METCON STEEL update
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Ductility for long life

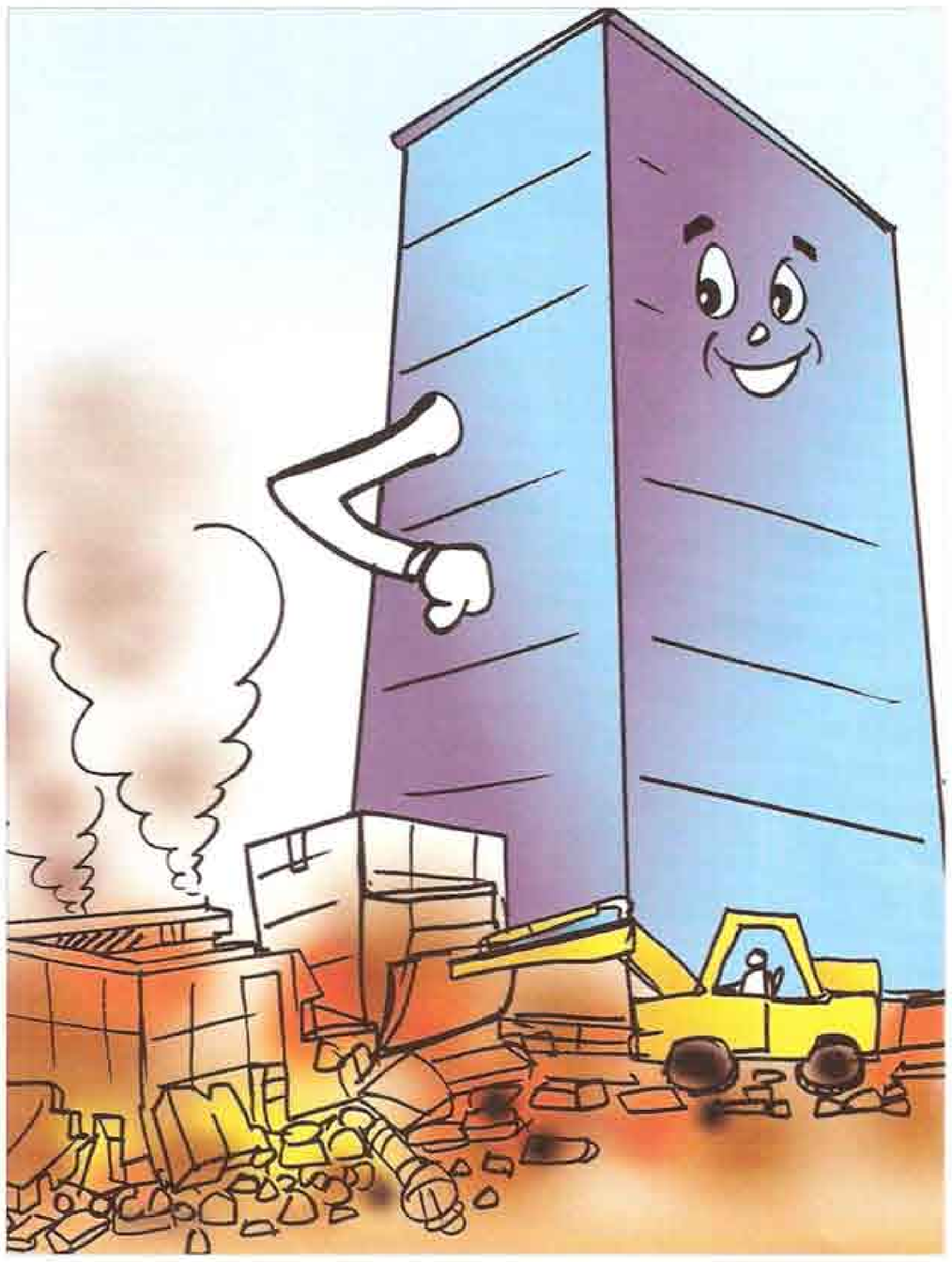
Ask for steel with high ductility than yield strength. It will protect your building better against an earthquake

Yield strength is a measure of the minimum load that a rebar can carry without elongation. In the market, they come in Fe 415, Fe 550 and Fe 550 varieties.
Ductility refers to the rate of elongation of a rebar under a load without breaking. This is represented in percentage
This is, yield strength means the load a rebar can take for a specific elongation; ductility denotes the elongation of the bar for a specific load.
To survive an earthquake, a structure had better use high ductile rebars.

Now, read on.

