

# Training Report

Place of Training: Zeolt Architects.

Period of Training: 20<sup>th</sup> July 2023 to 4<sup>th</sup> September 2023



**TECHNO INDIA NJR**  
INSTITUTE OF TECHNOLOGY

Submitted to

**Department of Civil Engineering**

Summer Training In-charge at TINJRIT: **Mr.Rakesh Yadav**

By

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(Batch 2021-2025)

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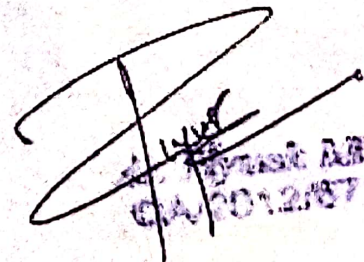
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Date: 13<sup>th</sup> September 2023

**To Whom So Ever it Concern**

This is to Certified That Mr. Dev Vaishnav S/o Kishan Vaishnav Student (B.Tech (Civil) III Year, Techno India NJR Institute Of Technology, Udaipur has undergone training in our office from 20th July 2023 to 4th September 2023. He has taken specific training in **Building Construction and Quality assurances.**

We found a Sincere and hardworking. His performance during training period was good. We wish best for future endeavors and his every success.

  
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## Certificate II

This is to certify that Mr. Dev Vaishnav S/o Mr. Kishan Vaishnav from Techno India NJR Institute of Technology, from department of Civil Engineering has successfully completed the 45 days industrial training in Civil Engineering Lab from Date 20/07/2023 to 04/09/2023 his work found quite satisfactory during his entire tenure.



Signature

Mr. Rakesh Yadav

HOD, Civil Engineering Department

## ACKNOWLEDGMENT'S

I take this opportunity to extent my gratitude to Zeolt Architecture for having provided me with an unbelievable practical learning experience during summer training it was indeed a pleasure to be a part of such organization.

First and foremost, I would like to thank **Mr. Piyush Suthar** (Architect) for providing me the opportunity to work under their guidance and close supervision.

Secondly, I am also grateful to other member of the department for their kind co-operation and spontaneous response.

Last but not the least; I express my gratitude toward **Mr.Rakesh Yadav** (Head of Civil Engineering Department). I Specially take the opportunity to thank our coordinator **Mr. Jitendra Choubisa** , **Mr.Nishit Jain** , **Mr.Gourav Purbia** for their valuable guidance and guidance which helped in completing this task through various stages.

**SUBMITTED BY:-**

**Dev vaishnav**

**Techno India NJR institute of technology, Udaipur**

**DEPARTMENT OF CIVIL ENGINEERING**

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## CHAPTER 1: BRIEF OF PROJECT

### 1.1 TASK PERFORMED

The industrial training underwent under the constant guidance of Mr. Piyush Suthar Sir and consulting site engineer Mr. Himanshu sanadhya Sir. The duration of the training was from 20th July to 2nd September.

- Initially the training was started with the information about the standard design procedure and practically consideration to be followed for the designed for the individual terms like beams, columns, chejja, staircase, and slab.
- Followed by, reading and understanding of typical drawings of various structural sections.
- Process then followed by the Formwork construction, laying of reinforced steel bars for construction of beams and columns.
- Then the pour compact and finishing concrete floor slab followed with curing concrete and removing Formwork.

# Plan Detail

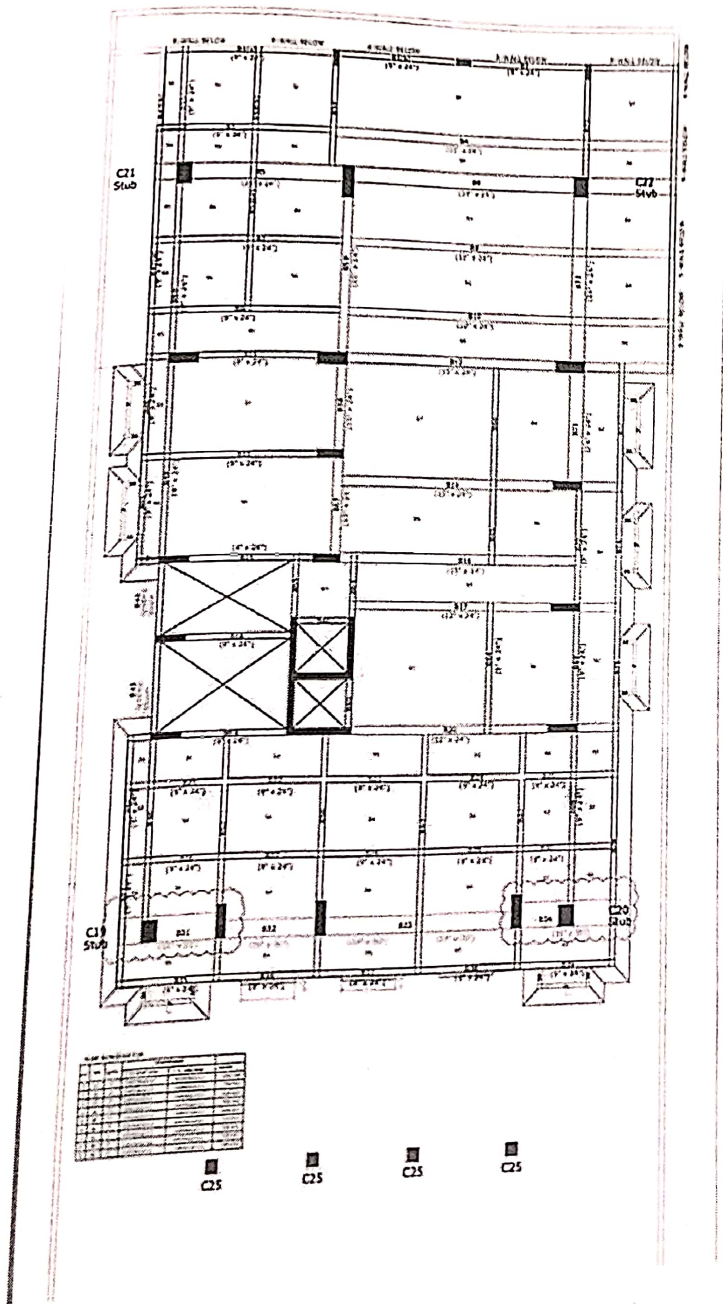


Fig.1



## Chapter:2 Reinforcement steel.

Reinforcement steel, also known as rebar, is a crucial component in reinforced concrete structures. It provides strength and stability to the concrete by resisting tensile forces.

