Southern Builder

Bulletin of Builders Association of India - Southern Centre

ESTD: 1941

For Private Circulation only

February 2015

ALL INDIA 4TH MC / 5TH GC MEETING

உள்ளே

CELEBRITY
BUILDERS

Celebrity Builders Pvt Ltd
11, 8th Avenue, Ashok Nagar, Chennai - 83

2371 0663, 4231 8009
www.celebrity.org.in

Southern Builder

Bulletin of Builders Association of India - Southern Centre

For Private Circulation only

ESTD 1941

Official Journal of Builders' Association of India - Southern Centre. February 2015

Builders' Association of India
Southern Centre
Casa Blanca, 11, Casa Major Road,
Egmore, Chennai - 600 008.
Tel: 2819 2006, Telefax: 2819 1874
Email: baisouthern@yahoo.com
Website : www.baisoutherncentre.com

Contents

Disclaimer

ஆசிரியர் மடல்

வணக்கம்

எல்லோரும் எல்லா நேரங்களிலும்
வெற்றிபெறுவதில்லை
யாரும் நிரந்தர தோல்வியாளராக
இருப்பதற்கும் விதிக்கப்படவில்லை

வெற்றி என்பது தாமதமாகியுள்ள தோல்வி
தோல்வி என்பது தாமதமாகியுள்ள வெற்றி
தோல்வி இறுதியல்ல
வெற்றி நிரந்தரமானதுமல்ல

இன்றைய வெற்றிகளும் தோல்விகளும்
நெடிய வாழ்க்கை பயணத்தில் மற்றுமோர் அடிதான்
வாழ்க்கை ஒரு விளையாட்டு
நீண்ட காலம் விளாயடினால் தாக்குப்பிடிக்கலாம்

பாதியிலேயே விலகிவிடாதீர்கள்
இறுதிவரை விளையாடுங்கள்
நீண்டகாலம் விளையாடுங்கள்
இறுதியில் வெற்றிக் கோட்டை அடைவீர்கள்
வாழ்த்துக்கள்

"பெருமை உடையவர் ஆற்றுவார் ஆற்றின்
அருமை உடைய செயல் - திருக்குறள்

அன்புடன்

மு. மோகன்

மய்யத் தலைவர் மடல்

வணக்கம்

மய்ய உறுப்பினர்களுக்கு ஒரு மகிழ்ச்சியான செய்தி. நமது மய்யத்தின் சார்பாக 2015-16ம் ஆண்டின் மாநிலத் தலைவராக திரு. N. ரகுநாதன் (முன்னாள் மய்யத்தலைவர்) போட்டியின்றி ஒரு மனதாக தேர்ந்தெடுக்கப்பட்டார். அவருக்கு தென்னக மய்யத்தின் சார்பில் வாழ்த்துக்களையும் தமிழக கட்டுநர் சங்க உறுப்பினர்களுக்கு நன்றியையும் தெரிவித்துக்கொள்கிறேன்.

இந்த மாதம் 20ம் தேதி அந்தமான மாநிலத்தில் கட்டுநர் சங்கத்தின் புதிய கிளை துவக்கப்பட்டது. நமது அகில இந்திய துணைத்தலைவர் திரு. L. மூர்த்தி மற்றும் மாநிலத்தலைவர் திரு. D.R. சேகர் அவர்கள் பெருமுயற்சி செய்து செங்கல்பட்டு மய்யத்தின் தலைவர் திரு. P. பழனி மற்றும் திரு. V. வெங்கடேசன் ஆகியோர் துணையுடன் அந்தமான் மய்யத்தினை துவக்கி வைத்தனர். நமது அகில இந்திய முன்னாள் தலைவர் திரு. இரா. இரதாகிருட்டிணன் அவர்கள் கலந்து கொண்டு வாழ்த்துரையாற்றினார்.

21ம் தேதி தமிழ்நாடு மற்றும் புதுச்சேரி மாநில பொதுக்குழு உறுப்பினர்களின் கூட்டம் சிறப்பாக நடந்தது. அதில் தென்னக மய்யத்திற்கு உறுப்பினர் சேர்க்கையில் சாதனை செய்தமைக்கு சான்றிதழ் மய்யத்தின் துணைத்தலைவர் திரு. O.K. செல்வராஜ் அவர்கள் பெற்றுக் கொண்டார்.

கடந்த 27ம் தேதி சென்னை ஆந்திரா கிளப் வளாகத்தில் தென்னக மய்யத்தின் சார்பாக சென்னை பெருநகர வளர்ச்சி குறித்த ஒரு கலந்தாய்வு கூட்டம் நம்முடன் ஒருங்கிணைந்த சங்கங்களுடன் நடைபெற்றது. இதில் CMDA நிர்வாகத்திற்கு நமது கருத்துக்களை எடுத்துரைப்பது சம்மந்தமாக விவாதிக்கப்பட்டு ஒரு கருத்துருவாக்கம் செய்து அரசுக்கு சமர்ப்பிக்க முடிவு செய்யப்பட்டது.

அன்புடன்

R. சிவக்குமார்

Environmental Friendly and Cost Effective Building Materials for Construction

Colonel. P Nallathambi, ME(Structural Engg), MBA, FIE, FIV
M/S Sakthi Consultancy Pvt. Ltd.

An environmental friendly building materials have to be manufactured easily from the natural materials and reused easily after demolition. However, all recent materials are being manufactured in a factory and it is hard to reuse it. In last two to three decades, cost effective appropriate technologies have cross the borders of laboratory and research organizations and have reached real construction sites. Many experimental and demonstrative projects have been constructed across the country proving the strength and feasibility of these technologies. A number of cost effective appropriate materials and technologies have been developed, standardized and are being used in the field with success over the years. Many of them have even proved themselves in the test of time. BIS has also included many of these technologies under their umbrella and are working towards covering the remaining so that minimum standardization is achieved and a standard specification for the same is evolved.

Environmental friendly technology produce construction materials which utilize locally available raw materials, wastes and by-products from industry, agriculture and natural fibres and are being extensively utilized in the construction of low-income housing both in rural and urban areas.

Building Materials & Technology Promotion Council (BMTPC), Central Building Research Institute (CBRI) and other Research Institutes engaged in R&D are constantly driving in development of environment friendly, energy efficient and cost effective materials and technologies. These technologies have been successfully utilized for environmental protection, employment generation and housing construction in rural and urban settlements in India and several other countries.

By and large, conventional building materials like burnt bricks, steel and cement are higher in cost, utilize large amount of non-renewable natural resources like energy, minerals, top soil, forest cover, etc,. The continued use of such conventional materials have adverse impact on economy and environment. Environment friendly materials and technologies with cost effectiveness are, therefore, required to be adopted for sustainable constructions which must fulfill some or more of the criteria such as : Not endanger bio-reserves and be non-polluting, Be self sustaining and promote self reliance, Recycle polluting waste into usable materials, Utilize locally available materials, Utilize local skills, manpower and managing systems, Benefit local economy by being income generating, Utilize renewable energy sources, Be accessible to people, Below in monetary cost.

Some of the Cost effective technologies adopted in building construction are highlighted:

In Foundations:

- Random rubble masonry in mud/cement mortar placed in excavation over thick sand bed. Rubble pointing above ground level in stabilized cement mortar.
- Use of lean cement concrete mix 1:8:16 for base with brick masonry in 1:6 cement mortar footings.
- Use of lean cement concrete mix as above for base and over burned bricks masonry in cement lime mortar (1:2:12) footings.
- Arch foundations in place of spread foundations.

In Walls:

- Brick work in 1:6 cement mortar using bricks from black cotton and inferior soil stabilized with fly-ash.
- Rat-trap bond brick work in 1:2:12 cement lime mortar/1:1.5:3 cement sand mortar.
- Hollow concrete block masonry in cement mortar.
- Compressed mud blocks masonry in mud mortar.
- Stabilized mud blocks masonry (4% cement or lime) in stabilized mud mortar.

- Sand lime brick walls in 1:6 cement mortar.
- FAL-G sand block with 1:6 cement mortar.
- Fly Ash-Sand-Lime-Gypsum Bricks.
- Compressed Earth/Fly Ash Sand Lime Gypsum Blocks (Interlocking Type).
- Compressed Earth Bricks/Blocks.
- Clay Fly Ash Burnt Bricks IBT.
- Marble Slurry Bricks.
- Cellular Light Weight Concrete.
- Reinforced Brick Panels & Joists.
- Ferro cement Wall Panels.
- Bamboo Mat Board.
- Bamboo Mat Veneer Composites.
- Bamboo-Rice Husk Composite.
- Fly Ash Polymer Composite.
- Sandwitched Fly Ash Panel.
- Non Erodable Mud Plaster.
- Fly Ash Sand Lime Bricks.
- Solid Concrete and Stone Bricks.

In Roofs:

- Domes and vaults in brick or stabilized mud block with appropriate mortar.
- Upgraded thatch roof on appropriate frame work.
- Pre-cast RCC "L" panel.
- Precast RCC cored units in M15 concrete.
- Precast RCC channel units in M15 concrete.
- Precast Waffle units in M15 concrete.
- Burnt clay tube roofing in vault form.
- Bamboo Corrugated Roofing Sheet.
- Precast RC Planks.
- Prefabricated Brick Panels .
- Precast RB Curved Panels.
- Precast RC Channel Roofing .
- Precast Hollow Slabs.
- Precast Concrete Panels.
- Trapezon Panel Roofing.
- Un reinforced Pyramidal Brick Roof.
- Precast Curved Brick Arch Panel Roofing.
- Blast Furnace Slag Composite.

In Floor/ Roof:

- Filler slabs.
- Partly precast RCC planks and joist in M15 concrete.
- Partly precast RCC joist and brick panels.
- Partly precast RCC in hollow concrete blocks.
- Thin RCC ribbed slabs.
- Ferro cement channels.
- Brick funicular shell on edge beam.
- Bamboo reinforced concrete.
- Brick funicular shells with RCC edge beams.
- Brick jack arched over RCC joist.
- Precast RCC cored units in M15 concrete.
- Precast RCC channel units in M15 concrete.
- Micro Concrete Roofing Tiles.
- Mosaic & Checkered Flooring Tiles.
- Ferrocement C-Beams/Rafters.
- Concrete Paving Blocks.

Spanning elements for openings:

- Brick arches : Flat, semi circular and segmented.
- Precast thin lintel and lintel cum chajja.
- Brick arch with sand stone chajja.
- Ferro cement chajjas.

Door cum window frames:

- Precast RCC frames with wood insert.
- Resin bonded saw dust frame.
- Polyvinyl chloride frame.
- Fiber reinforced plastic frame.
- Glass Reinforced Polymer (GRP) Door Shutter & Frames.

Door panels:

- Plantation timber styles with particle board inserts.
- Medium density fiber board doors.
- Cement bonded particle board
- Plantation timber style with rice husk board inserts.
- Red mud polymer panel doors.
- Ferrocement doors.
- Polyvinyl chloride doors panels.
- Flyash/Red Mud Polymer Doors and Panel Products.
- Finger Jointed Lumber from Plantation Timbers.
- Coir Polymer Composite Boards & Ply.

Few products used for constructions are briefly highlighted below:

Flyash-Sand-Lime-Gypsum Bricks.

These bricks are used for walls in housing and all types of buildings and boundary walls as an infill wall.

