

Student Name Adrian Ciocoi
Student ID 2209929

Table of Contents

Introduction.....	3
Elements.....	3
Framing	5
Traditional Wall Construction:	8
Modern Wall Construction:	8
Conclusion	9
References.....	10

Introduction

Buildings play an important role in our lives, acting as our homes, businesses, and community gathering places. Various parts must be properly developed and constructed to assure a building's safety, comfort, and functionality. In this post, we looked at some of the most important construction components and their functional needs. We've talked about the importance of a strong foundation, the role of walls and roofs in providing shelter and protection, and the critical role of framing in supporting a building's weight. We also investigated the distinctions between ancient and modern construction methods, such as the use of sustainable materials and the growing use of technology in the construction process. Understanding these characteristics allows us to appreciate the intricacy and beauty of the structures around us while also working to create safer, more sustainable, and useful structures for future generations. (Royal Institution of Chartered Surveyors 2021).



Image 1 <https://r.search.yahoo.com/>

Buildings are complicated constructions made up of numerous pieces, each having their own distinct function and purpose. These factors work together to offer inhabitants with a secure, comfortable, and functional environment. Understanding the different aspects of a building and their corresponding functional requirements is crucial to maintain the durability and effectiveness of the structure. In this answer, we will present a full description of the major aspects of a structure and their functional needs. (U.S. Department of Energy 2021)

Elements

Buildings are complicated constructions made up of several pieces, each with its own distinct function and purpose. Here is a full breakdown of the various architectural pieces and their functional requirements:

The foundation is the building's structural component that provides support for the whole structure. It must be built to sustain the weight of the structure and transfer that weight to the ground. The foundation should be strong enough to withstand movement, such as settling or shifting. (Royal Institution of Chartered Surveyors 2021).

Framing: The structural structure of the building that supports the floors, walls, and roof is referred to as framing. The framework must be robust enough to carry the weight of the structure while also resisting external pressures like wind and earthquakes.

Walls: The walls create the building's envelope, enclosing the inner rooms and safeguarding them from the elements. They must be sturdy enough to sustain the weight of the roof while also being resistant to external pressures such as wind and earthquakes. They also contribute to the building's insulation. (U.S. Department of Energy 2021)

The roof shields the internal rooms from the elements, giving protection from rain, snow, and sun. It must be built to withstand external pressures such as wind and be waterproof to keep water out of the structure.

Windows and Doors: Windows and doors enable light and air to enter the interior areas while also providing access to the building. They must be safe and waterproof, while also providing ventilation and natural light.

Heating, ventilation, and air conditioning (HVAC), plumbing, and electrical systems are examples of mechanical systems. These systems must be designed to ensure occupant comfort and safety while also being energy efficient and sustainable.

Insulation: Insulation is a substance that serves to limit the amount of heat lost or gained via a building's walls, roof, and floors. It must be correctly installed in order to be functional and increase the building's energy efficiency. (Australian Institute of Building 2014)

Materials such as flooring, wall coverings, and paint are examples of finishes. These materials must be long-lasting, easy to clean, and visually appealing.