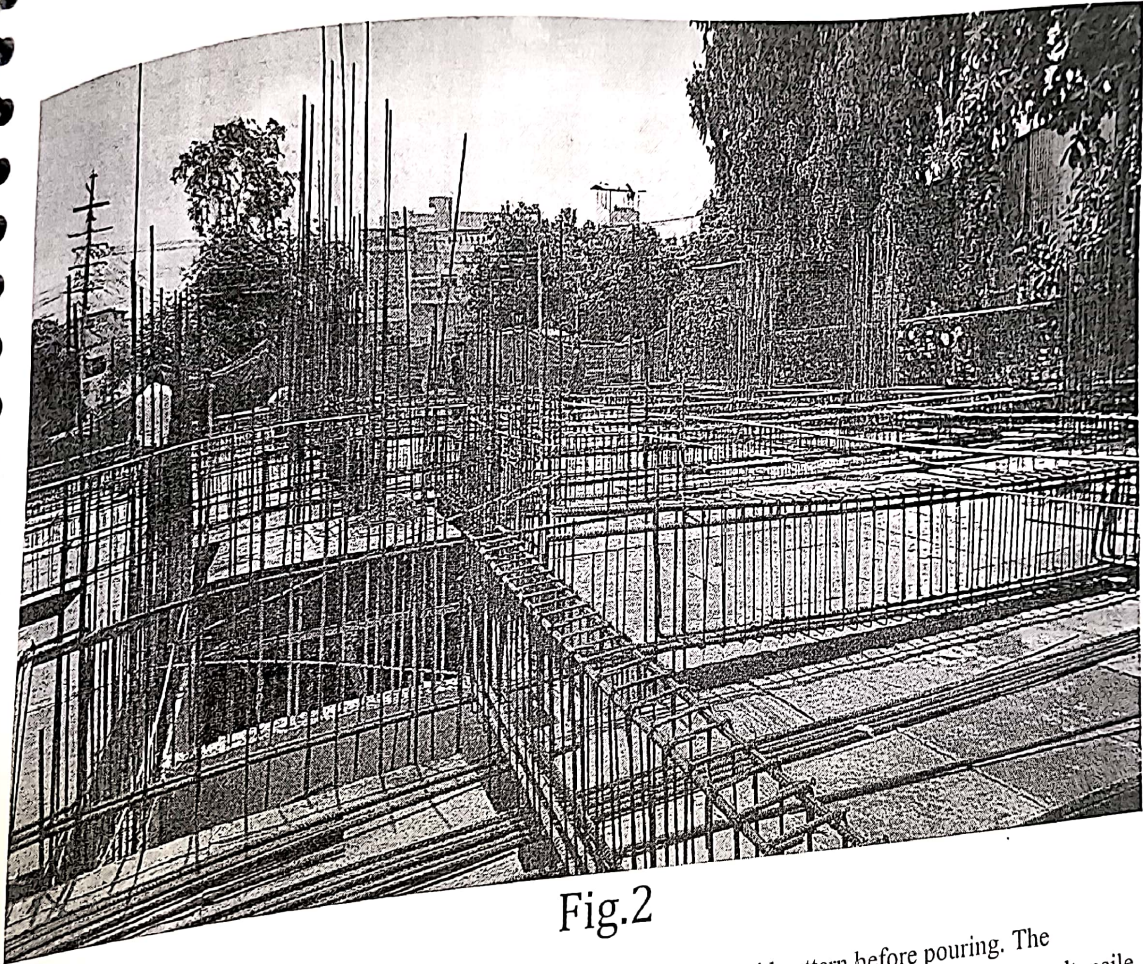


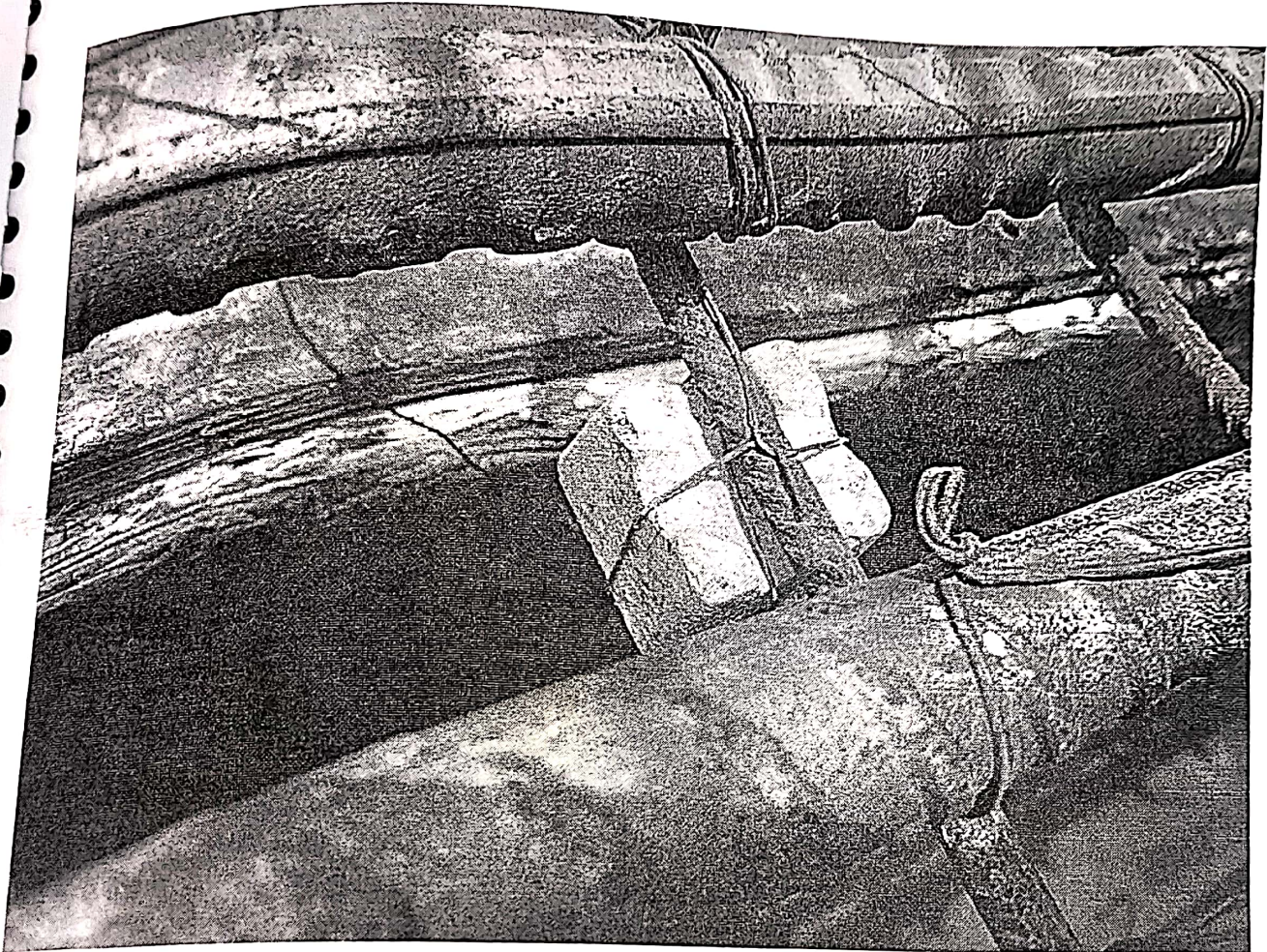
Fig.2

Reinforcement steel bars are typically placed within the concrete in a grid pattern before pouring. The combination of concrete and steel creates a composite material that can withstand both compressive and tensile forces, making it suitable for various construction applications such as beams, columns, and slabs. So, reinforcement steel plays a vital role in ensuring the structural integrity and durability of concrete. Mild steel and TMT steel are some types of reinforcement bars. Of which TMT steel reinforcement is currently the preferred steel reinforcement. In TMT steel bars there are grades like Fe 415, Fe 500, Fe 550, Fe 600 and Fe 700, all finding its own use in different areas of construction.

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### Chapter:3 Cover Blocks.

Cover blocks are small concrete or plastic blocks used in concrete construction to maintain a specified distance between the reinforcement steel and the outer surface of the concrete. They are placed on the reinforcement bars to ensure that the bars are adequately covered by concrete. This helps protect the reinforcement from corrosion, provides fire resistance, and ensures proper bonding between the concrete and the reinforcement.



A multi cover block is essentially a spacer used to lift the Steel mesh off the ground so that concrete may flow under the rebar. Also, know the Cover Block Rate.

#### Why cover block is Important?

- It protects the Reinforcement from Environment exposure or Corrosion.
- Maintain a specific distance between the steel bars and the shuttering

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- Give reinforcing bars sufficient embedding to enable them to be stressed without slipping.
- Provide thermal insulation, which covers the reinforcement bars from fire

**Important Checklist-** The cover must be the same grade of concrete that you're using in the building component.

### The different names of Cover Block

- Coral Concrete Cover Block
- Concrete Spacer Block
- Reinforced Concrete Cement Cover

### Cover Block Spacer

In this Multipurpose cover block, you'll find slots according to the Different spacing of the building components- such as for the column and footing have a separate section respectively.

