Community Construction Manual

A school is to be constructed in your village. In the past, the government workers would simply come, construct the school, and go. But today, you will not even have a chance to see if your building is being constructed properly or not.

This time, your building will be constructed in partnership with the people of your village. You will work with the engineers to ensure that the work is carried out correctly.

How will this partnership happen? What is your role, and what will the engineers need from you? Will you know if the building is being constructed properly? This book will answer all these questions.

INSIDE

1. The Community Construction Process
2. The parts of your school building
3. Details of the construction process
Our Team

The aim of this programme is to involve you and your village directly in the civil works activities. You will be entrusted with the responsibility of getting the works constructed. You will be provided with the funds and technical support of engineers (in the manner explained later). Your responsibility is to procure materials, provide/employ labour and monitor the progress of works.

Forming a Village Construction Committee

The Village Education Committee will represent your village and undertake the works. However, it may be more convenient to form a smaller sub-group that would be responsible for civil works.

For this purpose you must form a Village Construction Committee (VCC). This must happen in a full meeting of the VEC. During this meeting, five members must be chosen in the following pattern:

- President -- Woman member of the VEC
- Secretary -- School teacher (member of VEC)
- Member -- Retired armed forces person (member VEC)
- Member -- SC/ST member of the VEC
- Member -- Any other member of VEC
What will the members of our team do?

The VCC

The first task of the VCC is to mobilise the village. You must involve them and keep them informed of the construction works. The VCC must ensure cooperation and support for the programme from the entire village.

Next, you must make a suitable site available for the construction work.

Once the works start the VCC has three main responsibilities:

- You must procure the materials prudently after determining the best quality and price available.
- You must ensure that wastage of material or labour is kept to a minimum.
- You must ensure that the quality of construction is not compromised and that the work is completed in time.

The Engineer

It is the responsibility of the engineer to visit the site of work at least once a week (and at all major stages of work) and provide you with all necessary technical support and advice.

He will help you to plan in advance the requirement of labor and material.

He will inform you of the quality of materials required and the methods of checking quality.

He will apprise you of construction practices so that the quality of construction is maintained.

He will ensure timely fund releases so that the work is not delayed.
The Process

Step One - Select a site

You must explain to the entire village the work planned under DPEP and discuss possible sites where a new school could be constructed. You must identify the most suitable site for the school depending on the availability of land. You must help the JE in obtaining the transfer of land.

What should your school site be like?

Does your site meet most of these conditions:

☑ It should be within 1.5 km of the settlement
☑ It should not be located in any one community's area
☑ The area of your site should ideally be at least 1 acre. A site less than 1000 sqm should not be used for a school building.
☑ It should preferably be of a regular shape
☑ It should not be in a low lying area or in an area of heavy slope.
☑ It should not have filled up soil or soil with decomposed plant/animal material.
☑ Water should be available on the site or near it. It should preferably have access to electricity.
☑ It should not be located near hazardous area or sources of noise like highways, rail tracks, factories, etc.
Step Two - Open a Bank Account

The Block Development Office will help you to open the bank account. You will open a joint account between the member secretary and a lady member. Withdrawal of money from the account will require signatures of both the account holders.

The account must be opened either in a nationalised bank or in the local post office. Open your account without delay. The first installment of money for construction will be released only after you have opened the bank account.

Step Three - Fund Release

The first installment will be released to you by cheque during the training programme. (You should receive the cheque along with this manual). The first installment amounting to half the total cost shall be paid as an advance upon the signing of the agreement. With this you will be able to build the school up to the lintel level.

As explained in the Agreement Document the funds shall be released to you in three installments of 50%, 35% and 15% respectively.

You must maintain proper accounts of the money spent. (See page 6 - Accounts). After utilizing half of the first installment request for the second installment of funds, you must inform the engineer when the funds are utilised. The engineer shall certify the satisfactory completion of work and utilization of funds upto that stage. He will then forward the request to the DPO who will release the money.

