SRI VENKATESWARA COLLEGE OF ENGINEERING

Pennalur, Sriperumbudur Taluk, Tamil Nadu, India – 602117

Department of Civil Engineering

ISO 9001:2015 Certified by IRQS

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CIVILIANS CHRONICLE 2021-22

EDITORIAL BOARD

DEPARTMENT VISION

To become a department of excellence in Civil Engineering education and research producing globally competent civil engineers to serve the industry and society.

DEPARTMENT MISSION

The department vision will be achieved by

- Providing state-of-the art resources that contribute to an excellent learning environment.
- Imparting necessary skills, cultivating moral and ethical values.
- Establishing regular interaction and collaboration with industries.
- Motivating the students to take up competitive exams and pursue higher education.
- Promoting research and development activities in emerging areas of civil engineering and offering services to society and industry through education, research and consultancy activities.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Civil Engineering graduates during the first few years of graduation will:

I. Practice civil engineering in construction industry, public sector undertaking or as an entrepreneur by applying ethical principles and following norms of civil engineering practice.

II. Pursue higher education for professional development

III. Exhibit leadership and team working skills in their profession and other activities with demonstrable attributes to contribute to the societal needs and to adapt to the changing global scenario.

PROGRAM SPECIFIC CRITERIA

(Curricular requirements specified by International Professional Association American Society of Civil Engineers, ASCE)

1. The curriculum must prepare graduates to apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science. **(Maths and Science)**

2. The curriculum must prepare graduates to apply probability and statistics to address uncertainty. **(Probability and statistics)**

3. The curriculum must prepare graduates to analyze and solve problems in at least four technical areas appropriate to Civil Engineering. **(Breadth in Civil Engineering)**

4. The curriculum must prepare graduates to conduct experiments in at least two technical areas of civil engineering, and analyze and interpret the resulting data. **(Civil Engineering Experiments)**

5. The curriculum must prepare graduates to design a system, component, or process in at least two civil engineering contexts. **(Civil Engineering Design)**

6. The curriculum must prepare graduates to include principles of sustainability in design. (Sustainability in Design)

7. The curriculum must prepare graduates to explain basic concepts in project management, business, public policy and leadership. **(Project Management, Business, Public Policy, and Leadership)**

8. The curriculum must prepare graduates to analyze issues in professional ethics.(Professional Ethics)

9. The curriculum must prepare graduates to explain the importance of professional licensure. **(Professional Licensure)**

Faculty Requirements (Specified by ASCE)

The program must demonstrate that faculty teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience. The program must demonstrate that it is not critically dependent on one individual.

PROGRAM OUTCOMES (POs)

Students in the Civil Engineering program should, at the time of their graduation, be able to

1. Apply the knowledge of mathematics, science, engineering fundamentals and concepts of Civil Engineering to the solution of complex engineering problems. **(Engineering knowledge)**
2. Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. **(Problem analysis)**
3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. (**Design/Development of Solutions)**
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems. (**Conduct Investigations of Complex Problems)**
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. (**Modern Tool Usage)**
6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. (**The Engineer and Society)**
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. (**Environment and Sustainability)**
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. **(Ethics)**
9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. **(Individual and Team Work)**
10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. (**Communication)**

11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. (**Project Management and Finance)**
12. Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change. (Life-long Learning)

PROGRAM SPECIFIC OUTCOMES

1. Students in the Civil Engineering program should, at the time of their graduation, be able to provide solutions for real-life problems related to core areas of civil engineering by applying knowledge of mathematics, Basic and Engineering Sciences and by using appropriate engineering tools.
2. Plan, analyse, design, execute and manage infrastructure projects considering safety, societal and environmental factors.

