IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

Step-by-Step Construction of an RCC Building: A Practical Approach

Mr. Satish. P. Deore[1], Seema H. Jadhav[2], Rajashri J. Mahale[3], Urvashi R. Gavit[4], Chaitali S. Jadhav[5]
HOD, Department of Civil Engineering [1]
Students, Department of Civil Engineering[2,3,4,5]
Mahavir Polytechnic, Nashik, India

Abstract: *This paper explains the full construction process of an RCC (Reinforced Cement Concrete) building in a step-by-step way. It starts from clearing the site and goes up to the final finishing of the building. The report includes the tools, materials, and safety measures used during the work. The aim is to help civil engineering students understand how buildings are made on real construction sites and how to apply their classroom knowledge in the field. This project provides a basic and practical understanding of RCC construction for beginners..*

Keywords: RCC Building, Step-by-Step Construction, Site Work, Concrete, Foundation, Columns, Slab, Plastering, Field Practice, Civil Engineering

I. INTRODUCTION

RCC buildings are strong and long-lasting, so they are used in houses, offices, and schools. Building an RCC structure needs proper planning and step-by-step work. This paper explains those steps in a simple way, so students can learn how buildings are made on actual construction sites.Every construction project is a tedious, demanding, and hectic process. Hence, with clear and sensible project management guidelines, you can make an informed decision at every stage of the building process, from planning to execution to completion. Having a working understanding of every stage of your construction process helps you to turn your ideas into reality.In this project, we will study the detailed step-by-step execution of an RCC twin bungalow, covering every phase of construction from initial planning to the final finishing touches. The process begins with selecting an appropriate site, followed by obtaining necessary approvals and permits from local authorities and the builder. After permissions are granted, the next step is to gather all required documents, including 2D architectural plans, RCC structural drawings, electrical, and plumbing layouts.

II. LITERATURE REVIEW

Many books and construction codes give details about building processes, but they are often too technical for beginners. Engineers and experts say that following the correct order during construction is very important. This paper gives a clear and simple explanation of the real steps used on-site, which helps students learn better.

III. SCOPE OF THE PROJECT

- To understand the basic steps of RCC construction
- To learn about the tools and materials used
- To know how theory is applied in real construction
- To follow good safety and quality practices
- To help students get real field knowledge

IV. TOOLS AND MATERIALS USED

Tools:

- Tape, plumb bob, and level to measure
- Hammer, clamps, and spanner for shuttering

