



Southern Builder

Bulletin of Builders Association of India - Southern Centre



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November 2015



புதுக்கோட்டையில் நடைபெற்ற மாநில அளவிலான கூட்டத்தில் அமரர்
திரு. M. கோபலாகிருட்டிணன் (முன்னாள் மாநிலத் தலைவர் - தமிழ்நாடு மற்றும் புதுச்சேரி)
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Thanking you in anticipation your early response.
With regards,

K. Venkatesan
Hon. Secretary



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Contents

ஆசிரியர் மடல்	4
மய்யத் தலைவர் மடல்	5
Post Excon Report	6
New Construction Material: Basalt Rock and its Composite Reinforcement	9
பவள விழா நினைவலைகள்	14
Maintenance Tips on the House	21
Shotcrete or Grouted Concrete	25
Intelligent Building:A Wise Investment	29
Southern Centre Activities	33

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ஆசிரியர் மடல்

வணக்கம்

சென்னை நகரம் உருவாகி 375 ஆண்டுகள் ஆகிவிட்டன. நிறைய வளர்ச்சிகள் மாற்றங்கள் ஏற்பட்டுவிட்டன. 10 ஆயிரம் மக்கள் இருந்த நகரம் ஒரு கோடி மக்கள் வசிக்கும் அளவுக்கு வளர்ந்துவிட்டது.

மக்கள் பெருக பெருக அவர்களுக்கு தேவையான குடிநீர் ஆதாரங்களை பெருக்குவதை விடுத்து ஏற்கனவே இருந்த மாம்பலம் ஏரி, அம்பத்தூர் ஏரி, ஆவடி ஏரி, கொளத்தூர் ஏரி, வில்லிவாக்கம் ஏரி (சிட்கோ நகர்) போரூர் ஏரி, மதுரவாயல் ஏரி, நுங்கம்பாக்கம் ஏரி, தாம்பரம் ஏரி, முடிச்சூர் ஏரி ஆகிய ஏரிகளை குடியிருப்புகளாக மாற்றி ஏரிகளை மூடிவிட்டோம். சுமார் 3000 ஏக்கராக இருந்த பள்ளிகரணை சதுப்பு நிலத்தை 500 ஏக்கருக்குள் சுருக்கி விட்டோம்.

சென்னைக்குள் ஓடிவந்த கூவம் ஆறு 1950க்கு பிறகு கூவம் கழிவு நீர் ஓடையாக மாறியது. 1800 களில் பிரிட்டிஷ் அரசாங்கம் வணிக மேம்பாட்டுக்காக உருவாக்கிய பக்கிங்காம் கால்வாய் காக்கிநாடா முதல் கடலூர், பரங்கிப்பேட்டை வரை சுமார் (600 கிலோ மீட்டர்) சுதந்திர இந்தியாவில் தூர்ந்து போய் செயல்படாமல் ஆக்கிரமிக்கப்பட்டுவிட்டது.

ஒரு காலத்தில் பூம்புகார், மகாபலிபுரம், தரங்கம்பாடி, தற்போதைய தனுஷ் கோடி அழிந்ததை படித்திருக்கிறோம். கேள்விப்பட்டிருக்கிறோம். தற்போது சென்னை நகரம் பூகம்ப அபாயப்பகுதி 3ல் இருக்கிறது. சுனாமியைக் கண்டுவிட்டது. தற்போது வரலாறு காணாத மழையை, பெரு வெள்ளத்தை சந்தித்து விட்டது.

சென்னை பெருநகர வளர்ச்சிக் குழுமம் என்று ஒரு அமைப்பை உருவாக்கினோம். அதன் வேலை என்ன ? அது என்ன செய்து கொண்டிருக்கிறது ? பெருநகரத்தின் வளர்ச்சிக்காக அதன் எதிர்கால தேவைகளை குறித்து வல்லுநர்களைக் கொண்டு (சர்வதேச புகழ் பெற்ற அண்ணா பல்கலைக்கழகம் மற்றும் IIT நம் சென்னையிலேயே இருக்கிறது.) ஆராய்ந்து திட்டங்களை செயல்படுத்த வேண்டியது அதன் வேலை. ஆனால் ஒரு கோயம்பேடு வணிகவளாகம் மற்றும் பேருந்து நிலையம் மட்டும் அமைத்ததுதான் நமக்கு கிடைத்த பலன்.

சென்னை நகரின், குடிநீர் மேலாண்மை, நிலத்தடி நீர் மேலாண்மை, கழிவு நீர் சுத்திகரித்தல், மறு சுழற்சி பாதுகாப்பான கழிவு நீர் வெளியேற்றம் போன்றவைகளில் ஒருங்கிணைந்த திட்டமிடல் தேவை. மழைநீர் வடிகால்கள் மற்றும் வெள்ள நீர் வெளியேற்றம் குறித்த ஒருங்கிணைந்த அமைப்பு ஏற்படுத்தப்படவில்லை . நகரின் பசுமை பாதுகாப்பு மேம்பாடு குறித்த திட்டமிடல் தேவை.

சுற்றுச்சூழல் மிக்க, பாதுகாப்பான, சுகாதாரமான சென்னை நகரம் உருவாக ஆட்சியாளர்களும், அறிவியலாளர்களும் செயல்பட வேண்டுகிறோம்.

கெடுப்பதூஉம் கெட்டார்க்குச் சார்வாய்மற்று ஆங்கே
எடுப்பதூஉம் எல்லாம் மழை

- திருக்குறள்

அன்புடன்
மு. மோகன்





மய்யத் தலைவர் மடல்

அன்புள்ள உறுப்பினர்களுக்கு, வணக்கம்

புதுக்கோட்டை மய்யத்தால் 01.12.2015 ஏற்பாடு செய்யப்பட்ட 3வது மாநில அளவிலான கூட்டம் சிறப்பாக நடைபெற்றது. அதில் தென்னக மய்யம் சார்பாக மூத்த தலைவர்கள், அலுவலக நிர்வாகிகள், பொதுக்குழு உறுப்பினர்கள் உட்பட 22க்கும் மேற்பட்ட உறுப்பினர்கள் கலந்து கொண்டனர். சிறப்பாக உபசரித்த புதுக்கோட்டை மய்யத்திற்கு நமது பாராட்டுக்களை தெரிவித்துக்கொள்கிறோம்.

2015-16 ஆண்டிற்கான தென்னக மய்ய உறுப்பினர் எண்ணிக்கை கடந்த ஆண்டை விட 102 உறுப்பினர்கள் அதிகம் பெற்று மொத்த உறுப்பினர்கள் 2165 ஆக அகில இந்திய அளவில் தொடர்ந்து மிகப் பெரிய மய்யம் என்ற பெருமையை தக்க வைத்துக்கொள்ள ஒத்துழைப்புக் கொடுத்த அனைவருக்கும் என் நன்றியைத் தெரிவித்துக் கொள்கிறேன்.

12.11.2015 அன்று தமிழக அரசின் சுகாதாரத்துறை அமைச்சர் மாண்புமிகு திரு. விஜய பாஸ்கர் தலைமையில் நடைபெற்ற டெங்கு காய்ச்சல் விழிப்புணர்வு முகாமில் தென்னக மய்யம் சார்பாக செயலாளர் மற்றும் இணைச் செயலாளர் அவர்களும் என்னுடன் சேர்ந்து கலந்து கொண்டனர். பெருவாரியான கட்டுனர்களும் கலந்து கொண்டனர்.

21.11.2015 அன்று பூனையில் நடைபெற்ற அகில இந்திய மேலாண்மைக்குழு மற்றும் மூன்றாவது பொதுக்குழு கூட்டத்தில் அகில இந்திய முன்னாள் தலைவர்கள் திரு. R. இராதாகிருட்டிணன், திரு. M. கார்த்திகேயன் மற்றும் மாநிலத்தலைவர் உட்பட பத்துக்கும் மேற்பட்ட பொதுக்குழு உறுப்பினர்கள் கலந்து கொண்டனர்.

வருகின்ற ஜனவரி 8,9 மற்றும் 10 தேதிகளில் நடைபெற உள்ள அகில இந்திய 27வது கட்டுனர்களின் மாநாட்டில் நமது மய்யத்தில் இருந்து அதிக அளவு உறுப்பினர்கள் கலந்து கொண்டு சிறப்பிக்குமாறு கேட்டுக் கொள்கிறேன்.

அன்புடன்

O.K. செல்வராஜ்
மய்யத்தலைவர்



Post Excon Report

- V.G. Sakthikumar, Schwing Stetter India

SCHWING Stetter India proved itself again as a leader in concreting equipment industry by showcasing its product strength during this Excon 2015. As the leading concrete construction equipment manufacturer in India, SCHWING Stetter unveiled five new products along with five new upgrades and five new innovations in Electronics and Automation at Excon 2015. The eighth edition of Excon was the South Asia's biggest construction equipment event, which drew huge crowd of different stakeholders from the Industry.

SCHWING Stetter India occupied a prominent position at the entrance of the exhibition to showcase its cutting-edge technology and after sales support. The show was held at Bangalore International Exhibition Center, Bangalore from 25th to 29th November- 2015. Many visitors with very specific requirements for new concreting solutions visited SCHWING Stetter India booth.

SCHWING Stetter India's stall was spread over an area of 2460 sq.mt., to display its complete range of concreting machinery. The stall had a live display and demo of 32 machines, which attracted the customers. The new product launches was the major attraction during the event.

The range of the newly launched products includes:

1. M30Z – Batching Plant
2. SLM 2200 – Self Loading Mixer
3. RVH 18- Circular Distributor
4. LW 300 FN – Wheel Loader (3 tonne capacity)
5. ZL50GN- Wheel Loader (5 tonne capacity)



6. GR 150 - Motorgrader

In addition to this, SCHWING Stetter is launching 5 new upgraded products and 5 new innovations in electronics and automation.

The range of the newly upgraded products includes:

1. S43 Boom Pump: India's largest Boom Pump mounted on a Four Axle Truck
2. SP1807 Stationary Pump
3. New canopy for stationary pumps with Aerodynamic design.
4. Weighbridge
5. Inner climbing mechanism for Tower crane

The range of new innovation in electronics and automation includes:

1. MCI 55 Control System for Smaller Batching Plants
2. MCI 100 Control System for Medium Sized Batching Plants
3. MCI 550 Control System for Large Sized Batching Plants including networking and GPS connectivity
4. Electronic dosing system for shotcreting pumps
5. Integrated control panels for stationary pumps

The stall looked very attractive with its two-tier structure, along with the huge space for product display on the ground floor. While the meeting rooms provided opportunity for the customers to experience about our product application, training and automation. Schwing-Stetter India stall also provided live demo models for Auto greasing system and Weigh Bridge was also displayed.



The products were unveiled by Mr. AnandSundaresan, Vice Chairman & Managing Director, Schwing Stetter India, President ICEMA and Mr. V.G. Sakthikumar, Managing Director SCHWING Stetter Sales and Services Private Limited, Chairman of Mechanization committee, Builders Association of India. Speaking on the occasion, Mr.AnandSundaresan, Vice Chairman & Managing Director, Schwing Stetter Indiasaid, “We are delighted to have launched new products and be a part of Excon again. This is a prestigious event for us, and a great platform for us to showcase our latest products and our cutting-edge technology. The very key factor in launching new products is to make sure that they meet the Indian conditions, meet the customers’ expectations and help them to do their concerting job with ease”.

Mr.V.G. Sakthikumar,Managing Director SCHWING Stetter Sales and Services Private Limitedsaid, “This is a moment of pride for us at SCHWING Stetter India. Excon has always been the one-stop-shop for us to build and maintain relationships with potential as well as existing customers. Our newly launched products demonstrate high levels of quality and efficiency, as our mantra is to deliver the best-in-class concrete solutions for the construction industry. We hope to showcase our expertise with more such remarkable products and continue to re-define the construction space by employing the best-in-class technology.We were very happy that we could showcase our products, services and new technologies to the customers for their review. We received a very positive review from our customers. We also got many deals finalized for the equipment what we exhibited, especially for the new ones. So, this gave us a tremendous amount of satisfaction that we participated in EXCON and our commitment to the exhibition and to the customers were well appreciated by customers, other exhibitors and even the organizers.”

Excon is the industry’s most prestigious event or-



ganized by the Confederation of Indian Industry (CII) along with the Indian Construction Equipment Manufacturers Association (ICEMA). This event enables networking with all industry experts in a single platform including those from prestigious industry bodies like Builders Association of India (BAI). This event also co-incident with a conference on Rebooting Infrastructure by ICEMA, CII, Department of Industrial Policy and Promotion .

Mr. AnandSundaresan, President, ICEMA, in his welcome address, said that the conference is being held at an opportune moment where on the one hand, there is huge potential for infrastructure development and opportunity for the construction equipment business to grow, on the other hand, the manufacturers of construction equipment are cautiously optimistic due to negative growth in the last three to four years.

