

## Home Building Guide

### Home building decisions, Step by Step

#### Introduction

The whole process of homebuilding becomes easier if you know what decisions you need to take and when. If you are clear about your own priorities and preferences at each step, you can't go wrong.

Follow the simple steps shown below to know exactly how to plan your homebuilding according to your needs and the availability of funds.

#### **Best of Luck!**

#### STEP ONE

- Discuss your needs with your family.
- Consider your family/household size, present and future.
- How many rooms, bathrooms, storerooms, verandah, any other facility.  
(i.e. Size, Purpose etc.)

All this will make budgeting and planning that much easier area.

#### STEP TWO

Your two major cost components are land and construction costs.

**A.** Find out approximate cost of land in the area of your choice Rs. \_\_\_\_\_/sq. ft. x area required (In sq. ft.) = Rs \_\_\_\_\_

**B.** Make an approximate construction cost estimate Rs \_\_\_\_\_/sq. ft. x built-up area (In sq. ft.) = Rs \_\_\_\_\_

Therefore, the total cost of your home would be (A+B)

Type of finish	Cost per square feet	Description
Superior finish	Rs 650 to Rs 1000	High quality flooring, electrical and sanitary fittings, paints, timber, kitchenware etc.
Medium finish	Rs 450 to Rs 650	Medium quality flooring, electrical and sanitary fittings, paints, timber etc.
Basic finish	Rs 350 to Rs 450	Ordinary quality of finishes such as a neat cement finish Construction cost varies with quality of interior finishes and fixtures. Cost projections shown above may increase by 8 to 10% per year. This table does not include cost of land.

Type of finish Cost per square feet Description Superior finish Rs 650 to Rs 1000 High quality flooring, electrical and sanitary fittings, paints, timber, kitchenware etc. Medium finish Rs 450 to Rs 650 Medium quality flooring, electrical and sanitary fittings, paints, timber etc.

Basic finish Rs 350 to Rs 450 Ordinary quality of finishes such as a neat cement finish Construction cost varies with quality of interior finishes and fixtures. Cost projections shown above may increase by 8 to 10% per year. This table does not include cost of land.

### STEP THREE

You can generate funds through: (see section on home loans)

C. Your own savings and

D. Borrowings

Therefore, total funds available would be C + D

### STEP FOUR

- Look for less expensive land further away from the city centre to reduce land cost.
- Reduce the built-up area. Reduce the size or number of rooms
- Ask your architect to design your house to allow phase-wise construction, so that you can build part of it now and add rooms later, when you have the funds.
- Reduce land requirement. Say, instead of 1000 sq ft on one floor, opt for two floors of 500 sqft each. This will not only reduce your land requirement it will also save on your construction cost by 10 to 20% Referring examples given in STEPS TWO & THREE, let's revise the estimate following the guidelines above:

### **Who's who... Before you build your home**

Family, Friends/ Relatives, Broker, Lawyer, Contractor, Engineer, Mason, Electrician, Architect, Plumber, Carpenter etc and other professionals who plan and build your home... It not only helps you to know who does what but also helps in knowing Who can help you, How can they help you, and on What terms would they be helping you.

### **Friend/Relative**

People who have recently built homes can be a big help. Talk to them. They'll be only too happy to share their experiences with you.

### **Broker**

A middleman with resources to locate land according to your needs for a fee (generally 1 to 2% of the land cost).

### **Engineer**

Works with the architect in designing the foundation and structure. May be involved in the entire project to oversee construction work. His inputs are critical for the safety and durability of your home.

### **Lawyer**

Conducts the search process for verifying the legal status of the land you want to purchase. Draws up the necessary documents of sale and registration.

### **Contractor**

Takes up a contract for building your home from organizing Labour, building materials and equipment to getting the construction work done. The scope of his responsibilities may vary widely. Consult your architect about your contractor's scope of work and terms of payment.