Compressed Earth / Fly Ash Sand Lime Gypsum Blocks (Interlocking Type).

These blocks are used in walls for all types of constructions. They are interlocking type of blocks, required minimum quantity of mortar for plastering in the masonry work. The performance of masonry is good because of less number of joints. Volume of one block is equivalent to three standard size bricks.

Compressed Earth Bricks/Blocks.

These blocks are used in walling in a variety of ways to construct buildings that are aesthetic, efficient and easy to build. Better thermal insulation, external and internal plastering not essential.

Clay Fly ash Burnt Bricks IBT.

It is uses for walling in the same manner as conventional burnt clay bricks. Reduction in drying shrinkage and efflorescence as compared to clay bricks. Better thermal insulation and good strength.

Marble Slurry Bricks.

These bricks are used for walling as an alternative to conventional clay bricks. Much stronger than clay bricks, Good heat and sound insulation, Fire resistant technology, Plastering can be avoided, High load bearing capacity.

Cellular Light Weight Concrete.

In is used in multi- storied buildings as an alternative to conventional bricks/blocks and it helps in substantial reduction of dead weight leading to reduction of cost of foundations. Fly ash/ Volcanic ash as one of the major constituents used in these concrete blocks. It has got high thermal insulation which is more suitable to air-conditioned buildings.

Rat Trap Bond Brick Masonry.

Bricks placed on edge in 1:6 cement sand mortar is a rat trap bond wall. It is used in walls as an alternative to conventional English/ Flemish bond. Advantages are, reduction in consumption of bricks by 25% as compared to 230 mm thick solid brick wall. Good thermal insulation, equal strength compared to other conventional bonds and same stability as that of solid walls are the advantages of using Rat Trap Bond brick masonry.

Micro Concrete Roofing Tiles.

It is used as cladding for sloping roofs of different types of buildings, as a substitute to country tiles, asbestos and other corrugated sheets. Benefits are: (a) More durable and strong in different climatic conditions (b) coloured tiles are available (c) Manageable tile size make the structure relatively lighter.

Finger Jointed Lumber from Plantation Timber.

It is used to join smaller sections of plantation timber for bringing them upto useable length for panelling, partitions, panel doors, flush doors, furniture, joinery etc. Advantages are: (a)Saving finger wood by utilisation of plantation wood (b) Joint strength are upto 75% of original wood strength.

Emerging Technologies for Housing and Building Construction By Building Materials & Technology Promotion Council (BMTPC)

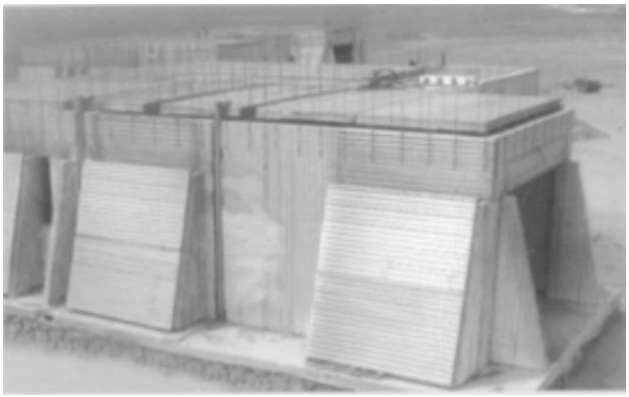
R-Panels - Panel Building System using steel mesh, polystyrene core and chipping concrete.

R- Panel system is a modular panel composed of two electro –welded galvanized high resistance steel meshes having dia 2.5 – 5 mm are joined by connectors and suitably shaped foam polystyrene plate is fixed in the middle. This polystyrene is self-extinguishing foam polystyrene, which is used as disposable foam and as an insulating layer. EPS is made of carbon hydrogen and 98% air. Once the panels are installed, they are anchored and finished with the application of light weight concrete on both the sides.

This building system is a load bearing wall construction which is seismic resistant and thermally insulated. As a load bearing element, the double panels and the floors are finished during the installation with concrete of suitable grade and placed into the slab ribs as well. In the case of non-load bearing walls, concrete plaster or even a pre-mixed one is applied for a thickness of at least 25mm. Buildings of any types and architectural structural ranging from most simple to most complicated ones could be constructed using R- Panel sytem.

Expanded steel mesh panels, polystyrene beads & alleviated concrete.

These panels are prepared at a site in a conventional manner by regular, poured, heavy concrete or alleviated concrete. The galvanized steel mesh panels are cast and expanded in continuous process from 1.6



R- Panel system

Expanded steel mesh panels

Plastic Form Work

mm thick and 30 cm wide galvanized sheet coil. They are tied to the soldered wire mesh and to the iron rods in the base and in the foundations and assembled in accordance with the design of the house. The complete skeleton of the construction along with the roof is formed by fitting galvanized steel wire studs horizontally and vertically into each other. Once this procedure is completed, alleviated or light concrete made up of cement, fiber, sand and expanded polystyrene beads (1-4mm) are injected with a special concrete pump. The injected walls are then finished, levelled and smoothen from both the sides.

Pre-stressed precast prefab technology using hollow core slab, beams, columns, solid walls, stairs, etc .

As the name suggest, these slabs, columns, beams, stairs, etc. are designed and manufactured in the factory shipped and erected at site. The structural frame is commonly composed of rectangular columns of one or more storeys height. The beams are normally rectangular, L-shaped or inverted T-beams. They are single span or cantilever beams, simply supported and pin-connected to the columns. The joint between the floor elements are executed in such a way that concentrated loads are distributed over the whole floor. This system is widely used for multi storeys buildings.

Monolithic Concrete Technology Using Plastic Form Work.

In this technology, walls and slabs are cast in one operation and specially designed light weight form/ moulds are use for concreting. Concrete is poured in to the special forms and forms are removed after setting of concrete, which gives box like cubical structure of the required architectural design. This pre-designed formwork acts as some sort of assembly line production and enables rapid construction of multiple units of repetitive type.

Monolithic Concrete Construction Using Aluminium Form Work.

In this system concrete walls and slabs are cast monolithically at one pour. This allow reduction in thickness of concrete members below the minimum value than the conventional construction, just reducing the consumption of resources. This technology reduces the cost of maintenance and repair as compared to conventional system

Precast Concrete Panel.

These load bearing panels are made of reinforce concrete with a polystyrene insulated core that varies in size from 40mm to 200mm depending upon the insulation requirements. These panels are moulded in a specially designed steel moulds under control factory conditions. Then the panels are removed from the moulds and stacked vertically for curing. Power and water conduits are installed in the panels during production. Due to cohesive structural design, this system requires only strip foundation for most of the buildings. The concrete panels can be designed with the strength 34 N/mm2 so as to have a stronger thinner and light

weight panels as compared to concrete blocks or most poured concrete walls. This system takes two hours to prepare foundation and three hours for the panels to set.

Precast Concrete Panel

GFRG Wall Panel

GFRG/ Rapid wall Building System Technology.

Gypsum plaster reinforced with glass fibers (GFRG) is a panel product suitable for rapid mass-scale buildings construction, was originally developed and used since 1990 in Australia. These panels are presently manufactured to a thickness of 124mm. The main application is in the construction of walls, it can also be used in floor and roof slabs in combination with reinforced concrete. It is mandatory to provide embedded RCC horizontal tie beam over all the walls below the floor slab/roof slab. The panels may be unfilled, partially filled or fully filled with reinforced concrete as per requirement. These panels possess substantial strength not only as load bearing elements but also capable to resist earthquake and wind. Buildings up to ten storeys in low seismic zones can be designed with these systems. GFRG building systems can be constructed only with technical support or supervision by qualified engineers and constructors.

Some of the Low Cost Technologies are Highlighted Below:

In the construction of walls, rammed earth, normal bricks, soil cement blocks, hollow clay blocks, dense concrete blocks, small, medium and room size panels etc of different sizes are used. However, bricks continue to be the backbone of the building industry. In actual construction, the number of the bricks or blocks that are broken into different sizes to fit into position at site is very large, which results in wastage of material and poor quality. Increasing the size of wall blocks will prove economical due to greater speed and less mortar consumption, which can be achieved by producing low density bigger size wall blocks using industrial wastes like blast furnace slag and fly ash. Several prefabrication techniques have been developed and executed for walls but these medium and large panel techniques have not proved economical for low rise buildings as compared to traditional brick work.

Non-erodable mud plaster.

The plaster over mud walls gets eroded during rains, which necessitates costly annual repairs. This can be made non-erodable by the use of bitumen cutback emulsion containing mixture of hot bitumen and kerosene oil. The mixture is pugged along with mud mortar and wheat/ rice straw. This mortar is applied on mud wall surface in thickness of 12 mm. One or two coats of mud cow dung slurry with cutback are applied after the plaster is dry. The maintenance cost is low due to enhanced durability of mud walls.

Precast curved brick arch panel roofing

This roofing is same as RB panel roofing except that the panels do not have any reinforcement. A panel while casting is given a rise in the centre and thus an arching action is created. An overall economy of 30% has been achieved in single storied building and 20% in two or three storied buildings.

Non erodable mud plaster

Pre Fab Brick Arch Panel

Un Reinforced Pyramidal Brick Roof

Un-reinforced pyramidal brick roof.

Un-reinforced pyramidal brick roof construction system is suitable for low cost houses in cyclone affected and other coastal areas. Corrosion of reinforcement was found to be the major cause of failure of RCC structure in coastal areas and a pyramidal roof with brick and cement concrete without reinforcement was developed. The roof is provided with peripheral RCC Ring beam. The beam is supported on eight brick columns or walls and is cast as integral part of the pyramidal roof using suitable shuttering. The roof can be of different sizes and shapes.

Conclusion

Engineers have created large numbers of concrete jungles in past two decades and the same trend is continuing. After few decades, all these buildings have to be demolished and dispose it off. We are going to have difficult time to handle the artificially made construction wastes. Let us think from now, how to make our future generations live in our mother earth safely and healthily. Therefore, let us use environmental friendly and cost effective technology construction materials for sustainable development.

"We do not inherit the Earth from our ancestors;
We borrow it from our children" - Lakota

References

- https://www.unido.org/fileadmin/user_media/Publications/Pub_free/Environment_ friendly_Indian_ building_material_technologies_for_cost_effective_ housing.pdf.
- http://sepindia.org/ihd-sep/ceeef-technologies - Cost Effective Environment Friendly Construction Technologies.
- www.naredco.in/pdfs/Parag.ppt Emerging Technologies for Housing & Building Construction
- http://www.tce.co.in/low_cost_housing.pdf.Low Cost Housing.

ABSOLUTELY AMAZING MATHEMATICS

1 x 8 +1	= 9
12 x 8 +2	= 98
123 x 8 +3	= 987
1234 x 8 +4	= 9876
12345 x 8 +5	= 98765
1 23456 x 8 +6	= 987654
1234567 x 8 +7	= 9876543
12345678 x 8 +8	= 98765432
1 23456789 x 8 +9	= 987654321

Courtesy - Whatsup

Differing Site Condition Claims

Dr. D Thukkaram

Differing Site Conditions discovered unexpectedly during execution are quite common in construction. By and large, differing site conditions relate in majority to differing subsurface conditions experienced during the progress of the work. Soil is a variable material and soil strata can vary significantly even over small areas. Geotechnical investigations may not always completely and comprehensively indicate the varying soil profile since tests and borings are usually made in limited numbers at selected locations. These usually affect the contractor's time schedules and costs.