The conference would deliberate on key challenges in accelerating growth of infrastructure with focus on sustainable development. Other focus areas of the Conference include; Make in India – Components & Aggregates Manufacturing; Easing regulatory policies for successful implementation of projects; Construction Equipment Financing; Upgradation of Technology; Skills & Manpower Development.

ICEMA and CII published a Report on Indian Construction Equipment Industry - Vision 2020. The report was released on 25th November by Shri Nitin Gadkari, Hon'ble Minister of Road Transport & Highways and Shipping, Government of India at the inaugural ceremony of EXCON 2015. The key features of the report would be (a) state of infrastructure industry in India (b) current demand scenario of Indian construction equipment (c) critical issues faced by the ICE industry (d) future outlook and projected market size of equipment by 2020, and (e) the way forward on the critical issues faced by the ICE industry in India.





Southern Builders Charitable Trust Builders Association of India



Chennai Flood Relief Appeal

Dear Fellow Builders

08.12.2015

You are well aware of the disastrous faced by the Chennai City and Suburb due to the unprecedented rain and floods which was record for the last one century. The Devastation caused huge loss of properties, belongings and houses. Especially the under privileged construction workers who are living in temporary tenements have lost everything except their lives. The southern builders Charitable Trust And Builders Association of India, Southern Centre(Chennai) have already started mobilizing funds and distribution of essential commodities like bed sheets, lungies, towels, water bottles etc.

We have desired to procure more household articles to the really needy thousands of construction workers. We kindly request you to contribute liberally for the good cause. The beneficiaries will directly get the benefit by the above method of distribution.

You can send Cheque/ Draft and transfer fund through RTGS/ NEFT towards your contribution as detailed below.

Cheque And Draft can be drawn in favour of Southern Builders Charitable Trust.

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Here we would like to bring to your kind notice that the Southern Builders Charitable Trust is already got exemption u/s 80G of the income Tax Act Under 1961.

We once again pray and request the noble hearted brothers to send your contribution as early as possible.

With warm regards and best wishes.

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THEME FOR PLATINUM JUBILEE CELEBRATION
“BETTER INFRASTRUCTURE FOR BULAND BHARAT”



New Construction Material: Basalt Rock and its Composite Reinforcement



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Introduction

Fibers such as steel, carbon, glass, plastic, polymer, etc are available for producing various construction materials. However, Basalt fiber is different from these fibers because of its uniqueness, blended property, green and harmless natural. There is a quote to comment a highly talented person that "He is the person can takeout fiber from stone", this statement has become true now that fibers are taken out from basalt stone and used for manufacturing construction materials.

Today every organization has to contribute in lowering carbon pollution and step into sustainable construction. The key products of igneous basalt rocks such as diopside and diabase are green materials. These basalt minerals carry special parameters such as advanced strength, high melting temperature, low thermal conductivity, chemical resistance to acids, alkali and salt environment. In addition to this, diopside and diabase have their own unique features that allow them to be used in separate industries in the most efficient way.

Basalt Fiber

Basalt fiber is an innovative high-technological material made out of basalt rock raw material. Basalt rocks have magmatic origin and naturally have high chemical and thermal resistance. Basalt is one of the strongest natural silica rocks. Therefore, fiber from basalt rock have high strength, durability, electric insulation, resistance to salt, acids, alkali, corrosion and chemicals environment. In addition to this, basalt fiber doesn't lose its structure even after multiple repeated effect of various temperature changes. Because of unique physical, chemical and mechanical properties, basalt fiber can be used in such conditions where other materials doesn't work or where structures and parts periodically need to be repaired (high temperatures, vibration, aggressive environment etc.). These special

properties allow wide use of basalt fibers in concrete reinforcing for bridges, tunnels, water barriers, beams, road surface, aircraft landing strips and other building constructions where steel bar is exposed to humidity, salt and alkali environment. Basalt fiber is compatible with organic and inorganic binders that allow to create a new family of composite building materials. Operating temperature of pure basalt fibers ranges from -260°C to $+650^{\circ}\text{C}$. Therefore, fibers are suitable for filters that clean waste gases from dust particles in metallurgical, energy and other plants.

Chopped continuous basalt fiber is an effective reinforcement additive. They are used in reinforced concrete, foam concrete, polystyrene concrete, asphalt, etc to improve tensile strength of the materials.



Properties of basalt fiber:

- Significantly increases the impact and fatigue strength
- Significantly increases the tensile and tear strength.
- Increases resistance to mechanical action, reduces shrinking deformation
- Provides three-dimensional material reinforcement.



- Increases resistance to abrasion.
- Increases crack resistance, ensures absence of shrinkage cracks and stress cracks.
- Prevents plastic deformation, surface flaking.
- Posses high adhesion to solution and forms a homogeneous mass.
- Is completely non-flammable, make the material fire and heat resistant (operating range of fiber temperature: from $\square 260$ °C to 750 °C).
- Structural strength throughout the temperature range.
- Environmentally and chemically clean (basalt fiber is a 100% stone) and durable material

Types of Basalt Fiber

The quality of basalt fiber primarily depends on original raw material. Basalt fibers fall into two major groups: continuous and discrete ones. Almost any type of basalt rock is suitable for discrete fiber production, but not for continuous one. Basalt quarries are irregular. Huge quarries exist on several countries such as Russia, Ukraine, USA and China. Several companies from Georgia, Armenia, Germany, Belgium and USA have tried to produce basalt continuous fiber. However, by this moment, there are almost no project in these countries which have reached mass production level.

Basalt Continuous Fiber

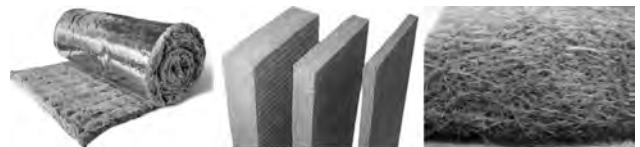
Basalt continuous fiber machinery consists of rock melting furnace with several feeders, depending on furnace sizes. There are platinum- rhodium flow bushings installed in feeder. There are several different technologies of producing basalt continuous fiber. They differ by furnace and feeder scheme, cooling and spinning equipment etc. But basic technological process involve: Collection of basalt aggregates; Turning aggregates into a melt; Melt is drawn through bushing; Fiber drawing; Fiber lubrication; Finally spooling on the coil.

Basalt is inherently one of the forms of glass. Glass is an inorganic solid amorphous body obtained by melt glass overcooling which acquires mechanical properties of crystalline solids as increased viscosity. Glass holds an intermediate position between liquid and crystalline substances. Glass does not melt when heated like crystalline substances but softens by gradual transfer from the solid to plastic and then liquid state. At the temperatures ranging from 700°C to 1250°C basalt glass crystallizes due to its mineralogical memory. Continuous fiber is formed at temperatures from 1250°C to 1450°C.

Continuous fiber is obtained by continuous glass melt drawing through die holes followed by winding on a rotating drum. The process of fiber formation from the melt through die holes is determined by: glass viscosity; nature of viscosity change as the temperature changes; level of surface tension; crystallization rate; temperature of the upper limit of crystallization. To obtain continuous fiber, it is necessary to use basalt raw material with the low rate of crystallization. It is desirable to ensure the minimum upper limit of crystallization. High-viscosity glass melt has a high tensile resistance which requires the increased drawing force and can lead to fiber breakout. As the melt temperature increases, its viscosity decreases and can reach such low values that the surface tension forces lead to glass formation as droplets, instead of drawing into continuous fiber. In the interval between these two extreme states glass melt can have an application viscosity that ensures the fiber formation process. Different species of basalt raw materials have a different application. Thus, in order to produce quality basalt continuous fiber that has high mechanical properties and low level of breakage, it is necessary not only to choose the right raw materials but also to develop an efficient melting and drawing method.

Basalt Roving is a complex thread, consisting of evenly stretched basalt continuous fibers. Basalt roving has inherent strength, resistance to chemicals, water, salt, alkali and acids, long service life and immaculate electric isolation properties. Roving is classified by density, quantity of fibers in a thread and called as a "tex". Tex is the weight of 1 km of roving, usually ranges from 800 to 2400 Kgs. Roving is packed in wrapped bobbins. Basalt continuous fiber is manufactured by melting diabase basalt rock and drawing the melt through die holes. Fiber thickness is approximately 12 micron that is 7 times thinner than a human hair.

Basalt Discrete Fiber



Vertical air or vapor blowing

Currently, fine basalt fiber is widely produced by the method of vertical air or vapor blowing, including processing thereof into broached heat insulating and filter mats. Rocks with the properties of low viscosity and medium viscosity melts are used as the source single component raw material. The distinctive feature of the technology is the use of single component raw materi-



als, absence of glass platinum-rhodium feeders during melt processing and avoid wastages. High technical and economic characteristics of products provide for their wide use as an insulating material for general construction, drainage filters, resistant to aggressive groundwater, filters for the medical industry, etc.

Multi-roll centrifugal method.

The more advanced fiber production technology is a high-speed multi-roll centrifugal method. The melt is sprayed in high-speed (up to 6,500 rpm) roll centrifuges. During fiber formation, the expanded raw material passes through the electromagnetic field, resulting in obtaining high-quality fiber with the diameter of 3 to 4.5 μm and the length of about 35 to 50 mm which has a very low content of non-fiber inclusions (not more than 2%). The fibers are carried over by the gas flow to the fiber deposition chamber in which they are deposited on a moving screen feeder in the form of the carpet and, finally, wound on a take-up drum. The thickness of the resulting basalt carpet depends on the feeder rate. The carpet is removed from the drum and fed to further processing steps. The basalt carpet roll is a heat insulation material supplied for heat and sound insulation of walls, floors of buildings, manufacturing of bodies of refrigerators, coolers, insulation of cookers, washing machines, ships, aircraft, etc.

Duplex method

This method is used for the production of ultrafine basalt fiber. Basalt gravel of the strictly defined size is fed in portions into the melting unit. Basalt is melted, homogenized and punched under its own weight through bushing plates made of heat resistant steel with complex orifices, thus forming droplets. The droplets are used to draw filaments 300 to 350 μm thick which at the next step are blown up by the high temperature gas-air mixture blowing fiber at 90° angle. Primary fiber is melted, and secondary filaments 1 to 9 μm thick are drawn by the high speed flow of incandescent gas.

Comparison of Basalt Fiber With Glass Fiber

Both are very similar composite materials but basalt fiber advantages are: Higher ultimate resistance to harsh alkaline, acids, chemicals; Better electrical insulation; Stronger tensile strength; Better UV resistance; Difference based on original raw material are: Basalt Fiber are from volcanic rock and Glass Fiber are from sand. Production process differences are: Raw materials for glass fiber are silica sand, feldspar, sodium sulfate, anhydrous borax, boric acid, and many other materials. For basalt fiber need only one kind of raw material ie basalt.

Basalt Fiber is a Green Product

Basalt continuous fiber is more ecological than other composite materials for the following reasons:

- Natural and pure raw material - basalt rock. 1 kg of basalt rock produce 1 kg of basalt fiber;
- No additives are used when melting the rock; no chemicals, mediums, pigments or any other materials;
- Natural gas or electricity is used for furnace and feeders;
- Machinery and equipment are ecologically safe, space-saving and doesn't emit harmful waste; only products of natural gas complete combustion are emitting to atmosphere after cooling in recuperative heat exchanger and purification in filters;
- Basalt fibers are ecological, incombustible, explosion-proof and doesn't evolve hazardous agents in air and water;
- During recycling basalt fiber turn into a powder which is easily removed from furnace and then can be used as a filler for various matrix.

Basalt Composite Reinforcement

Durability problems in concrete related to environmental causes such as steel corrosion, delamination, cracking, carbonation, sulfate attack, chemical attack, scaling, spalling, abrasion and cavitations in which, corrosion in steel is a major problem in RCC. Probably, basalt fiber kind of corrosion free rebar material may replace steel bar in future and give immense benefits in the RCC construction. Non-metallic basalt composite reinforcement is a worthy competitor to the conventional steel reinforcement. It has been increasingly used both in the residential and industrial construction, as well as in the construction of administrative and municipal facilities. This type of reinforcement provides a perfect adhesion to concrete, has high strength and is practically not subject to various deformations.

Basalt composite reinforcement is ideal for concrete that contact with aggressive media. The number of laboratory tests shows that basalt reinforcement is resistant to acid and alkaline media, does not come into contact with chemical agents. This allows to significantly increase the service life of structures compared to conventional concrete structures. It also has a low heat conductivity coefficient which contributes to the energy efficiency of any facility. In addition to heat conductivity, it also has some other characteristics: for example, this reinforcement is magnet inert and acts as a dielectric which allows avoiding electromagnetic



turbulence perceived both by the medical and different single-purpose equipment. The cost of building structures is reduced due to the use of non-metallic reinforcement of smaller diameters compared to metallic reinforcement. Furthermore, the lack of reinforcement corrosion leads to the increased durability of product operation, reduction or elimination of repair costs. The weight of 1 kilometer of composite reinforcement with the diameter of 8 mm is only 100 kg compared to 400 kg of steel reinforcement.