The final installment shall be released only after the satisfactory completion of the entire works.
Step Four - Construction of the building

Getting the money for the job. It is advisable that you divide responsibilities clearly amongst itself. To do this, smaller groups should be formed within the VCC including:

A purchase group responsible for all the material purchasing required
An accounts group, responsible for keeping all bills and accounts
A supervision group, responsible for the day-to-day check on the works along with keeping any records that may be required

Procurement of materials

The Purchase Group will be in charge of the purchase of materials. They must buy the amount of materials as specified in Section III of this manual. Before buying the materials you must compare the prices between a few shops. You must also check the quality of the materials. Section II explains how the quality of materials can be checked. Be sure to take bills for all the materials you buy. Give all the bills to the Accounts Group.

Accounts Group

The Accounts Group will be responsible to keep a record of all the money received and spent for materials and labour. It is very important to keep the accounts neatly and properly. The format in which the accounts are to be kept is given below.

The Accounts Group must also inform the Engineer when half the installment money is spent. The engineer will then see the accounts and send a request for the next installment to be given.

If the record of accounts are not kept properly, or the engineer is not informed in advance, the release of money may be delayed and the work may have to stop.

Supervision Group

The Supervision Group has a very important role to play. They must be present on site every day to check that the works are being done properly. Please read through Section II and III carefully. These sections explain clearly how the work will be done and how you can check if the work is being done properly. Take this manual to the site everyday and refer to it while you check the work. Use the checklists given, to see if the work is being done properly. Mark on the manual itself as the work gets done.

If you have any difficulty in understanding the manual, ask the engineer to explain it to you.
## Accounts Format

**NAME OF THE VILLAGE:** Sarai Rohilla  
**TYPE OF BUILDING:** Two Room School  
**TOTAL ESTIMATED COST:** Rs. 2,50,000/-

<table>
<thead>
<tr>
<th>Date</th>
<th>Cheque No.</th>
<th>Amount Rec'd. (Rs.)</th>
<th>Expenditure</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Material</td>
<td>Qty</td>
</tr>
<tr>
<td>12/03</td>
<td></td>
<td></td>
<td>Bricks</td>
<td>9300</td>
</tr>
<tr>
<td>13/03</td>
<td></td>
<td></td>
<td>Cement</td>
<td>25 bags</td>
</tr>
</tbody>
</table>
Supervision
The Site Engineer (JE) shall visit the site at least once in every week. In addition, he will be present at all important stages of construction. The schedule and number of visits are given below:

### TECHNICAL SUPERVISION SCHEDULE

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>STAGE OF WORK</th>
<th>NO. OF VISITS</th>
<th>POINTS TO BE CHECKED</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Foundation upto ground level</td>
<td>4</td>
<td>• Layout</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reinforcement of grade beam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• piles</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• curing</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• compaction</td>
</tr>
<tr>
<td>2</td>
<td>Brick work, upto DPC</td>
<td>2</td>
<td>• Quality of brick work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Mortar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Curing</td>
</tr>
<tr>
<td>3</td>
<td>Brick Work upto lintel level</td>
<td>6</td>
<td>• DPC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Quality of brick work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Door, window detailing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Spanning of openings</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Levels</td>
</tr>
<tr>
<td>4</td>
<td>Brick Work above lintel level, roof shuttering and reinforcement</td>
<td>1</td>
<td>• Ventilators</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Shuttering levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reinforcement of ring beam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Roof slab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Proportion of concrete and water-cement ratio</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Workmanship</td>
</tr>
<tr>
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<td>• Thickness</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Finishing</td>
</tr>
<tr>
<td>5</td>
<td>Concreting of roof slab</td>
<td>2</td>
<td>• Curing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Plastering</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Flooring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Door, window fixing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Painting</td>
</tr>
<tr>
<td>6</td>
<td>Finishing of building</td>
<td>1</td>
<td>•</td>
</tr>
</tbody>
</table>

### Completion
The work after completion shall be inspected by a committee consisting of the architect/consultant to the office of the Mission Director, State Project Engineer, District Engineer and the Junior Engineer for the site. The above committee will issue the completion certificate duly signed by each member. The last installment shall be issued after the approval of the above report and utilization certificate from the AE/JE of the DPEP staff by the Mission Director.