Consequences of Differing Site Conditions

These could be one or more of the following:

- Greater difficulty in excavation or removal with corresponding increase in cost and time.
- Increase (or decrease) in the quantities to be excavated with corresponding increase (or decrease) in cost and time.
- Suitability or otherwise of material from identified borrow pits or quarries. Contractor may need to incur more expenditure and invest more time to transport materials from an alternate site, at a location further than anticipated.
- When a situation arises that what is physically obtained at site is different from what is expected or anticipated, the consequences of such a situation will have to be borne by one of the parties to the contract.
- This paper examines contractor claims for additional compensation when contractors' costs are more than expected because of unforeseen site conditions.

Differing Site Conditions and the Contracting System

A contractor who designs and builds assumes all the risks of differing site or subsurface conditions. There is no ambiguity as to who assumes the risk of additional expenditure if and when unanticipated situations arise. However, in contracts where the design and construction is done by different agencies there is a problem in determining as to who assumes the risk of unforeseen site conditions.

In normal construction projects, soil investigations will be carried out by the owner using available resources or through a geotechnical consultant. The test results will be used to design and plan the structural elements and to ascertain the cost and effort involved in excavation, filling and other subsurface related processes. This information on site, soil and subsurface parameters may be made available to the contractors bidding for the project.

Owners may or may not guarantee the accuracy of the test results and the information provided. The bidders will usually be warned that they must inspect the site and conduct their own tests independent of the results provided. Generally, this does not happen since the time available is short and the effort and expenditure involved considerable. As a result, contractors submit bids without a clear idea as to the prevailing site conditions, especially subsurface conditions, and frequently find themselves facing problems and additional costs that were not anticipated. There is need to clearly understand and appreciate how this risk is likely to be apportioned.

Information Provided by the Owner

As brought out earlier, owner generally provide the necessary information and test results to prospective bidders based on the actual investigations carried out on the site. Such information may be factual eg: physical details, geological details, number and locations of bores or pits, depths to which investigations carried out, test methodologies, results of tests and so on. Information provided may also be by deduction or analysis of the acquired site and test data with certain professional opinions expressed. Normally, contractors will base their bids on the information so provided.

Owner's Concerns on the Information Provided

The average owner is concerned that on issues pertaining to the accuracy of the information provided, the contractor should not have an opportunity to litigate and recover additional costs. It is for this reason

that the owner may state that while the information is provided in good faith, the accuracy of the information is not assured. This implies that the owner takes no responsibility for the information provided and the contractor should conduct independent tests and inspections to ascertain the actual conditions prevailing on the site. Such a disclaimer is common. If the owner sees no guaranteed protections if the accuracy of the information is challenged, then such disclaimers become common.

The second possibility is that the owner provides no information of any sort and advises the prospective bidders to make their own assessments on the site and thereafter make their bids. However, there is a problem here. However, a study of certain court directions indicates that if information on the conditions prevailing at site is available to the owner, it is incumbent that such information is shared with the prospective contractors. Certain other dispensations by courts have been contrary to this. It is clear that this is a vexed issue and several varying points of view are possible in deciding who assumes the risk.

The third possibility is that the owner states that the information provided is supplementary and outside the scope of the contract. This is an escape clause in the belief that the owner is thus immune to any claims on this account.

Finally, what must be said as a matter of caution is that the concerns of the owners and the methods adopted to transfer risk and protect themselves have been considered and viewed differently by different courts.

Contractor's Concerns on the Risk Assumed

It is clear that the contractor will have to bear the risk of unforeseen site conditions unless it is established beyond doubt that:

- the contractor based his bid in good faith on the information provided by the owner
- contractual provisions exist to relieve the contractor of consequences due to unforeseen or unanticipated site conditions
- the owner has wrongfully withheld or denied information which was available and relevant to the work

In fixed price contracts it will be difficult for contractors to transfer risk to the owner on the plea that the work was more difficult due to unanticipated ground conditions. This is more so if the owner is a public entity.

The Basis for Contractors' Claims

Contractors may argue that the locations chosen for the boreholes or trial pits were not optimal and hence the samples and test results were not representative of actual conditions on the site. It may also be said that the professional opinions, derived by the owner on the basis of the site investigations and provided to the contractors, were not correct. Another possibility is that the contractors may allege non-disclosure of information available to the owner. More seriously, contractors may allege fraud and complain that false information was provided deliberately, with the object of misleading the contractor.

Contractors will resort to allegations of fraud only if substantial proof is available. When the contractor gathers information on the site and uses such information while bidding for a project, recovery will seldom be possible. However, when the contractor bases the bid on information provided by the owner, without conducting independent checks to verify the accuracy of such

information, negligently or otherwise, relief is generally available to the contractor.

Seldom does it happen that misrepresentations are made with the object of misleading the contractor. Misrepresentations may be attributable to negligence, in which case the contractor can claim reasonable compensation.

When the owner employs a geotechnical consultant, the responsibility for any negligent misrepresentations in the soil information generated by the geotechnical consultant engineer rests with the owner. The owner, however, will only be guilty of innocent misrepresentation. The information supplied to the contractor bears an implied warranty with regard to its accuracy and the contractor will rely upon it and base all plans and costs on this.

Innocent misrepresentation is the least serious in the three forms of misrepresentation. Since there has been neither an attempt to deceive nor has there been any negligence such a misrepresentation would be the least culpable. Contractors will generally find it more appropriate to justify their claims for additional compensation by invoking the implied warranty as inherent when the owner provides the information on site conditions. Realizing this, owners resort to disclaimers that shield them from such additional compensation claims.

Disclaimer Clauses

Judges have often been seen to view disclaimer clauses differently. The principles of equity are applied and on this basis, some Courts may be unwilling to permit the owner to provide information and simultaneously disclaim responsibility on the accuracy of such information. The argument here would essentially be that the contractor is not as well informed as the owner on prevailing site conditions and generally would rely on the information furnished by the owner. Moreover, time and cost constraints do not generally permit the contractor to ignore the information provided and go for an extensive investigation at the site in an independent manner. If equity in the contracting process is to be the watchword, judges would frown on attempts to unfairly transfer risk on the contractor, A fair and just apportionment of risk will result find favour in courts of law.

Disclaimer clauses generally result in higher bids.

Greater the attempt to transfer risks, greater is the need for the contractor to build in contingencies to cover the perceived risks. Some contractors may choose not to do so and when they realize that the risks have resulted in cost and time overruns, disputes arise and the completion costs increase

In light of above, the question arises as to how disclaimers should be used. If a fair and equitable relationship is sought to be established with the contractor, disclaimers should be used sparingly. The provisions of the contract, when examined in the context of unfair risk transfer, will also appear more equitable to courts when disputes are adjudicated.

Differing Site Conditions Clause

As brought our earlier, the strategy to shift the risk on to the contractor may not be in the overall interests of the owner. Realizing this, some contracting parties have adopted a system where the owner willingly accepts to pay for additional expenses caused by unanticipated site and subsurface conditions. This is done through a Differing Site Conditions (DSC) Clause. US Federal Government Clause on DSC is drafted as follows:

- The contractor shall promptly, and before such conditions are disturbed, notify the Contracting Officer in writing of: (1) Subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in this contract. The Contracting Officer shall promptly investigate the conditions, and if he find that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, as equitable adjustment shall be made and the contract modified in writing accordingly.
- No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in (a) above; provided, however, the time prescribed there for may be extended by the Government.
- No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract.

The spirit behind such a Clause is that bidders are given information on which they may rely in making their bids, and are at the same time promised an equitable adjustment under the changed conditions

clause, if subsurface conditions turn out to be materially different than those indicated in the logs. The two elements work together; the presence of the changed conditions clause works to reassure bidder that they may confidently rely on the logs and need not include a contingency element in their bids. Reliance is affirmatively desired by the Government, for if bidders feel they cannot rely, they will revert to the practice of increasing their bids.

The purpose of the changed conditions clause is thus to take at least some of the gamble on subsurface conditions out of bidding. Bidders need not weigh the cost and ease of making their own borings against the risk of encountering an adverse subsurface, and they need not consider how large a contingency should be added to the bid to cover the risk. They will have no windfalls and no disasters. The Government benefits from more accurate bidding, without inflation for risks which may not eventuate. It pays for difficult subsurface work only when it is encountered and was not indicated in the logs.

All this is long-standing, deliberately adopted procurement policy, expressed in the standard mandatory changed conditions clause and enforced by the courts and the administrative authorities on many occasions. Faithful execution of the policy requires that the promise in the changed conditions clause not be frustrated by an expansive concept of the duty of bidders to investigate the site. That duty, if not carefully limited, could force bidders to rely on their own investigations, lessen their reliance on logs in the contract and reintroduce the practice sought to be eradicated - the computation of bids on the basis of the bidder's own investigations, with contingency elements often substituting for investigation.

A DSC creates two methods of obtaining an equitable adjustment, conditions different from those represented (Type I) and unanticipated conditions (Type II).

A Type I claim requires a material variation between the actual condition encountered and that indicated. The actual condition encountered need not be contrary to the express representations in the plans and specifications. A representation may be inferred if from a reading of the contract document as a whole the contractor would reasonably be led to believe that it would not encounter the conditions that were in fact encountered. For example, one contractor obtained relief where the specifications described a dry excavation procedure but the contractor encountered water.

Type II requires a variance between the site condition actually encountered and that to be reasonably expected. Not only should the contractor have had no information from the owner, but it must not have had knowledge of such conditions from any other source. It must not be able to have reasonably anticipated such conditions at the time the contract is made.

The Contractor will be judged as a prudent and responsible bidder who normally makes a reasonable site investigation, studies the contract documents and makes an intelligent assessment of the requirement of the job based on sound construction experience. If after pre-bid investigation a reasonable bidder would have reasonably anticipated the conditions encountered, the contractor will be denied recovery.

It should have been known what was likely to be encountered. The condition must be unusual and not one ordinarily encountered in works of a similar nature. But the condition need not be unique.

The location at which the differing site condition is encountered need not necessarily be at the construction site itself. If the particular area in which the condition was encountered was designated in the contract documents, the condition will be considered to have occurred "at the site". For example, where the contract documents specified a quarry as a source of construction material and the quarry was composed of unsuitable material, the contractor will be entitled to an equitable adjustment.

Normally a DSC is a condition occurring below the surface or otherwise not ascertainable by normal inspection. In addition, the condition must be physical. Examples of conditions that fit within these requirements include excessive groundwater, rougher than anticipated ground composition, underground obstacles, uncharted utilities, and unsuitable material in borrow pits. This chapter deals principally with existing subsurface conditions and not events that subsequently occur and make subsurface work more expensive.

To obtain an equitable adjustment, the contractor must notify the contracting officer promptly in writing. Courts seem more willing to waive strict notice requirements if it appears that the owner knew that the contractor had encountered unforeseen subsurface conditions and that it was likely that a claim would be made.

Concealed Conditions

The American Institute of Architects (AIA) adopts a similar approach and AIA document A20 1 currently provides the following:

12.2.1 Should concealed conditions encountered in

the performance of the Work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions below the surface of the ground or should concealed or unknown conditions in an existing structure of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, be encountered, the Contract Sum shall be equitably adjusted by Change Order upon claim by either party made within twenty days after the first observance of the conditions.