Basalt Composite Reinforcement is a composite polymer material reinforced by basalt fiber. Composite materials are characterized by low density, high strength and high resistance to all types of aggressive environment. It is a composite polymer material reinforced by basalt fiber, would like to introduce diopside materials perfectly suited for high quality concrete production. Composite reinforcement is used as flexible coupling of three-layer walls of civil, industrial and agricultural buildings and structures which include a base layer, a lined layer and a hard insulator layer, as well as in light and heavy concrete (foam concrete, floor slabs, solid foundations) and in road construction for asphalt coating.



	Basalt composite reinforcement	Steel bar grade A500 (analog of BS4449; BS460)
Line expansion coefficient ($10^{-6} \text{ } ^\circ\text{C}^{-1}$)	9	15
Ultimate tensile strength (MPa)	1000-1200	550
Modulus (MPa)	50 000-70 000	200 000
Elongation (%)	2	14
Ultimate bond between rebar and concrete (MPa)	35	38
Ultimate yield strength (kgf/mm ²)	130	49
Thermal conductivity (W/mK)	0.3-05	56
Corrosion resistance	Non-corrosive	Corrosive
Aggressive environment resistance	High	Low
Density (t/cub.m)	1.9-2.1	7.8
Electric and magnetic behavior	Dielectric; Diamagnetic	Electrically conductive; Creates electromagnetic fields when interacting with electricity; magnetizable
Weight of 1 meter (kg)	0.3	1.2

The scope of application of composite reinforcement is not limited to civil engineering and road construction. It can be expanded upon major industrial applications such as aircraft and aerospace, shipbuilding, oil & gas, petroleum, nuclear, petrochemical, automotive, sports and garments and building and construction.

Applications in Building and Construction. Almost 30% (4 million tons) of composites produced are used

in building and construction. The most popular fields are transport infrastructure, utilities sector, civil and industrial construction.

- Reinforcing of conventional and pre-stressed concrete structures and elements operating in various aggressive environments.
- Reinforced structures exposed to corrosive media destroying steel reinforcement in aggressive gaseous, liquid, solid media containing chloride salts environment.
- Road and transport construction: reinforced concrete slabs and asphalt roads, concrete elements of the railway, sea and river berthing facilities and bridges.
- Underground construction such as mines, tunnels, subways, etc.
- Capacitive water intake facilities and sewage treatment plants, sewage, drainage and storm water communications.
- Constructive and cladding plastics and reinforcing nets.
- Basalt composite reinforcement for bridges, tunnels, railway sleepers, subways and for concrete constructions strengthening.
- Reinforcing materials for road surface, building blocks and foamed concrete.
- Hydraulic construction - reinforcing material for dams and irrigation equipment materials;
- Marine construction - reinforcing, constructive and fireproof basalt materials for sea and river ports, offshore platforms etc.

Drawbacks Basalt Composite Reinforcement

Though the Basalt rocks properties are better than steel rebar properties, it has major drawbacks in ductility (2% only). It is a major concern for the earthquake resistance structures. It is more useful for those countries where earthquake resistance structure is not a major concern. The cost of composite reinforcement is 4-5 times higher than steel rebar but its weight is 3-4 times less than the steel rebar weight. It may take more time to come to the market to meet the demand.

Basalt Rock Composite FZE Manufacturing Company. It is a trading company that supplies modern building materials for industrial and civil building and construction. Basalt rock deposit is located at the east of Russia, Sakha republic (Yakutia) and contain huge reserves of pure diopside lumps without alloys or hazardous, toxic elements. The quarry for FZE com-



pany is located at the east of Russia on the territory of Sakha Republic (Yakutia) which is located close to Tommot railway station (30 km.) and allows to reduce transportation costs. The nearest sea ports are: Vladivostok, Vostochny and Nakhodka. Contact address for the product is, P.O.Box 61044, Building (LOB) 6, office G09, Jebel Ali Free Zone, Dubai, UAE. Interested builders can contact this company and get dealership to promote the products in our country.

Conclusion

The major concern in concrete construction is corrosion in steel and it affects the durability of building in a big way. For a long time, our construction industry is

in search of alternate material to steel rebar. Though many fibers such as carbon, glass, plastic, polymer etc are available in the market but they could not fully replace the steel rebar due to its manufacturing cost, limited production etc. Basalt composite reinforcement may be a better choice than other fibers but one has to wait and see the development for a while. If it can be made available like steel rebar with required ductility then the construction industry will have major break through in reinforcing in concrete.

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மகிழ்ச்சியை தேடி

பெரிய அரங்கில் ஒரு கூட்டம் நடந்து கெண்டிருந்தது. அப்போது பேச்சாளர் எல்லார் கையிலும் ஒரு பலூனை கொடுத்து தங்கள் பெயரை எழுத சொன்னார். எல்லோரும் தங்கள் பெயரை பலூனில் எழுதி முடித்தவுடன் அதை இன்னொரு அறையில் நிரப்ப சொன்னார். இப்பொழுது அந்த பேச்சாளர், உங்கள் பெயர் எழுதிய பலூனை அந்த அறைக்குள் இருந்து எடுத்து வாருங்கள் என்று அறிவித்தார். உடனடியாக அனைவரும் விழுந்து அடித்து அந்த அறைக்குள் ஓடிச் சென்று ஒவ்வொரு பலூனாக எடுத்து தேடினர். ஒருவருக்கொருவர் நெக்கி தள்ளிக் கொண்டு கீழே விழுந்து தங்கள் பெயருக்குரிய பலூன் கிடைக்கிறதா என்று பரபரப்பாக தேடினர். 5 நிமிடம் கடந்த போதிலும் ஒருவராலும் தங்களுக்குரிய பலூனை தேடி கண்டு பிடிக்க முடியவில்லை. இப்பொழுது அந்த பேச்சாளர் சொன்னார். ஒவ்வொருவரும் ஒரு பலூன் மட்டும் எடுங்கள் அந்த பலூனில் யார் பெயர் இருக்கிறதோ அதை அந்த பெயர் உடைய நபரிடம் கொடுங்கள் என்றார். அடுத்த ஒரு நிமிடத்தில் தங்கள் பெயர் எழுதப்பட்ட பலூன் எல்லோருக்கும் கிடைத்துவிட்டது. இப்பொழுது அந்த பேச்சாளர் சொன்னார் “இது தான் வாழ்க்கை எல்லோரும் மகிழ்ச்சியை தேடுகிறோம். ஆனால் அது எங்கே எப்படி எதில் கிடைக்கும் என்று நினைப்பது இல்லை.” நம்ம சந்தோசம் அடுத்தவர்களுக்கு உதவுவதில் தான் இருக்கிறது. அடுத்தவர்களுக்கு மகிழ்ச்சியைக் கொடுங்கள் உங்கள் மகிழ்ச்சி உங்களை தேடி வரும். இந்த நாள் அனைவருக்கும் சந்தோஷமாய் மலரட்டும்.





பவள விழா நினைவலைகள்



R. இராதாகிருட்டிணன்

சென்ற இதழில் நமது சங்கத்தின் முக்கிய நிகழ்வாகிய சேலம் நிகழ்வை குறித்து நாம் தெரிந்து கொண்டோம். அந்த நிகழ்விற்கு முக்கிய பொறுப்பேற்று செயல்பட்டவர்கள் திரு ஜெயபால் மய்யத்தின் தலைவராகவும் அவரோடு இணைந்து திரு. கிருஷ்மூர்த்தி, திரு. வெங்கடேசன், திரு. அர்சுனன், திரு. நாமக்கல் பெரியசாமி, திரு. ஆறுமுகம், திரு. பரமசிவம். திரு. S. P. ராமசாமி, போன்ற சேலத்து அன்றைய முன்னோடிகள் மிக நேர்த்தியாக நிகழ்வுகள் அமைய அரும்பாடு பட்டவர்கள் என்பதனை நாம் இங்கு தெரிந்து கொள்ள வேண்டிய செய்தியாகும். அவர்களது அந்த செயல் திறமை என்றும் நமது சங்கத்தின் சரித்திரத்தில் குறிப்பிட வேண்டிய நிகழ்வாக அமைந்தன என்றால் அது மிகையாகாது.

சூலை 20,21 தேதிகளில் சென்னையில் அகில இந்திய பொதுக்குழு மற்றும் செயற்குழு நடைபெற்றது. திரு. T.N. சுப்பாராவ் அன்றைய அகில இந்திய தலைவர் தலைமையில் இரண்டு நாள் கூட்டம் நடைபெற்றது. கூட்டத்தில் கலந்து கொள்ள திரு. சுப்பாராவ் அவர்கள் தனி விமானம் மூலம் சென்னை விமான நிலையம் வந்தார். அன்றைய காலக்கட்டத்தில் பெருமை கொள்ள வைத்தது. அன்னாருக்கு விமான நிலையத்தில் மிகச் சிறப்பான வரவேற்பினை தென்னக மய்யம் ஏற்பாடு செய்தது. விமான நிலையத்தில் மேளதாளம் முழங்க, 10000 வாலா சரவெடிகள் வெடித்து சற்றொப்ப 50 காரர்கள் அணி வகுப்போடு கன்னிமாரா ஓட்டலுக்கு அழைத்து வரப்பட்டார். அந்தநிகழ்ச்சிகளுக்கு வர வேற்பு குழுத்தலைவராக திரு. பழனி முதலியார் செயல்பட்டார். அவரோடு இணைந்து திரு. ராமானுஜம், திரு. வாசுதேவராவ், திரு. M.K. சுந்தரம், திரு. துக்காராம், திரு. நரசிம்மலு, திரு. S.N. நாயக், திரு. S.V. ராவ். திரு. யேமச்சந்திரன்,

திரு. P.M. கிருட்டிணமூர்த்தி, திரு. P.R. நரசிம்மன், திரு. கணபதி, திரு. கார்த்திகேயன். முதலானோர் பங்கேற்று சிறப்பான ஏற்பாடுகள் செய்தார்கள். இவை அனைத்தையும் ஒருங்கிணைத்து செயலாற்றிய பொறுப்பினை அடியேன் ஏற்று செயல்பட்டேன் என்பது எனது நினைவில் இன்றளவும் ஒரு பசுமையான நிகழ்வாக அமைந்துள்ளது என்றால் மிகையாகாது.

20ந்தேதி மாலை கன்னிமாரா ஓட்டலில் தென்னக மய்யம் சார்பாக அன்றைய அகில இந்திய நிர்வாகிகளுக்கு பாராட்டு விழா நடைபெற்றது. பாராட்டு விழாவிற்கு தலைமை விருந்தினராக மாண்புமிகு நாவலர் நெடுஞ்செழியன், தமிழக அரசின் நிதி அமைச்சர் அவர்கள் கலந்து கொண்டார்கள். விருந்தினை அன்றைய தென்னக மய்யத்தலைவர் திரு. கார்த்திகேயன் அவர்கள் அறிமுகம் செய்து வைத்து மாலை அணிவித்தார். விழாவில் அடியேன் வரவேற்புரை ஆற்றினேன், திரு. ரங்கநாதாச்சாரியர் அன்றைய அகில இந்திய துணைத்தலைவர் சங்கத்தின் செயல்பாடுகள், சங்கத்தின் சரித்திரத்தையும் அவருடைய உரையில் குறிப்பிட்டார். நமது அகில இந்திய தலைவர் Dr. T.N. சுப்பாராவ் தலைமை உரையாற்றினார். அன்னாருடைய உரையில் கட்டுநர் பணி, தேச நலனில் கட்டுநர் ஆற்றும் சேவை, ஒப்பந்தக்காரர்களின் இன்னல்கள், இடர்பாடுகள் குறித்து அனைவருடைய பாராட்டினை பெறும் வகையில் உரையாற்றினார். முதன்மை விருந்தினர் மாண்புமிகு தமிழக நிதி அமைச்சர் சிறப்புரை ஆற்றினார். அன்னாருடைய உரையில் நமது தலைவர் ஆற்றிய உரையின் கருத்துக்கு விவரமான விளக்கங்களையும் தேவையான நிவாரணங்களையும் தமிழக அரசு பரிசீலனை செய்து ஆவன செய்யும் என்ற உறுதியை அளித்தார். அன்றைய தென்னக மய்ய செயலாளர்



திரு. யேமச்சந்திரன் நன்றி நவில கூட்டம் இனிதே நடந்தேறியது. விழா தொகுப்பாளர் Kuttu Flush Door திரு. சங்கர கிருட்டிணன் மிகச் சிறப்பாக விழாவினை தொகுத்து நடத்தினார். விழா சிறப்பாக அமைய அன்றைய தென்னக மய்யத்தலைவர் திரு. கார்த்திகேயன் அவர்களது ஆலோசனைகள் பேருதவியான அமைந்தது.