When you step into a shop selling steel rebars, you will find a variety of offerings, including tor and TMT. The dealer will mark them as Fe 415, Fe 500, or Fe 550. If you ask him, he will explain it as a measure of yield strength. Chances are that he will choose not to go into details. And ductility is definitely not a term which he will be discussing with you.

But ductility, the quality of steel which helps it elongate, is too important to be ignored. This is because ductility, expressed in terms of minimum elongation at fracture value in percentage, of a rebar helps it elongate under strain. Like, when subject to an earthquake, the steel rebars take the impact of the strain and elongates itself, sparing the concrete. This results in the building escaping major damages even in the case of earthquakes measuring up to 8.5 on the Richter scale. The higher the ductility of the bar, the higher the elongation and lower the damage to the structure. As a result, even if it yields, it will not fail.



Steel with higher ductility will result in higher total elongation (at least a minimum of 20%) against 14.5% for Fe 415 as required by IS-1786-2006. A high ductile steel bar will have a more uniform elongation profile than an ordinary bar.

However, till now, most countries, including India, allowed rebars with low ductility to be used in construction. The Bureau of Indian Standards, too, has defined parameters for steel rebars with reference to ductility. At present, the Indian code IS 1786 allows rebars with ductility of 14.5% to be used. This is inadequate if it were to be in a high seismic activity zone as most of India comes under Seismic Zones 3, 4 and 5 (which means it is under the threat of earthquakes of high density).

This is now changing. New Zealand, a high seismic zone, insists on 18 % with 7.5 % uniform elongation. Europe has introduced BS 4449-2005 effective from January 2006.

It is high time that we in India also started insisting on high ductile steel.

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The load on a building in all circumstances, including when subjected to strain during a quake, can be calculated at the designing stage itself. This makes ductility a key factor in choosing the right rebar.

New international norms have introduced the concept of uniform elongation. This is the strain developed in the bar at maximum lead. On the other hand, total elongation includes the strain involved in the deformation at the necked region which has no structural value.

Teak your pick

Chevvoor offers the widest variety and choice in home furniture

If you are building a new house, a trip to Chevvoor will be well worth it. Chances are that you will return home with quality furniture of your choice at the lowest cost.

Travel 5 km on the Thrissur-Kodungaloor route, and you start noticing furniture shops dotting both sides of the road. Chairs and settees, dining tables and chairs, dressing tables, easy chairs, cots. Or just about anything you wanted to furnish your home or office with.

There are as many as 40 shops lined up on the 1.5-km stretch from Palakkal to Chevvoor. About 2,000 employees work in 150 workshops to fill the shops with these pieces, some of which even qualify as artefacts.

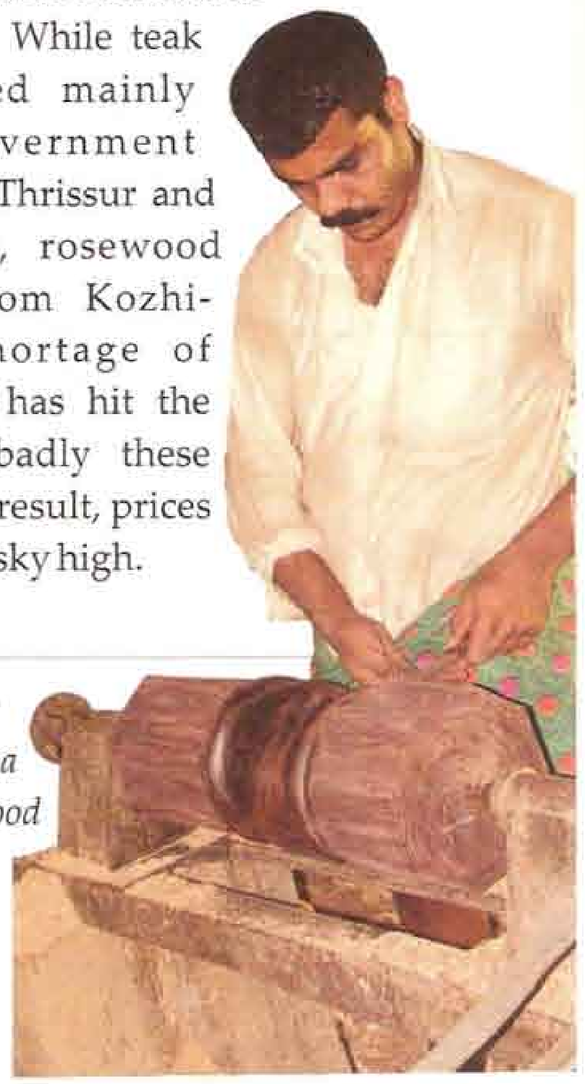
"It all started as a cottage industry about 12 years back," said Devassy Pullokkaran, who runs Pullokkaran Furniture. "The workshops were attached to households, supplying to wholesalers in Thrissur and Ernakulam." In those days, the local festivals also offered a good marketing avenue.