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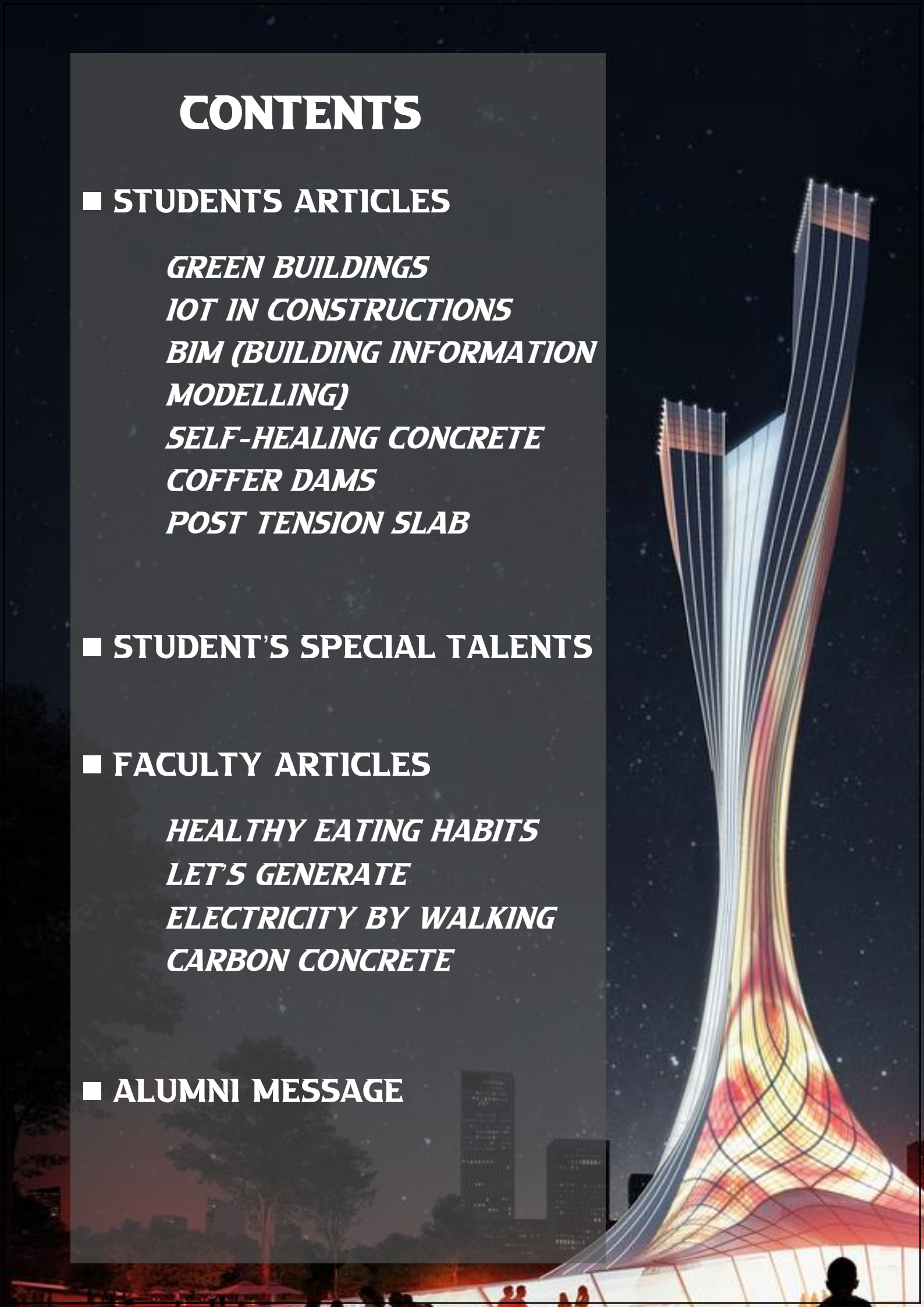


STUDENTS ARTICLES

GREEN BUILDINGS...🌱

In the Era of concrete houses and cement buildings, people are running toward homes which will connect them with nature. Green building was created which will provide thehwith house and help them connect them with nature.

Green buildings

A Green building is an environmentally sustainable structure which is in sync with nature. Green buildings are built with the available local resources. These buildings are eco-friendly and self-sufficient.

Goals of Green building

- Life cycle assessment
- Sitting and structure designing efficiency
- Energy efficiency
- Water efficiency
- Materials efficiency
- Indoor environmental quality enhancer
- Operation and maintenance optimization
- Waste reduction

Generally, Green building is built using local renewable resources such as clay, sand, stone, and bamboo. The waste material generated during the construction of Green buildings is recycled which makes it sustainable. Green buildings are energy sufficient and water sufficient. Green buildings generally use solar panels for generating electricity which makes them eco-friendly and less polluting. The waste generated during the construction of the building is recycled reducing waste. It must be provided with space for trees and plants which make them unique from the concrete buildings. All the Green buildings are built in a way so that they have an integrated space for farming, rooftop gardening and backyard gardens.