சூலை 21ம் நாள் அகில இந்திய மேலாண்மை மற்றும் பொதுக்குழு கூட்டம் கன்னிமாரா ஓட்டல் தர்பார் அரங்கில் மிகச் சிறப்பாக நடைபெற்றது. இரண்டு நாள் நிகழ்ச்சிகளும் அகில இந்தியாவில் இருந்து கலந்து கொண்ட அனைவருடைய ஏகோபித்த பாராட்டினையும் அதுகாரும் இது போன்ற நிகழ்வுகள் இந்த அளவு நேர்த்தியாக வேறெங்கும் நடைபெறவில்லை என்ற செய்தியினையும் பதிவு செய்தார்கள். இந்த நிகழ்கள் தென்னக மய்யத்தின் சரித்திரத்தில் ஒரு மிகப் பெரிய மைல்கல்லாக அமைந்தன என்றால் அது மிகையாகாது.

1985 பிப்ரவரி திங்கள் 22 முதல் 24 வரை நமது சங்கத்தின் 11வது அகில இந்திய மாநாடு கல்கத்தா நகரில் நடைபெற்றது. மாநாட்டிற்கு Dr.T. N. சுப்பாராவ் தலைமை பொறுப்பேற்றார். அன்றைய மத்திய நகர்ப்புற மேம்பாட்டு அமைச்சர் மாண்புமிகு Abdul Gafoor அவர்கள் மதன்மை விருந்தினராக கலந்து கொண்டு மாநாட்டினை துவக்கிவைத்தார். மாநாட்டிற்கு முதன் முதலில் அகில இந்திய மேலாண்மைக்குழு அடியேனை Convention தலைவராக நியமனம் செய்தது. கல்கத்தாவில் நடைபெற்ற மாநாட்டிற்கு தென் கோடியில் இருந்த என்னை முக்கிய பொறுப்பில் என்மீது தலைவர் திரு. T.N. சுப்பாராவ் கொண்ட அளவுற்றி நம்பிக்கையே காரணம் என்றால் அது மிகையாகாது. மாநாட்டில் முதன் முறையாக நமது சங்கத்தைப் பற்றியும், நமது சங்கத்தின் தோற்றம், வளர்ச்சி, சங்கத்தின் செயல்பாடுகள், சங்கம் ஆற்றும் பணிகள், குறித்து மாநாட்டுத் தலைவர் என்ற முறையில் உரையாற்றக் கூடிய அரிய வாய்ப்பினை பெற்றேன்.

மாநாட்டின் தலைமை உரை திரு. T.N. சுப்பாராவ் அவர்கள் ஆற்றினார். அன்னாருடைய உரையில் கட்டுமானத்துறையின் செயல்பாடுகள், நாட்டு வளர்ச்சியில் கட்டுநர்கள் ஆற்றுகின்ற பணிகள், கட்டுநர்களின்

அறபணிப்புகள், மத்திய மாநில அரசுகளின் நடைமுறைப்படுத்த முடியாத சட்டங்கள் சமநிலை அற்ற ஒப்பந்தபடிவங்கள் போற் கருத்துக்களை மிக நேர்த்தியாக ஆணித்தரமாக எடுத்துரைத்தார். தலைமை விருந்தினர் அமைச்சர் அவர்களின் உரையில் நமது தலைவர் ஆற்றிய உரையின் முக்கிய அம்சங்களை கோடிட்டு காட்டி அதற்கான நிவாரணங்களை பெற்றுத் தர முயற்சிகள் மேற்கொள்ளப்படும் என்ற உறுதியினையும் சபைக்கு கூறினார். கல்கத்தா மய்யத்தின் மாநாட்டுக் குழுத்தலைவராக திரு. ராகவேந்திராராவ் அவர்கள் செயல்பட்டார். அன்னாருடைய தலைமையில் பல்வேறு குழுக்கள் மிகச் சிறப்பாக பணி ஆற்றிய மாநாடு வெற்றி அடைய அரும்பாடுபட்டார்கள். அகில இந்திய அளவில் இருந்து கலந்து கொண்ட பிரதிநிதிகளின் ஏகோபித்த பாராட்டுக்கள் கல்கத்தா மய்யத்தின்பால் தெரிவிக்கப்பட்டன.

மாநாட்டில் தென்னக மய்யத்திலிருந்து 100க்கு மேற்பட்ட பிரதிநிதிகள் கலந்து கொண்டார்கள். அனைவரும் ஒரே ரயில் பயணம் மேற்கொண்டார்கள். ஒரு பெட்டி முழுவதும், அடுத்த பெட்டியில் மீதமுள்ளவர்களும் இணைந்து சென்னை கல்கத்தா கோரமண்டல் ரயிலில் பயணம் மேற்கொள்ளப்பட்டது. ஒரே ரயிலில் 100 நண்பர்கள் குடும்பத்தோடு மேற்கொண்ட பயணம் மிகவும் போற்றுதற்குரிய பயணமாக அமைந்தது பயண ஏற்பாடுகள், திரு. துக்காராம், திரு. அனந்தசயனம், திரு. M.K. சுந்தரம், போன்றவர்கள் முன் நின்று ஏற்பாடு செய்தனர். திரு. போரலிங்கய்யா அவர்கள், பயணத்தில் நேர்த்தியான சிறப்பு ஏற்பாடுகள் மூலம் ரயில்வேதுறையின் ருசியான உணவு எல்லோருக்கும் ஏற்பாடு செய்யப்பட்டது. பயணித்த அனைவரும் உவகை கொள்ளத்தக்க வகையில் ஏற்பாடுகள் செய்யப்பட்டன. நமது மய்யத்திலிருந்து பயணித்த சகோதரிகள் வெகுவாக பாராட்டினர் என்பது இங்கு குறிப்பிடத்தக்கது. மாநாட்டின் நிறைவிற்கு பிறகு தென்னக மய்யத்தைச் சேர்ந்த சிலர் சிலுகுரி, டார்ஜ்லிங் சென்று களித்து சென்னை திரும்பினோம்.

1985 டிசம்பர் திங்கள் திருச்சியில் முதன் முதலில் நமது சங்கத்தின் சரித்திரத்தில் பிராந்திய மாநாடு நடைபெற்றது. அடியேன் தென்





Warm Reception at Salem Junction to Sri. R.Radha along with Dr. T.N.Subba Rao & Sri.Achar 1984

Sri. R.Radha addressing Zonal Conference at Trichy 1985 also seen BAI President Dr. T.N.Subba Rao and Sri. Adikal Raj M.P.

பிராந்தியத் தலைவராக மாநாட்டின் தலைமைப் பொறுப்பேற்று நடத்திய அரிய வாய்ப்பினைப் பெற்றேன். திருச்சி மய்யத்தின் தலைவராக நமது அகில இந்திய முன்னாள் தலைவர் திரு. யூசூப் அவர்கள் பொறுப்பில் இருந்தார். மாநாட்டிற்கு நமது அகில இந்திய தலைவர் Dr. T.N. சுப்பாராவ் அவர்கள் தலைமையேற்றார். முதன்மை விருந்தினராக அன்றைய கேரள ஆளுநர் மேதகு பா. ராமச்சந்திரன் அவர்கள் கலந்து கொண்டார். சிறப்பு விருந்தினராகளாக தமிழக வீட்டு வசதித் துறை அமைச்சர் மாண்புமிகு நல்லுசாமி அவர்களும், திருச்சி பாராளுமன்ற உறுப்பினர் திரு. அடைக்கலராஜ் அவர்களும் புதுவை பொதுப்பணித்துறை அமைச்சர் அவர்களும் கலந்து கொண்டார்கள். மாநாடு இரண்டு நாட்கள் நடைபெற்றன. மாநாட்டோடு இணைந்து கட்டுமான பொருட்களின் கண்காட்சியும் நடைபெற்றது. திருச்சி மய்யம் இரண்டு நாள் நிகழ்ச்சிகளையும் மிக நேர்த்தியாக ஏற்பாடுகள் செய்து சிறப்பான விழாவாக அமைந்தது. தென்னகத்திலிருந்து மட்டுமல்லாமல் அகில இந்திய தலைவர்களும், முன்னோடிகளும் மாநாட்டில் பங்கேற்றார்கள்.

மாநட்டை ஓட்டி நடைபெற்ற கண்காட்சி

அனைவரது பாராட்டினைப் பெற்றது. கண்காட்சிக்குழுத் தலைவராக திரு. பாண்டியன் அவர்களும் அவருக்கு துணையாக நாகப்பாவும், தங்கராஜ் போல் அவர்களும் சிறப்பாக பணியாற்றி கண்காட்சியை வெற்றி அடையச் செய்தார்கள். திரு. தேவராசன் விருந்தோம்பல் குழுத்தலைவராக பொறுப்பேற்று மிகச் சிறந்த முறையில் பணியாற்றி அனைவருடைய பாராட்டையும் பெற்றார். திருச்சி மய்யத்தின் மூத்த முன்னோடிகளும் திரு. ராமதாஸ், திரு. பந்தமநாபன், திரு. சுப்பிரமணியன். திரு. செல்ல முத்து முதலியவர்கள் தங்களுடைய ஈடுபாடு காரணமாக மாநாடு வெற்றி பெற காரணமானவர்கள் என்பதை இங்கு பதிவு செய்ய விரும்புகிறேன். திருச்சி மய்யம் அதன் அன்றைய தலைவர் திரு. யூசூப் அவர்களின் தலைமையில் ஒரு சிறந்த பிராந்திய மாநாடு நடத்தி அகில இந்திய நமது சங்கத்திற்கு பெருமை சேர்த்ததோடு அல்லாமல் ஒரு அகில இந்திய மாநாடு அளவிற்கு நடைபெற்ற நிகழ்வாக எல்லோருடைய பாராட்டையும் பெற்ற ஒரு நிகழ்வாக அமைந்தது.

மேலும் நினைவலைகள் தொடரும்.





Sri. R.Radha with Hon'ble Finance Minister Neduchezen 1984

Zonal Conference at Trichy with Governor of Kerala His. Exc. P.Ramachandran 1985



Sri. R.Radha with French Trade Commissioner during his visit for Batimat Exhibition 1987 December (He has attended this exhibition at the Invitation of French Trade Commission)

Sri. R.Radha with IFAWPCA President at Singapore 1979



12.11.2015: அன்று நடைபெற்ற டெங்கு விழிப்புணர்வு ஆலோசனைக் கூட்டம்



03..11.2015: அன்று நடைபெற்ற ரயில்வே ஒப்பந்ததாரர்கள் கூட்டம்



01.11.2015: அன்று புதுக்கோட்டை மய்யத்தால் ஏற்பாடு செய்யப்பட்ட
முன்றாவது மாநில அளவிலான மேலாண்மை மற்றும் பொதுக்குழு கூட்டம்



Maintenance Tips on the House

Collected from the desk of Late Shri.K.P.Baney (Past Vice President)

Devi Constructions Pune



M. Karthikeyan, BAI
All India Past President

1. Flooring

A clean floor is not only good to look at but very much desirable in view of good hygiene and safety. This entails floors in every room be swept and swabbed daily to rid them of dust, dirt, stains and grit. This will prevent your floors from losing their luster and developing a rough and dull surface with the passage of time.

Floors don't take very kindly to dragging of heavy furniture or other items, especially those with metal bases. Shift such articles, by lifting them completely off the floor, or after inserting some suitable padding like newspapers or rubber sheeting between the supports and the flooring, if they are too heavy to be carried.

Direct contact with iron/ steel articles (flower-pot stands) for prolonged periods of time can leave permanent rust stains on the floor. Use appropriate plastic/ rubber/ paper sheeting or mats to place such articles on.

Cleaning with acids or wire brushes is the best way to damage your flooring, so avoid it totally. Use a vacuum cleaner or a floor cleaning detergent instead. An effective and inexpensive remedy is a mixture of two spoonfuls of kerosene to a bucket of water to mop the floor. This will help your floors retain their shine with the added bonus of keeping cockroaches at bay.

Take precautions to keep floors (specially in bath / toilet) oil, grease and soap-water free. Getting 'floored' is not a very pleasant experience for most people, particularly the old folks at home.

Use of doormats on the main entrance and for every bath or toilet entrance is highly advisable as it discourages excessive dirt and dampness.

The skirting/ dado is as much a part of the flooring as of the wall. Similar care and treatment is needed.