- Footing- 50 mm
- Column- 40 mm
- Beam- 25 mm
- RCC Slab- 15 mm
- Staircase-15 mm

### Footing Cover block

A Cover Block of 50 mm will use for the Footing, and after that, rebars are laying above the cover, and the footing mesh is prepared.

you can see below how the rebars are placed above the concrete blocks.

### **Multipurpose Cover Block in Column**

**Cover Block of 40 mm:** Place the Cover block in the Direction to fit with the Plywood. See below How it is holding both the Bar and the shuttering.

### **Cover Block in Beam**

A concrete cover Block of 25 mm is placed with the shuttering.

You can clearly see in the picture how to place the 25 mm cover block with reinforcement to find the actual spacing of the beam.

### **Clear Cover for Building Structures**

Here are the important Points to know that How Much spacing should be for each structural component. and according to that the **Multipurpose cover block** can be laid and prepared the rebar mesh.

- Footing- 50 mm
- Column- 40 mm
- Beam- 25 mm
- RCC Slab- 15 mm
- Staircase-15 mm

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## Chapter:4 Auto level for slab leveling.

Auto level is a precise instrument used for accurate leveling of surfaces, including slabs, during construction. It uses a telescope-like device that emits a laser beam to establish a level reference line. By measuring the height of the laser beam at different points, it helps ensure that the slab is perfectly level. This is important for achieving a flat and even surface, which is essential for various construction applications. The auto level simplifies the leveling process and improves the overall quality of the slab. So, it's a valuable tool for achieving precise and efficient slab leveling.

### 4.1 Principle Of Auto Level:

Principle: The automatic level has a compensator mechanism that uses a combination of fixed prisms or mirrors and a moving prism suspended on a pendulum to give a horizontal reference.

### 4.2 How Auto Level Works

On an automatic level, there are two sights along the top of the barrel of the telescope. These sights allow the operator to loosely align the telescope with the object being sighted. At the opposite end of the objective lens sits the part of the telescope that the user looks into, the eyepiece. It is useful instrument for surveying.

