopment of the building.

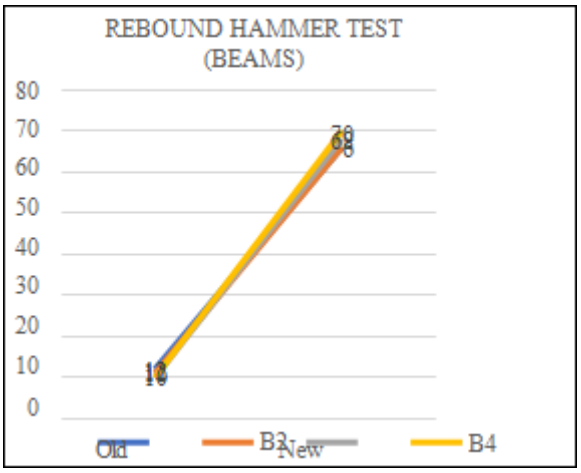
Cost estimates: The conceptual design includes cost estimates for the proposed design, based on the project budget and scope.
Site plans: The conceptual design includes site plans that show the layout of the building and any outdoor spaces, such as parking lots or green areas.

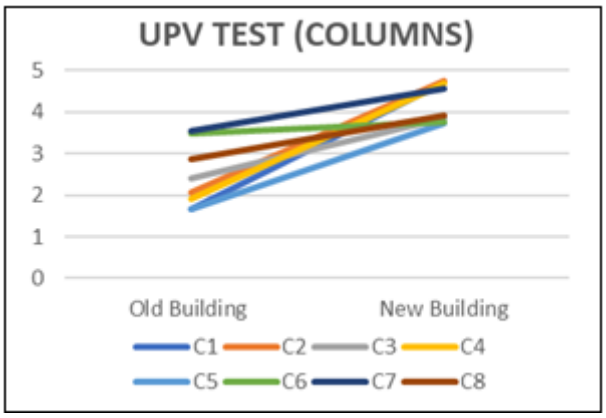
Design elements: The conceptual design includes design elements such as color schemes, materials, and architectural features that help to create a cohesive vision for the project.

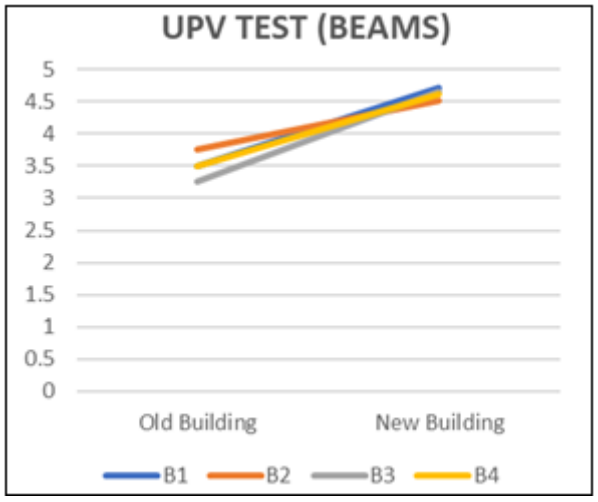
Cost estimating: Once the conceptual design is complete, a detailed cost estimate is developed for the project. This involves calculating the costs of all aspects of the project, including design, construction, permits, fees, and contingency costs. The cost estimate helps to determine whether the project is within budget and financially feasible

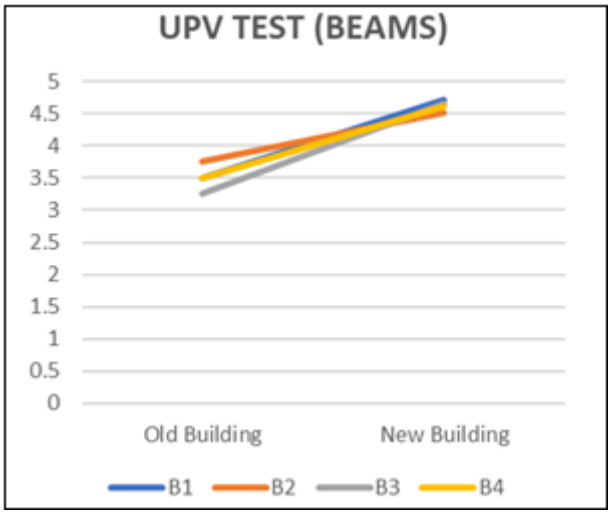
4. Results

Concrete is a crucial building material in civil engineering, and its strength and quality are essential for ensuring the safety and durability of structures. Nondestructive testing methods, such as the rebound hammer test and ultrasonic pulse velocity test, are often used to assess the strength and quality of concrete structures without causing damage to the material. The rebound hammer test involves using a specialized hammer to strike the surface of the concrete and measure the rebound velocity, which can be used to estimate the compressive strength of the concrete. The ultrasonic pulse velocity test involves sending high - frequency sound waves through the concrete to measure the time it takes for the waves to travel through the material, which can be used to evaluate the overall quality of the concrete. Both tests have their own advantages and limitations. The rebound hammer test is relatively simple and inexpensive, but sensitive to surface conditions, while the ultrasonic pulse velocity test is more accurate and detailed but requires specialized equipment and trained personnel. These tests are often used in combination with other testing methods to provide a comprehensive evaluation of the concrete.









Materials	Quantities
Total Steel Used	135 tons
Total Concrete Used	2435 cu. ft
Total Cost of project	Rs.4, 53, 57, 222

5. Conclusion

The total quantity of steel required is 135tons. The total quantity of concrete required is 2243.55 cu. m. The total cost of project is Rs.4, 53, 57, 222.

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