In AIA Doc. A201, 1.2.2, the contractor is supposed to have visited the site the site and become familiar with local conditions under which the work is to be performed. Suppose the contractor should have seen certain site conditions or actually saw site conditions that varied from the conditions indicated by the contract documents. If relief should be accorded only when the conditions are concealed, a contractor who knows or should know what it will encounter because of access to the site should not receive a Type I equitable adjustment under 12.2.1.

A comparison of 12.2.1 with the federal DSC reveals gaps in the AIA's clause, traceable perhaps to the different type of projects that use AIA Documents. The contractor need only make a claim within twenty days after first observance. (The same requirement applies to any claim by the owner for a decrease). On the other hand, the Federal DSC requires that a written notice be given promptly and specifies information that must be furnished.

Perhaps more important, the Federal DSC requires that the notice be given before the conditions are disturbed, a requirement not found in 12.2.1. Giving the notice as soon as possible allows (he owner and consultants hired by the owner to study the conditions to determine whether relief is justified as well as the need for design changes. Strictly speaking, under 12.2.1, the contractor could continue the work so long as it gave the notice within twenty days. Although the obligation of good faith and fair dealing may cure this deficiency, leaving such an important matter to implication is unwise. It may be useful to require that the notice contain any projected impact on the contractor's schedule caused by the discovery of differing site conditions in order to prepare for the inevitable "impact" delay claim.

There is another important feature of 12.2.1. A Type I equitable adjustment requires a comparison between what is encountered and "the conditions indicated by the Contract Documents. "Under AIA Doc. A20 1, 1.1.1, the bidding documents are excluded from the contract documents.

If the subsurface information is included in the specifications, there will be no difficulty. Suppose the subsurface information is included in the instruction to bidders or simply is made available at the geotechnical engineer's office. It would be very difficult for the contractor to be able to claim an equitable adjustment.

Conclusion

Undoubtedly arguments can be made for a disclaimer system or a system that uses a DSC Clause. In all fairness, courts should accept whichever choice has been made. If it appears clear that the contractor has, happily or not, accepted the risk of unforeseen subsurface conditions, the court should accept that risk allocation and not seek to destroy it by tortured interpretation generated by a belief that it is unconscionable for the owner to place these risks upon the contractor. Only if it is clear that the contractor was not made aware of the risk or if the imposition of the risk violates the obligation of good faith and fair dealing, should the court entertain a line of reasoning based on risk allocation as expressed in the contract.

Courtesy : The Masterbuilder

Buildings that Generate its Own Power

Suresh Srinivasan
Power Gen-Solar

Buildings alone account for over 40 % of final energy Consumption and 70 % of electricity used, and during when energy brought from the generating point to this building another 15 % is lost as "Transmission Loses". So, it is necessary to take actions for : Energy Saving, Sufficient use of resources and Distributed Generation Model – to generate as much energy possible at the site itself, locally.

The Best Solution is BIPV – Building Integrated Photo Voltaic. This is nothing but, the Solar Photo-voltaic properties are directly fitted into the Building Directly – in the form of Glass, which is commonly used in Facades, Windows, Doors, Skylights, Curtain Walls, Roofs, Braise Soleils, Pergolas, Car-Parking, etc. The BIPV aids in : avoid duplication works when installing Solar PV Modules externally, avoid wastage of floor-space, and also enhancing the Aesthetics Looks.

ONYX Solar is one of the Leading Manufacturers of BIPV Glazing, headquarted in Aviva, Spain. Novartis Project is the Largest BIPV installations in the world till date. ONYX operates in more than 20 countries through channel partners, and also the Company of First Choice for ICONIC & AWARD WINNING projects, all over the World. More information can be had at : www.onyxsolar.com.

Advantages of BIPV are :

- Visually Stunning Design Build
- Allows Natural light to enter the building
- Multi-coloured Glazings (Red, Orange, Yellow, Blue, Brown, Green, Purple, Grey – all hues in these)
- Multi-Transparency (for natural lighting to come through the SOLAR PV Glass)
- Directly fitted in – Façade, Skylights, Canopy, Roof-top, Floor, Braise Soleil, Pergolas, Curtain Wall, Car-park, Double Wall , Koisk, ATM Booths etc..
- Electricity Generation from Solar
- 22 to 321 Watts generation / panel
- UV & IR Filtering (allows only 1 to 10 %)
- Thermal Filtering
- Acoustic Filtering
- Low 'U' Value
- Reduces Internal Heat Buildup
- Reduces the Tonnage of Air-conditioner (5 to 20 % depending on the design & usage of BIPV)
- Lit Flooring.

Some of the installations are : International Airport (Brazil), Femsa-Coco Cola (USA), Novartis (USA), BART Station (USA), Washington University (USA), Arcadia University (USA), GenYo (Phizer) Building (Spain), SML House (Spain), GDR Office (Spain), Bejar (Super) Market (Spain), San Antor Market (Spain), and many more.

Power Gen-Solar, is the National Exclusive Distributor for ONYX Solar in India, started in 2014, headquarted at Chennai. Promoted by Mr. Vijayanandan (Taamaesek Design Consortium), Mr. Suresh Srinivasan (Auro Power Systems), Mr. Goms (Goms Electricals) and Mr. Raja.

Power Gen-Solar brings NEW, Futuristic Products and Technologies in Renewable Energy to Indian Customers. Vision is to make the Users Energy Efficient and Self Sufficient, by offering solutions with Greater Value for Money.

Regd. No. 1422/2000 ✆ : 6587 6608

PAVER FINISH ROAD BUILDERS ASSOCIATION
CHENNAI.

No. 2, Pulla Avenue, (First Floor), K.V.N. Mansion, (Opp. to Canara Bank) Shenoy Nagar, Chennai - 30.

President	Vice-President	Secretary	Joint Secretary	Treasurer
S. PANDIYEN	MJF Ln. V.N. GUNASEKHAR	R. PARTHIBAN	K.R. PARTHASARATHY	T.M.S. SIVAKUMAR
Mob. : 94443 80733	Mob 98400 57457	Mob 89395 95737	Mob 9884' 50230	Mob 94440 30984

05.03.2015

To

THE CHAIRMAN
BUILDERS' ASSOCIATION OF INDIA
SOUTHERN CENTRE, EGMORE.
CHENNAI-600 008.

பொருள்: ஒப்பந்ததாரர்களின் - பிடிப்பு தொகை (Retention amount) - நீண்ட நாளைய பிரச்சினை - தங்கள் ஒத்துழைப்புடன் தீர்வு செய்யப்பட்டது - நன்றி தெரிவித்தல் - குறித்து.

நாம் வேலை செய்த பில்களில் பிடிக்கப்பட்ட 2½% பிடிப்பு தொகை, ஒப்பந்தகாரர்களுக்கு பல வருடங்களாக வழங்கப்படாமல், அலைகழிக்கப்பட்டு நாம் இலாபம் என்று நினைத்திருந்த அந்த பிடிப்பு தொகை பல கோடிகள் வழங்கப்படாமல் இழுத்தடிக்கப்பட்ட நிலையில் நமது சங்கம் விடாப்பிடியாக தொடர்ந்து போராடி வெற்றி பெற்றது. இந்த வெற்றிக்கு தோள் கொடுத்த தென்னக மைய தலைவர் திரு.R.சிவகுமார் அவர்களுக்கும் உறுதுணையாக இருந்த திரு.Mu.மோகன் அவர்களுக்கும் எங்கள் சங்க உறுப்பினர்கள் சார்பில் நாங்கள் பெருமித மிக்க நன்றியை தெரிவித்துக் கொள்கிறோம்.

நன்றி, வணக்கம்.

S. Pandiyen
தலைவர்

செயலாளர்

தென்னக மய்யம் சார்பாக CMDA வில் திருத்தி அமைக்கப்பட உள்ள வளர்ச்சி சட்டங்கள் சம்மந்தமாக வரைவு மனு அளிப்பதற்கு Affiliated Association நிர்வாகிகள் மற்றும் உறுப்பினர்களுடன் நடைபெற்ற கலந்தாலோசனைக்கூட்டம்.

MADURAI CENTRE - BUILDERS DAY CELEBRATION

2015-16 ம் ஆண்டிற்கான மாநிலத்தலைவராக திரு. N. ரகுநாதன் அவர்கள் தேர்ந்தெடுக்கப்பட்டதற்கு தென்னக மய்யத்தலைவர் திரு. R. சிவக்குமார் அவர்கள் பொன்னடை அணிவித்து வாழ்த்துத் தெரிவித்தார்.

Inaugural Function - Andaman & Nicobar Islands Centre

Inaugural Function - Andaman & Nicobar Islands Centre

High Grade PSC Piles for Foundations-Versatile Product for Construction Industry

While Indian construction codes have now very stringent provisions for earth quake resistant designs, PSC pile is probably the only solution to meet these requirements fully.

21st century may be called as the era of infrastructure boom. Mega fast track projects are coming up globally, more particularly in developing countries. The speed of construction has to match with pace of developments. Most of the infrastructure projects like bridges, flyovers, ports, multi storied buildings etc; require pile foundations. The durability of any such structure is linked to its foundation, being the lower most part of a structure, which is affected by soil condition, pollution, sulphate attack, moisture, corrosion of steel reinforcement, disintegration of concrete or such other challenging environment. While Indian construction codes have now very stringent provisions for earth quake resistant designs, PSC pile is probably the only solution to meet these requirements fully.

Pre-stressed Spun concrete piles are being used globally for pile foundation, as such the product and technology have proven track record. In India, however we have yet to adopt this product in a deserving big scale. High Grade PSC Pile is probably the only tech-economic solution for all challenging foundation requirements. It has Strength, Durability and Time Saving advantages over any other type of piling options.

The availability of PSC piles in all standard sizes and advanced jointing and cutting methods can help the engineers to keep execution period to minimum and while it can also prevent any degradation of quality due to speed of construction.

Durability of The Structure:

Piles used for foundation are buried in the ground and the same cannot be accessed for maintenance. Durability of any structure can be ensured with maintenance free foundations. In such a situation any compromise on durability aspect of the foundation may limit the life of whole structure. In view of this PSC pile is the best possible option for Construction Industry.

Precast concrete

Now Pre-cast and Pre-stressed is no more a new concept for the engineering community. It is well understood that, Pre-cast gives much better quality control as compared to that of its cast in-situ counterpart. Pre casting is always a well matured stream lined process under which one can have good control on quantity and quality of the ingredients, better compaction and ideal curing conditions.

Reinforced Concrete

Concrete is good in compression but has practically no tension resistance capacity. Reinforced concrete has steel on tension side to impart tensile capability to concrete. Whenever bending stresses occur in the reinforced concrete member, compressive and tensile strains are bound to occur. Tension side concrete is also strained even though it is not contributing to the tension strength of the member. Exactly here the life of reinforced member is adversely affected. The concrete in tension zone cracks under strains produced by the bending action. This in turn gives passage to water and atmospheric air to come in contact with reinforcing steel. It is now well understood that life of reinforced

member is limited by corrosion of steel contained by the member, it is the reason for which the covering provisions in recent codes have increased. But even increase in cover also fails to ensure crack free concrete in tension zone.