### 4.3 How Is Auto Level Calculated

1. Set the tripod to the optimum position, tread on tripod limbs to meet the base.
2. Attach auto level to the tripod.
3. Change point to put the bubble in middle in case.
4. Change recital until crosshairs are visible
5. Change the objective lens until entity that is beheld get visible.

### 4.4 Advantages Of Auto Level:

- Auto level is very easy to use, easily adjustable.
- No adjustment for staff reading is required in auto level as the actual reading is seen from the eyepiece.
- The measurement accuracy of the auto level is higher.
- Auto level results are very reliable.
- Ease of use of auto level saves time and money.
- The price of the auto level is low and affordable.

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#### 4.5 Uses Of Auto Level:

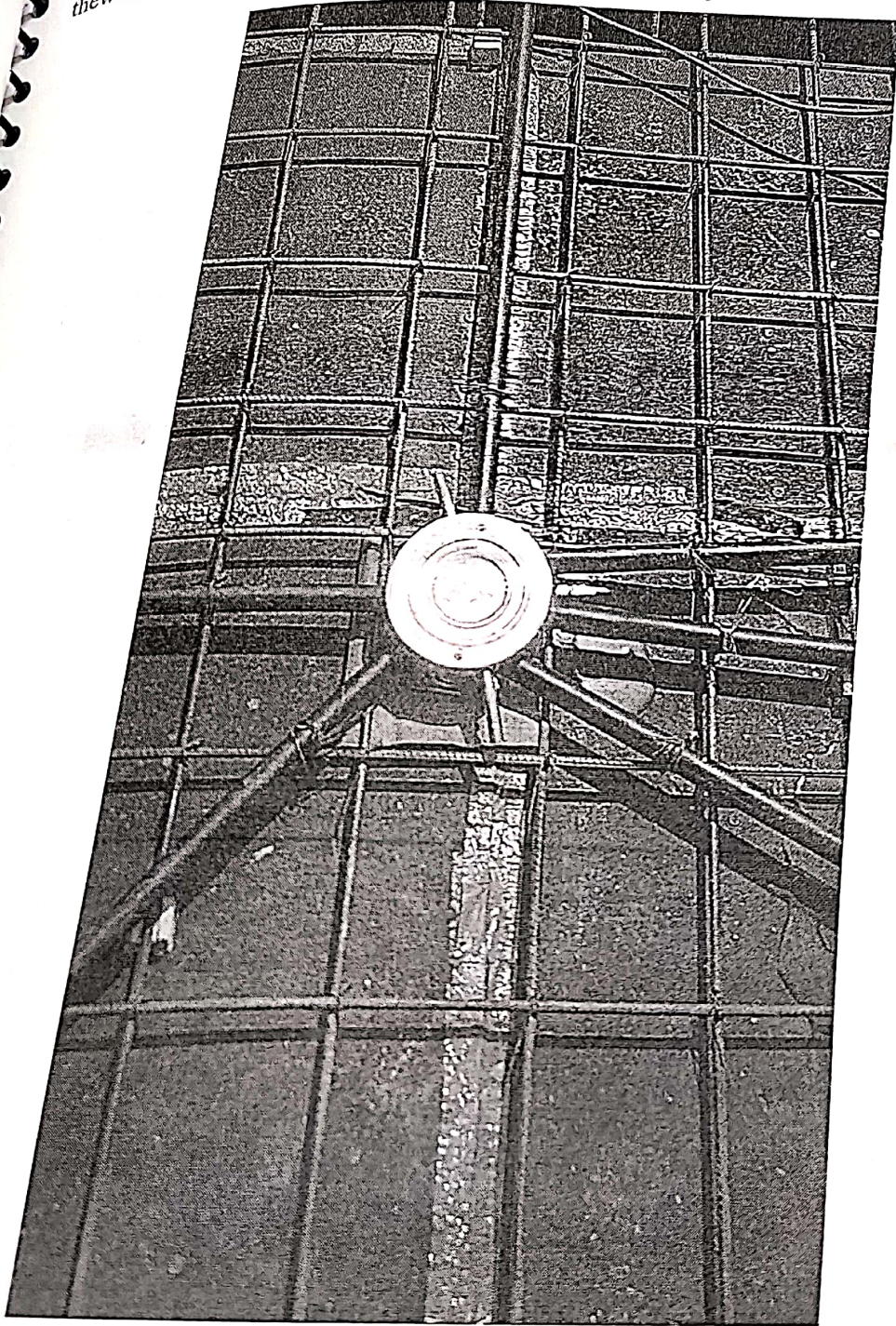
- A dumpy level, builder's auto level, leveling instrument, or automatic level is an optical instrument.
- It is used to establish or verify points in the same horizontal plane.
- It is used in surveying and building.
- It is used to measure height differences and to transfer, measure and set heights.

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**Chapter:5 electrical appliances.**

Electrical appliances can be installed on a slab in a building. However, it's important to consider the load-bearing capacity of the slab and ensure that it is designed to support the weight of the appliances. Additionally, proper electrical wiring and connections should be



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Fig.5

installed to ensure safety and functionality. It's always recommended to consult with professional electrician or engineer to ensure that the electrical appliances are installed correctly and in compliance with building codes and regulations. So, with proper planning and installation.

Electrical systems in these buildings begin at a step-down transformer provided by the utility company and located within or very close to the building. The transformer reduces the standard line potential to two dual voltage systems, which then pass through master switches and electric meters to record the subscriber's usage. Each of the voltages provided serves a separate category of use; different levels are required for incandescent lights and small appliances, large appliances, ceiling-mounted non-incandescent lighting, and heavy machinery. Each voltage pair has a separate distribution system of wiring leading from the meters and master switches to circuit breaker panels, where it is further broken down into circuits similar to residential uses. Because high-voltage wiring is considered hazardous, the switches controlling overhead lighting use lower voltages, and each heavy machine has its own fused switch. From the circuit breaker panel, low-voltage power conduit and wiring is typically distributed through partitions and ceiling sandwich spaces, but, in large open areas of commercial buildings, there may be wireways embedded in the floor slab. These wireways can be either rectangular metal tubes inserted into the concrete slab before pouring or closed cells of formed steel deck; the wireways are tapped where desired to provide convenience outlets at floor level.