### **Labour Contractor**

Takes up the contract for supplying skilled and unskilled workers for construction. His payment terms could be on a per square foot basis or a per man-day basis. (The former is preferable.)

### **Mason**

Lays the bricks and concrete, makes the foundation, makes the slabs and does other such work. Often called the Rajmistry.

### **Architect**

The professional who analyses your requirements, prepares first sketches, then the home plans. He designs your home to make it look beautiful. He may guide you through the entire process. His technical skills and experience can help you cut costs on land, building materials and save you time and money.

### **Carpenter**

Handles all the wood work - doors, windows, frames, furniture and so on.

## Electrician

Ideally a licensed electrical contractor who lays the electric lines for your home. Also plans layouts for concealed wiring and electrical accessories in consultation with the architect and you. May also help in getting you the power connection.

## Painter

Does the priming and finishing jobs in painting exterior and interior walls, wood work and is involved in other such areas.

## Labourer

Does the manual jobs such as fetching and carrying materials - bricks, concrete, light structurals. Usually hired in teams and paid by contractor/Labour contractor.

## Plumber

One who lays the water pipes and helps in setting up the sanitary fittings and sewerage connections. Professional bodies such as Indian Institute of Architects and Directories such as Real Estate Directory and Yellow Pages can give you more information about Architects/Engineers/Contractors. Architects, building material dealers and hardware stores are good information sources for Labour Contractors. Paint stores, furniture and electrical stores can help you with information on Painters, Carpenters and Electricians respectively

How do you hire?

## Selecting Architects / Engineers

- Ask your to be neighbor's / friends / relatives who have recently built their own homes about the architects/ engineers they engaged:
  1. Did their homebuilding process run smoothly? What were the problems?
  2. Did their work finish on time? What could have been the causes for delay, if any?
  3. Were the initial budget estimates accurate? Did they exceed the budget? Why?
  4. Did the architect/engineer help in solving layout problems or budget problems by suggesting good alternatives?
  5. Did the architect/engineer offer useful suggestions when needed?
  6. Were the architect/engineer present on the job frequently?
  7. Did they face any problem after moving into their home? How were they solved effectively? Who solved them?

Check if they are chartered architects/engineers.

### Getting the best from your Architect

- The key to a successful home plan and project is clear communication with your architect:
  1. Give him a realistic budget to work on - a good architect can modify a plan to fit the budget.
  2. Take time to decide on the important details and share these with your architect - flooring for rooms, bathrooms, furniture and cabinets - especially built-in items, storage lofts, kitchen table-tops, electrical and sanitary fittings, placement of appliances (TV, music system, fridge, oven, washing machine, computer...).
  3. Discuss future needs. Extensions, possible partitioning, conversions for renting out. Addition of fixtures such as an antenna the roof or a clothesline.
  4. Fix the rates and terms of payment before work starts and discuss all important issues frankly.

(Payment terms are usually fixed on the basis of rupees per sq ft of built-up area or a certain percentage of the overall construction cost.)

### Selecting Contractors/ Labour Contractors

Check out the current commercial terms, the terms quoted to you, and compare with rates from at least three or four sources.

- Discuss with your architect the scope of the contractor's responsibilities, the kind of materials he will supply, the kind of equipment he has - such as the quality of shuttering material, the concrete mixer, vibrator, any other equipment because later these could become sources of dispute.
- Before deciding on the cost of materials from the contractor, do visit the market and find out for yourself.
- Check contractor's/sub-contractor's registration/license (such as electrician or plumber.) Start to Finish Where to build

### Steps for choosing land and location

- First, broadly identify localities in the city/town where you want to build. Look at real estate classifieds, maybe even the Internet. Visit the areas you are interested in and talk to a few local real estate agents. Ideally buy a map, put down the prices on the map according to the area.
- Once you've shortlisted your options, check out the civic amenities. Drainage, sewerage, garbage disposal systems. Street lighting. Roads and

transport links. Proximity to market, post offices, banks, schools, ration shops, police stations, medical facilities. Power availability. Atmospheric pollution and even traffic noise.