People who noticed the quality of Chevvoor furniture started insisting on them. That was when the first showroom came up. Its success bred more. "Now we have customers from Thiruvananthapuram and Palakkad to Malappuram,' said Devassy. Chovvoor's fame has now crossed the State borders, with people from Chennai, Bangalore and Coimbatore coming to this otherwise non descript village.

Customers say there is about 25 per cent cost advantage in buying furniture from Chevvoor. "This is because our overhead expenditures are very less compared to those in the cities," said Devassy. "Most showrooms are run by family members with few employing staff. Even the workshops function from family premises, resulting in reduced prices."

The guarantee on the quality of wood is another major draw. "This is one of our main selling points," said Devassy. Customers can see the product at the pre-finished stage, or before polishing. "This trust helps us get repeat orders, and orders from friends and relatives of our customers," said Devassy. Chevvoor is also known for the intrinsic and fashionable designs: carved doors and wooden staircases are made to order.

The demand now is mostly for furniture made of teak and rosewood. While teak is sourced mainly from government depots in Thrissur and Nilambur, rosewood comes from Kozhikode. Shortage of rosewood has hit the industry badly these days. As a result, prices have gone sky high.



A carpenter at work on a solid rosewood log

For K Sreekanth who has come down from Kottayam to pick furniture for his newly built home, the variety Chevvoor offers is one key factor. "If I am not satisfied with one shop, I can just walk into another," he said. And most likely, he will not be disappointed.

With the housing and construction industry really picking up across Kerala, Chevvoor is doing brisk business. And new shops come up at regular intervals.

Take your pick

Settee
Teakwood: Rs 9,000-30,000
Rosewood: Rs 14,000-50,000

Dining table (glass top)
Teakwood: Rs 15,000 upwards
Rosewood: Rs 24,000 upwards

Cot (single)
Teak: Rs 3,500 onwards

Cot (double)
Cot (family) (6'x5')
Teakwood: Rs 5,500 onwards

Dressing table
Teakwood: Rs 4,000 onwards
Rosewood: Rs 6,000 onwards

Cupboard (6')
Teakwood: Rs 8,000 onwards
Rosewood: Rs 15,000 onwards

Dressing table
Teakwood: Rs 4,000 onwards
Rosewood: Rs 8,000 onwards

Make it strong

Piling makes loose soil hard, and ready for construction

The Leaning Tower of Pisa, the Italian architectural marvel, was designed to stand straight but a poorly laid foundation and loose substrate resulted in its shifting direction. The Church can afford a leaning tower, but most of us cannot. Hence the importance of the foundation.

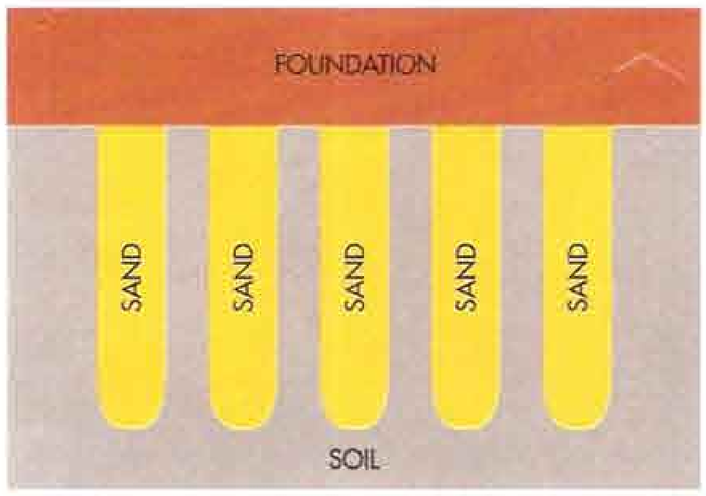
The foundation of a building ensures that the load on the structure is distributed evenly on the ground so that there is no disproportionate weight on any single part, lest it should result in settling. Or in leaning, as in the case of the Tower.