The CII-Godrej GBC in Hyderabad is the first platinum rated green building in India built in 2003. Maharashtra ranks 1st in green buildings . Tamil Nadu ranks in 3rd place.

Implementation of Green buildings reduce carbon footing and helps in decrease of global warming.Occupants of Green house building feel that they can breathe fresh air because of the trees surrounding them. Researches say that the occupants of Green building are tend to be healthier and happier than the occupants of concrete slab.

R.Priyadharshini
I year B.E.(Civil Engineering)

IoT IN CONSTRUCTIONS

The Internet of Things in construction: what are the pros and cons?

A labourer on your job site has stayed two hours over his normal shift to cover for a buddy. He's stressed and tired – his heart rate is up and his alertness is reduced. It is an accident waiting to happen. Fortunately, your company has invested in Internet of Things solutions for construction. An automatic alert is sent from the device he is wearing to the shift manager who can quickly pinpoint his exact location and intervene.

This is just one of the many potential use cases of the Internet of Things (IoT) in construction – one of the most promising innovations in construction technology of the past decade. Already some USD $8 billion has been invested in IoT in construction worldwide, making this a very promising market indeed.

What is IoT in construction, how is it being used, and what is its potential?

WHAT IS IOT IN CONSTRUCTION?

IoT in construction involves the use of internet-connected sensors which are placed around job sites or worn by labourers. IoT devices for construction are able to collect certain kinds of data about activity, performance and conditions on the building site and send this to a central dashboard where the data is analysed to help inform decisions.

Traditionally, most internet-connected devices have been computers and mobile phones. However, a huge variety of sensors can now easily and cheaply be upgraded with a chip (like a SIM card), hence the term 'Internet of Things'. From wristbands that monitor heart rate to temperature sensors to vibration monitors, it is now possible to connect these devices to a central database, meaning many more aspects of your sites can be monitored in 'real time'. And this has huge implications for safety, security, productivity, and cost reduction.

WHAT ARE THE POTENTIAL USES OF IOT CONSTRUCTION SOLUTIONS?

Countless building companies around the world have already begun using IoT in construction in some form or another. Here are just some of the ways that the technology can be used:

Improving safe working practices:

As with the example at the beginning of this article, wearable IoT devices have real potential for improving safety on building sites. If all staff on a job site wear a wrist band or clip-on device, data about their movements and activity can be used to discover any risky behaviour.

Take the example of a New York construction firm who supplied workers with clip-on IoT devices. The device would send an automatic alert to the company's site safety manager whenever the device physically dropped by three foot or more (the idea being to immediately notify health and safety of any falls). The manager noticed that one worker appeared to be repeatedly falling and went to investigate. As it turned out he was jumping into a pit, rather than using the ladder provided. He was naturally reminded of the dangers of his behaviour!

Besides improving safety on-site, this kind of data could additionally be used to renegotiate insurance premiums too.

Improve resource management:

How many hours get wasted on building sites searching for materials? How many litres of fuel get burnt by idle engines? How much time do labourers spend underemployed when they could be sent to support other tasks?

Using IoT devices could make significant improvements to resource management on construction sites. If all machines, staff and materials are connected to the internet with a chip, you can geolocate them immediately. The potential cost and time savings here are significant.

Take truck monitors by the IoT firm Trimble – their rugged IoT construction solutions can identify location and activity of a wide variety of vehicles and other assets.

Better reporting and maintenance:

With sensors dotted around a building site, IoT devices can continually feedback information about conditions in both completed and under-construction sites. Sensors can monitor for things like unusual vibrations on a piece of machinery that suggests it needs to be fixed. They can detect increases in humidity which can tell your inspection teams about damp issues. Or in the case of IoT building construction company Pillar, devices can even help prevent fires.

At PlanRadar, this is an area we are particularly excited about. Our app already functions as an IoT device for construction by providing real-time ticketing information for site problems to maintenance teams. But with improvements in IoT sensors, this could be achieved even faster.

IoT in construction is already delivering real benefits to companies in the industry. It is helping to:

- Improve health and safety in the construction industry
- Reduce insurance premiums
- Cut waste and theft
- Encourage more proactive (and therefore cost-efficient) maintenance
- Improve resource management

Nevertheless, there are certain hurdles and issues that need to be addressed before more widespread adoption of this technology.