- Based on initial quotes, make your budget estimates (refer to Home Building Decisions). Now decide which area fits your budget.
- There may be a choice of plots available within the area you've identified. Talk to at least two or three brokers to get the best bargain.
- Before you actually invest in a plot...
- Establish how the intended seller acquired the property in the first place.
- Check the address and reputation of the broker as well as the landowner.
- Get your information first hand. Visit the site. Ask the seller and local inhabitants about it. Have it measured?
- Go through the legal documents. It might be wise to hire a lawyer to conduct a search at the municipal land records office, and the courts of registration/mutation to see if all the papers are in order:
- Landowner's title deed (at least a true copy) and the latest tax receipt from the land revenue department.
- Confirmation (through the Registrar of Assurance) that the plot is free of mortgage, legal disputes and other such issues.
- Ask for a copy of the master plan as approved by the Town and Country Planning Board or similar authorities and make sure the land in the area you've identified is earmarked for residential use.
- Ensure you pay stamp duty while registering the Sale Deed as this will prove the validity of your ownership. When you take a home loan, find out how much you need to pay every month. Other than EMI, look at the administration fee, processing fee and any other costs. A great deal of Income Tax savings are possible with home loans. This can be used for paying your EMI Interest calculation is best done by the daily reduction method, which is better than the monthly reduction method, which in turn, is better than the annual reduction method. Ideally, you should choose the bank which does not require a guarantor and offers home loans without pre-payment penalty (or a penalty for repaying loan before it is due). So that you can repay your loans earlier, if possible.
- Once you move into your own home, you save on your rent. This can be used to pay your EMI.

## Sources of Home Loans

- **Banks**  
State Bank of India, Corporation Bank, Punjab National Bank, Central Bank, Dena Bank, Bank of India, HSBC, Bank of Maharashtra, Benaras State Bank, ANZ Grindlays, Citibank and many more
- **Public Sector**  
Housing Finance Companies BoB Housing Finance, Can Fin Homes, GIC Housing Finance, LIC Housing Finance, Ind Bank Housing, PNB Housing Finance, SBI Home Finance, Centbank Home Finance and many more
- **Other Institutions**  
HDFC, ICICI, LIC, HUDCO and others
- What Banks/HFCs require to give you home loans
- If you are a Salaried Employee
  1. The latest salary slip showing statutory deductions.
  2. Form 16 (showing tax deducted at source by employer).
  3. Proof of age (birth certificate/voter identity card/passport/school-leaving Certificate/valid driving license).
  4. Certificate/valid driving license).
  5. Proof of residence (phone bill/electricity bill/ration card)
- If you are a Salaried Employee
  1. The latest salary slip showing statutory deductions.
  2. Form 16 (showing tax deducted at source by employer).
  3. Proof of age (birth certificate/voter identity card/passport/school-leaving Certificate/valid driving license).
  4. Certificate/valid driving license).
  5. Proof of residence (phone bill/electricity bill/ration card).
- If you are Self-employed
  1. Computation of income for the previous two years, certified by a Chartered Accountant.
  2. Profit & Loss Account and Balance Sheet for the previous two years, certified by a Chartered Accountant.
  3. Proof of age (birth certificate/voter identity card/passport/school-leaving Certificate/valid driving license).
  4. Certificate/valid driving license).
  5. Proof of residence (phone bill/electricity bill/ration card).

Armed with all this information, you can now go to several banks and HFCs and get more details and explanations to get the lowest cost loan for building your home...