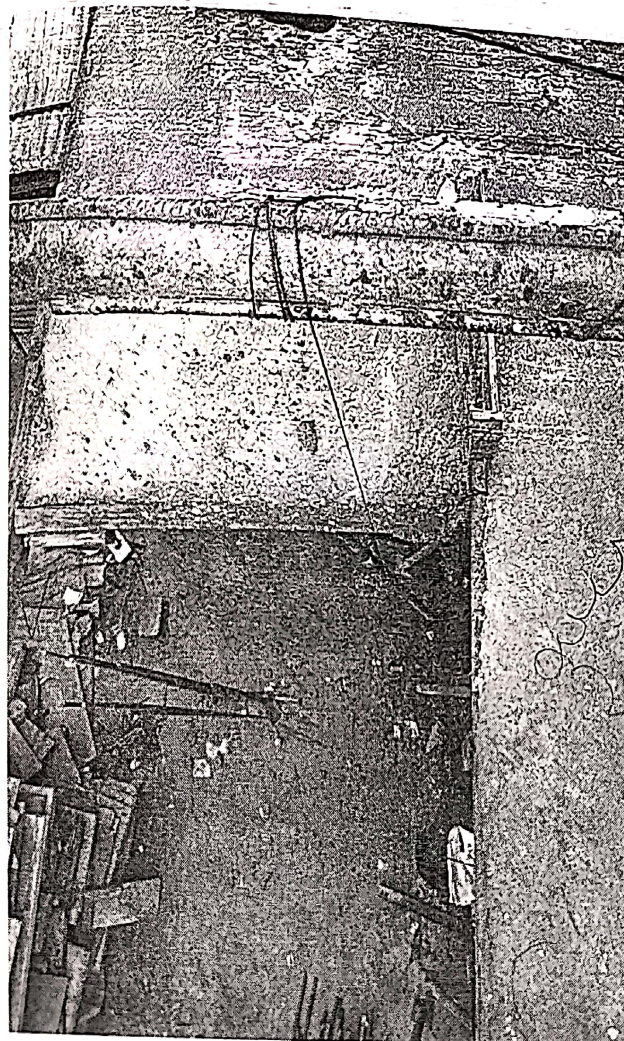
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## Chapter: 6 Plumb bob for column layout.

To perform a plumb bob column layout, you will need a plumb bob, a string, and a measuring tape. Here's how you can do it:

1. Start by marking the center point of the column base on the floor or slab.
2. Attach the plumb bob to the top of the column and let it hang freely.
3. Hold the string against the plumb bob and let it hang straight down.
4. Align the string with the center point on the column base and mark the corresponding point on the floor or slab.
5. Repeat this process on all sides of the column base to establish the layout.
6. Use a measuring tape to ensure that the distances between the marked points are equal and accurate.
7. Once you have established the layout, you can proceed with the construction of the column.



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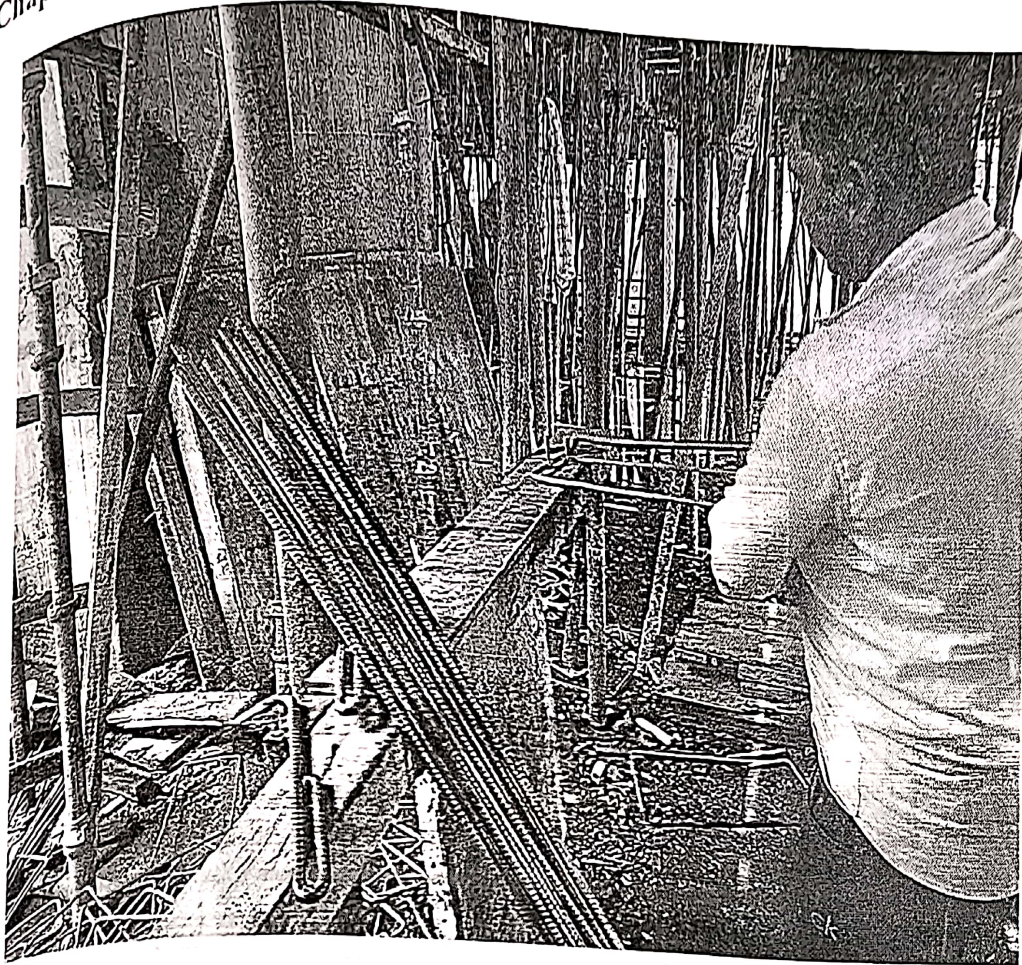


Fig. 7.1

A column ring, also known as a column collar or column band, is a reinforcement element used in concrete construction. It is typically a circular or rectangular ring-shaped reinforcement that is placed around the column at a specific height. The purpose of a column ring is to enhance the strength and stability of the column, especially in areas where additional load or stress is expected. It helps prevent the column from cracking or failing under these conditions. Column rings are commonly used in high-rise buildings, bridges, and other structures where column strength is crucial.