The utilization certificate of the amount spent by You shall be jointly signed by the chairman and member secretary of You. The utilization certificate shall be submitted to the Mission Director through the DPC for record.
Community Construction Manual

Parts of your School Building

A new school is going to be constructed in your village. It is for the benefit of your entire village, especially your children.

Your village and your representatives will be responsible for the construction of the school. This section of the manual explains, one by one, the different parts of your school building and how they are to be constructed. Read this carefully. If you need something to be explained ask the engineer when he comes for his weekly visit.

Remember, if you construct a good school, your village will benefit more than anyone else - if a good school is not constructed only you will lose - not anyone else.

What are the different parts of your building? Why are they required? And how will you know if they are being constructed properly?

This section of the Manual provides this information. Carry this manual when you go to your site. Use it to check if your school building is being constructed properly.

INSIDE:

- The different parts of your school.
- The reason why they are required.
- How they will be constructed.
- How you can check the construction.
Let us familiarise ourselves with the parts of the building which will be discussed.

The plinth lies at the floor level right below the walls (not under any openings like doors).

The plinth lies between the floor and the ground.

The foundation is invisible and lies below the ground, just beneath the walls.
FOUNDATION

- What is the foundation?

The foundation is the part on which the entire building rests. It is constructed below the ground. You will not be able to see it once the building is complete. However, the strength and life of your building depends on it.

Prior to the construction of the building, earth is dug up and a thick "wall" is built inside this excavated portion. This thick wall is the foundation. It may be twice or even thrice the thickness of the wall above the ground depending on the number of floors in your building.

- Why is it required?

The foundation is required to provide stability to the walls and ensure that your school does not settle with time. The foundation gives your building strength in two ways: First, it prevents the wall from falling side ways. Secondly, it ensures that the building does not settle down into the soil due to its own weight.

As we dig into the earth, the soil generally becomes harder and harder. In some places we may even find stones and rocks when we dig into the earth. By building into the ground, we make the wall more stable. It will not fall easily even if it is pushed from the side. Also, if it is built on hard ground, the building will not settle easily.
What are the different types of foundations?

Different types of soil are found in different places. The type of soil, the water table and the type of building determine the type of foundation required.

- In places where the soil is hard and rocky the foundation need not be very deep. Normally, the depth of the foundation would be about 3 feet.
- In places where the soil is sandy we must dig deeper. The depth of the foundation would be about 5 feet or until hard or rocky soil is found.
- We must be very careful about black-cotton soil. In black cotton soil the foundation must be constructed very carefully. This is explained in detail on the next page.

- Does your village have black cotton soil?
  Black-cotton soil should be avoided wherever possible. If there is no better site available, great care should be taken while constructing the building.

It is very dangerous to construct your school buildings on filled-up sites. Filled-up sites should never be used for constructing buildings.
How is the foundation constructed in other soil conditions?

Hard soil: In hard or rocky soils the foundation may be shallow. Generally, the depth of the foundation is not more than 3 feet.

- The trench is dug as per the lines marked-out by the mason.
- After excavation a layer of lean concrete 3"-4" thick is laid. The width of the concrete layer should be 4" more than the width of the masonry to be constructed.
- The centre-lines must be marked on the concrete bed. The foundation masonry may be of brick or concrete.
- The masonry is stepped, as shown in the diagram.
- The foundation is constructed up to the plinth level.
- A water level check must be done at this stage to ensure that the plinth level is uniform.

Loose Soil: The foundation needs to be deeper where the soil is loose. It may be constructed to a depth of 5 to 6 feet. The system of construction is similar to the construction of shallow foundations.