## **Building materials**

### **Cement**

Cement is the binder that holds concrete and mortars together. Which is why it plays the most critical role in giving strength and durability to your home. It is used to make concrete for slabs, foundations, beams, columns, lintels, chhajja (sunshades), and mortar for brickwork, plastering, flooring and other such work. Cements used for domestic building such as your home are basically of three types:

- Portland Slag Cement (PSC) conforming to IS: 455. A combination of good quality blast furnace slag (from the iron and steel industry) with clinker (which makes OPC) and gypsum.
- Portland Pozzolana Cement (PPC) conforming to IS: 1489. A combination of fly-ash (from thermal power plants) with clinker and gypsum.
- Ordinary Portland Cement (OPC) 33 Grade conforming to IS: 269, 43 Grade conforming to IS: 8112 and 53 Grade conforming to IS: 12269. A combination of clinker and gypsum. Good quality cements have the following features
  - Reduced water requirement.
  - Improved workability.
  - Less permeable to moisture.
  - Improved resistance to acids and chlorides.
  - Reduced heat of hydration.
  - Easier to finish.
  - Reduced shrinkage.
  - Reduced leaching problems because it is low on free lime.

The color of cement has no relation to the strength characteristics.

The right cement and its application

It is very important that you use only a reputed brand of cement. Good brands of cement may Cost 2 to 5% more but offer quality, consistency and reliability as well as 10 to 20% greater Strength characteristics. Cement accounts for a mere 12

to 18% of the total expenditure on your home. So, using cheaper cement gives you little overall savings.

Cement must be added to the concrete and mortar in a precise, consistent manner. Too little or too much cement in concrete can cause lower strengths, shorter design life and lower durability.

Ask your engineer/architect whether you can alter the ratios of the mix. Never try to save on cement use by diluting the concrete mix. Remember, that by using 30 to 40 bags less of cement, you would save no more than Rs 3000 to Rs 4000. But it could permanently weaken a building that costs Rs 5,00,000 to Rs 7,00,000 to build! Please note that good quality blended cements like PSC and PPC will take more time to set and gain early strength in lower temperatures during winter than OPC, but final strengths at 28 days will be high. Cement must be kept dry, say by covering with tarpaulin, until final mixing into a construction material.

## **Sand**

Proper selection of sand is critical in the durability and performance of your concrete mixture. It should be:

- Clear, angular and hard.
- Free from clay, mica and soft, flaky material.
- Graded, which means it should be a mix of fine, medium and coarse sand.
- Free from contaminants like sea salt.
- Consistent in moisture (water) content which should not exceed 7%.

When mixing concrete the moisture content must be taken into consideration.

The price of sand includes three or four components - base cost, transportation, handling and number of intermediaries. Procuring sand in bulk directly from the source will be cheaper. Your neighborhood dealer in this case is likely to be costlier, except when you need smaller quantities.

## **Stone Chips**

Technically known as coarse aggregates, stone chips are a major ingredient of concrete, giving it strength and solidity. The quality of concrete depends very much on the characteristics of aggregates used. Stone chips should be angular or round, not flat or flaky they should not contain marks or layers of any other color they should be free from mud and other impurities, which are harmful for concreting. It is advisable to wash the stone chips before mixing to make it free from dust, dirt and mud.

### **Tips for selection**

Aggregates should be well-graded. Which means these should contain sizes from 5mm to 20mm in proper proportion, so that voids are minimal. This will make a

strong and durable concrete. At the same time, this will save on cement (see diagram below).

Stone chips are generally sold or supplied in multiples of 100 cubic feet (cft). A standard truck generally carries 300 cft of aggregates. This is calculated by multiplying the carrying area of the truck by the average depth of the load, measured by inserting a rod at four to five points to calculate the mean depth. A shrinkage of up to 2% per truck is allowed. Price is a function of ex-works (quarry) price + transportation cost + handling + involvement of intermediaries. One should get aggregates from the source to get the best price. Always insist on graded aggregates and not on 'pure' ones. Graded aggregates-all sizes in Proportion give density concrete Single-size 'pure' aggregates-result in voids Within the concrete & more cement consumption Caution:

You may end up paying more for 'pure' aggregates because aggregates are sold in volumes. So, a given volume of 'pure' aggregates will give you less weight because of larger voids between the chips.

