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Construction of Medical College Building

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Abstract: *The Construction of Jangaon Medical College is part of a significant expansion in medical education within Telangana. On September 15, 2023, Telangana Chief Minister K. Chandrashekhar Rao inaugurated nine new government medical colleges, including the one in Jangaon. This inauguration is part of a broader initiative to enhance healthcare and medical education in the state. By the next academic year (2024-2025), eight additional medical colleges are expected to become operational, making Telangana the only state in India with a government medical college in each district. The new medical colleges, combined with upgraded district hospitals, are expected to significantly improve tertiary healthcare and increase the number of medical seats available to students. The state has seen a dramatic increase in medical seats, from 2,850 in 2014 to 8,515 currently. This initiative is part of Telangana's ongoing efforts to position itself as a leader in medical education and healthcare infrastructure in India.*

Keywords: Focused on materials, testing methods, cost estimation processes, and Optimization of cost

I. INTRODUCTION

About Company

BPR Infrastructure Limited is significantly involved in the construction of the new Government Medical College in Jangaon, Telangana. The project has been approved by the National Medical Commission and will accommodate 100 students annually for the MBBS program under the Kaloji Narayana Rao University of Health Sciences.

BPR Infrastructure Private Limited, with over 40 years of experience in civil construction, is handling the project. The company's operational scope includes civil, structural, infrastructural, and electrical engineering services. The college's construction is part of BPRIL's broader portfolio, which includes a mix of ongoing and completed projects predominantly in Andhra Pradesh and Telangana.

Project Overview

Name Of The Project: Construction of Jangaon Medical College
Project Cost : 130 crore
Project Period : 18 Months
Date Of Commencement: 3-2-2024 G Due
Date Of Completion: 1-1-2026
Total Builtup Area : 7.04
Acres Number Of Floors : G+3

II. PURPOSE OF THE PROJECT

The project aims to serves as a one-stop destination for citizens, businesses, and stakeholders. Centralizing government offices into one complex allows for better coordination and faster decision-making, as departments will be physically close to one another. This improves the efficiency of public administration and service delivery to citizens.

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III. SCOPE OF WORK

The construction of the experimental investigation on modern complex building covers all activities required to design, construct, and complete the facility in accordance with applicable standards and regulations. This scope includes

- Site Preparation and Surveying: Conducting geotechnical and topographical surveys to assess soil conditions, site topography, and environmental factors that may influence the design and construction process.
- Clearing and Excavation: Clearing the site of any vegetation, debris, or existing structures and performing excavation for foundation works, including trenching for utilities (water, sewer, electrical, etc.).
- Leveling and Grading: Ensuring that the site is properly leveled and graded for effective drainage and foundation support.
- Architectural Design: Development of architectural plans that include floor layouts, elevations, and space planning for different functional areas such as patient care rooms, administrative offices, utility areas, and common spaces. The design must ensure accessibility and compliance with building codes.
- .Structural Design: Detailed design of structural elements, including foundations, superstructure, and roof systems, to ensure the building's safety, stability, and compliance with local seismic, wind, and safety regulations.
- Electrical and Plumbing Systems Design: Designing power, lighting, and wiring systems, as well as plumbing systems for water supply, waste management, and drainage. This includes selecting energy- efficient solutions for lighting and HVAC systems.
- Foundation Work: Excavation and construction of reinforced concrete or masonry foundation, including formwork, reinforcement, and concrete pouring as per the approved design
- Superstructure Construction: Erection of the structural framework, including columns, beams, slabs, and walls. This may involve the use of reinforced concrete, steel, or a combination of materials based on the design specifications.
- Roofing: Construction of the roof structure, which may include reinforced concrete slabs or metal roofing.

IV. LITERATURE REVIEW

Comprehensive literature review was conducted to gather existing information on the construction of integration of modern complex building. The review covered topics such as building codes, regulations, material choices, structural design, and energy-efficient practices in building facility construction. Sources included peer- reviewed journal articles, government publications, case studies, and best practice guidelines from health organizations and civil engineering bodies.

The experimental investigation on modern complex buildings presents several challenges, including high construction costs, regulatory hurdles, and technical limitations. The future of building integration lies in the continued development of new technologies, more sustainable materials, and enhanced collaboration between professionals across multiple disciplines.

The construction of complex buildings necessitates advanced structural engineering techniques and the use of innovative building materials. These buildings are often large in scale and must be able to withstand varying loads, dynamic forces, and environmental factors.