Piles

Pile is the lower most part of the structure, which has to remain under ground level for its service life. Piles may range from about four meter to several meters below the ground level. For these levels we normally have little predictions of the ground water levels, and chemical composition. The condition may remain moist for most of the time. These conditions make the steel susceptible to corrosion. The cracking of concrete in tension zone further increases the permeability of concrete, which paves the path of water to reinforcing steel. This not only reduces the life of the piles but also the life of complete structure, which rests on these piles.

Spun Concrete

Compaction of concrete expels entrapped air from the concrete. Presence of mere 4 percent entrapped air can reduce strength of concrete by almost 30 percent. The entrapped air not only reduces the strength of concrete by great extent but also reduces the life of structure by increasing permeability of concrete. Spinning is one of the best compaction methods available, which can ensure dense and practically impermeable concrete.

Pre-stressing

The reinforced concrete (RCC), even with increased cover fails to ensure impermeability and it could be the governing disadvantage to limit the life of structure. Any such crack in concrete can be prevented only by pre-stressing the concrete. By pre-stressing we apply compressive stress in concrete and even on applying of bending tension the resulting stress remains compressive through out the section, which ultimately resists any cracking to happen.

Sulphate Attack

It is observed during studies that, concrete foundations on various sites worldwide could be under threat from “concrete eating bugs” which leave affected structures vulnerable to accelerated sulphate attack as warned by an American Forensic Civil Engineer. A 15 year old six storey office block on the U.S. east Coast has been demolished because its foundations were eaten away and one comer was found to be sagging more than 200 mm as many of the low grade precast concrete piles had virtually disintegrated. There are enough reasons and valid grounds to believe that same threat persists anywhere in the world.

PSC Piles are manufactured with Concrete of grade >M-55.

It is found that, such high-grade concrete is of low permeability, thereby unlikely to suffer serious attacks due to sulphate of concentration in ground water up to 1000 ppm. Increased sulphate resistance can be obtained by use of sulphate resistant cement. The first line of defense against sulphate attack on concrete lies in ensuring that the concrete is dense and impervious. Thus PSC Pile is the only alternative for longevity in general applications and that of coastal or chemically polluted areas in particular. It is quite clear from the above that, if we need a durable structure then we have to go for all above techniques namely, pre casting, pre-stressing and spinning. This wonder combination ensures durability of the structure even under moist conditions.

Technical Features & Advantages

Besides the durability aspect there are other advantages like: load- bearing capacity as well, which is explained in this section for PSC piles.

Resistance to Large Bending Moment

PSC piles can be used in various types of soil conditions because

(1) Piling is highly effective in resisting bending moment and axial tensile stress due to pre-stressing, and (2) Piling resists axial compressive stress because of the high compressive strength of spun concrete.

Large Bending Capacity

As the compressive strength PSC Piles is not less than 500 Kg/cm2 at an age of 28 days, the allowable compressive stress can be safely assumed as being high in spite of the presence of pre-stress. The allowable compressive stress is so high that foundation can be designed in a most economical manner.

Strong Joints - Easy, Reliable Welding

Piles are made in single lengths up to 14 Mtr, while for higher lengths, piles can be joined by welding. The method involves welding together of the end plates (steel, ring-shaped discs) firmly fixed at each tip end of the PSC Pile, when it is necessary to install a longer pile by joining two or more end to end. The welded

	Table of Standard Dimensions of PC Piles								
Outer					Moment	Calculated Bending			
	Wall	Length		Area of	of Inertia	Moment		Allowable	Nominal
Dia	Thickness		Class	Concrete	of			Axial Load	Weight
(D)	"t" (rrun)	"L"(m)		(Sq.cm)	Concrete	Cracking	Ultimate	(t)	(kg/m)
(mm)					(cm"4)	(t-rn)	(t-rn)		
			A			2.5	4.1	50	
300	60	7-13	B	452	34608	3.5	6.9	45	119
			C			4.1	8.5	40	
			A			3.9	6.4	60	
350	65	7-15	B	582	62163	5.2	9.9	55	151
			C			6.3	12.7	55	
			A			5.8	9.2	80	
400	75	7-15	B	766	106489	7.6	14.6	75	199
			C			9.0	18.4	70	
			A			8.0	12.5	100	
450	80	7-15	B	390	166570	11.2	21.7	90	242
			C			12.7	26.0	85	
			A			10.8	16.4	125	
500	90	7-15	B	1159	255324	15.5	30.1	115	301
			C			17.2	35.1	105	
			A			17.6	25.9	170	
600	100	7-15	B	1571	510508	25.4	49.8	155	408
			C			29.4	60.4	145	

joint has strength at least equal to that of the concrete portion of the pile.

Prevention from Cracking

Even if there is tensile load on the piling during transportation, handling, or pile-driving work, the pre-stress effect prevents any crack in the piling. Even should cracking appear in the pile owing to a sudden, temporary excessive tensile load, such cracks will disappear as soon as the load is removed. There is therefore no possibility of corrosion of the pre-stressing steel reinforcement.

Noiseless, Non-vibrating Installation Method

For installing the piling in different types of environments, various kinds of methods are available. Pile driving rigs used for conventional Pre-cast RCC piles can be used for these piles.

Economic Viability and Applications:

The grade of concrete normally used for conventional Pre-cast RCC piles is up to M-25, while the concrete used in PSC piles is above M-55 grade. Thus the volume of concrete shall be reduced substantially, thereby reducing the cost. The diameter of PSC piles can also be reduced to save on cost of drilling for pile driving.

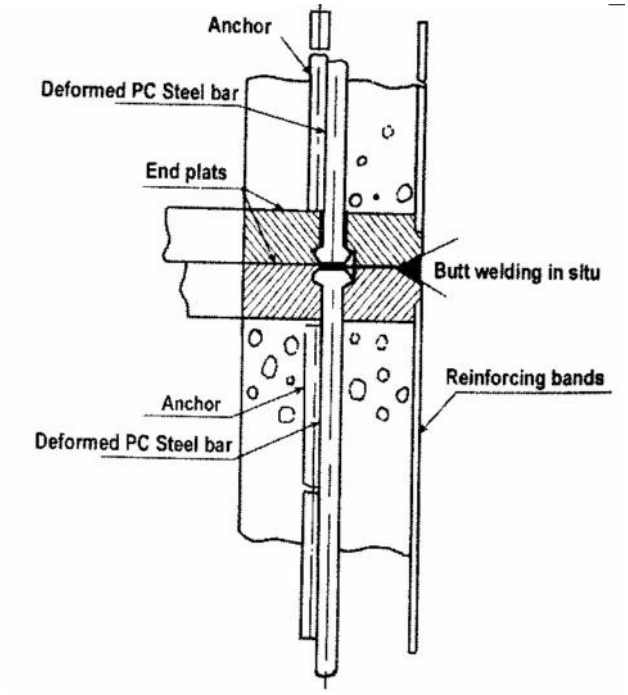
Applications

Foundation Piles

Technical details:

Standard Dimensions:

Construction - All kinds of buildings bridges, bridge piers, abutments for highway bridges, railway bridges, ports, river structures landing piers, quay walls, dol-



phins, break-waters, sea walls, docks, sluice gates retaining walls, retaining walls, underground walls.

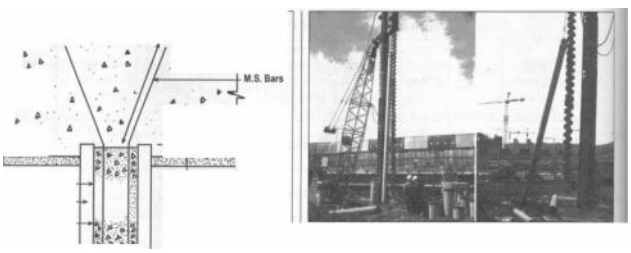
Columns: Construction columns for prefabricated constructions: Bonding Of PSC Piles Into Pile Cap:

As the PC bars are bonded with the concrete, PSC piles may be cut off at any point. The piles need not be stripped down to expose the bars, and can be bonded to the pile cap as shown in the following sketch. If the piles are not subject to tensile loads, the recommended MS bars are considered adequate.

Another method of cut-off pile head preparation for compression load as shown in the following sketch.

Conclusions:

Pre-stressed concrete is a composite structural material having appropriate blending of the properties



Diameter of Pile	M.S. Bars		
(mm)	Quantity (No.)	Diameter (mm)	L(cm)
250	4	12	50
300	4	12	50
350	5	12	55
400	5	12	70
450	5	15	80
500	6	15	90
600	8	15	100
700	8	18	120
800	8	20	140

of concrete and steel. High-grade concrete manufactured under controlled conditions of mix design can give better compressive strength of concrete. Such concrete if compacted by spinning process, can produce dense, impermeable concrete with the highest strength, as minimum water cement ratio is achieved with this process. Thus pre-stressed Spun concrete is the best possible composite structure available with this technique.

References:

1. Korean Industrial Standard for PSC Pile.
2. JIS.A.S33S: 1987 for PSC Piles modified to suit B.S.8004: 1986 for foundations
3. CBRI Paper on Deterioration of concrete in sulphate and soft waters.
4. PCI Committee Report on: Recommended Practice for Design Manufacture and Installation of Prestressed Concrete Piling.

Ramesh A. Pokerna is associated with Pre-cast concrete industry since 1970. He was the former President of Spun Pipes Manufacturers Association of Maharashtra (SPMA), that has pioneered for indigenous development of PSC Spun Tubular poles in India. Presently executing overseas projects for technical & management back up to set up plants to manufacture PSC Spun Poles in East Africa. He has presented 11Ulny technical papers and visited Pre-cast/ Pre-stressed concrete plants in Japan, Germany, Belgium, S. Korea, China etc; he can be contacted at 412,N-3,CIDCO, Aurangabad 431003). E-mail: ramesh@betonindia.com

Courtesy: The Masterbuilder

Timely Delays

TIMELY COMPLETION of a construction project is one goal of the owner and the contractor. When completion is delayed, each party will likely incur additional costs and lose potential revenues. While contractors sometimes contend that delays are "calculated risks which constitute a normal feature of the contracting business", the party who has been damaged by the other party's unexcused delay can recover reasonably foreseeable losses caused by the delay. But mere delay, even when accompanied by a time-of-the-essence clause should not automatically terminate the delaying party's right to continue performance. Only, if the delay is serious and not easily compensable by damages, is it likely that the delaying party may have its contract rights terminated.

While other types of breaches also must be serious before they can justify termination, the law requires more by way of seriousness to terminate the contract for delay. For this and other reasons, rarely will delayed performance be asserted as grounds for terminating the delaying party's performance in the construction contracts. Delayed performance will generally earn the performing party the right to the contract price with a reduction for any damages, which the other party can establish.

The law has assisted the owner by generally enforcing clauses, stipulating in advance, losses chargeable to the contractor for unexcused contractor delay. On the other hand, the contractor faces formidable hurdles in establishing delay damages even when "no damage" clause does not preclude damages from being recovered. It is rare to find a construction contract in which the parties stipulate in advance an agreed damage amount for owner caused delay.

Causes for Delay

Delays to parts of the contractor's program, which may not necessarily cause delays in the project as a whole, may be categorized as follows:

- Those for which the owner / employer or supervisor is responsible
- Those for which the contractor is responsible
- Those for which neither parties to the contract are responsible

Acts of Owner or Owner's Representative

Delays can be caused by the owner's failure to furnish the site or owner-supplied materials to the contractor by any agreed date. When the owner or design professional is required to coordinate the work, failure to do so properly can generate delays for which the owner is responsible. Delays can be caused by correction of work caused by faulty design or incomplete drawings or specifications. Delays can result from the design professional's failure to pass on shop drawings, conduct tests or inspect within a reasonable time. The design professional's unreasonable delay in issuing certificates or the owner's failure to make progress payments can cause delay. Finally, delay almost always results from changes in work.