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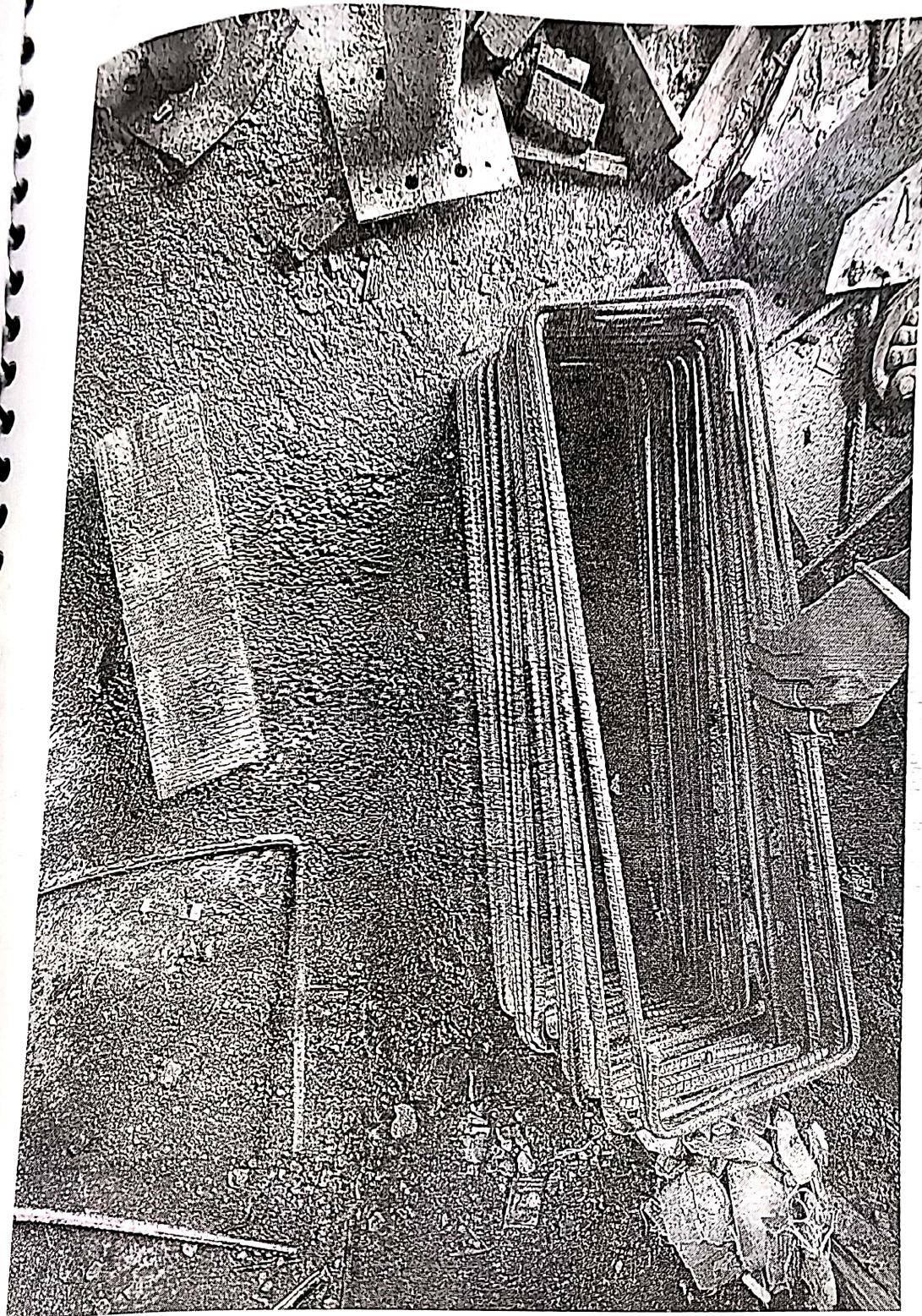
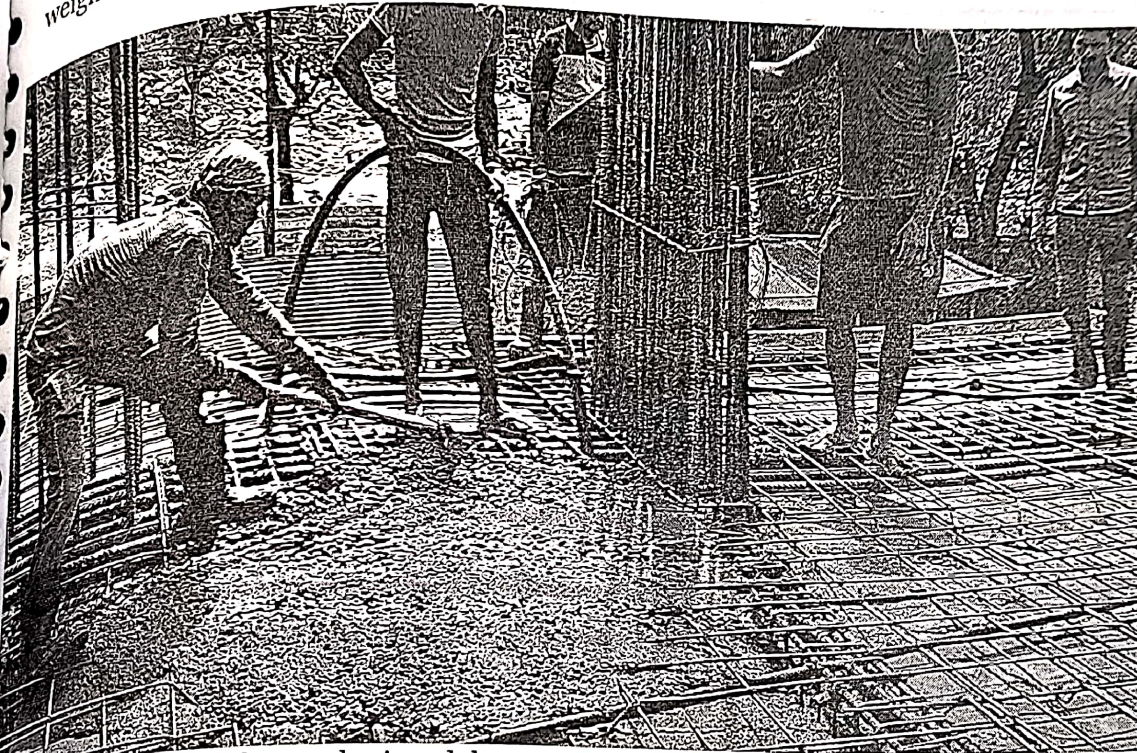