- How can you know if the foundation is being constructed properly?

Check List:

1. Has the trench been dug in accordance with the plan?
2. Mark centre-lines on PCC layer.
3. Is the PCC 4" wider than the masonry on either side?
4. Water level check at plinth lvl.
DAMP PROOF COURSE (DPC)

- **What is damp-proofing?**
  Damp proofing is normally laid as a thick layer of cement concrete. Alternatively a layer of sand-stone may be laid. It is used to prevent damp from getting into the walls of your school. However, if a plinth beam is constructed, the damp proofing layer is not required. Damp proofing is laid above the foundation masonry. Above this the walls are constructed.

- **Why is it required?**
  It is required to prevent water (dampness) from the ground rising into the walls. Dampness reduces the strength of the wall. It also makes the paint and plaster fall off from the wall. The damp proof layer prevents this from happening as water cannot pass through it.

- **How is it laid?**
  Any one of the following may be used as a damp proof layer:
  - Sandstone: A layer of concrete is laid over the foundation masonry to create a level surface. Slabs of sandstone 1.5" thick are laid above this. The slabs must be laid at the level of the finished floor.
  - Damp Proof Course: A cement concrete layer, 1.5" thick (DPC) may be laid in place of the sandstone. The mortar must be a rich cement mix. A water-proofing chemical should also
be added to the concrete as per the instructions provided with the waterproofing compound.

- Plinth Beam: A plinth beam is sometimes constructed depending on the foundation and soil conditions. A plinth beam is not to be constructed just to prevent damp. However, if a plinth beam is provided, no other treatment for damp is required.

- How do we know if the damp proofing is being laid properly?

Proper laying of the damp proof course or sandstone can be checked easily:

☐ Check the thickness of the DPC. It must be uniformly 1.5" thick. If sandstone is used the thickness of the stone-slab should be at least 1.5".

☐ The width of the DPC must be the same as the wall constructed above it.

☐ If cement concrete is being used, the mix must be rich i.e. 1:2:4 or 1:3:6.

☐ Most importantly check the level at which the DPC is being laid. It must come at the level where the finished floor will be.

☐ The finished height of the DPC should be the same. The mason will check this with a water level as shown in the figure.

If the DPC is lower than this than the damp will rise from the floor into the walls of your school. If it is higher then the damp will be able to rise into a part of the wall in any case. This is why the proper position of the DPC is at the same level as the finished floor.
Why are walls required?
We all know that the walls and roof provide us with shelter. Walls are required not only for shelter but also to make the building strong and stable. It is on the walls that the roof rests.

What is the wall built of?
Bricks, stone and concrete blocks are some of the typical wall materials.

Bricks: Unburned bricks and over-burnt bricks must not be used for construction. If they are used they will reduce the strength of the building. Good bricks should be of uniform size, will not have cracks and will not break easily.

Stone: Uncoursed stone masonry should not be used as far as possible.

Concrete blocks:

How do we know if the walls are being constructed properly?
You can easily check if the walls of your school are being constructed carefully and properly.

- If bricks are being used in the construction then they must be soaked (immersed) in water for at least one hour prior to construction.
- Cement and sand should be mixed thoroughly while they are dry. Cement mortar must not be used more than half an hour after water is added. So, only so much mortar...
(wet mix) must be prepared as can be used immediately.