Acts of Contractor or Contractor's Representative

Delays can be caused by the contractor's inability to have workers on the site at particular times or to have materials at particular stages of work. Work may have to be redone because improper materials were

supplied or because of poor construction workmanship. Supervision may be inadequate or subcontractors may cause delay.

Events Attributable to Neither Party

The contractor may be delayed by events, which are not attributable to either contractor or owner. There may be fires, labour difficulties, or extremely bad weather conditions. Public authorities may interfere with the work. There may be labour or material shortages which go beyond what was expected at the time contract was made. Third parties may sometimes cause delays. For example, in one case, a third party who had obtained a court order shutting down a construction project caused delay. In another, a union-caused delay, shut down a project over a labour dispute. Part of the delay caused by poor weather conditions may be attributable to the contractor's failure to take proper preventive measures. Fire sometimes results from the negligence of the contractor. Frequently, the cause or causes for delays are not easy to trace. Some delays are caused principally by the acts of one party. Many others are caused by a combination of factors. Causation problems frequently complicate the responsibility for delay.

Time Extensions

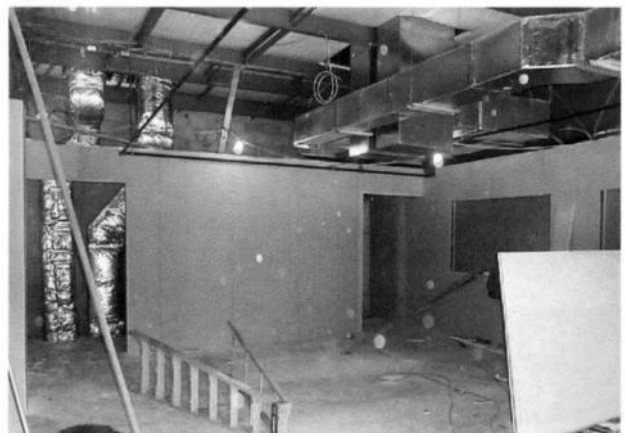
The owner and contractor should agree upon the issuance and extent of any time extension. In the absence of an agreement, contracts usually provide a mechanism for determining this question. That mechanism usually consists of contract language specifying when time extensions are to be granted and providing for a third party, such as the design professional, to determine in any particular cause whether a time extension is justified and the amount of the extension. The determination of whether a time extension should be granted usually requires applying the contract language to the facts asserted to constitute justification for a time extension. But, to determine the amount of time extension, poses a challenge.

Measurement of Time Extensions

Suppose an abnormal weather conditions precluded work from October 1 through October 14. During that period, there were 10 working days. Unless the contactor can show he would have worked during the other days also, the time extension should be limited to 10 days. Usually time extension mechanisms provide that the contractor must give notice of the occurrence of an event, which is to be the basis for a time extension claim. A timely notice would enable the design professional to determine what has occurred while the evidence is still reasonably obtainable and witnesses still remember what actually transpired.

Reasonable Time for Performance / Substantial Completion

This question often elicits different answers, when asked of the owner or asked of the contractor. Generally, this question would center upon whether the building had been completed in accordance with the plans and specifications. The contract should define 'completion'. Contracts frequently define completion by 'substantial completion'. Usually the determination of whether there has been substantial completion is made by the design professional and formalized by the issuance of a certificate of completion. The American Institute of Architects [AIA} defines substantial completion as follows:



Substantial completion is the stage in the progress of the work when the work or designated portion thereof is sufficiently complete in accordance with the contract documents so that owner can occupy or utilize the work for its intended purpose.

Many contracts contain two completion milestones: substantial completion and final acceptance. Final acceptance may occur 30 - 60 days after substantial completion. Courts on numerous occasions have intervened to resolve disputes over substantial completion. Based on a review of a large number of appellate decisions, the following are the primary inquiries that are made:

- How extensive is the claimed defect or incomplete work?
- To what degree was the purpose of the contract defeated?
- How easy is the defect to correct?
- Has the owner benefited from the work performed?

Substantial Completion vs Substantial Performance

Substantial completion has two distinct legal meanings. On the one hand, substantial completion refers to the date and significance of that date in the contract. This contract milestone is usually called substantial completion. On the other hand, substantial performance refers to a court finding that a party, although not in full compliance with the terms of the contract, is entitled to recover the contract amount less the value of incomplete work. The significance is that the contractor does not have, in all cases, to do exactly what was contracted to be done.

It is interesting to note that in the mid-1800s, a contractor completing 99% of a project could not recover any withheld payments because he or she breached the contract by not completing the remaining 1 %. Gradually, a common law principle known as substantial performance evolved. This principle ensures that contractors are compensated even though they have not performed the work covered by the contract to exact perfection. This principle also prevents owners from being unjustly enriched by receiving the benefits of a nearly complete project without paying the full price.

Claims Arising out of Delays

Claims are inevitable features of major projects that will have to be dealt with on the majority of contracts. The designer's inability to fully provide for all eventualities means that changes will be made to the contract as it proceeds, and where these involve additional work, adjusted payments will be necessary. Disagreements on the level of these payments will be a typical source of claims. Along with changes to the payments made, these variations may also result in delays to the work. Where these delays have a knock-on effect on the project as a whole, they may give rise to extra costs. These result from the contractor's prolonged presence on site generating additional overhead costs for the extended period. There are of course, factors other than varied work that may delay the project and it is also generally recognized that delays may be attributed to the employer I owner, to the contractor, or to neither party. The contract will normally have a pre-determined time in which it must be substantially completed and available for use.

Liquidated Damages

In the absence of delays, failure to substantially complete within this time frame will often mean that liquidated damages will be deducted from the contractor. These will be at the level defined in the contract and will be payable for the period by which the whole project is delayed. Such damages should aim to compensate the employer / owner for any lost revenue or lost benefits stemming from the inability to make use of the project at the agreed date. Clearly where delays have occurred during the project, which can be attributed to the employer / owner and have delayed the contractor, these should be taken into account before the damages are finalized. The opportunities available in many contract conditions to recognize a contractor's right to have the time for completion of the contract extended, reflect this acceptance of the more likely state of affairs. Liquidated damages must be assessed in accordance with the provisions of the contract. A careful reading of the contract is important.

Bonus Provisions

Sometimes liquidation clauses are joined with bonus clauses. Such combinations mean that the contractor loses the designated amount for each day of unexcused delay but gains a designated daily bonus if the project is completed in advance of the completion date. While enforceability does not require a bonus clause, some feel attaching a bonus to a liquidation clause is desirable. It may assist in enforcing the liquidation clause, as it appears to have "mutuality" attractiveness. Its use may also make it appear that contractor and owner have actually bargained the amount. However, the principle determination of whether a bonus clause is used should be based on importance of obtaining performance in advance of the completion date.

Can an Unpaid Contractor Terminate Obligation to Perform?

Suspension is temporary. Termination relieves the contractor from the legal obligations of having to perform in the future. In the absence of any contract provision, dealing with this question, termination is proper if the breach is classified as "material". Such a breach is one, which can have a significant impact on the contract and indicate the likelihood of future breaches by the owner. Much will depend upon the financial conditions of owner and contractor as well as the amount of the payment and the effect of delay. Certainly, non-payment should not automatically give the right to suspend performance. Shutting down and starting a construction project is costly. It would be unfair to allow the contractor to shut down the job simply because payment is not made absolutely on schedule. Under Document A 201, General Conditions of Contracts of the American Institute of Architects, seven days after a progress

payment should have been made, the contractor can give a seven-day notice of an intention to stop the work unless it is paid. Failure to pay by expiration of the notice period justifies suspension. The contractor shall receive a price increase for his reasonable costs of shut down, delay and start up. Undoubtedly, the contractor should be able to suspend the work when it is not paid after a reasonable period of time. However, the seven-day period even with the seven-day notice period may be too short. It may not take into account book keeping realities of construction projects.

Time as Essence of the Contract

Sometimes the parties to a contract specify the time for its performance. Ordinarily it is expected that either party will perform his obligation at the stipulated time. But if one of them fails to do so the question arises as to what is the effect upon the contract. Section 55 of the Indian Contract Act, [ICA] contains the answer for this and also throws some light on time being the essence of the contract.

Effect of failure to perform at fixed time, a contract in which time is essential

When a party to a contract promises to do a certain thing at or before a specified time, or certain things at or before specified time, and fails to do any such thing at or before the specified time, the contract, or so much of it as has not been performed, becomes voidable at the option of the promisee, if the intention of the parties was that time should be essence of the contract.

Effect of such failure when time is not essential

If it was not the intention of the parties that time should be of the essence of the contract, the contract does not become voidable by the failure to do such thing at or before the specified time; bur the promisee is entitled to compensation from the promisor for any loss occasioned to him by such failure.

Effect of acceptance of performance at time other than that agreed upon

If, in case of a contract voidable on account of the promisor's failure to perform his promise at the time agreed, the promisee accepts performance of such promise at any time other than that agreed, the promisee cannot claim compensation for any loss occasioned by the non performance of the promise at the time agreed, unless, at the time of such acceptance, he gives notice to the promisor of his intention to do so.

According to this section, 'if the intention of the parties was that time should be the essence of the

contract', then a failure to perform at the agreed time renders the contract voidable at the option of the opposite party. Time is generally considered to be of the essence of the contract in the following three cases:

- Where the parties have expressly agreed to treat it as of the essence of the contract
- Where delay operates as an injury
- Where the nature and necessity of the contract requires it to be so construed, for example, where a party asks for extension of time for performance

The matter depends upon the intention of the parties. Even where a specified date is mentioned for the completion of the contract, one has not to look at the letter, but at the substance of the agreement in order to ascertain the real intentions of the parties. In building contract, time is ordinarily of the essence of the contract. This is so because the business world requires certainty and also because merchants are not in the habit of placing upon their contract stipulations to which they do not attach some value and importance. The expression 'time is of the essence' means that the breach of the condition as to the time for performance will entitle the innocent party to consider the breach as a repudiation of the contract.

Some Contradictions in the Time Essence Clause

The usage of this particular clause 'time is of the essence of the contract' requires certain discretion on the part of the person drafting the contract. The indiscriminate use or over use of this powerful term will render the term meaningless, instead of working to the advantage of the owner.

A common mistake found in certain contracts, which have not been drafted properly is the usage of the clause 'time is of the essence of the contract' as well as penalty or damages clause in case of delays.

This latter clauses mask the effect of the former clause, because it implies that certain amount of delays will be tolerated, with a certain amount of penalty or damages attached to it. In that case, it clearly implies that time is not of the essence of the contract, and that the owner is actually not very serious about time delays. This shows clearly that if liquidated damages or penalty clauses are included in the contract, it is meaningless to include the clause, 'time is of the essence of the contract'.

This particular contradiction is found, unfortunately, in many contracts, clearly drafted by persons who are unaware of the strong implications of this particular clause.

Remedies for Countering Delay

Any discussion on time delay will not be complete delays do not occur in the first place, the question of the implications of time delays on construction contract would not arise. Though, delays are very common in any contract, especially in construction contracts, it is possible to finish a project within a stipulated time limit, if certain procedures are followed.