Fig.7.2

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## Chapter:8 RCC ROOF CASTING.

RCC stands for Reinforced Cement Concrete, which is a popular material for constructing roofs. It involves pouring a mixture of cement, sand, aggregates, and steel reinforcement into a formwork to create a strong and durable roof structure. The roof slab is supported by a series of beams and columns, which distribute the weight of the roof evenly throughout the building's structure. The slab may be



designed as a flat slab or a sloping slab,

The design and construction of a roof slab depend on factors such as the span, load requirements, and local building codes.

### 8.1 Reinforcement

It has to be prepared according to the BBS arranged as per the approved drawing. The R/F shifting and binding has to be commenced right after shuttering is undertaken. R/F binding should persist as formwork.

### 8.2 Concreting

#### a) Construction Joint

The construction joint might be pre chosen and settled before beginning of the cementing/concreting. It is wanted to have two construction joints for principle building as chose. If there should be an occurrence of massive breakdown of the Batching plant,

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the extra Construction joint might be cleared out. The area of the construction joint should be at the 33% traverse. Construction joint should be straight and have profile of 'L' shape so that progressive layer of the concrete might be impeccably reinforced with previous laid layer.

Arrangement of construction joint might incorporate roughening, expelling all laitance holding fast to the joint and utilization of thick slurry before begin of the new concrete.

*b) Production and Placement of concrete*

The stock of the materials has to be adequate to commence on the concrete. It has to be properly ensured by stores/purchase department that concreting is not halted on the account of necessary materials.

All plant, machineries and equipments are pre-checked and are put in working conditions.

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## Chapter:9 Vibrators.

Using a vibrator in the concrete mixture helps to consolidate the concrete and remove any trapped air bubbles. This process, known as vibration or consolidation, improves the strength and density of the concrete, resulting in a more durable and homogeneous structure. The vibrator is inserted into the mixture at regular intervals to ensure proper compaction. So, the vibrator is an important tool in achieving high-quality concrete.

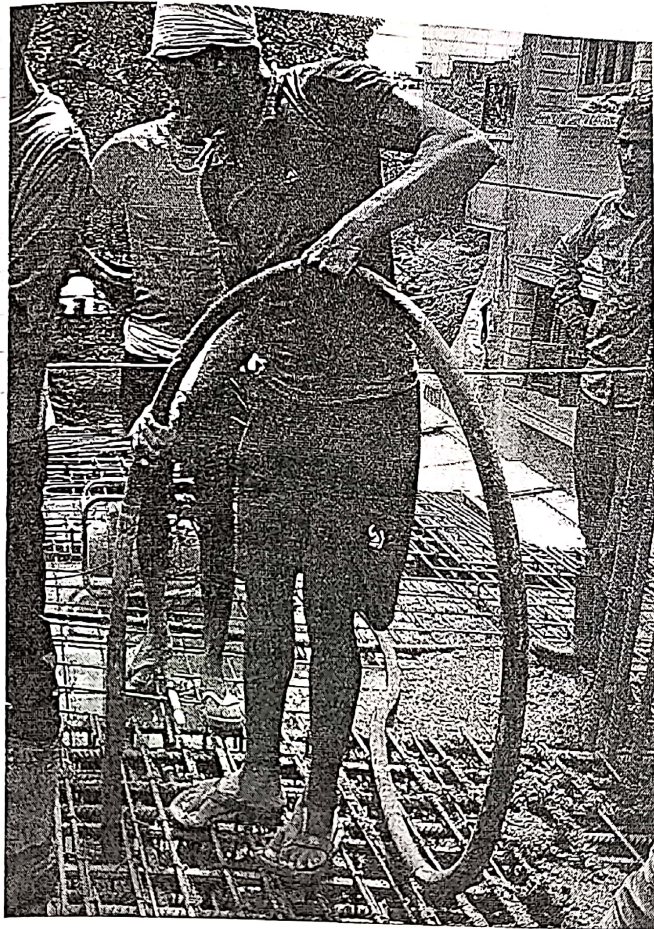


fig.9

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## Chapter:10 Mixture.

**Transit mixture:** A transit mixer, also known as a concrete mixer truck, is a vehicle specially designed to transport ready-mixed concrete from the batching plant to the construction site. It has a rotating drum that continuously mixes the concrete during transportation to prevent it from setting. This ensures that the concrete remains fresh and workable when it reaches the site.