OBSTACLES TO THE INTERNET OF THINGS IN CONSTRUCTION

Although IoT devices for construction are already in use on many building sites around the world, there are several obstacles to more widespread adoption. First and foremost, there are certain safety and privacy issues to overcome. If a malicious actor found a way to hack into a company's IoT database, it could be a real goldmine of sensitive information. A list of where all your machinery is currently located or where expensive materials are stored could be a boon to organised criminals. Related to this are concerns about tracking the physical movement of workers. Many may object on privacy grounds, as could labour organisations.

While most IoT devices are relatively cheap, many job site owners will need convincing that they are worth the investment. Especially on smaller sites where you can conduct all checks in just a couple of minutes, it might seem unnecessary to spend money on sensors and learn to use a

dashboard when it can continue being done manually. For the time being, it is likely that IoT construction solutions will mainly be used on large building and civil engineering projects.

Finally, like any technology, sensors are only as good as the way they are deployed. There is little sense in spending money on, say, moisture sensors, when the biggest risk on a site is heat. Sensors need to be placed and chosen strategically – many construction firms will have to follow a big learning curve before being able to truly benefit from these tools. Simply placing IoT sensors around a site won't solve issues on its own.

THE FUTURE OF IOT IN CONSTRUCTION

The Internet of Things is one of the most exciting new innovations in construction technology. Consultants at McKinsey reckon it could have a global economic impact of nearly $1 trillion on worksites worldwide by 2025, which indicates it is likely to become an increasingly common feature in the industry. With the sheer variety of applications and some serious benefits, IoT in construction is definitely one to watch.

About Plan Radar

Plan Radar was founded in 2013 and provides innovative mobile-first software solutions to the construction and real estate industries. Our app is available on all iOS, Android and Windows devices and has helped more than 7,000 customers in over 44 countries to digitise their workflow.

Raghavendra B
I year - (B.E. Civil Engineering)

BIM-(Building Information Modelling)

Building information modelling (BIM) is one of the most promising recent developments in the architecture, engineering, and construction (AEC) industry. With BIM technology, an accurate virtual model of a building is digitally constructed. This model, known as a building information model, can be used for planning, design, construction, and operation of the facility. It helps architects, engineers, and constructors visualize what is to be built in a simulated environment to identify any potential design, construction, or operational issues. BIM represents a new paradigm within AEC, one that encourages integration of the roles of all stakeholders on a project. The findings of this study provide useful information for AEC industry practitioners considering implementing BIM technology in their projects.

What is BIM ?

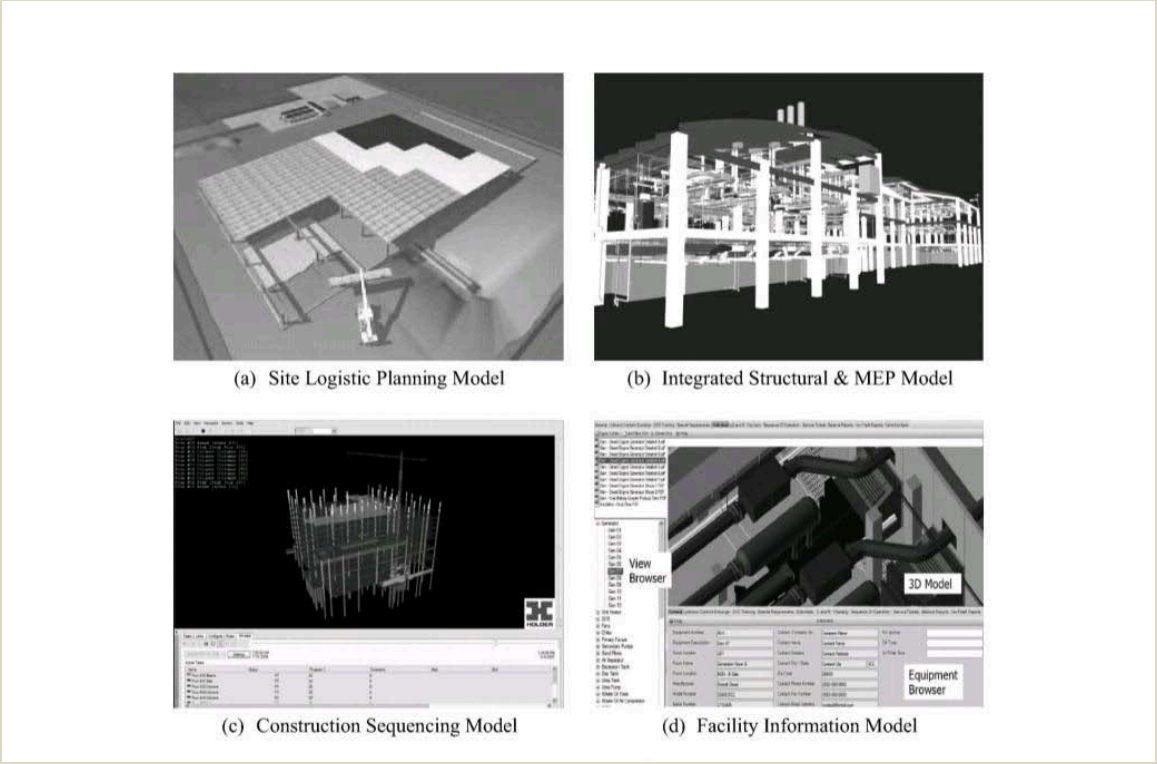
Building Information Modeling (BIM) is the holistic process of creating and managing information for a built asset. Based on an intelligent model and enabled by a cloud platform, BIM integrates structured, multi-disciplinary data to produce a digital representation of an asset across its lifecycle, from planning and design to construction and operations.It is important to note that BIM is not just software; it is a process and software. BIM means not only using three-dimensional intelligent models but also making significant changes in the workflow and project delivery processes.