Components of Building

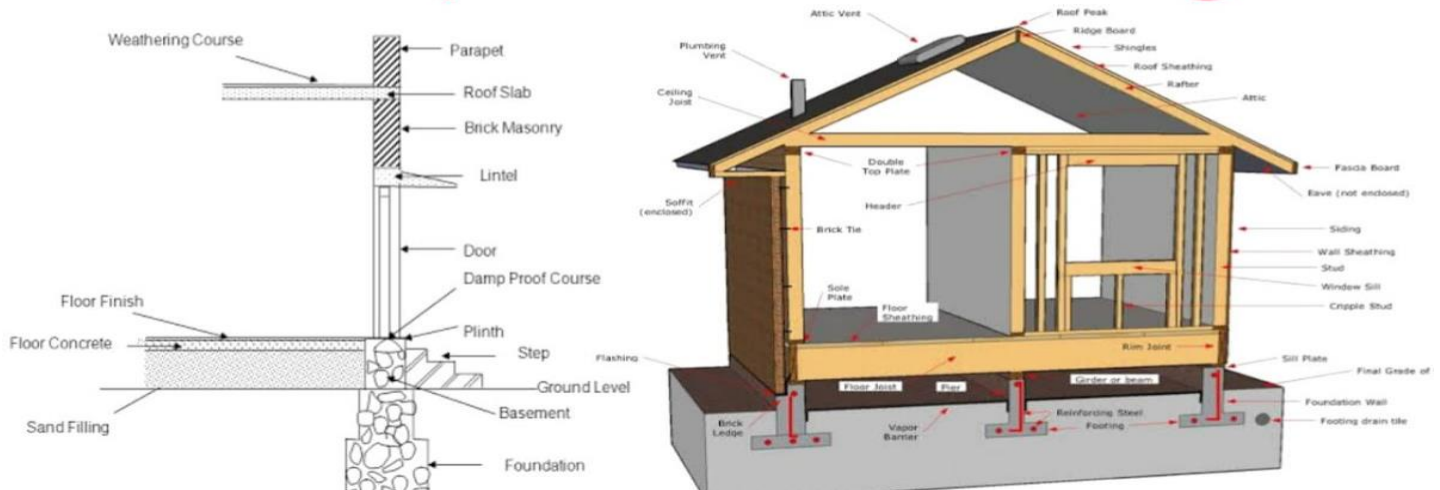


Image 2 <https://civiltech-p.blogspot.com/>

Framing

The process of forming the skeleton framework of a building that provides support and stability for the walls, roof, and other components is referred to as framing. The frame of a building serves as its skeleton, distributing the load of the structure to the base. Wood, steel, or concrete are commonly used for framing.

Wood Framing:

Wood framing is a popular framing technology, particularly in residential building. The weight of the roof, walls, and other components is supported by a frame made of wooden beams and columns in this approach. The most popular style of wood framing is "stick framing," which uses individual hardwood studs to build a frame. The frame is built by nailing, screwing, or bolting the separate components together. (Australian Institute of Building 2014)

Steel Framing:

Steel frame is a popular choice for commercial construction since it is sturdy, resilient, and fire and insect resistant. Steel beams and columns are used to construct the frame in steel framing. Typically, the frame is constructed off-site and then moved to the building site to be fastened together. Steel framework may be manufactured to exact specifications, reducing waste and saving time. (Royal Institution of Chartered Surveyors 2021).

Concrete Framing:

Concrete framing is utilised in high-rise structures when structural strength and longevity are critical. The frame is built using reinforced concrete columns and beams in this technique. The columns and beams are poured on-site, and once the concrete has set, the formwork is removed. Concrete framing is extremely robust and long-lasting, but it may be costly and time-consuming. (Australian Institute of Building 2014)

Framing Diagram:

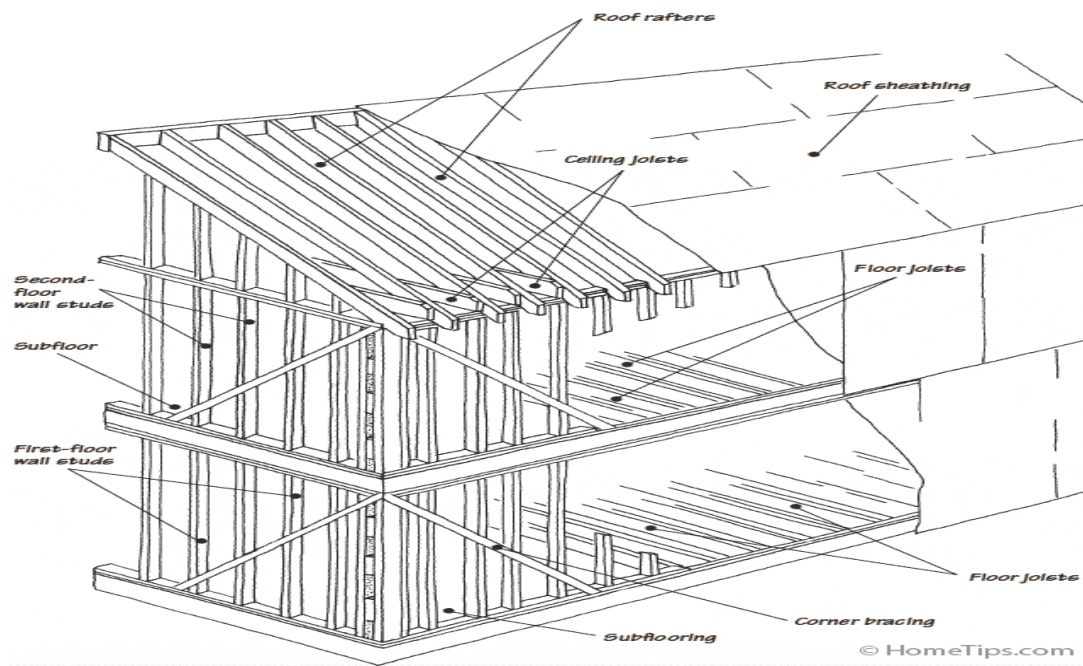


Diagram 3 <https://r.search.yahoo.com/>

A simplified representation of the wood frame building process is shown below:

- The foundation is built initially, providing a strong basis for the building.
- Sill plates are set on top of the foundation to provide a level platform for the floor joists.
- The flooring is supported by floor joists, which are put on top of the sill plates.
- To build the walls, wall studs are inserted vertically between the floor and ceiling joists.
- To support the roof, roof rafters or trusses are built.