- While laying the bricks, the mason should use a centre-line to ensure that the wall is being constructed properly.
- The cement mortar joints must be 8mm thick. The mortar should not be more than 1cm thick as this reduces the strength of the wall.
- After every three courses the mason should check plumb. Plumb is checked with a plumb-bob to see that the wall is being constructed vertically and not tilting to one side.
- The mason must also check level and line. The water level is used to check and maintain the level of the corner bricks. Then string is tied to these corner bricks and used to maintain the line of all the intermediate bricks in the course.
- The bricks / stone must be staggered when they are laid. This means that each brick must rest half on one brick and half on the next one. Ensure that bricks are not laid exactly one on top of the other.
- Similarly, at the corners where two walls meet, the bricks must overlap. This way the two walls are joined together and become stronger. If the bricks are not staggered the walls will not be joined together. This way the walls of your school building will not be strong and it may collapse after some time.
DOORS AND WINDOWS

- Why are windows required?
  All schools are designed to have windows with shutters. Windows are required to ensure that the classrooms receive adequate light and ventilation. Providing shutters ensures that the windows can be closed when the weather outside is bad.

- How are windows and doors fixed?
  Windows and doors are fixed in two parts. First the frames are fixed. The shutters of the doors are fixed after the flooring is done.

- How will we know if the doors and windows are being fixed properly?
  It is important to ensure that doors and windows are fixed properly. If not the doors and windows of your school may not open or close properly. That would be a waste of so much effort!
  Three things must be checked to ensure that your doors and windows work properly, namely, line, level and plumb.
  - **Line**: The door and window frame must be fixed at the centre of the wall. They must not be at one edge.
  - **Level**: The bottom and top level must both be checked. The bottom of all doors must be uniform. It must be the same level as the damp proof course. The bottom of all windows must be at the cill level which must be the same for all windows. Similarly, the top level of all doors and all windows must be the same.
The mason must check that all the levels are correct with a water level.

- **Plumb**: The door and window frames must be plumb (i.e., they must be placed exactly vertical). If the frames are not fixed plumb then your doors and windows may not be able to open or close properly.

**Holdfasts**: To ensure that the doors and windows are fixed properly to the walls, holdfasts must be provided. These are metal strips (as shown in the figure) that are embedded into the wall with cement mortar. The frames are fixed to the holdfasts.

**Hinges**: Strong hinges must be used to fix your shutters to the frame. They must be nailed or screwed to the frame. If the hinges are not strong and of good quality, you may have problems in opening and closing your doors and windows.
**LINTELS**

- **What are lintels?**
  Lintels are the part of the wall exactly above the door and window openings. The lintel is constructed to be one complete piece. It is normally a stone slab or a concrete beam which spans the opening.

- **Why are lintels required?**
  An opening in the wall has to be made for doors and windows. To hold up the wall above the opening, lintels are required. The lintel may be made of stone, RCC or brick.

- **How do we know if they are being constructed properly?**
  There are many things that you can check to see if the lintel is being constructed properly.

  **Level:** Check to see that the lintels are being placed exactly horizontal. The mason will check this with a water-level as explained earlier. All lintels must be at the same height.

  **Bearing:** All lintels must have a bearing of at least 4.5". This means that at least 4.5" of the lintel must be resting on the wall on either side. So, if you are buying stone slabs for the lintels, make sure that they are at least 9" longer than the span of the opening.

  **Chajja:** All the windows of your school must be protected by a projection. If the window is flush with the wall then a chajja.
must be provided. For this purpose a stone slab of adequate width could be used. If RCC is being used then the chajja should be cast along with the lintel.

As explained later (Roofs and Beams), all RCC works must be cured for at least one week to ensure that it is strong enough.
What are beams and roofs?

*Beams:* Buildings like your school have rooms of a large size. It is not possible to lay a roof over such a large area in one piece. So beams are used to span the classroom. On top of the beams, the roof is laid. You can see the beam from inside the room. It may be of RCC, steel or even stone.

*Roof:* The roof is what gives us protection. It is constructed on the walls. If both sides of a room are larger than 10 to 15 feet, the roof will require the support of beams as well.

Roofs can be flat or sloping. In areas where there is heavy rain or snowfall, the roof should be sloping. The roof is typically made of RCC or stone slabs.

How are roofs constructed?

*RCC Roofs:* The construction of RCC roofs is a complicated process and must be checked carefully.