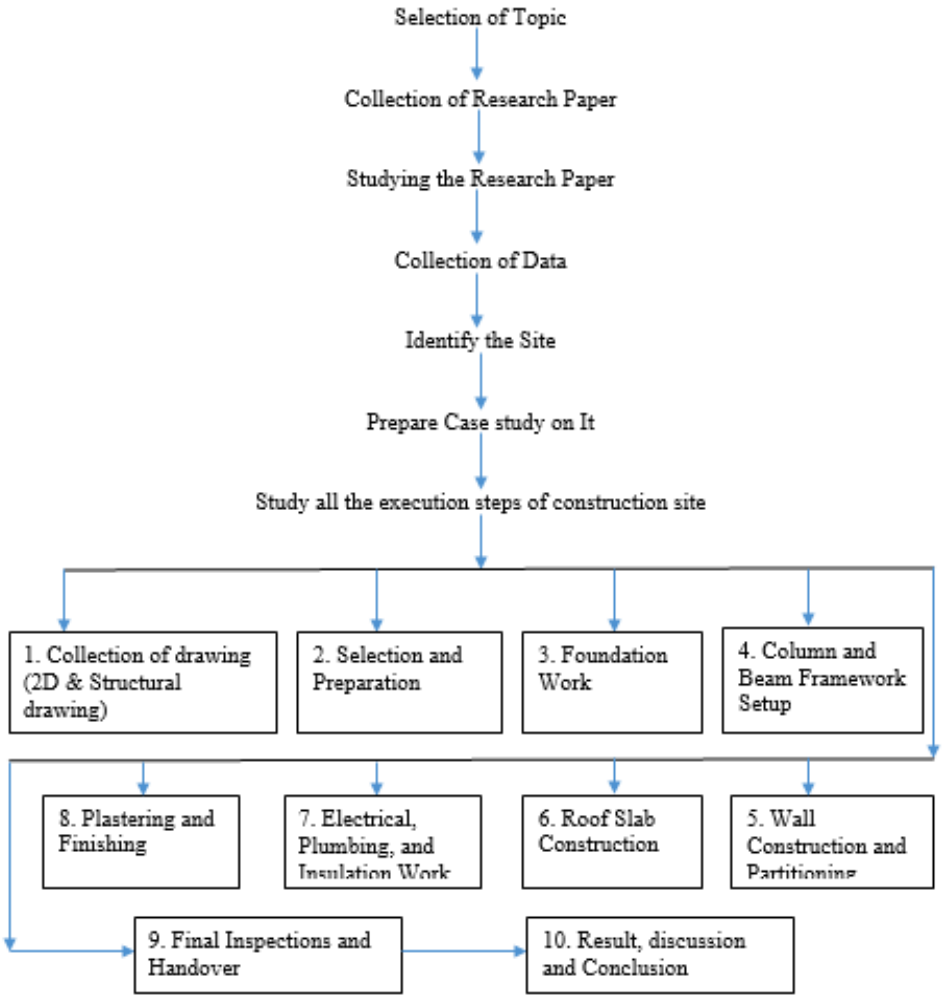
DOI: 10.48175/IJARSCT-25061

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

- Vibrator, trowel, pan, and wire cutter

Materials:
Cement, sand, gravel (coarse aggregate), steel bars (reinforcement), water

V. METHODOLOGY



1) Selection of Topic
Choosing the research topic related to bungalow construction.
2) Collection of Research Paper: Gathering relevant research and literature.
3) Studying the Research Paper
Understanding different construction methods, materials, and technologies.
4) Collection of Data
Gathering technical details, site information, and construction requirements.
5) Identify the Site
Selecting the plot where the bungalow will be built.
6) Prepare a Case Study on It

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

5.2 Site Visit:

VI. CASE STUDY

Name of Site: RCC Twin bungalow project
Address: Near Krushnai hotel, pathardi Phada

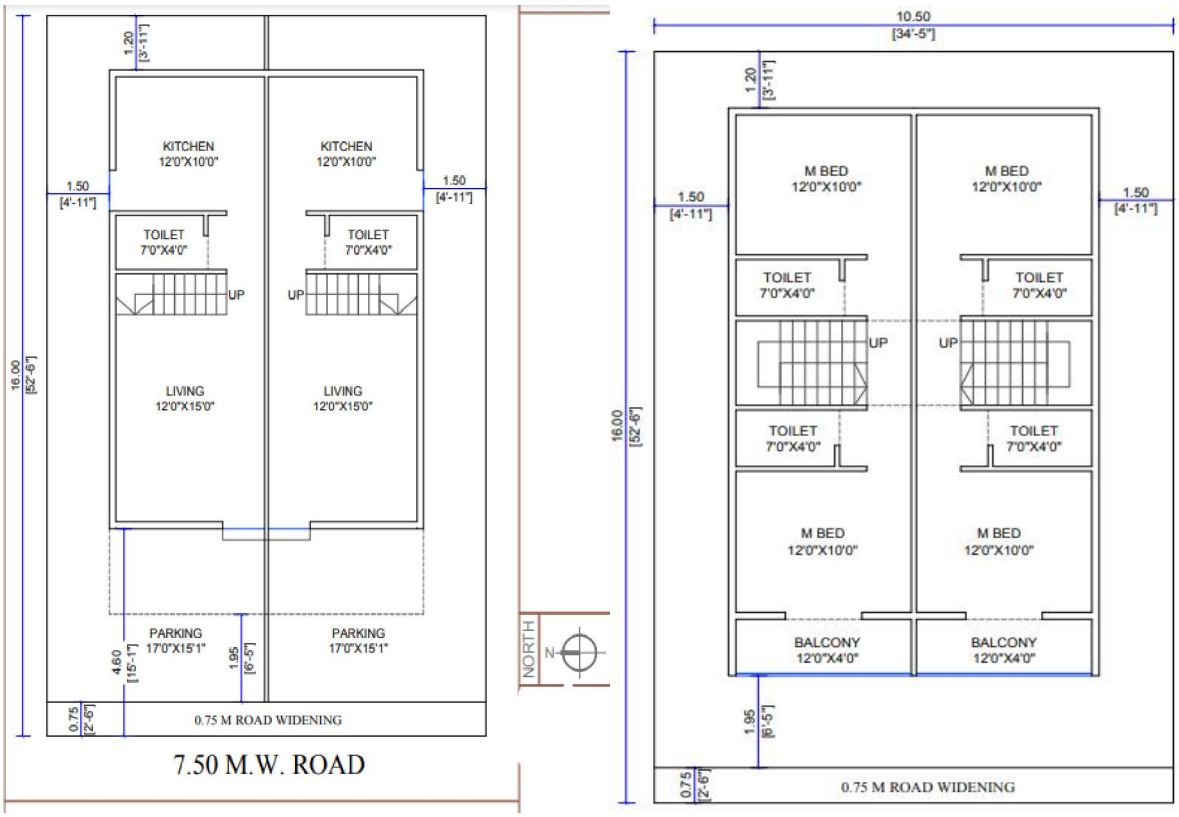
6.1 Collection of drawing (2D & Structural drawing)