Difference between 3D modelling and BIM:

The difference between 3D CAD modelling and BIM is that, while both processes provide geometric expressions of buildings and infrastructure, the BIM process goes beyond geometry to capture the relationships, metadata, and behaviours intrinsic to real-world building components. Combined with technology of the BIM ecosystem, this data drives improved project outcomes in a way that 3D modelling cannot.

Advantages of BIM over cad:

Both CAD and BIM processes are used to capture and communicate the design and construction intent of an AEC project using a drawing representation, helping stakeholders understand what needs to be built, and how. BIM enables design and construction teams to leverage their technology investment to do much more. The BIM process supports creation and management of information across the lifecycle of an AEC project by federating all multi-disciplinary design and construction documentation into a common dataset. Since that data can be accessed in multiple representations, from 2D to 3D to tables, the information is far more accessible and connected than the disparate data sources associated with traditional CAD approaches.



(a) Site Logistic Planning Model (b) Integrated Structural & MEP Model

(c) Construction Sequencing Model (d) Facility Information Model

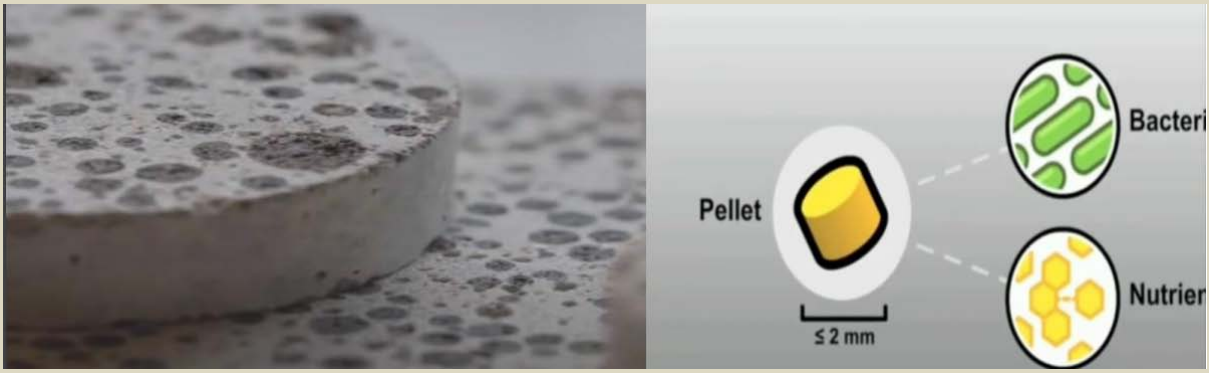
Applications of building information modelling:

- **Visualization:** 3D renderings can be easily generated in house with little additional effort.
- **Fabrication/shop drawings:** It is easy to generate shop drawings for various building systems. For example, the sheet metal ductwork shop drawings can be quickly produced once the model is complete.
- **Cost estimating:** BIM software has built-in cost estimating features. Material quantities are automatically extracted and updated when any changes are made in the model.
- **Construction sequencing:** A building information model can be effectively used to coordinate material ordering, fabrication, and delivery schedules for all building components.
- **Forensic analysis**:A building information model can be easily adapted to graphically illustrate potential failures, leaks, evacuation plans, and so forth.
- **Facilities management:** Facilities management departments can use it for renovations, space planning, and maintenance operations.