The capacity of the earth to support such loads depends on the strength and stability of the supporting soil or rock materials. One option to measure the same is by using a Standard Penetration Test (SPT), or soil test as it is commonly known. The test gives the N-value which refers to the hardness of the soil. For water, the N value is 0 and for a hard rock, it is 100. The more the N value, the stronger the soil so that the foundation can be simple, like the random rubble foundation.

If the N-value is lower than what is required, then an economic solution is to go in for soil improvement methods. Especially in the case where the load is not too high. The other option to transmit the load to a hard strata below is to go for a deep foundation, which is costly.

Do you know...

Thousands of pressure-treated wood pilings form the foundation of the new construction projects for JFK Airport in New York and Dulles Airport in Northern Virginia. The city of New Orleans, Louisiana, is built on timber piles. Driven piles have a long history in advancing civilisation in all parts of the world. They remain a key method of construction.



SOIL IMPROVEMENT OPTIONS

Mechanical Stabilisation

The soil may be pressed hard so that it becomes hard. This is a simple method that can be applied on normal soil.

PILING TECHNIQUES FOR SOIL IMPROVEMENT

Sand

Sand piling is a cost-effective method of ground improvement used in all types of soils. In sand piling, clay is drilled out and it is filled with river/quarry sand which imparts higher strength and stiffness to the ground. It also allows easy consolidation of the soil by acting as a drainage for the water in the clay while it is being stressed with the weight of the structure.

Sand plus lime

In soil with high clay content, sand will be mixed with lime and used for piling.

Sand plus cement

If the soil has high sand content, cement may be used.

Grouting

A mixture of concrete without a reinforcement bar can be a piling material. This would remarkably improve the soil quality.

Wood

Wood piles are used mostly in wet land. The selected wood such as bamboo or coconut tree trunks are driven into the land.

Degradation of wood is a concern in places that are subjected to alternative wet and dry cycles. In such cases, the wood piles may be subjected to chemical treatment. It is found that wood piles last as much as 100 years in normal conditions.

Wood piling is advised where the raw material is available in plenty. The disadvantages are the chances of rotting above the ground water level and of damages during driving.

Concrete

In concrete piling, steel rod frames are lowered into the holes formed by drilling mud and concrete is filled in the frames and allowed to set. The foundation is built over such pillars.

This is not a soil improvement technique but it is used for transferring the load to the soil by either friction or end bearing.

Pre loading methods

Pre loading is essentially loading the ground with a sand fill which is equivalent to the actual load of the structure. As settlement happens with the pre loading, the structure will not have further settlement.

To be continued

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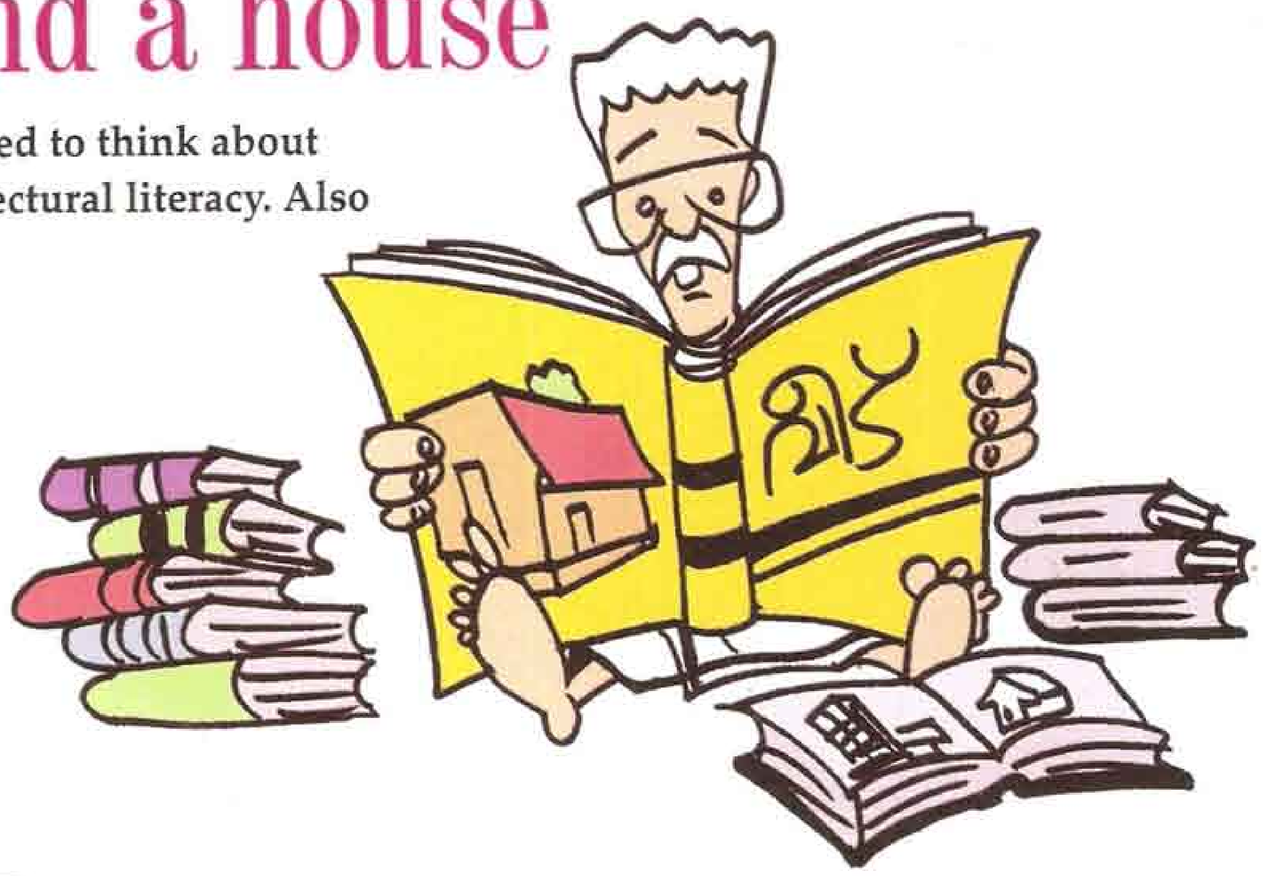
How soil test is conducted