### **Reinforcing steel**

Reinforcing steel contributes to the tensile strength of concrete. Concrete has low tensile, but high compressive strength. The tensile deficiency is compensated by reinforcing the concrete mass through insertion of plain or twisted mild steel bars. Both branded and unbranded bars are available. It is wise to buy good brands, the names of which are marked on the steel.

During construction, make sure that steel reinforcement is provided exactly as the engineering design specifies.

### **Precautions:**

Steel bars/rods should be reasonably clean and free of rust. Bars that cannot be easily bent manually or mechanically should be rejected. Optimum length bars must be chosen to reduce wastage in cutting. To avoid laps, shorter bars must not be accepted. Welded lengths of bars should not be accepted.

### **Water**

It is very important to use clean, potable water in quality concrete production. Brackish or salty water must never be used. Contaminated water will produce concrete and mortars with lower durability, erratic set characteristics and inconsistent colour.

### **Bricks**

Bricks are distinguished by their base (raw) material and size. Standard burnt clay bricks come in the size 10" x 5" x 3". Modular bricks, rarely used because they are not easily available, come in the size 200 mm x 100 mm x 100 mm (including mortar thickness.) Fly ash bricks, sometimes, also come in modular form.

Conventional bricks have a 'frog' (depressed/raised portion) on one of the larger surfaces

Bearing the manufacturer's brand. These also provide a good mechanical key for bonding (i.e. lock ability) with mortar. The modular bricks do not have the 'frog' on them. Fly ash bricks exhibit almost similar mechanical properties as burnt clay bricks. Exposed brickwork with precise pointing is possible if the shapes are perfect. How do you recognize good bricks? They show uniform texture and color. When broken, they leave no lumps and grit

### **Precautions:**

Ensure that bricks are not made from saline clay. Look for proper and uniform burning. The four broad categories of bricks used in construction:

1. 1st Class Bricks
2. 2nd Class Bricks
3. 3rd Class Bricks
4. Jhama/Over burnt Bricks

Perfect in size/shape Red to cherry-red in color Do not break when dropped from waist height do not absorb more than 15 to 17% of their own weight if kept submerged for 1 hour under water Suitable for precision work such as exposed Not so uniform as **1st class bricks** in shape/size/quality of burning do not absorb more than 25% water of own weight if kept submerged under water for 1 hour Good for brickwork wherever subsequent plastering is to be done Much inferior to **2nd class bricks** in terms of shape/size and burning Absolutely out of size and shape, over burnt, fused with more bricks, with a honeycomb texture Dark red to black in color These bricks are unsuitable for any kind of brickwork, and are only used in broken pieces for consolidation of foundation soil and sub base of floors brickwork Buying Tips Bricks may be purchased directly from the brick fields located close to your area at a lower cost Keep samples for conformity to ordered quality.

### **Ensuring durability**

- Make sure your Contractor / Rajmistry carefully selects the building materials such as sand and stone chips. He must wash them thoroughly 24 hours prior to dhalai, then lets them dry.
- Keeps the shuttering totally watertight.
- Checks for the cover blocks of 15 mm x 15 mm x 15 mm under the reinforcing bars.