Harini A
I - year B.E. (Civil Engineering)

SELF-HEALING CONCRETE

Concrete is one of the most important elements in civil engineering projects mainly used in infrastructures. However, concrete structures are susceptible to cracking. Natural process such as Earthquake, humidity change and temperature cause crack in the concrete. These cracks will cause harmful substances to enter the concrete leading to the corrosion of stickers and deterioration of concrete.

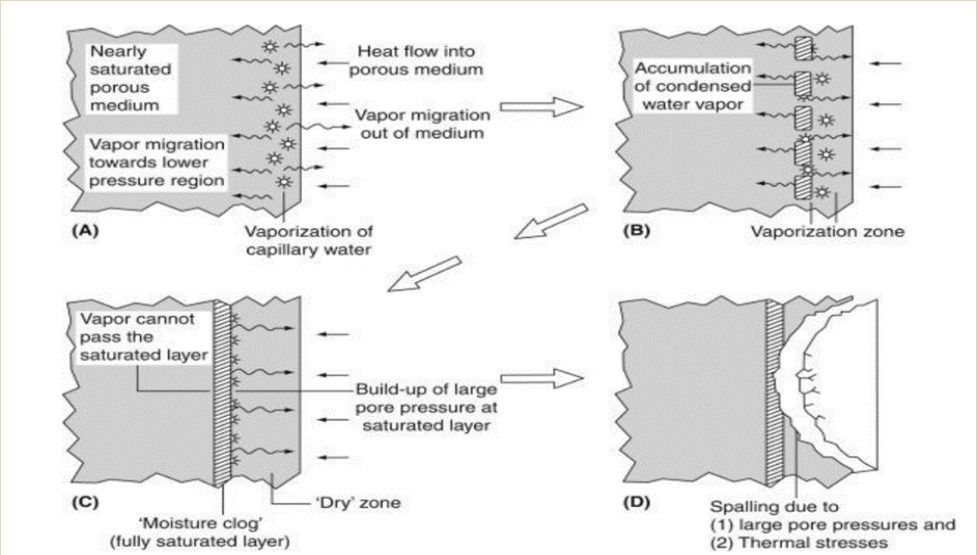


In order to cope with this issue, the quality of concrete should be improved, but yet you can only partially stop cracking which it also cost a lot. Scientists have explored new methods for building concrete. For this reason, they investigated and studied the tissues of living organisms that could be restored. Skin is an example of such living organism that is restored over time after wounding. In doing so, they investigated the living bacteria in order to use them in the production of self-healing concrete which increases the durability and life of the concrete significantly. Employing bacteria, they were able to create the spontaneous repair of the cracks in the concrete, which is one of the most important intrusions in concrete.

Creating micro cracks in concrete is an undeniable fact that in the traditional way of coping with concrete restorer materials, in particular the types of polymers used, which, in addition to its high costs for the environment, is also harmful. The alternative method that scientist have achieved. The use of bacteria in concrete and the production of self-healing concrete, while reducing the cost of maintenance of concrete for the environment is not harmful and contributes to the durability and performance of concrete and also increases the life span of the concrete. Since concrete is used less than cement and because concrete restoration materials are harmful to the environment, self-healing concrete is eco-friendly.

The purpose of this study is to prove that the use of self-restraint concrete will be very beneficial for human health and leads to a healthier environment. This type of concrete also helps the application of this technology to be extended to the environment.

SELF HEALING CONCRETE



Self-healing concrete is mostly defined as the ability of concrete to repair its cracks autogenously or autonomously. It is also called self-repairing concrete. Cracks in concrete are a common phenomenon due to its relatively low tensile strength. Durability of concrete is impaired by these cracks since they provide an easy path for the transportation of liquids and gases that potentially contain harmful substances. If microcracks grow and reach the reinforcement, not only the concrete itself may be attacked, but also the reinforcement steel bars will be corroded. Therefore, it is important to control the crack width and to heal the cracks as soon as possible. Self-healing of cracks in concrete would contribute to a longer service life of concrete structures and would make the material not only more durable but also more sustainable.