*Shuttering:* Before the construction of RCC works, a shuttering or framework is made which would support the concrete slab, beam or column for the first few weeks. Roof shuttering is in the form of poles (usually wood) over which wooden flats and panels are fixed.

*Reinforcement:* Steel bars are laid over the shuttering and tied together with steel wire.

*Pouring concrete:* Over this framework the concrete is to be poured. This is
known as the casting of the slab. The entire roof slab must be cast in one day.

**Compaction** : After the concrete it must be compacted. This must be done with rods (durmut) and planks.

**Curing** : Like plants and trees concrete work also requires watering if it is to grow strong! Luckily, you have to water it for fourteen days only! The concrete must never become dry throughout these fourteen days. It possible the slab must be kept submerged in water.

- How do we know if the roof and beams are being constructed properly?

**Level** : It is very important that the mason checks the level of all sides of the shuttering after it is fabricated.

**Mixing and Compaction** : The concrete must be mixed very well and be of uniform consistency before it is poured. There should not be so much water that the concrete begins to flow. After pouring it must be compacted properly if the roof of your school is to be strong.

**Curing** : It is very important that curing (watering) is done. The concrete must always be wet throughout this 14 day period. Otherwise the roof of your school will not be strong.

**Casting in one day** : The casting of concrete elements must be in one day.

**Beam & Roof** : The reinforcement of the beam and roof should be tied together and they should be cast together. This makes the roof stronger.
CHECKING MATERIAL QUALITY

• Brick
Bricks must be strong and not break easily. To know if the bricks are of proper quality you can try the following tests:
  • Raise the brick to a height above your head and drop it. If the bricks break, it is not of good quality.
  • Take two bricks in your hand and bang them against each other. If either one breaks then the bricks are not of good quality.
  • Put a few bricks in a bucket of water and leave it overnight. If the bricks dissolve by the morning, they are not of good quality.
  Try these tests on a number of bricks. Only if the bricks are strong should you buy them.
Sometimes the shopkeeper may show you good quality bricks for testing and actually supply poor quality bricks. Ensure that he supplies the same quality bricks that you have tested.

• Steel & Joists
There is a simple test for steel. Just check that the steel is totally rust-free. If steel rusts it loses its strength. Using rusted steel in your school will only reduce its strength and endanger your children.

• Wood
Wood should be free of knots and insects. If insects have bored into the
wood or if there are knots, then the strength of the wood would be reduced.

- **Sand**  
  You should check to see that the sand is fine. You can do this by simply feeling the sand in your hand.  
  Coarse sand must not be used for brick masonry work.
STORAGE OF MATERIALS

- All materials must be stacked in an orderly manner. Materials must be piled in neat stacks. Wastage and damage to materials can occur if they are not stacked properly.
- Cement and lime must always be stored above the ground. They must be covered with plastic sheets or in a waterproof place. If the cement or lime get wet you will not be able to use them for construction and all your money will go waste.
- Sand and aggregate must be stored in heaps with side protection. If you don’t give this side protection there will be a lot of wastage. Bricks can be lined along the edge of the heap to prevent the materials from spreading.
Community Construction Manual

Work Management

Construction of your school is not as difficult as it may appear.

The following pages break down the process of construction into distinct steps. For each stage of work, the amount of labour and the materials that you must buy are clearly indicated. The amount of time that the work should take is also shown.

Do not forget to check if the work is being done properly. Good construction practices that must be followed at each stage is indicated. Refer to these as well as the check-lists that are provided in Section II and you can be sure that your building will come up well.

INSIDE:
- How much time will the work take?
- What materials should you buy and when?
- How much labour must you employ?
- How you can check the construction.

There are various tasks to be undertaken to construct your school building. How much time will these tasks take? What are the main materials that you will require? How much should you buy and when? How much labour would you require for these jobs?

This section of the manual provides answers to these questions and is a step by step guide for your work.
MAKE BRICK PIERS AND
MARK CENTRE LINES ON
THEM.