- Uses wooden boxes of a specific size, for convenience of batching. He must have at least 4 to 6 boxes made, of 1.5 ft x 1.5 ft x 1 ft or slightly larger size, as convenient for the labourers. This ensures uniform proportioning.
- Uses a mixer machine for best results. If hand mixing is necessary, he must use 10% additional cement and a pan large enough to provide uniform mixing.
- Uses only enough water to obtain the minimum workability. Additional water weakens the concrete and greatly enhances cracking potential. For a 1:2:4 mix, when the aggregates are dry, addition of water must be restricted to 28 to 30 litres per 50 kg bag of cement. For a 1:1.5:3 mix, addition of water must be restricted to 25 to 26 litres per 50 kg bag of cement. If a vibrator is used, water must be reduced by 5 to 10%.
- Uses a vibrator vertically for proper compaction. Concrete must not be over vibrated or moved with the vibrator.
- Does not add water while spreading or compacting.
- Plans in advance to have all materials present at the site when concreting for a roof slab. This is because interruptions or breaks in concrete operation like that of a concrete roof slab can give rise to joints and thereby weaken the structure and this can lead to seepage problems at a later stage. He must also make sure that the mixer machine along with the vibrator and fuel are readily available in place. Concreting should start early in the morning. No interruptions must be allowed until the entire roof slab has been concreted. Concreting operations must be avoided during peak hours of high temperature in summer. Concreted portions must be covered to avoid direct sunlight which reduces evaporation losses.
- Water after concrete has set. This can happen around 12 to 15 hours after casting at a temperature around 27°C. For floors and roof slabs - 3" high bunds of 2 ft x 2 ft must be made with cement, sand, mortar (1:6). After 24 hours, the bunds must be filled with 2" deep water. Till the entire curing period is over, generally between 14 to 21 days, the bunds must always be full of water.
- For columns - after the shuttering is removed, they must be wrapped with used jute bags which must be kept wet by intermittently sprinkling water at least 3 to 4 times a day, for at least 3 to 4 weeks. For beams - after the side shuttering is removed, these must be wrapped with used jute bags which should be kept wet as in the case of the columns. Or else, water must be sprayed at least 5 to 6 times a day, for at least 3 to 4 weeks. Starts curing by mildly sprinkling

- The concrete work must be stopped in case it starts raining between the operation, and the concreted portion well covered with a plastic sheet in such a way that water drains off easily. Ideally, concreting must be avoided during rain or if rain is imminent. Ask your engineer to follow the standard code for removal of shuttering and the recommended curing period and method.
- Removing shuttering early is not good. Little details

### Ask your architect to plan your interiors well in advance:

- The positions of switchboards and plug points. This will depend on where you place your kitchen mixer, TV, audio system, fridge, washing machine, computer or other such equipment.
- The positions of Amirah's and other large furniture with regard to doors/windows.
- Built-in cupboards and storage areas.
- Correct sloping for the bathroom and kitchen floor should be provided to allow efficient drainage.
- Correct sloping should also be provided for the roof surface to allow efficient drainage of rainwater (stagnant water can create seepage problems later on). The joint of the rain water pipe at the roof slab should be effectively sealed so that seepage problems do not occur in the future.
- Ensure concealed electrical conduits are placed prior to concreting / plastering.
- Stair roof doors should always open outside so that the rain water does not enter the house.
- Individual shuttering planks should have a smooth, flat surface. The planks when placed together should give a uniform, levelled surface. This way the concrete surface will also be even, thereby saving money on plaster work.
- Chhajjas should have a slight protrusion (drip course) at the edges so that rainwater does not drain inside and spoil the paint. The underground water tank should be placed at a level so that in case of waterlogging, murky water does not enter it.
- Sanitary/sewerage lines should all be placed on one side of the building, Walls of underground water tanks/septic tanks should be made of concrete and not brickwork. This will make them more durable. Information is the key! Before building a home of your own, collect information. Talk to at

least two people who have recently built homes of their own. Meet at least two architects, contractors and even Rajmistris. Find out who the better known, reliable contractors are in the locality, and the nearest place where masons assemble. Start a diary. Take notes. Prepare a plan. Get into the details. Find out the prevalent local prices of building materials in the area. Types, brands, prices of sanitary ware, electrical, plumbing, flooring materials, woodwork. Purchasing from wholesale markets may give you substantial savings. Make an initial budget - and always keep aside some money (about 10% of your budget estimate) for unplanned expenses .