Large construction projects often use the CPM or critical path method. This method requires that the contractor seek and obtain precise information as to when each subcontractor will have drawings ready, when material will be on the job and when it will be in place. Proper use of CPM and compliance with it can reduce construction time and accomplish the work more efficiently.

The contractor immediately after being awarded the contract, is expected to prepare and submit for the owner and design professional's information, an estimated progress schedule for the work. The progress schedule shall be related to the entire project to the extent required by the contract documents, and shall provide for expeditious and practical execution of work.

In addition, the contractor is expected to 'carry .the work forward expeditiously with adequate forces'. The requirement of the schedule and that the contractor work expeditiously indicate the importance of moving the project along.

Schedule Dates us Completion Dates

While schedules are important and while the contractor's performance can be terminated by persistent failure to meet the progress schedule, schedule dates do not have the same finality as the completion dates. Schedules can be changed, as circumstances require. The party creating a schedule must be given some latitude and the party compelled to perform in accordance with the schedule should also be given some leeway in performance. There will be times when changing the schedule or not complying with the will be serious enough to be a breach of contract and perhaps even justify termination. Generally, schedule dates tend to be more flexible than completion dates.

Even when delays occur, it is always better to update the CPM as and when delays occur, and calculate the total time taken for the completion of the project. If this is done on a periodical basis, the contract will have sufficient proof, in case of a delay, that he was time conscious.

Courtesy: The Masterbuilder

The Best "OM" is HOME

The Best "AGE" is COURAGE

The Best "MILE" is SMILE

The Best "STAND" is UNDERSTAND

The Best "END" is FRIEND

The Best "DAY" is TODAY.

Courtesy - Whatsup

Concrete Floating Structures & Floating Home Foundations

Mathias Tobias
Senior Project Manager,
IMFS International Marine Floatation Systems Inc.

The concrete floating foundation is now the standard by which all other marine structures for marinas, docks, floating pontoons, and large commercial floating structures are measured by. It can be designed to any shape and size, customizable to each owners request and has the longevity that is expected to outlast the building structure above it.

Archimedes Principal

Archimedes the great Greek mathematician and inventor determined that "the law that a body immersed in a fluid is buoyed up by a force (buoyant force) equal to the weight of the fluid displaced by the body". This is the basic principal that allows all ships to float and all floating structures along with floating homes to stay floating.

Some history of living on the water

Living on the water is not new; we have always migrated to the water's edge. In the 1920's in North America many of the logging camps where built on the water because prior to logging there was no place to live accept on the water's edge. Fig. 1 shows a historic picture of how some of these floating logging camps looked. Many of these floating logging communities had remained as part of the water front scene for many years. In cities like Vancouver and Seattle the original floating homes where all built on cedar& spruce logs that where abundant all along the shores of the rivers or lakes. In the early days anyone who was handy with their tools could build a house with just the construction materials that they could find around, and without having to clear a land site. A floating home seemed to be the quickest way to build yourself a house. Building floating homes with logs was a cultural technique that has remained around even today; there are still many floating homes that are built on logs, but these logs floats are now saturated with water, to keep these homes floating they have all added extra floatation under the logs using plastic barrels & foam billets. The log float construction looks like a "V" shaped structure with logs, barrels and foam making up the wide top part of the float and the water saturated logs going down to one single log several feet below the surface.

Fig.1 (Source http://gallery.crmuseum.ca/category/keywords/float-camp)

The floating home communities that have remained part of the waterfront landscape in the Pacific North West, have struggled through the years with the municipalities to keep their access to the water. Even the definition of the floating home compared to what often it is called as a "houseboat" has been a discussion with municipal leaders, lawmakers and float home own-

ers. A houseboat really is a “boat”, it has a motor, it is meant to move from place to place, generally having a raked bow or stern. It is only in the last 30 years that the definition of a “float home” has meant that this floating structure is moored in place, piled or anchored, does not have a motor;the owner of the home pays taxes, and is a legitimate dwelling that is part of the municipal grid. In the floating home community this differentiation between float home & houseboat, has often been the difference in showing that the floating home community is a viable, insurable, mortgage able, unique part of the city.

Waterfront real-estate has always been in high demand and as real-estate becomes more expensive, many of the industrial waterfront areas have been displaced for residential and public areas. Now the floating home communities that where in habited by people with modest means, have slowly now changed to the ones who can afford million dollar homes and up. The log floating homes have been replaced by concrete floating foundations and architecturally designed houses that appeal to many people living in coastal cities all over the world. These waterfront floating home communities already exist in Canada, USA, Netherlands& many parts of Asia. There are many other countries that have “houseboats” type floating residences, but these are motorized vessels, which by definition and municipal recognition is not the same as a floating home.

Floating Home living is just a unique form of real-estate

The world is quickly realizing that the surface of the water is another form of real-estate. It should not be surprising to us now that with the concerns of world climate changes and higher sea levels being predicted, many of our coast urban areas are now being assessed for future flooding. The densification of urban areas and the premium being paid for living by the water, floating structures start to become a real solution. The floating home way of life has become increasingly popular with the baby boomers, most of our clients are couples that have decided now that the kids are out of the house, they want to simplify their lives, “no more lawns to cut”, and many want the ability of having their pleasure boat moored beside the house. Many economists speak of the baby boomers as the demographic that is driving the world economies, and this is exactly the group, which is now in a transitional stage many choosing to be closer to nature and within communities that will support each other and watch over their homes while they travel.

Fig.2 (Sourcewww.FloatingStructures.com)

Fig.3 (SourceIMFS www.FloatingStructures.com)

In 1980 Dan Wittenberg President of (IMFS) International Marine Floatation Systems, Inc. of Vancouver, British Columbia conceives of permanent floating concrete foundation for float homes. He determined that a floating foundation had to have the following characteristics; it must be engineered, unsinkable, fireproof, maintenance-free, one piece construction, have mass/weight, durable, rigid, environmentally safe and insurable. The engineered structural reinforced concrete float built with 100% polystyrene (EPS) foam has revolutionized the floating structures industry. Fig 2.shows the community of Canoe Pass Village in Ladner, B.C. it is the development that Dan envisioned & created to suit his floating foundation characteristics. This development today is fully occupied with 50 floating homes with all types of architectural designs; every home has moorage space for one boat. The houses are like any other land based home, connected to electrical, water, sewer and gas. The development was the first of its kind to be a floating stratified home development, where each owner purchased 1 square foot of land on shore which gives them the riparian rights to the use of the water. The water is not owned, but leased from the government which is paid through a monthly strata fee.

Fig.4 (Shew FH–Vancouver,B.C)


Fig.5 (Carlson FHSeattle - FloatingStructures.com)

The Fig. 3 shows Dan's original floating home within the community which had a foundation 30ft (9.14m) x 40ft (12.19m), with a home approximately 1800 square feet (167 sq.m) of living space, and wrap around outside decks to enjoy. This development is now 33 years old, and Dan often says, "I'v never had a call back, about the concrete floating foundation"! These foundations will outlast the building that is on them, which gives the owners a great sense of security & comfort.

Floating Home Community Living

This floating lifestyle creates a very unique sense of community, which is not seen in standard land base neighbourhoods. The people that live in these floating neighbourhoods have an incredible sense of stewardship towards the natural surroundings and environment that they are in. There is a respect for the water


Fig.6 (Arizona- FloatingStructures.com)


Fig.7 (Arizona, - FloatingStructures.com)

that keeps them afloat and in general for "Mother Nature". The community is bound together by a type of "good neighbourhood" code which is always looking after each other, a built in "block watch", which gives help-thy-neighbour a whole new meaning. How many communities have a newsletter or write books about the way of life within the community? How many communities have neighbours that in any weather or storm watch out for each other? There is no doubt that the closer you live with nature the more you tend to respect it, and these floating home communities are a testament to that.

There is a wonderful book that was created by a floating home community resident, the book is called "Facing the Water" which is a great example of floating home community within the Pacific North West. http://www.blurb.ca/b/4372843-facing-the-water

The Concrete Floating Foundation

The Douglas Fir, Spruce and Cedar logs have now

Fig.7 (IMFS Floating community concept- FloatingStructures.com)

been replaced by the concrete floating foundations. The engineered structural concrete floating foundation (CFF) is now the standard for building floating structures. IMFS concrete system has over 30 years of experience with no evidence of breakdown on any of the concrete floating projects that we have done. We take great care with having appropriate concrete coverage on the reinforcing "black steel" for all our structural walls& slabs, along with proper concrete consolidation. Our specified concrete mix is a 35Mpa (5,000 psi), using 14mm aggregate and flyash. We have manufactured most of our projects with black reinforcing steel because we feel that the uncoated bar adheres much better to the concrete and provide a stronger section overall. The polystyrene (EPS) used is a Type 1 foam with 10% regrind material allowing for 6% water absorption, the dimensional stability and compressive strength of this foam is necessary to withstand normal engineered loads.

There is no limit to designing CFF. As it has already been proven, concrete has been the material of choice for many engineers, architects who are designing structures including high-rises, bridges, airport landing strips, hydro dams and almost anything that requires strength and longevity. The CFF can be designed to be one piece foundation like many floating homes, or if the foundation needs to be larger, it can be designed to be modular with pieces that are match cast together to make one large piece. These individual pieces can then be post tensioned together with common industry PT techniques to make up one large floating foundation. Fig 6.Shows 27,000 square foot (2508 sq.m) CFF, a project IMFS designed and engineered in 2006 which

Fig.8 (IMFS Completed Floating Projects- FloatingStructures.com)

was built in Arizona, for Lake Powell house boating facility. This CFF was made up of 14 individual large floats Fig. 7 showing one of the floats being launched down the very narrow ramp into the water. These individual floats where then floated together, post tensioned to make up the 27,000 SF foundation. After the foundation was complete the local builder started building the restaurant, general store and washroom facilities that made up the building.

The limitation of design of a CFF is often the ability to put or launch the foundation in the water. It is critical to design the CFF to what the local or site specific lifting and launching equipment which is available. When designing structures that are 50/100/400 Tons, many construction details need to be considered, everything from the capacity of your lifting equipment to the integrity of your work yard ground condition, proximity to water, tidal fluctuations, launching water depths, distance to the ultimate location and site specific considerations.

The Future of Concrete Floating Foundations (CFF)

Every major city that is surrounded or close to seas, lakes and rivers, are now talking about the effects of climate change and possibility of devastation because of water level is rising. The impact of urban areas by flooding as we have seen in many parts of the world is very real. The reality to engineers and architects is that if they are going to design buildings and cities that are by the water, they should consider them to be floating structures. Fig. 7 below shows IMFS concept drawing of a waterfront floating community that has access to land, but is completely self-sufficient. The perimeter large breakwater or wave attenuator has the capacity to hold major roadway, and all the retail and common community requirements above the roadway. The houses and the density shown is just concept, as architects and engineers can make this whatever style or layout they deem suitable. It is quite evident in today's news articles of industry magazines as this one; that these types of communities are being designed and considered already viable options and in time will become part of our urban landscape.