- To give structural strength, plywood or oriented strand board (OSB) sheathing is put on the exterior of the walls and roof.
- In the framed apertures, windows and doors are inserted.
- In the walls and floors, electrical and plumbing systems are built.
- Thermal and acoustic insulation is put between the wall studs, ceiling joists, and roof rafters.
- Interior walls and ceilings are finished with plasterboard or other materials.

□

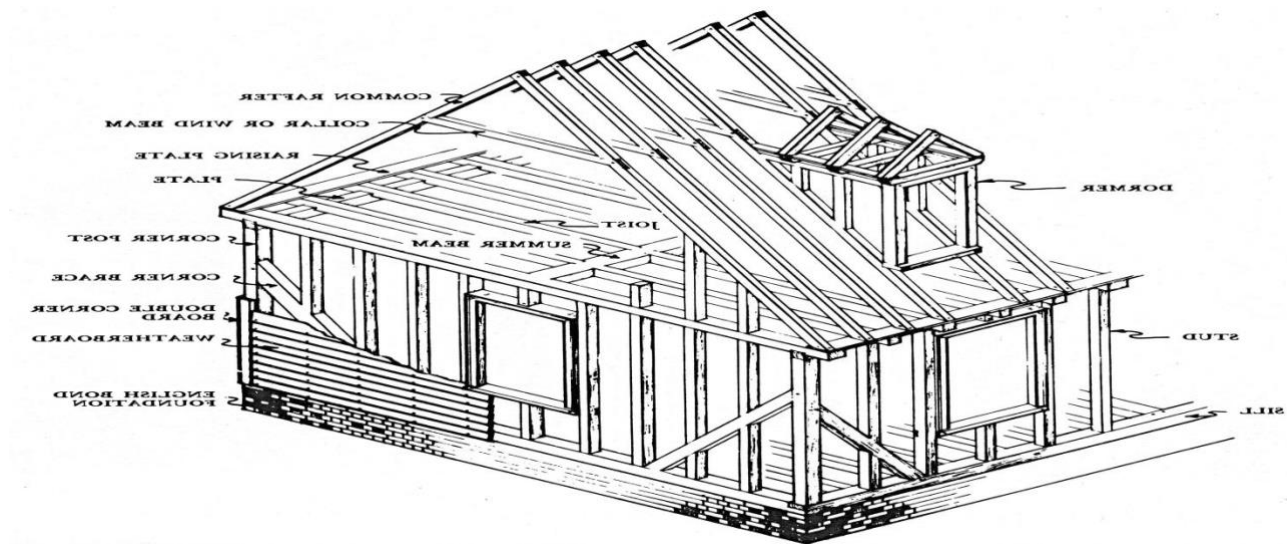


Diagram 4 <https://r.search.yahoo.com>

Framing is an important part of the construction process since it serves as the foundation for the remainder of the structure. Proper framing guarantees that the structure is structurally solid and can withstand natural and climatic pressures.

To compare current and historic building processes, consider wall construction.

Traditional Wall Construction:

Walls are often built using brick or stone masonry in traditional wall building. Masonry walls are constructed with a cement, sand, and water combination. The walls are created one layer at a time, with each layer drying before adding the next. The thickness of the wall is determined by the weight it must support and can range from 9 inches to 2 feet. (U.S. Department of Energy 2021)

Modern Wall Construction:

The design, the material, and the desired performance all play a role in the selection of the various methods used in contemporary wall construction. Here are a few instances of present day wall development procedures:

- **Construction with Concrete Blocks:** Walls are constructed using concrete blocks in this method. Pre-cast concrete blocks are produced in a factory. After that, they are brought to the construction site and put together to make walls. This strategy is quicker and requires less talented work than conventional workmanship.