CROSS CHECK TO ENSURE THAT
THE CORNERS OF THIS BLDG
ARE FORMING RIGHT ANGLES.
(DIAGONALS SHOULD BE EQUAL)

MARK OUT THE EXTENTS
OF THE TRENCH TO BE
EXCAVATED AS PER DIMENSIONS
**Work Management Charts**

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<thead>
<tr>
<th>Step</th>
<th>Work</th>
<th>Start Date</th>
<th>Planned Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site clearing activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Procuring of material (ordering)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Setting out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Centre line grid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DAILY REQUIREMENT OF LABOUR (PER ACTIVITY)**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site clearing activity</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Procurement of material on site</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting out</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centre-line grid</td>
<td>2</td>
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**MATERIAL PROCUREMENT**

<table>
<thead>
<tr>
<th>Item</th>
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<th>Actual</th>
</tr>
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<tbody>
<tr>
<td>50 bags</td>
<td></td>
<td>43 cu.m</td>
</tr>
<tr>
<td>8 cu.m</td>
<td>16,000</td>
<td></td>
</tr>
</tbody>
</table>

**GOOD CONSTRUCTION PRACTICES**

- Check that the diagonals are of equal length.
EXCAVATION SHOULD BE VERTICAL AND AS PER THE DIMENSIONS IN THE PLANS.

COMPACT THE FLOOR OF THE TRENCH PROPERLY BEFORE LAYING THE PCC.

THE TRENCH FLOOR SHOULD BE MADE WET BEFORE LAYING THE PCC.
**Work Management Charts**

<table>
<thead>
<tr>
<th>Step</th>
<th>Work</th>
<th>Start Date</th>
<th>Planned Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Excavation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6&quot; thk. sand filling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Brick laying (as required)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>6&quot; thk. PCC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Daily Requirement of Labour (per activity)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Work</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Excavation</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6&quot; thk. sand filling</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Brick laying (as required)</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>6&quot; thk. PCC</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Good Construction Practices**

- Excavation is vertical
- Bottom of trench is level
- Width and depth are as per dimensions
- All soil must be removed and compacted properly
- Lay PCC on wet ground
Step  Work  Start Date  Planned Days
9  Brickwork in foundation  
10  Back filling in foundation  
11  Damp Proof Course  
12  Earth fill of plinth  

DAILY REQUIREMENT OF LABOUR (PER ACTIVITY)

<table>
<thead>
<tr>
<th></th>
<th>SUGGESTED</th>
<th>ACTUAL</th>
<th>SUGGESTED</th>
<th>ACTUAL</th>
<th>SUGGESTED</th>
<th>ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Brickwork in foundation</td>
<td>1</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Back filling in foundation</td>
<td></td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Damp proof course</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Earth fill of plinth</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MATERIAL PROCUREMENT

<table>
<thead>
<tr>
<th></th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 bags</td>
<td>45 cu.m</td>
<td>10 cu.m</td>
<td>21,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GOOD CONSTRUCTION PRACTICES

1. Check the width & height of the foundation steps.
2. Check plumb and level at every step.
3. Use a level greater than 15 cm when building.
4. Check that the plumb is NOT ready when the bricks are too tight.
5. Check if the level is correct. Use a level greater than 15 cm when building.

While filling the earth, fill intervals of 30 cm. Water and add 2 cm layer thoroughly before laying the next.
Do a level check at the cill level.

Prop up the door and window frames.

Leave holes in the wall for erecting platforms to work on.
Work Management Chart

<table>
<thead>
<tr>
<th>Work Description</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 4&quot; thk. sub-floor sand filling</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>14 Concreting of sub-floor</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>15 Fixing of door frames</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16 Brick work up to Cill level</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>17 Fixing of window frames</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**GOOD CONSTRUCTION PRACTICES**

- Ensure proper finishing: mortar, thickness, and curing.
- Check plumb & level before fixing floors & windows.
- Prepare mortar in small quantities. Prepared mortar should be used within 1 hour.
AT Lintel level, check the plumb and level properly before casting.