Self-healing is actually an old and well-known phenomenon for concrete as it possesses some natural autogenous healing properties. Due to ongoing hydration of clinker minerals or carbonation of calcium hydroxide (Ca(OH)2), cracks may heal after some time. However, autogenous healing is limited to small cracks and is only effective when water is available, thus making it difficult to control. Nonetheless, concrete may be modified to build in autonomous crack healing. Dry started to work on autonomous self-healing concrete in 1994 . In the following years, several researchers started to investigate this topic. Many self-healing approaches are proposed. They mainly include autogenously self healing method, capsule-based self-healing method, vascular self-healing method, electrodeposition self-healing method, microbial self-healing method, and self healing method through embedding shape memory alloys (SMAs). For example, Edvardsen found that the greatest potential for autogenous healing exists in early age concrete. Mihashi et al. used urea-formaldehyde microcapsules (diameter 20– 70 μm) filled with epoxy resin and gelatin microcapsules (diameter 125–297 μm) filled with acrylic resin to achieve self-healing of concrete under compression and splitting. Joseph et al. made use of an air-curing healing agent, provided by glass tubes. One end of the tubes was open to the atmosphere and curved to supply healing agent. When the tubes become depleted after concrete cracking occurred, additional agent could be added via the open end to allow healing of wider cracks .Otsuki et al. proposed the electrodeposition

method as a means of repair for cracked concrete structures and investigate the effects of this method on various concrete properties. Jonkers et al. investigated the potential of bacteria to act as self-healing agent in concrete, i.e., their ability to repair occurring cracks. They proved that the application of bacterial spores as a self-healing agent appears promising. Kuang and Ou, and Li et al., found that the SMA wire as a reinforcing bar can make cracks close and perform the task of emergency damage repair in concrete structures. The cracks are closed due to the super elastic behaviour of embedded SMAs.

BACTERIAS USED IN THE PRODUCTION OF BACTERIAL CONCRETE

- Bacillus pasteurizing
- Lysinibacillussphaericus
- Escherichia coli
- Bacillus subtilis
- Bacillus cohnii
- Bacillus halodurans
- Bacillus pseudofirmus

ADVANTAGES OF SELF HEALING CONCRETE

- Repair the cracks
- Strength more than normal concrete
- Corrosion resistance
- Increase the lifetime of concrete.

KAVIYA R
I YEAR- B.E. (CIVIL ENGINEERING)

COFFER DAMS

Coffer dams are temporary enclosures to keep out water and soil so as to permit dewatering and construction of the permanent facility(structure)dry. To take up the foundation works in the marine region, it is necessary to obstruct the water flow by means of coffer dam. The purposes to use this structure is to retain soil and water and provide working area for workers, to facilitate pile driving operations, it is used to place grillage as well as the raft foundations, sometimes it is also provided to store water temporarily.

There are many types of coffer dams and they are selected like, earth fill coffer dams are for the low heads of water, single wall sheet pile coffer dams otherwise double wall coffer dams are for narrow excavations, the materials available at site of work for construction, rock filled crib coffer dams are when the possibility of overtopping by floods, tides, etc. and sliding, cellular coffer dams could not be suitable but single wall sheet pile would be required when the nature of bed on which the coffer dam is to rest. Coffer dams can be used in various sectors like, Civil engineering: underground car parking, foundations, basement construction. Transportation engineering: bridge pier, support walls, ramps, ground water retention, tunnel work etc, Water engineering: weirs, culverts, flood protection walls, scour protection walls, securing embankment etc.

Port construction: dock works, jetty works etc. The design of an adequate coffer dam involves the problem of construction economics. When the construction is timed so that the foundation work can be executed during the low-water season, the use of coffer dams can be held to a minimum. However, where the stream flow characteristics are such that this is not practical, the coffer dam must be so designed that it is not safe, but also of the optimum height.

HEIGHT LIMITATIONS FOR COFFER DAM

The height to which a coffer dam should be constructed may involve an economic study of coffer dam height versus diversion works capacity. This may include routing studies of the diversion design flood, especially when the outlet works requirements are small. If outlet works requirements dictate a relatively large outlet conduit or tunnel, diversion flows ordinarily may be accommodated without a high coffer dam. It should be remembered that the floodwater accumulated behind the coffer dam must be evacuated in time to accommodate another storm.