2. Walls

Walls and ceilings are subject to cracks, usually soon after construction, sometimes much later. Much

of the earlier cracking is superficial, easily remedied and quite unlikely to recur. You may now breathe a sigh of relief.

Why do these cracks occur? Diagnosis of the specific cause is often difficult to ascertain. Numerous forces come into play as every building is unique in its design. Besides, several extraneous factors may also contribute (sometimes very generously) towards the formation of a crack.

Commonly noticed patterns of cracks are:

SHRINKAGE CRACKS This type is perhaps the most common and innocuous form of cracking observed in building due to drying. Thankfully, it can be easily rectified after a full season of its appearance, by scraping and painting.

Sometimes a thin layer of paint peels off in small quantities along the length of the crack. This is best remedied while repainting.

SETTLING CRACKS These usually make their debut horizontally below a beam. Higher stories seem more susceptible to this type of cracking than lower ones.

The cause is attributed to minor settling of the building structure, but its appearance can be very unsettling to the occupants. Though normally not severe, it is agreeably unsightly and unanimously unacceptable.

After a year of anxious observation, if the crack does not show any further signs of lengthening or widening, it may be safely filled up with 'Snowfilla' or putty after thorough cleaning and touched up with the right shade of paint.

If the crack shows signs of widening or a new major pattern of cracks develop, a careful analysis by a competent consultant is required and his advice sought for effective remedial measures.

RADIATING CRACKS These are the outcome of hammering nails or hooks into walls made of solid concrete blocks.



You can avoid cracking the walls by using hand driven augers, jumping bits or portable drills (the best option) to drill holes and then plugging them with wetted 'Rawal' plugs to hold the screws.

The Rawal plugs or 'grip' plugs as they are sometimes called, will hold the screws firmly in the wall and also prevent any development of radiating cracks.

Don't forget to check for concealed electrical wiring before driving in any screws. It could be a shocking experience for anyone!

IMPACT CRACKS These can occur in the neighborhood of door / window frames when the doors and windows are left unsecured with stays or stoppers and a strong gust of wind takes an unfair advantage of the situation. They also occur when heavy carpentry / breaking work is done in the building.

The impact of shutters against the frames may not only leave cracks in the neighboring walls, but also result in broken window-panes and loose hinges not discounting the possibility of serious injuries.

So keep your doors and windows well secured, whether shut or open.

Radiating and impact cracks can be easily attended to by:

- Cleaning cracks full width and depth by a sharp nail.
- Blowing off the dust and then filling up with M-Seal or any other suitable sealant / filler.
- Scraping off excess sealant / filler with a sharp edge to level it.
- Retouching the crack with just the right shade.

Simple. Isn't it?

3. DOORS

The doors in your home are vital for security, and of course, privacy. A little concern towards their maintenance will ensure they work smoothly, reliably and last longer.

Do the doors in your household squeak every time they are opened or shut? What they want is a drop of multipurpose oil in the hinges, every 3 months or so, to still their protest.

Wooden doors in baths / toilets tend to decay due to excessive damp and formation of algae. Scrub the first signs of decay with soap / detergent and fill the cracks with M-Seal to avoid further damage.

An aluminum or plastic sheet covering the lower

portion of bath/toilet door upto a height of 12 inches is very good protection against moisture and decay.

Make use of door stoppers, lest the doors bang shut, damaging themselves and cracking the surrounding walls with the force of the impact.

Door fittings and fixtures like latches, handles, alldrops, stoppers etc., are best replaced as soon as they are rendered unserviceable. Why take chances? All you need is a simple Screwdriver to accomplish the job.

4. Windows

Windows not only ventilate your house by letting in fresh air and sunshine, but also serve as protection against inclement weather like heavy rains and strong winds, and keep out uninvited visitors like pigeons and rats who seek ready shelter in your absence. They also keep out prying eyes and peeping Toms !

A few handy tips to keep them in good shape.

STEEL WINDOWS. A rattling window pane is neither very soothing music to the ears, nor is it easy on the nerves. Besides, a strong gust of wind could result in a smashing finale! Applying putty to secure the glass panes tight to the frames will put an end to this nerve-jangling ensemble.

Ensure peg stays are functional as they prevent undue damage by strong winds to window shutters, panes, frames, glass and fingers!

Check for loose nuts and bolts on the handles and screws on the hinges. Tighten them if necessary. The multipurpose spanner in the M.Kit is provided for just such a purpose. Use it!

ALUMINIUM SLIDING WINDOWS Regular cleaning of the channels ensures free and easy movement of the sliding wheels, and saves you from expending extra energy every time you need a breath of fresh air.

External holes in the bottom channels help drain rainwater quickly. Make sure they're not clogged with dirt to defeat the purpose. A length of flexible wire of suitable size will be ideal for the job.

During the monsoons, wet patches may form on the inside walls of your room, due to rainwater seeping through gaps between the window sills and the frames. Though this 'wet look' is much fancied on Hindi movie heroines, we wonder if you'll find it half as appealing on your walls? If you don't, plug the gaps with M-Seal or any suitable mastic.



Weathering action is likely to shrink the rubber lining that holds the glass firmly in place. This will result in the glass rattling even when the panels are sliding. Don't experiment, replacement of the lining / putty is the sure-fire remedy.

If you ever have to replace the glass panels, ensure that they are cut to exactly the same measurement as the original. This will prevent any play and ensure noiseless operation.

5. PLUMBING

TAPS Has your tap sprung a leak?

It could be due to defective washers, worn out threads or an eroded seat. A dripping tap you'll agree is an intolerable nuisance and not to be encouraged. Besides wastage of precious water, it can leave permanent discolouring stains.

Worn out washers are easy to replace if you have tools and a set of spare washers. The multipurpose spanner and washers (nylon / fiber) are adequate for the job. Use nylon washers for cold-water taps and the fiber washer for hot-water taps.

If you are uninitiated in plumbing skills, call in a professional and observe him at work. The next time a washer gives way, you can tap your own skills.

Don't loose your sleep your worn out threads or eroded seats. Change the tap for a new one which costs no more than Rs.100/-. However, this contingency should not arise for the first five years at least.

WASH BASINS They can be kept sparkling and clean by using sponge and some good detergent like Vim twice a week.

A provision is made below the wash basin for a bottle-trap to catch heavier particles of dirt and food so as not to clog the drainage pipes. This bottle-trap accumulates dirt with the passage of time – and your unwitting help – preventing free flow of water, resulting in a 'choked' basin. Just unscrew the bottle trap and do the needful.

A sink cleaner can also do a quick job of clearing obstructions. Place it over the drainage hole of the wash basin, exert yourself by pumping hard a few times. Cleared? Well done!

Wash basins are fitted firmly into the walls and supported with the aid of strong brackets. However, don't lean on them to test their strength while brushing your teeth or sit little 'Tinku' on the edge to pee. They were not designed for that purpose.

KITCHEN SINK Avoid dropping bits of left-overs, vegetable refuse, pieces of paper/plastic, small items of garbage down your sink, unless the plumber is a family friend whose visits you look forward to.

Use the waste paper basket instead to dump all waste. This will prevent clogging and hefty plumbing bills from burning a hole in your wallet.

A clogged sink can also be cleared with a Sink Cleaner as described earlier (see WASH BASINS). A readily available chemical called Drainex, can also be used for the purpose. Follow the instructions on the packet.

STOP COCKS These are used to turn off the water supply when fixing worn out washers, taps or plumbing, and to prevent unnecessary wastage and splashing of water. When leaking around the spindle, stopcocks can be fixed using plumbing tape. Turn the spindle in and out once in a while, when you're in the mood, to prevent it from getting stuck. A seized stopcock can be freed by oiling it or warming it with hot water.

If you still don't take stopcocks seriously, you'll realize their importance when you have to fix some plumbing problem and have to climb all the way up to the terrace to turn off the main value – after getting the secretary's permission, if he's not already left for work; securing the keys from the watchman, if he's around; and informing the other occupants supplied by the same mains line, to bear with you for a while.

WATER CLOSET This consists of four important units that are vital to its functioning:

Commode This is made of burnt clay material like the wash basin and is as delicate and can be maintained as attractively. But, it is a lot costlier and bothersome to replace if damaged. A bewildering variety of brushes and chemicals like Flush Kleen are available in the market for the purpose of cleaning. Take your pick.

Cistern Flush Tanks The common problems encountered here are listed below:

- Overflowing of water the cistern.
- No flow of water from the cistern.
- Inadequate flushing action.
- Continuous weak running of water.
- Flush operating lever inoperative.

Overflow occurs due to some obstruction in the free movement of the plunger. Remedy? The plunger casing needs to be cleaned and freed from dirt.



No flow of water even after depressing the lever, occurs when cistern is empty of water. This could be because of no water supply, internal obstruction in the supply pipe or the stopcock being turned off. Both, identification and rectification of the fault is simple.

Inadequate flushing is due to water not filling up to the required level in the cistern. This is due to a damaged float resulting in defective float action. The float ball can be easily replaced by unscrewing off the old one and screwing on a new one onto the threaded end of the float rod.

Continuous weak running water occurs due to an air-lock in the siphon of the cistern. Clear up the air-lock by opening the siphon system.

Flush operating lever becomes ineffective when the cotter pin connecting the handle and the siphon get disjointed or loose. The cotter pin needs to be repositioned or replaced if broken.

Plastic Seat & Cover Seats are attached to the commode by two nuts which tend to get loose with use. Use of spring washers or double nuts is recommended as they prevent the nuts from frequently loosening and keep the seat (and the seated) in place.

Connecting Pipe if the connecting pipe, i.e. the channel between the commode and the external drainage pipe should ever develop a problem, it is best to seek professional help since it involves the handling of delicate joints. A minor problem like a loose joint may be fixed yourself with M-Seal.

NAHANI TRAP These are fixed over drainage outlets under the kitchen sink and in bathroom corners to prevent large particles of waste matter from entering and fouling up the drainage system. Firmly instruct your servants, not to try and remove these traps to dump the trapped waste into the drains. This could result in your house being flooded with foul-smelling waste water. Daily removal of any trapped waste from the surface and cleaning will keep the Nahani Traps clear of problems.

Use mastic or M-Seal to fill any gaps between the circular edges of the trap and the floor tiles.

When the trap needs replacement, make sure that the trap and tiles are at the same level. In no case should the trap be higher than the floor level. It will help accumulate water in your bathrooms with the possibility of it overflowing into the adjoining rooms, creating a mess that's no fun to clean up.

உலர் திராட்சையின் மகிமை

வளரும் குழந்தைகளுக்கு உலர் திராட்சை சிறந்ததாகும். இதில் கால்சியம் சத்துக்கள் நிறைந்துள்ளதால் எலும்புகள் உறுதி பெறவும் உடல் வளர்ச்சி பெறவும் இது உதவுகிறது.

குழந்தைகளுக்கு தேக புஷ்டி வேண்டுமென்றால் தினமும் இரவு தூங்கச் செல்வதற்கு முன்பு பாலில் போட்டு காய்ச்சி அருந்தச் செய்யுங்கள்.

உலர் திராட்சை தாமிர சத்து கொண்டுள்ளதால் ரத்தத்தில் உள்ள சிவப்பணுக்களின் எண்ணிக்கையை அதிகரிக்கும். இந்த பழத்தை வாயில் போட்டு சாப்பிடும் போது எலும்பு மஞ்சைகள் வலுபெறும்.

தொண்டை கட்டு ஏற்பட்டவர்கள் பால் காய்ச்சும்போது மிளகுதூள், உலர் திராட்சையைப் போட்டு பருகலாம்.

உடல் வலியால் அவதிப்படுபவர்கள் சுக்கு, பெருஞ்சிரகம். உலர் திராட்சையையும் சேர்த்து தண்ணீர் விட்டு காய்ச்சி பருகினால் உடல் வலி தீரும்.

தினமும் ஒரு பத்து உலர் திராட்சை பழத்தை தொடர்ந்து ஒரு மூன்று மாதம் சாப்பிட்டு பாருங்கள் உங்களுக்கு பல மாற்றங்கள் தெரியும்.



Shotcrete or Grouted Concrete



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What Is Shotcrete?

The concrete in which mortar or concrete is pneumatically projected at high velocity on the backup surface is known as shotcrete or gunite. It is also known as spray concrete as the force of jet impacting on the surface compacts it so as to make itself supporting.

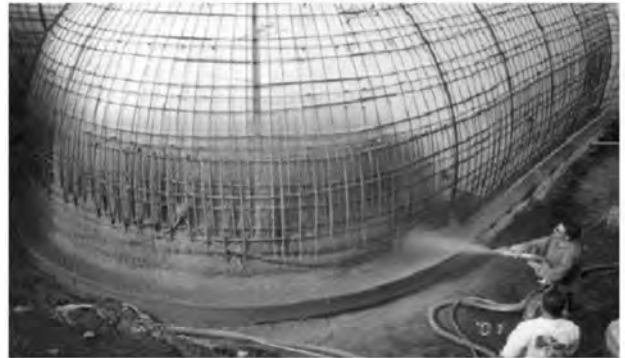
This type of concrete has no special properties as compared to normal concrete placed under similar conditions.