Twin Bungalow Area Table

Terr No.	Carpet area Ground fl + First fl + Second fl (in Sq.ft)	Parking area 50%(in Sq.ft)	Terrace area 50%(in Sq.ft)	Built up added 40%(in Sq.ft)	Net Built up (in Sq.ft)	Garden area 50%(in Sq.ft)	Net total area (in Sq.ft)
1	1045.93 Sqft	37.83 Sqft	105.05 Sqft	475.52 Sqft	1664.33 Sqft	185.85 Sqft	1850.18 Sqft
2	1045.93 Sqft	37.83 Sqft	105.05 Sqft	475.52 Sqft	1664.33 Sqft	185.85 Sqft	1850.18 Sqft
						Total sellable	3700.36 Sqft

DOI: 10.48175/IJARSCT-25061

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67



6.2 Foundation Work

PCC before footing

Footing and Foundation – Place steel bars and pour concrete for the foundation

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

Formwork and reinforcement Isolated footings or Pad footing

6.4 Column and beam framework setup

Column Framework

Beam Framework

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

6.5 Wall construction and Partitioning

1) Foundation & Base Preparation
- The wall construction starts with a stable foundation.
- A damp-proof course (DPC) is laid to prevent moisture rise.

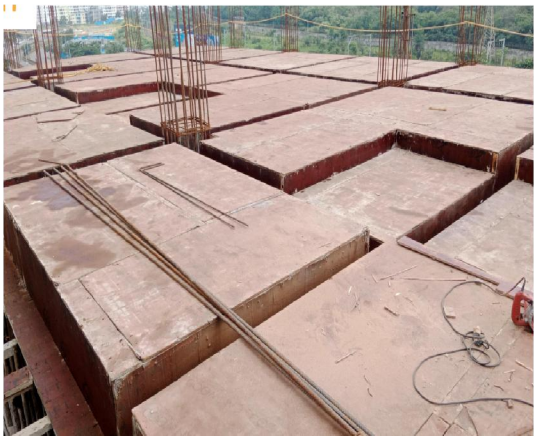
2) Brickwork or Block Work
- Bricks or concrete blocks are arranged in layers using mortar.
- Proper bonding (stretcher, header, or English bond) ensures strength.
- Vertical alignment (plumbing) is maintained.

3) Reinforcement (If Applicable)
- Some walls include reinforcement bars (RCC walls) for added strength.

4) Curing & Strengthening
- Walls are kept wet for 7-14 days to improve durability.

6.6 Roof Slab Construction

The roof slab construction process involves reinforcement placement, concrete pouring, finishing, and curing to ensure structural strength and durability.



Formwork and Centering

B. Placement of Reinforcement Bars
- **Main bars:** Placed along the shorter span of the slab (primary load-carrying bars).
- **Distribution bars:** Lay perpendicular to main bars to evenly distribute the load.

Spacing: Typically 100mm–200mm c/c, depending on the structural design.
- **Cover Blocks:** 20mm thick cover blocks are used to maintain proper concrete cover.
- **Binding Wire:** Used to tie bars at every intersection to prevent movement during concreting.