Reinforcement used should be as per drawings.

After pouring the concrete mix, it should be thinned thoroughly.
### Work Management Charts

<table>
<thead>
<tr>
<th>Step</th>
<th>Work</th>
<th>Start Date</th>
<th>Planned Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Brick work from cill to lintel</td>
<td>1561</td>
<td>m_s</td>
</tr>
<tr>
<td>19</td>
<td>Centering for lintel</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Pouring of concrete in lintel</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

### DAILY REQUIREMENT OF LABOUR (PER ACTIVITY)

<table>
<thead>
<tr>
<th></th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Brick work from cill to lintel level</td>
<td>1</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Centering for lintel</td>
<td>2</td>
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</table>

### MATERIAL PROCUREMENT

<table>
<thead>
<tr>
<th></th>
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<th>Suggested</th>
<th>Actual</th>
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<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 bags</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>11 cu.m</td>
<td>11 cu.m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GOOD CONSTRUCTION PRACTICES

- Check levels at the lintel level.
- Ensure proper reinforcement and mixing before casting.
- Construction should be good and cure properly.
STAGE 6: Roof level

Reinforcement should be tied properly and cover stones should be placed.

The entire roof slab must be cast together in a single day.

Do a level check before casting the slab.
**Work Management Charts**

<table>
<thead>
<tr>
<th>Step</th>
<th>Work</th>
<th>Start Date</th>
<th>Planned Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Brick work above lintel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Shuttering &amp; centering for roof</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Pouring of concrete in slab</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DAILY REQUIREMENT OF LABOUR (PER ACTIVITY)**

<table>
<thead>
<tr>
<th></th>
<th>SUGGESTED</th>
<th>ACTUAL</th>
<th>SUGGESTED</th>
<th>ACTUAL</th>
<th>SUGGESTED</th>
<th>ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Brick work above lintel</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Shuttering &amp; centering for roof</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Pouring of concrete in roof slab</td>
<td>2</td>
<td>2</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**GOOD CONSTRUCTION PRACTICES**

- Check the level of the shuttering and erect props at every 10m.
- Maintain uniform slab thickness and make the beams as per details.
- The angle slab should be cast in a single day and curing should continue for 14 days after casting.
ALWAYS APPLY A LAYER OF PRIMER BEFORE PAINTING DOORS AND WINDOWS.

PLASTERING MUST BE EVEN AND SMOOTHER CURE ADEQUATELY TO AVOID CRACKS.
**Work Management Charts**

<table>
<thead>
<tr>
<th>Step</th>
<th>Work</th>
<th>Start Date</th>
<th>Planned Days</th>
<th>FEB</th>
<th>MAY</th>
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<tr>
<td>24</td>
<td>External plastering</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>25</td>
<td>Chalk board</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Plaster under slabs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Plaster over slabs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Internal plastering</td>
<td></td>
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</table>

**DAILY REQUIREMENT OF LABOUR (PER ACTIVITY)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>External plastering</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>Chalk board</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Plaster under slabs</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>27</td>
<td>Plaster over slabs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Internal plastering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GOOD CONSTRUCTION PRACTICES**

- Plaster thickness should be as specified.
- Avoid undulations in the walls.
- While plastering, use only a small amount of plaster to avoid waste.
- Always keep doors and windows shutters open.
## Work Management Charts

### Daily Requirement of Labour (Per Activity)

<table>
<thead>
<tr>
<th>Step</th>
<th>Work Description</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
<th>Suggested</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
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<td>3</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Fixing door &amp; window shutters</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Painting of frames and shutters</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Site treatment</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Good Construction Practices

- Ensure that a grid of glass tiles is laid while making the floor. This prevents cracking of the floor.
- The surface of the blackboard must be smooth and even. There should be no holes or depressions.