Shotcrete is concrete conveyed through a hose and pneumatically projected at high velocity onto a surface, as a construction technique. It is reinforced by conventional steel rods, steel mesh, and/or fibers. Fiber reinforcement (steel or synthetic) is also used for stabilization in applications such as slopes or tunneling. Shotcrete is placed and compacted at the same time, due to the force with which it leaves the nozzle. It can be sprayed onto any type or shape of surface, including vertical or overhead areas. Shotcreting has proved to be the best method for construction of curved surfaces. Domes are now much easier to construct with the advent of shotcrete technology. Tunnel linings are also becoming easy with this technology. Not only are these but there a wide range of applications where this technology has been a leading one.

Definition of Shotcrete

Shotcrete is a mortar or high performance concrete conveyed through a hose and pneumatically projected at high velocity onto a backing surface. It is the force of this spraying action that leads to compaction of the concrete or mortar which then forms layers of concrete to the required thickness. Shotcreting has been an acceptable way of placing cementitious material in a variety of applications.

Usually patented polypropylene fibers are included in the shotcrete which increases the cohesive nature



of the shotcrete through mechanically binding the cementitious materials together. This mechanism reduces the rebound waste that occurs through the shotcreting process and these fibers also resist plastic shrinkage and cracking through their ability to enhance the early stage tensile strength of concrete.

Shotcrete also gives better surface finishes and reduces surface tearing on non-linear sections. Cementitious material containing the poly propylene fibers resist cycles of freezing and thawing and also reduces the chances of water and chemical penetrations.

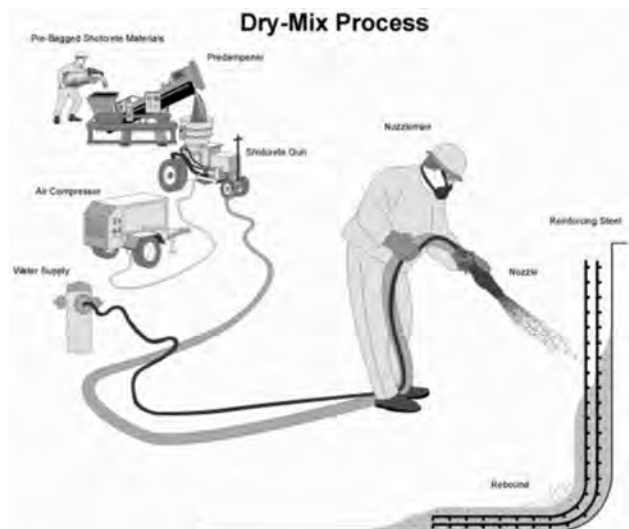
Dry-Mix Process

Cement and damp aggregate are thoroughly mixed, or premixed, and prebagged cement and aggregate are fed through a premoisturizer. The cement-aggregate mixture is then fed into the gun. The mixture is introduced into the delivery hose via a metering device such as a feed wheel. Compressed air is added at the gun and the mixture is carried through the delivery hose to the nozzle. The nozzle is fitted inside with a perforated water ring through which water and admixtures are introduced under pressure and intimately mixed with the other ingredients as they go through the nozzle. The concrete is propelled from the nozzle at high velocity onto the receiving surface. a. Description



of guns. Dry-mix guns are divided into two classifications, the double chamber gun and the continuous feed gun, each of which is capable of delivering mixtures in a wide range of consistencies.

- (1) Double chamber. The first gun developed was the double chamber or pot type, introduced in the early 1900's. Although the material enters the upper chamber in batches, the valve arrangement is such that the discharge from the lower chamber is continuous. Until recent years, this gun had been used only for mortar mixtures and the production rate was low, but larger, high-production units which will handle coarse aggregate up to about 3/4 inch are now available.
- (2) Continuous feed. The continuous-feed gun was introduced about 1960. Most of these guns will handle mortar or concrete mixtures with aggregate up to about 3/4-inch and will produce shotcrete at production rates up to 2 cubic yards per hour.



Wet-Mix Process

Cement, aggregates, and admixtures (except accelerators) are thoroughly mixed. The mixture is fed into the gun and propelled through the delivery hose to the nozzle by compressed air or pneumatic or mechanical pumping. Air is injected at the nozzle to disperse the stream of concrete and generate the velocity for shotcrete placement. a. Description of guns.

- (1) Pneumatic-feed. In the pneumatic-feed equipment, the premixed mortar or concrete is conveyed from the gun through the delivery hose to the nozzle by slugs of compressed air. At the nozzle additional air may be added if needed to increase the velocity and improve the gunning pattern. This equipment

can handle mixtures of a consistency suitable for general shotcrete construction, using mixtures containing up to 3/4-inch aggregate. Guns with a dual mixing chamber and a two-way valve allow mixing of materials and a continuous flow operation.

- (2) Positive displacement. In the positive displacement equipment, the concrete is pumped or otherwise forced through the delivery hose without the use of compressed air. Air is injected at the nozzle to disperse the stream of concrete and impart the velocity necessary for shotcrete placement. Positive displacement delivery equipment requires a wetter mixture than pneumatic-feed equipment, and the velocity of the shotcrete being applied is lower. It is difficult to apply shotcrete to vertical and overhead surfaces by this method unless a suitable accelerator is used. This equipment can also satisfactorily shoot material containing 3/4-inch aggregate.



Dry Mix and Wet Mix

The dry mix method involves placing the dry ingredients into a hopper and then conveying them pneumatically through a hose to the nozzle. The nozzleman controls the addition of water at the nozzle. The water and the dry mixture is not completely mixed, but is completed as the mixture hits the receiving surface. This requires a skilled nozzleman, especially in the case of thick or heavily reinforced sections. Advantages of the dry mix process are that the water content can be adjusted instantaneously by the nozzleman, allowing more effective placement in overhead and vertical applications without using accelerators. The dry mix process is useful in repair applications when it is necessary to stop frequently, as the dry material is easily discharged from the hose.



Wet-mix shotcrete involves pumping of a previously prepared concrete, typically ready-mixed concrete, to the nozzle. Compressed air is introduced at the nozzle to impel the mixture onto the receiving surface. The wet-process procedure generally produces less rebound, waste (when material falls to the floor), and dust compared to the dry-mix process. The greatest advantage of the wet-mix process is all the ingredients are mixed with the water and additives required, also larger volumes can be placed in less time than the (Dry- P).

Shotcrete Application Techniques

- a. Techniques and procedures. The nozzling techniques and procedures used in applying shotcrete greatly affect the quality of the shotcrete and the amount and composition of rebound. Rebound material may become entrapped in succeeding shotcrete if poor nozzling techniques are followed. The entrapment of rebound results in a decrease in the ultimate strength and durability of the shotcrete.
- b. Nozzle angle. Plane surfaces should generally be shotcreted with the nozzle held at 90 degrees to the surface. When this principle is not followed, excessive rebound and decreased compaction usually result. Two exceptions to this practice occur when gunning an interior corner or when encasing reinforcing steel. Interior corners should be gunned by directing the nozzle in the plane bisecting the angle of intersection of the two surfaces which reduces the amount of rebound entrapped in the corner. Areas with reinforcing steel should be gunned at a slight angle from each side. When gunning horizontal work, the nozzle should be held at a slight angle from vertical so that rebound is blown onto completed work for ease of removal.
- c. Nozzle distance. The optimum distance between the shotcrete nozzle and the surface is generally about 3 feet. Rebound increases when the nozzle is held at a distance greater than 3 feet and compaction and strength of the shotcrete are reduced. Rebound can also increase if the nozzle is held closer than 3 feet and no reduction in pressure and delivery rate is made. At reduced distances, the nozzleman is more exposed to rebounding particles.
- d. Nozzle motion. A steady circular or elliptical movement of the nozzle across the surface is the proper gunning technique. The nozzle should not be directed toward one spot for extended periods since this causes increased rebound and difficulty in controlling the thickness of the layer. When the nozzle

is not consistently moved, areas of well-compacted material are formed adjacent to areas that are poorly compacted. (1) Overspray results when shotcrete material is carried by the airstream but not deposited at the point of application. The material has a reduced cement content and is not consolidated by high-velocity impact resulting in a zone of undesirable low-strength material. A sand pocket results if the overspray is encased by shotcrete. Overspray can be avoided by following proper nozzling techniques. (2) Horizontal and vertical corners should be filled first to eliminate the common collection areas for overspray. The center of the surface being shotcreted may then be brought to the required thickness.

- e. Encasing reinforcement. Encasement of reinforcing steel with shotcrete must be done carefully to prevent pockets of uncemented aggregates from forming behind the bars. (1) To prevent formation of these sand or rock pockets, the nozzle should be held close to the reinforcing bar and at a slight angle from the perpendicular to force material around and behind the bar. The front of the bar should remain clean and free of buildup until the entire bar is encased. A blowpipe should be used during the gunning operation to remove accumulation on the front of the bars and entrapped rebound from behind the bars (Figure 6-4). The shotcrete mixture should be slightly wetter than normal, although not so wet that there will be sloughing behind the bars. Where bars are closely spaced, more than one bar may be shot from each location.

Curing and Protection

- a. Proper curing of shotcrete is extremely important to ensure proper hydration, matrix and bond strength development, and to prevent cracking due to drying shrinkage. Note that the rate of bond strength development is significantly slower than compressive or tensile strength development. The thin sections commonly used in shotcrete construction are particularly susceptible to drying shrinkage. Surfaces should be kept continuously moist for at least 7 days. After this time interval, the shotcrete has gained sufficient tensile strength to resist shrinkage strains, and the permeability near its exposed surface is low enough to minimize loss of water from the interior of the section. Membrane curing is permissible only when drying conditions are not severe, where no additional shotcrete or paint is to be applied, and where it is esthetically acceptable. Coverage rates of rough shotcrete surfaces should



be twice what is used on conventional concrete surfaces.

- b. Silica-fume shotcrete must always be continuously moist cured to assure proper strength gain and surface durability. It is common to specify the use of fog nozzles to maintain a moist condition on all new surfaces. While less convenient, sprinklers and soaker hoses can provide adequate curing so long as it can be assured that all the surface area is maintained in a moist condition.



Applications of shotcrete :

- a. Repair. Shotcrete can be used to repair the damaged surface of concrete, wood, or steel structures provided there is access to the surface needing repair. The following examples indicate a few ways in which shotcrete can be used in repairs:
 - (1) Bridges. Shotcrete repair can be used for bridge deck rehabilitation, but it has generally been uneconomical for major full-thickness repairs. It is very useful, however, for beam repairs of variable depths, caps, columns, abutments, wingwalls, and underdecks from the standpoint of technique and cost.
 - (2) Buildings. In building repairs, shotcrete is commonly used for repair of fire and earthquake damage and deterioration, strengthening walls, and encasing structural steel for fireproofing. The repair of structural members such as beams, columns, and connections is common for structures damaged by an earthquake.
 - (3) Marine structures. Damage to marine structures can result from deterioration of the concrete and of the reinforcement. Damaging conditions are corro-

sion of the steel, freezing and thawing action, impact loading, structural distress, physical abrasion from the action of waves, sand, gravel, and floating ice, and chemical attack due to sulfates. These problems can occur in most marine structures such as bridge decks, piles, pile caps, beams, piers, navigation locks, guide walls, dams, powerhouses, and discharge tunnels. In many cases, shotcrete can be used to repair the deteriorated surfaces of these structures.

- (4) Spillway surfaces. Surfaces subject to high-velocity flows may be damaged by cavitation erosion or abrasion erosion. Shotcrete repairs are advantageous because of the relatively short outage necessary to complete the repairs.
- b. Underground excavations. For the most part, shotcrete is used in underground excavations in rock; but on occasion, it has been successfully used in the advancement of tunnels through altered, cohesionless, and loose soils. Typical underground shotcrete applications range from supplementing or replacing conventional support materials such as lagging and steel sets, sealing rock surfaces, channeling water flows, and installing temporary support and permanent linings.

What are the Advantages of Shotcrete?

- Shotcrete concrete layers are very strong.
- These types of concrete do not need construction or expansion joints.
- It can be evenly applied on uneven surfaces and can be applied from a distance.