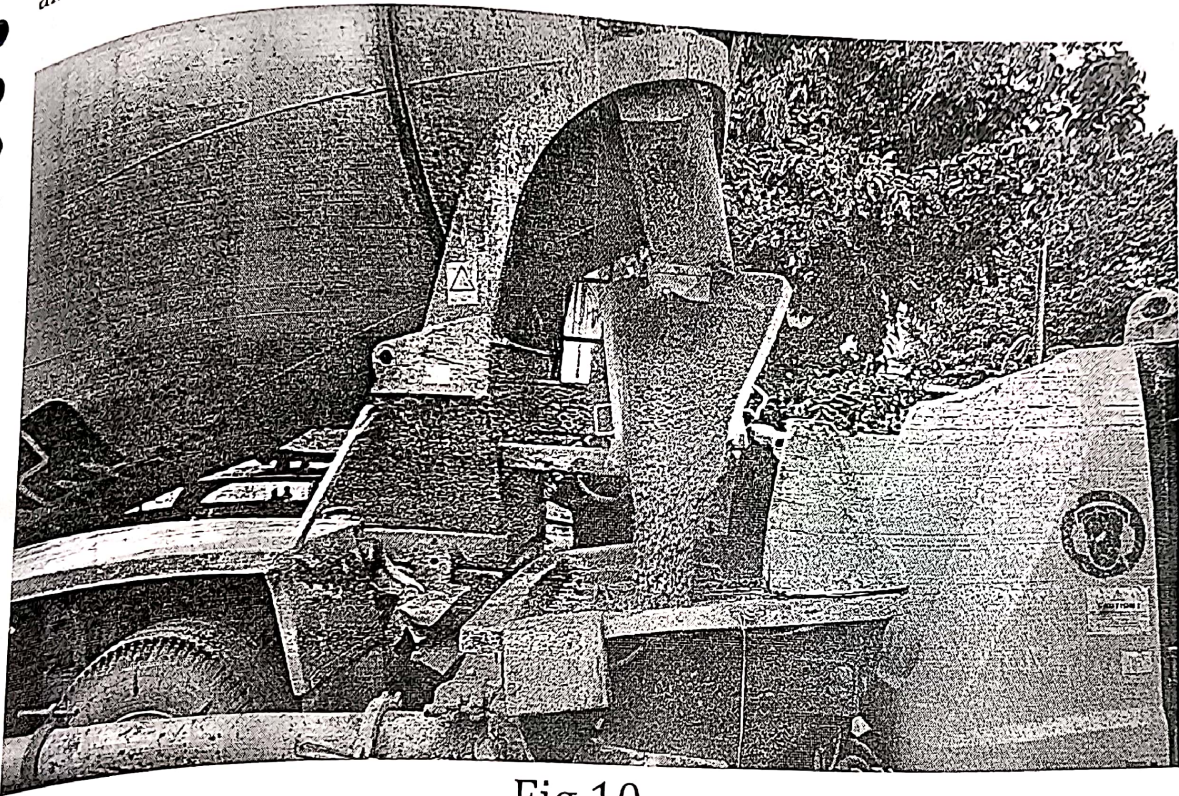


Fig.10

Transit mixer is a multipurpose device that used to transport concrete mortar from a concrete batching plant. The transit mixer is loaded with dry material and water; The transit mixer consists of a drum with a spiral blade which has the ability to move in two directions. The purpose of the drum is to ensure the concrete remains in the liquid state; while it rotates on its own axis. This type of mixer has multiple purposes and helps deliver concrete to several locations; especially remote locations.

### Components of a Transit Mixer

The transit mixer has several components which is possible to apprehend from the name itself. It is basically a vehicle which has a rotating drum used as a mixer. It is possible for this drum

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to rotate while the vehicle is travelling. The purpose of the rotation ability is to ensure the concrete remains usable and of good quality. The main purpose of this type of machine is to be able to deliver the concrete to a working site (in most cases a remote site) while still maintaining its quality. This machine has several components as listed below:

- Auxiliary Frame
- Discharge Support
- Detachable feed hopper
- Crank chute support
- Swivelling discharge chute
- Additional extension chute
- Bearing pedestals
- Drum bearing
- Water tank support
- Water tank
- Mixing drum
- Rollers
- Water Pump
- Diesel engine
- Suction filter
- Control Cabinet

#### Facts and Statistics

- Ready-mix concrete market size was USD 492.2 billion in 2015 worldwide.
- Ready-mix concrete market is expected to rise at a steady rate during the period between 2019 – 2024.
- The concrete market is likely to be a 7020 Million market by the year 2025.
- Predictions for the year 2021 include 260 – 300 Billion USD market as far as the African construction market is concerned.
- Predictions for the Concrete Mixer Truck market is looking bright too with an expected CAGR of 4.5% by 2022.

#### Working Methodology

This machine consists of a supporting element that is an auxiliary frame. Discharge support along with a discharge channel is mounted to this auxiliary frame, at the same time a discharged feed hopper is also mounted to the discharge support with the help of a tubular frame. The swivelling discharge chute is vertically adjustable as per the requirement with the special support provided. This has an elliptical cross-section and is mounted to the discharge support by a reinforced double arm. It is possible to extend the discharge chute using additional extension chute. A gearbox with a drum bearing is bolted to the bearing pedestal;

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this is fixed on the auxiliary frame with the help of U-bolts. The mixer drum has mixing spirals that is supported by two rollers in discharge support; these are highly wear resistant.

The water pump is fanged to the gearbox. The mixing drum has a speed of 14/min, the water pump has a pressure of 3.5bars, and has the capacity to supply 250 liters of water per minute.

A diesel engine runs the mixer and it is independent of the vehicle's basic system. This engine too consists of a piston gearbox, thus allowing the operator to control the drum speed in a precise manner.

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**Chapter:11 overlapping.**

Overlapping means the extra length arranged in the reinforcement steel bars. Here, two lengths are overlapped and attached with a wire to increase the length of any steel bar whenever necessary.



Fig.11

For column, the diameter of the steel should be  $45D$ .

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