The test uses a thick-walled sample tube, with an outside diameter of 50 mm and an inside diameter of 35 mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5kg falling through a distance of 760 mm. The sample tube is driven 150 mm into the ground and then the number of blows needed for the tube to penetrate each 150 mm up to a depth of 450 mm is recorded. The number of blows required to achieve the final 300 mm penetration is the standard penetration resistance, N. A lot of agencies conduct soil test and the cost varies from Rs 4,000 to Rs 20,000 for manual boring and machine boring (higher depth) respectively.

SYRIAC'S COLUMN

Book, film. And a house

We need to think about architectural literacy. Also



Keralites can define a good film or a good book. But they are often unable to define a good house.

Of course, some people have a gut feeling about a good house. But they cannot explain it in so many words as they explain a film by referring to its editing or scripting.

This is because of the woeful lack of architectural literacy in our society. The quality consciousness or thinking which comes into play while choosing a film or a book is missing when we decide to build a home

. Intellectual effort is absent in decisions made regarding the home, though it is much more important. We will probably be living our lives there. Instead, there is a random juxtaposition of elements which do not fit together. For instance, I have clients who say, "I saw this in a hotel and want it replicated in my living room." They don't think whether it will fit in with other elements.

Here is where the value of proper definition comes in.

For instance, the great architect Le Corbusier once defined a house as 'a machine to live in'. This had much to do with the times he lived in.

But the point he was trying to make was that the form of a house could only emerge from its definition.

But since we have not yet defined a house, we haven't conceived a form of our own.

Of course, there is an unconscious definition of a house as a means of displaying how wealthy or how influential a person is.

Some new trends can be discerned —the passion for traditional styles, the importance given to kitchens and bathrooms—but we are unable to tell ourselves what it all means.

We criticise public buildings—the new Assembly building for instance—but we don't know what exactly is wrong with it.

All this occurs because of our unfamiliarity with the language and poetics of architecture. It is about time we started studying them. At least the basics.

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Yield strength vs ductility

The difference between yield strength and ductility is very significant when designing earthquake-resistant buildings. While a rebar with high yield strength allows higher load to be applied, a steel rebar with higher ductility will allow maximum elongation of the bar without breaking for a given load. This means the structure gets the maximum elongation to tide over an earthquake.

Metrolla Steels Ltd, which introduced Thermo-Mechanically Treated (TMT) steel bars in Kerala for the first time, has again taken the lead in making high ductile steel available in the State.

The Metcon brand rebars now meet the standards which are prevalent in countries which come under Sections 3, 4 and 5 of seismic activity such as New Zealand and some of the European countries. "This is the result of our pursuit of the best technology and best products," said Metrolla Steels Managing Director Kurian Varghese. "We expect other players also to follow suit so that customers in Kerala get the best."

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