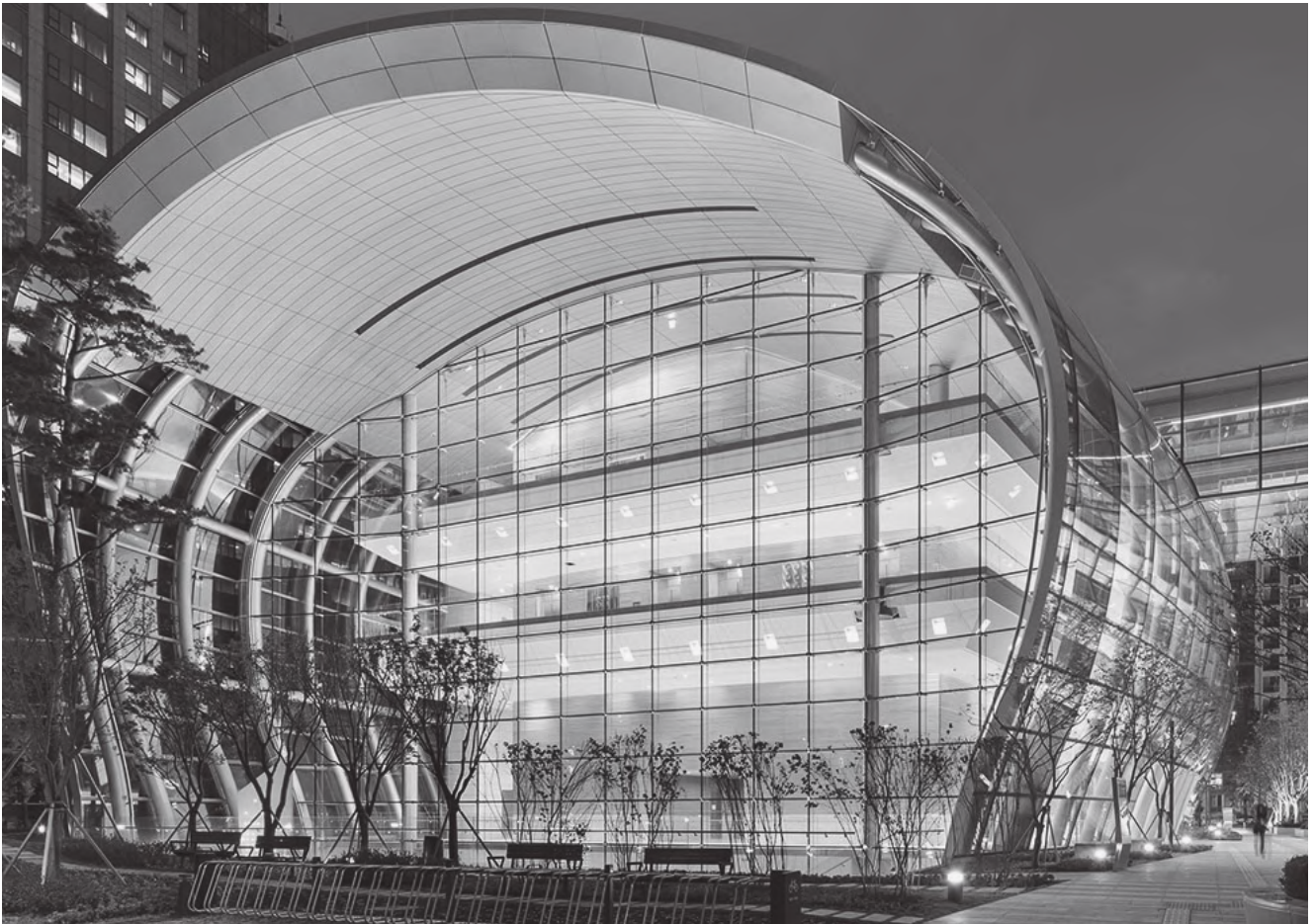
What are the Limitation of Shotcrete?

- It has high cost. Its lining is less durable than ordinary concrete lining of the same thickness.

Where to use Shotcrete?

- Thin and lightly reinforced sections like curtain walls etc.
- Shell or folded roofs.
- Lining of tunnels, canals etc, protective covering for soft dock
- Stabilizing rock slopes
- Encasing steel
- Repair of old building and disintegrated leaking lining etc.





Intelligent Building: A Wise Investment

Steve Brown

Certified Automation Professional,
Environmental Systems Design Inc., Chicago

The concept of intelligent buildings has been gaining more attention these days due to an increasing focus on energy efficiency and responsiveness, and the competitive advantage of offering tenants a technology embedded space. But what exactly is an intelligent building, and why do we need it? A simple internet search demonstrates that there are many interpretations and expectations for how an intelligent building should look and operate. Different companies and providers are offering what they call intelligent building “solutions,” most of which only address a portion or segment of a complete intelligent building solution. It is important to take a long-term, holistic view and develop a comprehensive end-to-end solution that delivers the intended enterprise business results.

Intelligent Building - What is it?

An intelligent building is defined as a set of dynamically connected smart systems that are made interoperable through accumulating, sharing, analyzing, and acting upon the collective smart building data. When designed properly and effectively, the intelligent building platform will result in a more efficient, secure, and productive asset that has the capacity to continuously improve over its lifetime. The intelligent building platform becomes a powerful tool, enabling optimal building performance across all metrics—life safety, security, energy efficiency, productivity, operational efficiency, utility consumption, sustainability, conservation measures, and employee and public engagement.



An intelligent building should be fit for purpose as well as fit for the future. It must meet the requirements and needs of the enterprise's potentially vast group of stakeholders, addressing the goals and initiatives set forth in the customer's charter and vision. Simultaneously, the intelligent building needs to be fit for future use, with the flexibility and scalability incorporated into the design to easily and seamlessly expand with, and adapt to, tomorrow's technologies.

A common misconception is that the utilization of smart devices and Internet of Things (IoT) technologies within a facility positions that space as an intelligent building. Smart device and IoT technologies are components of building systems that use embedded technology to gather more granular building data more effectively and efficiently than traditional methods. Examples of smart or IoT, technologies are data-enabled HVAC equipment (e.g. chillers, boilers, variable frequency drives), data-enabled electrical gear and distribution panels, light level sensors enabling lighting control strategies such as day-light harvesting, and wired and wireless environmental monitoring devices. Smart technologies are even beginning to extend to non-traditional building components like fire extinguishers, water/rain sensors, and waste receptacles to provide an even deeper view into the operation of a facility.

So smart devices and IoT technologies are the conduits to capture better and more relevant building data; however, if that data remains solely contained within the boundary of the original smart building system – building automation system (BAS), lighting control system, electrical power monitoring system, etc. – the power of the collected data cannot be fully realized. When enabled to share their specialized data through an open-source data platform, these smart building systems become collectively intelligent and their effectiveness increases exponentially.

Intelligent Building - Why do i Need it?

The intelligent building design creates a common software platform that aggregates, normalizes, and coordinates the data from and between the disparate smart systems. This platform enables transparent access to real-time building performance data while allowing intuitive visualization of the metrics important to each class of stakeholder through dashboards. The capabilities of the platform are further expanded through the implementation of fault detection, diagnostics, analytics, and advanced reporting applications.

There are many stakeholders interested in obtaining more granularity in their specific area of interest in



Figure 1: This venn diagram demonstrates how the six key stakeholder categories – those concerned with operational efficiency, financial performance, occupant experience, sustainability, and prestige / recognition – overlap within the performance data they require from the intelligence building solution and their utilization of visualization tools to organize and disseminate the information.

order to analyze the data gathered and optimize building systems. Each class of stakeholder has different requirements of the intelligent building design, and the desired outcomes vary depending on the individual, unique experiences and expectations of the assembled stakeholders. Gathering the project stakeholders to discuss their distinct and specific needs, including coming to a consensus and compromising where necessary is critical to a successful design.

While there can be numerous stakeholders on any one intelligent building project, their desired outcomes can generally be categorized in the classes represented by Figure 1. While the benefits of an intelligent building solution are expansive, many of the goals, initiatives, and desired outcomes of the stakeholder groups overlap. In fact, the concept of data visualization is pervasive through each of these categories. By looking at each category separately but keeping in mind these overlaps, it is clear that an effective intelligent building solution requires the right communication and integration among systems.

1. Improved operational efficiency / utilization. This class of stakeholders is focused on keeping the building functioning on a day-to-day basis. Inwardly, they are concerned with occupant satisfaction, ease of operation, access to critical systems information, and productivity of the maintenance staff.



The visibility provided by the intelligent building platform allows a real-time and more organized response to maintenance concerns, making their jobs easier and improving their ability to keep the occupants comfortable and happy. These stakeholders are concerned with the productivity of the non-staff occupants in the building and strive for optimal building comfort. They want access to information about the effectiveness of the building's spaces and how integration can improve productivity.

2. **Reduced utility consumption.** Beyond improved maintenance practices which can reduce the amount of wasted energy, the aggregation and analysis of data from IoT devices within the intelligent building platform can allow a company to predict its utility demand and implement more focused energy management strategies to maximize efficiencies and minimize costs. Companies can reduce their dependency on the grid when these strategies include the installation of onsite renewable energy sources, such as solar and wind. The power of IoT is ultimately optimized when this intelligence from the building platform is used to drive a net zero facility.
3. **Improved financial performance.** Expanding from the objectives of those stakeholders concerned with operational efficiency, knowing the financial effects of operational inefficiencies can foster more informed decisions. More efficient responses to maintenance concerns lowers the maintenance costs and inevitably promotes a more optimal, and therefore energy efficient and cost effective operation. Customized reports comparing financial met-

rics across the entire enterprise can also be provided to the financial stakeholders who are interested in how the intelligent building systems are impacting the company's financial metrics and the bottom line revenue/profitability.

4. **Enhanced occupant experience.** These stakeholders are concerned with the comfort and safety of the building occupants. Many studies have associated a strong link between an occupant's comfort and their productivity levels. These stakeholders also want the intelligent building to help disseminate messages during an emergency, including preaction and warnings. Additionally, they are interested in how the building's intelligence can be leveraged to maintain proper access control and improve emergency communications; improved tenant/employee attraction and retention.
5. **Sustainability.** Sustainability stakeholders are concerned with energy and water efficiency, utility optimization, and how to reduce emissions and save resources. These stakeholders will want to include performance data from throughout the intelligent building in lobby displays to promote the building's sustainability initiatives.
6. **Prestige/Recognition.** Prestige and recognition is a motivation for multiple stakeholders who want to create a high-profile image for the building, company, and/or community, showcasing the company's commitment and dedication to all occupants, visitors, and investors.

Strong visualization tools organize and present the building data so that stakeholders can better understand the building in order to make necessary adjustments for optimization. Individual dashboards for each of the building's stakeholders – ranging from those focused on the financial performance through the tenants concerned with prestige and recruiting – can be built to concentrate on targeted datasets. For example, the day-to-day building operator will need the most inclusive dashboard that features an overall picture of the facility as well as certain granular-level statistics specific to each facility, while the financial stakeholder will want to know how the day-to-day numbers play out in the overall budget.

Another benefit to effective visualization tools, and possibly the most powerful long-term benefit, is the power to influence behavioral change within the people that occupy and visit the Intelligent Building. Dashboards displaying the real-time data of a building's or a company's space can inspire more sustainable habits



Figure 2: This diagram illustrates the process of defining and designing the building systems and components that deliver on the stakeholders' vision of a truly intelligent building. It is a visual representation of the process to define the client's goals and initiatives for an intelligent building.



within the occupants of that space, which in turn can increase the space's efficiency.

Intelligent Building – What's Next?

Tomorrow's intelligent buildings will take today's technology to the next level, including the application of advanced algorithms, analysis, and fault detection and diagnostics (FDD), as well as an evolution of the role of facilities personnel in the intelligent building.

The facility manager's role will morph into maximizing the emerging intelligent building asset—the building data. Incorporating this role is already becoming a necessity and can be performed either in-house or via the services of a qualified third-party intelligent building consultant. If performed in-house, it may take some time to teach the necessary skill set to the property managers and building engineers. Training is available from the qualified intelligent building consultant who will guide the facility staff in the most effective use of their unique systems and building data. This will be aided by the proliferation of more user-friendly features and dashboards.

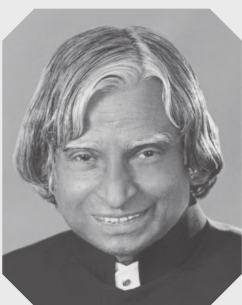
As capabilities grow and technologies continue to emerge and mature, it is expected that the intelligent building platform will be implemented across the client's new and existing buildings, extending the benefits throughout the portfolio.

The intelligent facility of tomorrow will be strikingly different from that of today's high-performance building. While both feature smart MEP systems, web-based technologies, and the latest equipment optimization, the intelligent building will stand out behind the scenes

for its ability to collect data from each disparate system and consolidate it into dashboards for individual stakeholders, and—most importantly—for its ability to use the collected data to impact the building positively and enable continuous improvements.

