



Construction Management And Execution Practices In PMAY Housing Project At Dudulgaon, Pune

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Abstract

The Pradhan Mantri Awas Yojana (PMAY) is one of the major housing initiatives launched by the Government of India to provide affordable housing for economically weaker sections and low-income groups. This paper presents the construction management practices, execution methodology, quality control measures, and innovative construction technologies adopted in the PMAY housing project at Dudulgaon, Pune. The project consists of 1190 residential tenements developed under the PMAY scheme using reinforced concrete construction and modern formwork systems. The study focuses on site execution activities such as excavation, raft foundation construction, shear wall execution, Mivan formwork technology, reinforcement detailing, curing methods, and quality assurance procedures. Various laboratory and field tests conducted on concrete, cement, and aggregates are also discussed. The implementation of aluminium formwork technology significantly improved construction speed, dimensional accuracy, and project efficiency. The paper highlights practical challenges encountered during execution and demonstrates the importance of planning, supervision, and quality management in large-scale affordable housing projects.

Keywords: PMAY, Affordable Housing, Mivan Technology, RCC Construction, Quality Control, Construction Management, Reinforcement Detailing.

1. Introduction

Housing is one of the fundamental requirements for human development and social stability. To address the shortage of affordable housing in India, the Government of India launched the Pradhan Mantri Awas Yojana (PMAY) in 2015 with the objective of achieving "Housing for All." The scheme focuses on providing permanent housing facilities for economically weaker sections (EWS), low-income groups (LIG), and middle-income groups (MIG).

The PMAY Dudulgaon project in Pune is a large-scale mass housing project developed for economically weaker sections under the PMAY scheme. The project includes 1190 residential tenements with approximately 320 sq.ft carpet area per unit. The project emphasizes cost-effective construction, timely execution, structural safety, and efficient project management.

The present paper discusses practical exposure obtained during internship training at the project site and focuses on construction methodology, execution sequence, reinforcement practices, quality control measures, and advanced formwork technology used in the project.

2. Project Overview

2.1 Project Details

Particular	Details
Project Name	PMAY Dudulgaon Housing Project
Location	Dudulgaon, Pune, Maharashtra
Client	Pimpri Chinchwad Municipal Corporation (PCMC)
Consultant	Creations Engineers Pvt. Ltd.
Type of Project	Mass Housing Project
Number of Tenements	1190
Carpet Area	Approx. 320 sq.ft per unit
Construction Type	RCC Framed Structure
Construction Technology	Conventional + Mivan Formwork

2.2 Objectives of the Project

- To provide affordable housing for economically weaker sections.
- To ensure quality construction with economical methods.
- To improve construction speed using modern technologies.
- To achieve structural safety and durability.
- To implement efficient construction management practices.

3. Construction Methodology

3.1 Excavation Work

Excavation was carried out according to the structural layout and soil investigation report. The excavation process included site marking, leveling, dewatering, and soil dressing. Safety measures such as barricading and proper slope maintenance were adopted during excavation.

3.2 PCC Work

Plain Cement Concrete (PCC) was laid below the footing and raft foundation to provide a level surface and prevent direct contact between reinforcement and soil. PCC also improves load distribution and durability.

Typical PCC grade used: M15.

3.3 Raft Foundation Construction

Raft foundations were adopted to distribute structural loads uniformly over weak soil strata. The reinforcement consisted of double mesh steel reinforcement with adequate spacing and cover blocks.

The major activities involved in raft construction were:

- Layout marking
- Reinforcement placement
- Chair support arrangement
- Concreting
- Vibration and compaction
- Curing

3.4 Shear Wall Construction

Shear walls were constructed to resist lateral loads generated due to wind and seismic effects. Reinforcement placement and alignment were carefully monitored before concreting.

3.5 Mivan Formwork Technology

Mivan aluminium formwork technology was adopted from upper floors to improve construction speed and surface finish quality.

Advantages of Mivan Technology

- Faster construction cycle
- Better dimensional accuracy
- Smooth concrete surface finish
- Reduced plastering requirement
- Improved construction quality
- Reusable formwork system

3.6 Plinth Beam Construction

Plinth beams were provided at ground level to tie structural columns and distribute loads uniformly. These beams also minimize differential settlement.

4. Reinforcement Detailing and Bar Bending Schedule

Reinforcement detailing was carried out according to IS 456:2000 and SP-34 guidelines.

4.1 Wall Reinforcement

The wall reinforcement included:

- Vertical reinforcement bars
- Horizontal distribution reinforcement
- Lap splices
- Anchorage lengths

4.2 Deck Slab Reinforcement

Deck slab reinforcement included:

- Bottom main reinforcement
- Top reinforcement near supports
- Distribution bars
- Cranked bars for shear resistance

Adequate cover blocks and spacing were maintained to ensure durability and proper concrete compaction.

5. Quality Control and Testing

Quality control is one of the most important aspects in RCC construction. Various field and laboratory tests were conducted during the project execution.

5.1 Concrete Testing

Slump Test

The slump cone test was performed to determine the workability of fresh concrete.

Compression Test

Concrete cube specimens were tested after 7 days and 28 days using Compression Testing Machine (CTM).

Grade of Concrete	7-Day Strength (N/mm ²)	28-Day Strength (N/mm ²)
M15	10	15
M20	13.5	20
M25	17	25
M30	20	30
M35	23.5	35

5.2 Cement Testing

The following tests were conducted on cement:

- Consistency test
- Initial setting time test
- Final setting time test
- Soundness test
- Compression strength test

5.3 Aggregate Testing

The following aggregate tests were performed:

- Sieve analysis
- Specific gravity test
- Water absorption test
- Flakiness and elongation index test
- Soundness test

6. Curing Practices

Proper curing was maintained to achieve required strength and durability.

The curing methods adopted were:

- Water ponding
- Gunny bag curing
- Continuous water spraying

Concrete curing was generally maintained for a minimum period of 7 to 14 days depending upon concrete grade and weather conditions.

7. Safety Practices at Construction Site

Safety measures implemented at site included:

- Safety induction training
- Use of personal protective equipment (PPE)
- Barricading of hazardous zones
- Working at height safety measures
- Temporary traffic control systems
- Scaffolding inspection

These measures helped minimize accidents and improve worker safety.

8. Construction Challenges

The project faced several practical challenges during execution, including:

- Labour management
- Material handling and storage
- Maintaining project schedule
- Coordination among contractors
- Weather-related delays
- Maintaining consistent quality standards

Efficient planning and supervision helped overcome these challenges.

9. Future Scope

Affordable housing projects under PMAY have significant future potential in urban development. The adoption of advanced technologies such as Mivan formwork, precast systems, and sustainable construction materials can further improve construction efficiency.

Future developments may focus on:

- Sustainable construction practices
- Green building concepts
- Faster project delivery methods
- Cost optimization techniques

- Smart housing infrastructure

10. Conclusion

The PMAY Dudulgaon housing project represents an important initiative toward affordable urban housing development in India. The project demonstrated effective implementation of construction management techniques, quality assurance practices, and advanced construction technologies.

The use of Mivan formwork technology significantly improved construction speed and quality. Practical exposure to excavation, raft foundation, reinforcement detailing, concrete testing, curing, and safety practices enhanced understanding of real-world construction management.

The internship experience provided valuable insights into execution planning, quality control, teamwork, and site supervision. The project highlights the importance of systematic planning and modern construction techniques in achieving successful mass housing development.

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