V. TECHNICAL SPECIFICATIONS

The following technical specifications are designed to ensure the successful construction and performance on construction of the experimental investigation on modern complex building, focusing on structural integrity, safety, energy efficiency, and sustainability. These specifications incorporate industry standards, local building codes, and

Foundation and Structural Systems:

- Superstructure: Reinforced concrete columns, beams, and slabs (RCC) designed to support the building loads, including occupancy, equipment, and emergency requirements

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- Frame System: Reinforced concrete frame or steel frame with bracing for lateral stability, designed to withstand seismic and wind loads based on local environmental conditions.
- Seismic Resistance: The structure will comply with relevant seismic design codes (e.g., IS 1893 for India, or equivalent) to ensure safety in earthquake-prone areas.

Building :

- Exterior walls: Hollow concrete blocks or fired clay bricks, with a thickness of 200-300 mm for thermal insulation.
- Interior walls: Plasterboard or lightweight partitions (gypsum board) for interior rooms, providing flexibility for future reconfigurations.
- Roof: Sloping roof with metal sheeting or reinforced concrete slab. The roofing will include thermal insulation material to maintain internal temperature. Roof will also include a rainwater harvesting system to collect runoff for non-potable uses.

Windows and Doors:

- Windows: Aluminum or UPVC frames with doubleglazed units to provide insulation and natural lighting while reducing energy consumption.
- Doors: Powder-coated steel or wooden doors with locking mechanisms designed for security and privacy in healthcare settings.
- HVAC (Heating, Ventilation, and Air Conditioning) Ventilation: Natural ventilation through operable windows and vents; ceiling fans and exhaust fans in areas requiring enhanced airflow
- Air Conditioning: Split-type or window-type air conditioners in patient care areas and administrative offices, where cooling is necessary.

Electrical Systems

- Main Power Supply: The building will be connected to the local electricity grid, with a backup power source (such as a diesel generator or solar power system) in case of grid failure. Lighting:
- Energy-efficient LED lighting throughout the building, ensuring appropriate illumination in patient rooms, treatment areas, and common spaces. Emergency lighting to meet health and safety standards, ensuring proper illumination during power outages.
- Power Outlets: Sufficient power outlets in treatment rooms, offices, and common areas to support medical equipment and office appliances.
- Grounding and Earthing: Compliance with local electrical codes to ensure proper grounding and protection against electrical hazards.
- Sanitary Fittings :High-quality sanitary ware (toilets, wash basins, urinals) made of durable, non-porous materials. Automatic flush systems for toilets in patient and hightraffic areas to maintain hygiene.

Safety and Accessibility Features

- Fire Safety: The building will comply with local fire safety codes (e.g., IS 3808 for India) and include fire extinguishers, fire alarms, emergency exits, and smoke detection systems.
- Fire-rated doors for critical areas such as the kitchen and utility Rooms accessibility:
- Barrier-free design with ramps, wide doors, and accessible restrooms for people with disabilities. Elevators (if multiple floors) for easy access to all areas of the building.
- Emergency Systems: Emergency exit signs, safety lighting, and evacuation plans to be displayed in all areas.

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Sustainability and Environmental

Considerations Energy Efficiency: Passive solar design principles to reduce the energy consumption for heating and cooling.Use of energy-efficient appliances, LED lighting, and solar panels (if feasible) for generating renewable energy.

Materials: Preference for locally sourced and sustainable materials to reduce carbon footprint and support local industries. Use of non-toxic paints, low-VOC materials, and durable finishes to improve indoor air quality.

Water Conservation: Rainwater harvesting system to reduce dependency on external water sources.

Low-flow faucets, showerheads, and water-efficient toilets to minimize water usage

VI. CONCLUSION

The construction of the medical college in Jangaon is progressing towards completion, with significant developments in infrastructure. As part of the Telangana government's initiative, nine new medical colleges have been inaugurated, including the one in Jangaon. This development aims to enhance medical education and healthcare services in the district. The new college is utilizing the existing district hospital and Mother and Child Hospital facilities until the new buildings are fully completed.

However, the Jangaon Government Hospital, which has been converted into a teaching hospital for the medical college, faces challenges such as inadequate facilities, staff shortages, and outdated equipment. Despite these issues, efforts are underway to secure additional funding and resources to improve the hospital's infrastructure and capabilities.These measures are expected to improve the quality of medical education and patient care in Jangaon once the college and associated facilities are fully operational.

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