We have described what an intelligent building is and what benefits can be derived from implementing an intelligent building design. So, why are more intelligent buildings not being built? One prevalent thought is: "It has to cost more to get all the benefits described - right?" In other words, "I need to invest more to get an intelligent building and all the benefits it offers." This is true, but not in the way you may be thinking. Most would equate investment to capital cost. However, in our experience, when the client and their design team invest in the proper amount of forethought, team coordination, and planning at project inception, the additional financial investment to obtain an intelligent building can be minimal, and possibly cost-neutral. The wise investment referred to in the title of this article is actually the investment in the master planning process for the intelligent building

As you begin on your intelligent building journey, engage a qualified and experienced intelligent building design consultant to be your advocate and develop the roadmap to meet your unique enterprise goal and initiatives. Intelligent building consultants, when engaged early in the process, will help gather the project objectives, align them with the project scope and budget, and apply best practices, setting the foundation for a successful intelligent building solution that delivers a competitive real estate advantage, now and for the future.



I had a sparrow as a pet but it flew away one day....

Then I had a squirrel but it ran away too...

Then I planted a tree and they both came back

- Dr. APJ Abdul Kalam



SOUTHERN CENTRE ACTIVITIES



01.11.2015: 3வது மாநில அளவிலான கூட்டம்

புதுக்கோட்டை மய்யத்தால் ஏற்பாடு செய்யப்பட்ட 3வது மாநில அளவிலான கூட்டம் மிகவும் சிறப்பாக நடைபெற்றது. இக்கூட்டத்தில் தென்னக மய்யம் சார்பாக மூத்த தலைவர்கள், அலுவலக நிர்வாகிகள், பொதுக்குழு உறுப்பினர்கள் உட்பட 22 உறுப்பினர்கள் கலந்து கொண்டனர்.

03.11.2015: ரயில்வே ஒப்பந்ததாரர்கள் கூட்டம்

The Southern Railway Engg. Contractors Association சார்பாக Hotel Park, Chennai-ல் நடைபெற்றது. இந்த விழாவில் அகில இந்திய முன்னாள் தலைவர் திரு. R. இராதாகிருஷ்ணன் முதன்மை விருந்தினராக கலந்து கொண்டு சிறப்புரையாற்றினார். இந்த விழா ஏற்பாட்டினை Railway Engg.Association தலைவர் திரு. K.S. பாபுராஜ் தலைமையில் அதன் செயலாளரும் தென்னக மய்யத்தின் கவுரவ செயலாளருமான திரு. K. வெங்கடேசன் மிகவும் சிறப்பாக செய்திருந்தார். விழாவில் இரயில்வே Engineering மூத்த அதிகாரிகள் 20க்கும் மேற்பட்டோர் கலந்து கொண்டு சிறப்பித்தார்கள், மேலும் அவர்களுக்கு இந்தக் கூட்டத்தில் சிறப்பு செய்யப்பட்டது, இதில் 100க்கும் மேற்பட்ட ரயில்வே ஒப்பந்ததாரர்கள் கலந்து கொண்டு சிறப்பித்தார்கள்.. இந்த விழாவில் தென்னக மய்யம் சார்பாக மய்யத்தலைவர் திரு. O.K. செல்வராஜ், முன்னாள் மாநிலத்தலைவர் திரு. MU. மோகன், முன்னாள் மய்யத்தலைவர் திரு. S. அய்யநாதன், பொதுக்குழு உறுப்பினர்கள் திரு. G. திலகர், திரு. V.S. ராமகிருட்டிணன், திரு. N.G. லோகநாதன் மற்றும் செயற்குழு உறுப்பினர் திரு. P. இராம்குமார் ஆகியோர் கலந்து கொண்டு சிறப்பித்தனர்.

2015-16 உறுப்பினர் சேர்க்கை சாதனை

2015-16-ம் ஆண்டிற்கான தென்னக மய்ய உறுப்பினர் எண்ணிக்கை விவரம் கீழ்க்கண்டவாறு தலைமையகத்திற்கு அனுப்பி வைக்கப்பட்டது. கடந்த ஆண்டை விட 102 உறுப்பினர்கள் அதிகம் பெற்று மொத்த உறுப்பினர்கள் 2165 ஆக அகில இந்திய அளவில் தொடர்ந்து மிகப் பெரிய மய்யம் என்ற பெருமையை தக்க வைத்துக் கொள்ள ஒத்துழைப்புக் கொடுத்த அனைத்து செயற்குழு, பொதுக்குழு மற்றும் மூத்த தலைவர்கள் அனைவருக்கும் நன்றியை மிகவும் மகிழ்ச்சியுடன் தெரிவித்துக்கொள்கிறோம்.

1. Patron	-	1532
2. New Annual Member	-	219
3. Renewal Member	-	414

	-	2165

Affiliated Association

1. Patron Affiliated	-	13
2. New Annual Affiliated	-	1

05.11.2015: ரயில்வே அதிகாரிகளுடன் சந்திப்பு

The Southern Railway Enggering Contractors Association தலைவர் திரு. K.S. பாபுராஜ் அவர்களுடன், அதன் செயலாளரும் நமது மய்ய கவுரவ செயலாளருமான திரு. K. வெங்கடேசன் அவர்கள் தென்னக ரயில்வே Finance Advisor, Chief Accounts Officer, மற்றும் Principal. Chief Engineer, ஆகியோரை சந்தித்து தீபாவளி பண்டிகையை முன்னிட்டு ஒப்பந்ததாரர்களுடைய நிலுவைத் தொகையை உடனடியாக வழங்க வேண்டும் என்று கேட்டுக் கொண்டனர்.



**12.11.2015 டெங்கு காய்ச்சல் பற்றி
விழிப்புணர்ச்சி முகாம்**

Department of Public Health and Preventive medicine சார்பாக டெங்கு காய்ச்சல் விழிப்புணர்ச்சி முகாம் Health and Family Welfare Training Centre, Egmore, Chennai-8ல் மாலை 3 மணி அளவில் ஏற்பாடு செய்யப்பட்டது. தமிழக மாண்புமிகு சுகாதாரத்துறை அமைச்சர் திரு. விஜயபாஸ்கர் தலைமை தாங்கினார். டெங்குகாய்ச்சல் விழிப்புணர்ச்சி பற்றி உரையாற்றிய திரு. இராதாகிருட்டிணன், IAS, Secretary., Health Department அவர்கள் ஏறக்குறைய ஒரு மணி நேரம் டெங்கு கொசு எங்கெல்லாம் உருவாகின்றது அதை எப்படியெல்லாம் தடுப்பது என்பது பற்றி Power Point Presentation மூலம் மிகவும் சிறப்பாக விளக்கிக் கூறினார். அவரது உரை மிகவும் உபயோகமாக இருந்தது. மற்றும் திரு. வடிவேலன், Addl. Director of Health Department ஆகியோரும் கலந்து கொண்டனர். தென்னக மய்யம் சார்பாக மய்யத்தலைவர் திரு. O.K. செல்வராஜ், கவுரவ செயலாளர் திரு. K. வெங்கடேசன், இணைச் செயலாளர் திரு. S. இராமப்பிரபு ஆகியோர் கலந்துகொண்டார்கள். மேலும் நமது மய்யத்தலைவர் திரு. O.K. செல்வராஜ்

அவர்கள் உரையாற்றும்போது டெங்கு காய்ச்சலை ஒழிப்பதற்கு தமிழக அரசு எடுக்கும் அனைத்து நடவடிக்கைகளுக்கும் நமது சங்கம் முழு ஆதரவு அளிக்கும் என்பதை தெரிவித்துக்கொண்டார். இந்தக் கூட்டத்தில் கலந்து கொண்ட மாண்புமிகு சுகாதாரத்துறை அமைச்சர் அவர்களும், மற்றும் அதிகாரிகளும் நம்முடைய சங்கத்தைப் பற்றி சிறப்பாகவும், நம்மை முன் நிறுத்தியும் கூட்டம் முழுவதுமே நடத்தப்பட்டது. பத்திரிக்கையாளர் சந்திப்பிலும் நம்முடைய சங்கம் சிறப்பாக ஒத்துழைப்பு கொடுப்பதாகவும் கூறி நமது சங்கத்திற்கு மேலும் பெருமை சேர்த்தார்கள். இந்த கூட்டத்திற்கு 100க்கும் மேற்பட்ட கட்டுநர்கள் மற்றும் அவர்களின் ஊழியர்கள் கலந்து கொண்டு சிறப்பித்தது பாராட்டிற்குரியது.

26.11.2015: எட்டாவது செயற்குழு கூட்டம்

26.11.2015 அன்று 8வது செயற்குழு கூட்டம் ஓட்டல் சவேரா, சென்னை-600 04 ல் உயர்திரு. M.ப. மோகன், உயர்திரு. S. அய்யநாதன், உயர்திரு. S.D.கண்ணன், உயர்திரு. L. சாந்தகுமார்

உயர்திரு. S. நேதாஜி ஆகியோரின் உபசரிப்பில் நடைபெற்றது.

SUDOKU

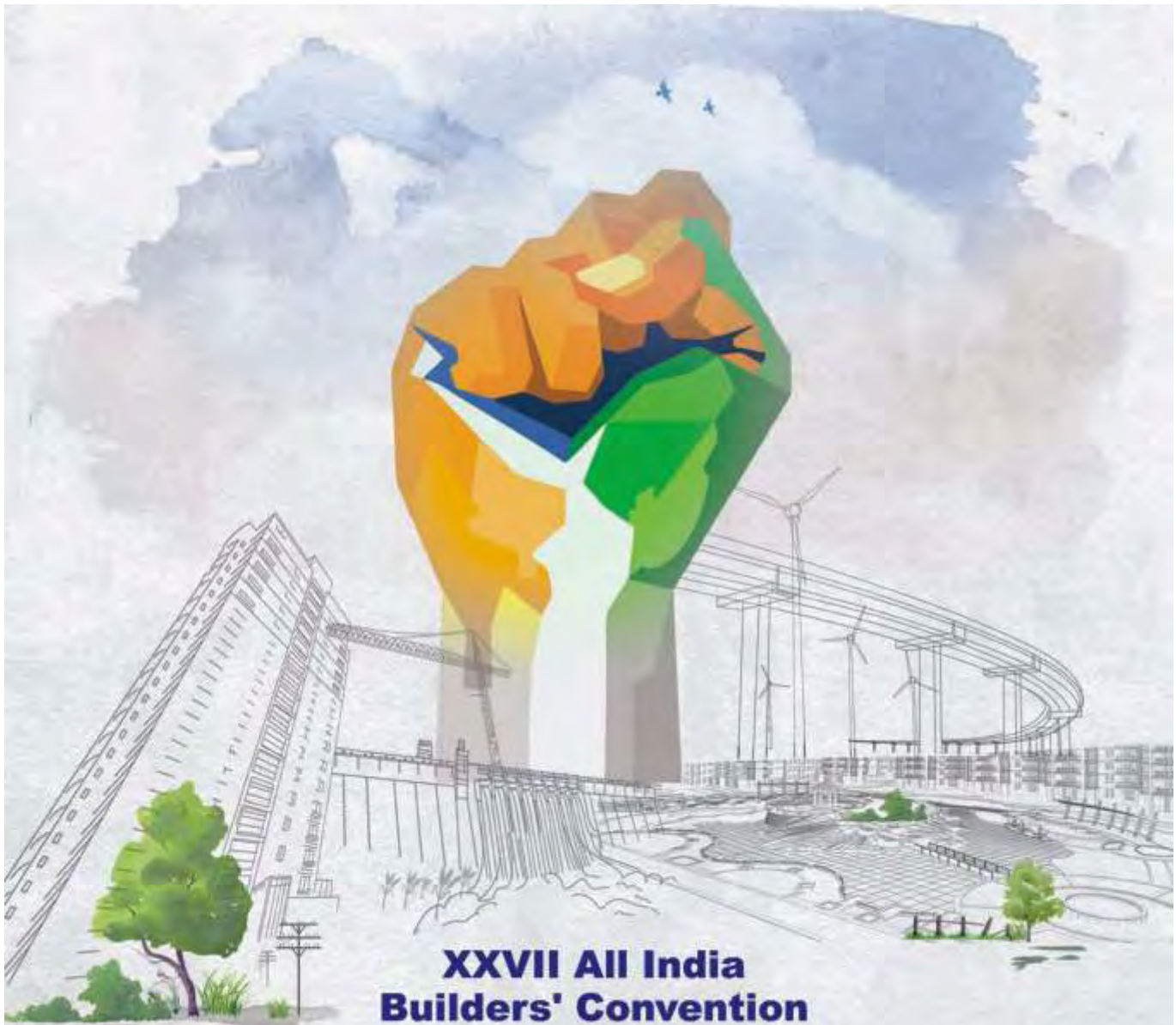
October Issue - SUDOKU - புதிருக்கான விடை

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

November Issue - SUDOKU - புதிர்

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