Panels for a Precast Concrete Wall: In this strategy, precast substantial wall boards are fabricated off-site and shipped to the building site. After that, they are put together to make the building's walls. Because the wall panels can be produced with high precision in a controlled environment, this method is faster and more effective than conventional construction. (Australian Institute of Building 2014)

- **SIPs, or structurally insulated panels, are:** SIPs are prefabricated wall systems with two oriented strand board (OSB) outer skins and a foam core. The panels are transported to the construction site after being cut to the desired size and shape. The boards are then collected nearby to shape the walls of the structure.

Differences Between Modern and Traditional Wall Construction:

- **Speed of Development:** The majority of the time, modern construction methods are quicker than traditional construction methods. Concrete blocks and prefabricated wall panels can be made in a factory and brought to the construction site, reducing the amount of time needed for on-site construction.

- **Quality Management:** Because the materials are manufactured in a controlled environment with high precision, modern construction methods provide better quality control. Conventional development techniques depend on talented work, which can be less reliable in quality.
- ☐ **Cost:** Due to the use of prefabricated materials, which can cut labor costs, modern construction methods can be less expensive than traditional construction methods.
- ☐ **Sustainability:** Because they use less material and produce less waste, modern construction methods can be more sustainable than traditional methods. Better insulation from precast concrete and SIPs can also help cut down on energy use.

Conclusion

In conclusion, a building's various components cooperate to provide its occupants with a space that is secure, inviting, and useful. The functional requirements of each component are distinct, and they must be designed and constructed to complement one another. A building's various components collaborate to provide its occupants with a safe, comfortable, and useful space. Every component has its own extraordinary practical necessities, and they should be planned and developed to cooperate as one to guarantee the life span and proficiency of the structure. (Royal Institution of Chartered Surveyors 2021). To ensure a building's structural stability, safety, and functionality, each component must be present. Every part of the structure, from the foundation to the roof, is important in transferring the building's weight to the ground and supporting it. Builders and homeowners can make better decisions about which options are best suited to their requirements and budgets by having an understanding of the various construction techniques and materials that are available. It is possible to construct buildings that are more energy efficient, durable, and friendly to the environment by utilizing cutting-edge building materials and methods. Generally speaking, the cautious thought of each building component is significant in making a protected, useful, and wonderful construction that can endure for an extremely long period.

References

1. Ahiaga-Dagbui, D.D., & Amoatey, C.A. (2016). An examination of construction management competencies required for successful project delivery in Ghana. *Built Environment Project and Asset Management*, 6(5), 511-526. <https://doi.org/10.1108/BEPAM-02-2016-0010>
2. Akhavan, P., Haji Hosseini, A., & Sadr, M.A. (2015). The role of construction management in sustainable development. *Journal of Cleaner Production*, 108(Part B), 1062-1068. <https://doi.org/10.1016/j.jclepro.2014.06.099>
3. Australian Institute of Building (2014). Australian Institute of Building Best Practice Guide: Building Information Modelling. https://aib.org.au/wp-content/uploads/2017/11/BIM-Best-Practice-Guide_2014.pdf
4. Building and Construction Authority (n.d.). Singapore Green Building Masterplan. <https://www.bca.gov.sg/GreenMark/others/SingaporeGreenBuildingMasterplan.html>
5. Construction Management Association of America (n.d.). What is Construction Management? <https://cmaanet.org/content/what-construction-management>
6. Construction Management Association of America (2021). Standards of Practice. <https://cmaanet.org/content/standards-practice>
7. Construction Management Association of America (2021). Certification Programs. <https://cmaanet.org/content/certification-programs>
8. International Council for Research and Innovation in Building and Construction (2019). CIB Task Group 107 on Construction in Developing Countries: Capacity Building for Construction Education in Developing Countries. <https://www.irbnet.de/daten/iconda/CIB23456.pdf>
9. International Organization for Standardization (2021). ISO 19650: Organization and Digitization of Information about Buildings and Civil Engineering Works, Including Building Information Modelling (BIM). <https://www.iso.org/standard/78931.html>
10. Leadership in Energy and Environmental Design (n.d.). About LEED. <https://www.usgbc.org/leed>
11. Ofori, G. (2017). *Construction industry development in developing countries*. Routledge.

12. Project Management Institute (2021). What is Project Management? <https://www.pmi.org/about/learn-about-pmi/what-is-project-management>
13. Royal Institution of Chartered Surveyors (2021). RICS Professional Qualifications. <https://www.rics.org/uk/join/become-mrics/rics-professional-qualifications/>
14. U.S. Department of Energy (2021). Building Energy Codes Program. <https://www.energycodes.gov/about>
15. World Green Building Council (n.d.). Advancing Net Zero. <https://www.worldgbc.org/advancing-net-zero>