DOI: 10.48175/IJARSCT-25061

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

Placement of Reinforcement Bars

Cover provided to Reinforcement Bars Pouring of concrete using pumping method

Finishing of Slab

Curing of Slab

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

6.7 Quality Checks on Site

Reinforcement Check:

✓ 20mm cover blocks properly placed.

✓ No direct contact between steel bars and shuttering.

✓ Lapping lengths are as per the design.

Concrete Pouring Check:

✓ M25 concrete properly mixed, without excess water.

✓ Concrete poured in layers to avoid segregation.

✓ No excessive freefall during pouring.

Compaction and Finishing Check:

✓Vibrators used correctly to avoid honeycombing.

✓ Surface properly leveled and finished.

Curing Check:

✓ curing done for at least 14 days.

✓ No early loading on the slab before full strength is achieved.

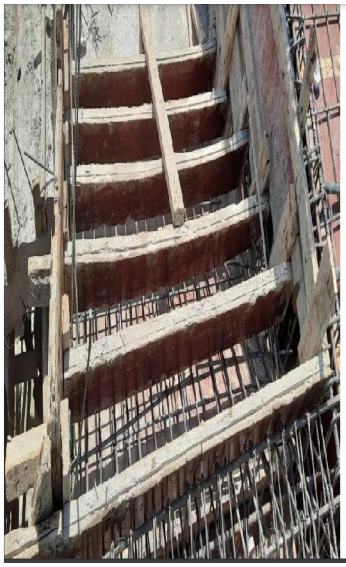
6.8 Electrical installation work

6.9 Plastering work

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

6.10 Finishing work

6.11 Staircase Installation



VII. SAFETY AND PRECAUTIONS

- Store materials properly
- Use safety gear while working
- Check steel and shuttering before pouring concrete
- Make sure to cure concrete properly
- Double-check wiring before slab casting

VIII. CONCLUSION

- From this case study, we got a clear and practical understanding of RCC construction by studying the step-by-step execution in detail.
- We saw how good planning, quality control, and modern construction techniques help in making a strong and long-lasting building.
- We learned that choosing the right site, placing reinforcement properly, curing concrete well, and following the correct process are very important for structural strength and stability.
- We also understood that problems like worker shortages, bad weather, and high costs can slow down construction, but they can be solved with better planning, skilled management, and new technology.
- This project gave us both technical and practical knowledge about RCC buildings, which will be very useful for future construction projects and engineering, work.
- It also helped us realize how small mistakes in execution can lead to big problems, and why every step in construction must be done carefully.

REFERENCES

[1]. Smith, J. & Johnson, L. (2019). RCC Construction Methodologies: A Comprehensive Guide. Journal of Civil Engineering, 45(3), 230-245.

[2]. Kumar, R., & Verma, S. (2020). Importance of Quality Control in RCC Execution. International Journal of Construction Management, 12(1), 15-28.

[3]. Sharma, A., Patel, M., & Singh, T. (2021). Technological Advancements in RCC Construction: Tools and Techniques. Journal of Building Technology, 34(2), 78-89.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, April 2025
Impact Factor: 7.67

[4]. Gupta, P., & Mehta, S. (2022). Sustainable Practices in RCC Construction. Sustainable Construction Journal, 8(4), 145-158.

[5]. Patel, A., & Singh, R. (2018). Site Selection and Preparation for RCC Buildings. Journal of Environmental Engineering, 24(2), 100-115.

[6]. Rao, N., Kumar, A., & Sharma, D. (2019). Foundation Construction in RCC Structures: Types and Techniques. International Journal of Structural Engineering, 10(3), 56-72.

[7]. Nair, J., & Thomas, R. (2020). Building the Framework: Beams, Columns, and Slabs in RCC Construction. Construction and Building Materials, 20(1), 21-34.

[8]. Iyer, V., & Roy, M. (2021). Curing Practices and Quality Assurance in RCC Construction. Journal of Civil Engineering Research, 17(5), 56-67.

[9]. Desai, K., Gupta, A., & Verma, P. (2022). Final Finishing Works in RCC Buildings: A Comprehensive Overview. Journal of Architectural Engineering, 29(4), 120-135.

[10]. Srivastava, N., & Bansal, R. (2020). Challenges in RCC Construction: Delays and Cost Overruns. Journal of Construction Management, 14(3), 205-219.