SOUTHERN CENTRE ACTIVITIES

11.02.2015: மாநிலத்தலைவர் தேர்தல் - 2015-16

கடந்த செயற்குழுக்கூட்ட முடிவின்படி தென்னக மய்யம் சார்பாக திரு. N. ரகுநாதன் அவர்களுடைய மாநிலத்தலைவர்- தமிழ்நாடு-2015-16 பதவிக்கான வேட்புமனு தலைமையகம் அனுப்பி வைக்கப்பட்டது.

18.02.2015: CMDA MEETING

மாண்புமிகு மாநில நிதி அமைச்சர் 2012-13 நிதி நிலை அறிக்கையில் EWS, LIG மற்றும் MIG போன்ற வீட்டு திட்டங்களுக்கு FSI (Floor Space Index) அதற்குண்டான கூடுதல் தொகை வசூலிக்காமல் வழங்கப்படும் என்று அறிவித்திருந்தார். அந்த அறிவிப்பை அமுல்படுத்தும் பொருட்டு Member Secretary - CMDA. இன்று காலை 11 மணி அளவில் CMDA அலுவலக வளாகத்தில் அதற்குண்டான வழி முறைகளை ஆலோசிக்க கூட்டம் ஒன்றை ஏற்பாடு செய்திருந்தார். அக்கூட்டத்தில் தென்னக மய்யம் சார்பாக கவுரவ செயலாளர் திரு. A.N. பாலாஜி அவர்களும், CMDA குழுத்தலைவர் திரு. S. இராமப்பிரபு அவர்களும் கலந்து கொண்டு தன் கருத்தை பதிவு செய்தனர்.

20.02.2015: புதிய மய்ய துவக்கவிழா

நமது அகில இந்தியத்துணைத்தலைவர் திரு. L. மூர்த்தி மற்றும் மாநிலத்தலைவர் திரு. D.R. சேகர் அவர்களின் பெரு முயற்சி செய்து செங்கல்பட்டு மய்யத்தின் உதவியால் புதிய மய்யம் அந்தமான் தீவில் துவக்கி வைக்கப்பட்டு புதிய அலுவலக நிர்வாகிகள் பதவி ஏற்றுக்கொண்டனர். நமது அகில இந்திய முன்னாள்தலைவர் திரு. R. இராதாகிருட்டிணன் அவர்கள் கலந்து கொண்டு வாழ்த்துரையாற்றினார்.

21.02.2015: நான்காவது மாநில பொதுக்குழுக்கூட்டம்

நான்காவது மாநில அளவிலான பொதுக்குழுக் கூட்டம் புதிதாக துவக்கப்பட்ட அந்தமான் தீவில் மிகவும் சிறப்பாக நடைபெற்றது. இந்த மாநிலக் கூட்டம் புதிதாக ஆரம்பிக்கப்பட்ட மய்யத்தால் நடத்தப்பட்டது. (Sponsor) என்பது குறிப்பிடத்தக்கது. அதில் தென்னக மய்யத்திற்கு உறுப்பினர் சேர்க்கையில் சாதனை செய்தமைக்கு சான்றிதழ் மய்யத்தின் துணைத்தலைவர் திரு. O.K. செல்வராஜ் அவர்கள் பெற்றுக் கொண்டார். புதிய மய்ய துவக்கவிழா மற்றும் மாநில அளவிலானக் கூட்டத்தில் தென்னக மய்யம் சார்பாக 25க்கும் மேற்பட்டோர் கலந்து கொண்டு சிறப்பித்தனர்.

27.02.2015: கலந்தாலோசனைக்கூட்டம்

சென்னை பெருநகர் வளர்ச்சிக் கழகத்தால் (CMDA) திருத்தி அமைக்கப்பட உள்ள வளர்ச்சி சட்டங்கள் (Development Rues) சம்மந்தமாக வரைவு மனு அளிப்பதற்கு தென்னக மய்யம் சார்பாக கலந்தாலோசனைக்கூட்டம் சென்னை ஆந்திரா கிளப், தி.நகரில் காலை 10.00 மணியளவில் ஏற்பாடு செய்யப்பட்டது. இதில் Affiliated Association களான North Chennai Flat Promoters Association, Flat Promoters Association (Avadi-Ambattur). Suburban Flat Promoters Association, Singara Chennai Flat Promoters Association, Chennai suburban Flat Promoters Association, Civil Engineers Association அலுவலக நிர்வாகிகளும் , உறுப்பினர்களும் நமது மய்ய நிர்வாகிகளும், உறுப்பினர்களும் கலந்து கொண்டு தங்கள் கருத்துக்களை பகிர்ந்து கொண்டனர்.

SOUTHERN BUILDER ADVERTISEMENT TARIFF

We request you to patronize the issues by providing your advertisements, to promote your products on our Southern Builder Magazine for the year 2015

S.No.	Description	Rate Per issue Rs	Rate per Annum (one Time Payment) Rs
1	Multi Colour A4 Size - Rear Cover outer	25,000	Rs. 2,50,000
2	Multi Colour A4 size - Front/Rear Inner	15,000	Rs. 1,50,000
3	Multi colour A4 size - Inner page	12, 500	Rs.1,25,000
4	Multicolour half size - Inner Page	7,500	Rs. 75,000
5	Black & White A4 size - Inner page	10,000	Rs.1,00,000
6	Black & White half size - Inner Page	6,000	Rs. 60,000

Thanking you in anticipation your early response.
With regards,

A.N. Balaji
Hon. Secretary

SUDOKU

January Issue - SUDOKU - புதிருக்கான விடை

3	4	7	5	2	9	6	1	8
9	6	5	8	4	1	7	3	2
8	2	1	3	7	6	5	9	4
5	9	3	2	8	7	4	6	1
6	7	2	4	1	5	3	8	9
1	8	4	9	6	3	2	5	7
4	3	6	7	9	8	1	2	5
7	1	9	6	5	2	8	4	3
2	5	8	1	3	4	9	7	6

February Issue - SUDOKU - புதிர்

					1			
		4	3	2		6		
	5						8	
6				4			1	
	7		2		6		5	
	8			1				6
	1						9	
		5		7	8	3		
			6					

சிமென்ட் நிறுவனங்கள் கூட்டு சதி

புதுடில்லி, பிப். 19–

"சிமென்ட் நிறுவனங்கள் கூட்டு சேர்ந்து, விலையை உயர்த்துவதால், சாலைகள் மற்றும் நெடுஞ்சாலைகள் அமைப்பதற்கான திட்டச் செலவுகள் தாறுமாறாக எகிறியுள்ளன," என, மத்திய அமைச்சர் நிதின் கட்காரி குற்றம் சாட்டியுள்ளார்.

அவர், இந்திய தொழிலக கூட்டமைப்பின் கூட்டத்தில் மேலும் பேசியதாவது:

சிமென்ட் நிறுவனங்களின் உற்பத்திக்கும், விற்பனை விலைக்கும் இடையே அதிக வித்தியாசம் உள்ளது. அவை, கூட்டு சேர்ந்து செயல்படுகின்றன. ஒவ்வொரு நிறுவனமும் லாபம் சம்பாதிக்க வேண்டியது தான். ஆனால், அளவிற்கதிகமாக சுரண்டக் கூடாது. சிமென்ட் நிறுவனங்களின் இத்தகைய போக்கு குறித்து, பிரதமரிடம் முறையிட உள்ளேன்.

அரசு, சிமென்ட் சாலைகளை அமைக்கவும், அவற்றுக்கான செலவைக் குறைக்கவும் விரும்புகிறது. ஆனால், மூலப் பொருள்விலைகுறைவாக இருந்தால் தான், இது சாத்தியமாகும். தேசிய நெடுஞ்சாலை ஆணையத்தை, சீரமைக்க வேண்டிய நேரம் வந்து விட்டது.

ஆணையத்தின் நடவடிக்கைகள் வெளிப்படையாக இருக்க வேண்டும். இதற்காக, ஆணையத்தை சீரமைத்து, நவீனமயமாக்க அரசு திட்டமிட்டுள்ளது.

இவ்வாறு, அவர் கூறினார்.

நிதின் கட்காரி

நடப்பு நிதியாண்டிற்குள், 8,000 கி.மீ., நெடுஞ்சாலை திட்டங்களை செயல்படுத்த, இலக்கு நிர்ணயிக்கப்பட்டு உள்ளது.

ஒரு நாளில், சாலை அமைப்பதற்கு நிர்ணயிக்கப் பட்ட குறைந்தபட்ச இலக்கு, 3 கி.மீ., என்ற அளவில் இருந்து, 30 கி.மீ., ஆக அதிகரிக்கப்பட்டு உள்ளது.

F.E.A.R has two meanings

Forget Everything And Run
Face Everything And Rise
The choice is yours.

Courtesy - Whatsup

jayaraj

Jayaraj International (P) Ltd.,

(an ISO Certified Company 9001:2008)

Leaders in Teak Wood





T. Raja Sekhar
Managing Director

Our Company has **"Sudan Teak"** a best alternative for **"Burma teak "**

Largest Importers of

Teak, Padouk, Mahagony, Gmelina, Iroko etc.,

Teak wood Logs | Teak Sizes | Door & Window Frames | Flooring | Wall Panelling

Timber Yard : No.19, Jaya Street, Puzhal Union Road, Vadaperumbakkam, Chennai 600 060
Corporate Office : 12/1, First Floor, United India Colony, 4th Cross Street, Kodambakkam, Chennai 600 024
Enquiry Nos. : 098400 70992 / 093826 66666 / 098408 15812 / 093846 66608 / 093828 66601 **Fax No.**: 044 2472 4688
Email ID : **jayarajenquiry@gmail.com** Website : **www.jayarajtimber.com**

Designed for Tough Site Conditions

Stetter

Self Loading Mixers

E-Weigh Batching

The different aggregate, sand, cement can be weighed accurately by the electronic weigh batching system.

Gradeability

High level of gradeability to make tough environment look easy.

Shovel

Hydraulic Cylinders activate 600L capacity loading Shovel. Single joystick control for easy loading and quick unloading shovel Gate operations.

With Long Service Life, we made them perfect with trusted Stetter Quality and supported with the Superior after-sales support across India. The machine comes with Electronic Weigh Batching as option and are available in 4 and 2 Cubic meter capacities. For further details please contact us.

Batching Plants | Concrete Pumps | Transit Mixers | Concrete Recycling Plants | Belt Conveyors | Separate Placing Booms | Shotcrete Pumps | Tower Cranes

SCHWING STETTER (INDIA) PVT LTD

ISO 9001:2008 :: OHSAS 18001: 2007 :: ISO 14001:2004

F 71 - 72, SIPCOT Industrial Park, Irungattukottai, Sriperumpudur Taluk, Kancheepuram District,Tamil Nadu - 602105.
Phone : 044 2715 6780 / 781, 47108100 / 33555588 Fax : 044 27156539 Visit us at www.schwingstetterindia.com

MUMBAI 022 25624863 / 64, 30718300 / 33555588 | **NEW DELHI** 011 3092 8500 / 33555588
HYDERABAD 040 6615 1783 / 33555588 | **BANGALORE** 080 4243 8400 / 33555588
KOLKATA 033 3322 3300 / 33555588 | **COCHIN** 0484 4055984 / 3355558
AHMEDABAD 079 40244200 / 33555588 | **PUNE** 020 26055651 / 2 / 33555588
MOHALI 0172 3957500 / 3957503 | **BHUBANESWAR** 0674 2463999 / 3355558
GUWAHATI 0361 2234738 | **RAIPUR** 0771 2562325

SCHWING Stetter