The maximum height to which it is feasible to construct the coffer dam without encroaching upon the area to be occupied by the dam must also be considered. Furthermore, the design of the coffer dam must take into consideration the effect that excavation and de-watering of the foundation of the dam will have on its stability, and it must anticipate removal, salvage, and other factors.

DESIGN OF COFFER DAMS

Whose design considerations closely follow those for permanent dams of the same type. Other less common coffer dam types are concrete cribs filled with earth or rock, and cellular-steel cofferdams filled with earth or rock. In this case, the major portion of the cofferdam consists of an earth and rock embankment, and steel sheet piling was used to affect final closure in swift water. Cellular steel cofferdams and steel sheet piling are adaptable to confined areas where currents are swift. If the coffer dam can be designed so that it is permanent and adds to the structural stability of the dam, it will have a decided economic advantage.

In some embankment dams the cofferdam can even be incorporated into the main embankment. In such instances, the saving is twofold-the amount saved by reducing the embankment material required and the amount saved by not having to remove the cofferdam when it is no longer needed

BrithishaS
III year – B.E(Civil Engineering)

POST TENSION SLAB

Post tension slab is a combination of conventional slab reinforcement and additional protruding high-strength steel tendons, which are consequently subjected to tension after the concrete has set. This hybridization helps achieve the formation of a much thinner slab with a longer span devoid of any column-free spaces.

WORKING PRINCIPLE OF POST TENSION:

We all know that concrete has a high compressive strength and steel has a high tensile strength, and when their combination is used to bear loads, the efficiency increases manifold.

When a heavy live load is brought upon a structure, its concrete slab undergoes tension, which leads to the formation of cracks and ultimately deformation occurs. To mitigate this problem, post tensioned steel tendons are inserted at the time of concreting and tensioned after concreting with conventional rebars.

When these post tensioned steel tendons are stressed, the concrete is squeezed, in other terms, the concrete is compacted which increases the compressive strength of the concrete and at the same time the steel tendons that are pulled increase the tensile strength. As a result, the overall strength of the concrete increases.

COMPONENTS OF POST TENSIONING SLAB:

DUCT:

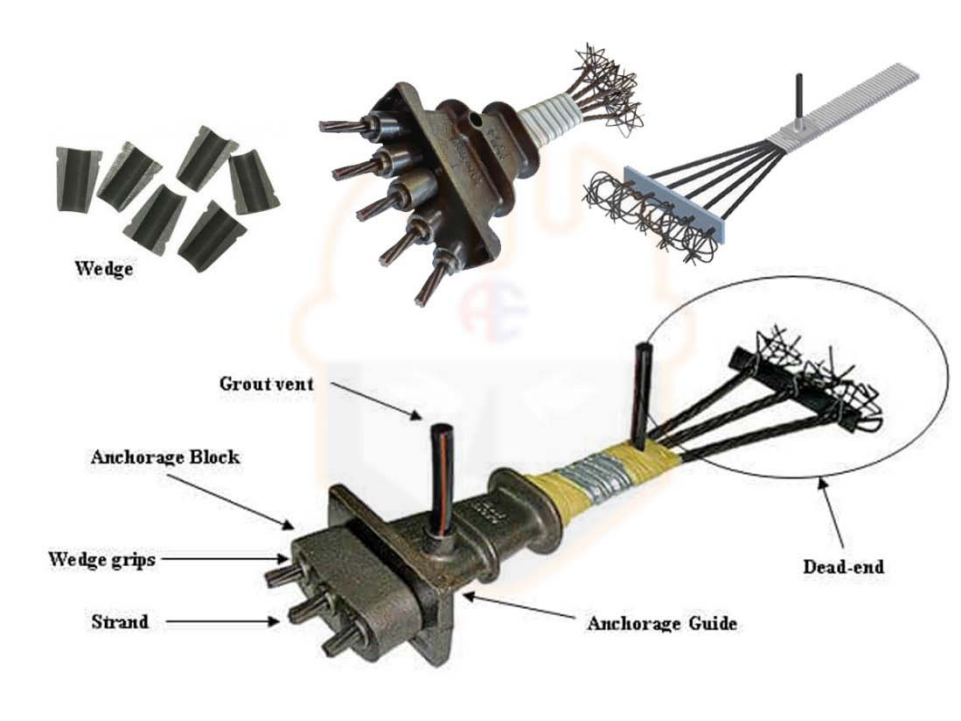
Thin sheet metal pipes with claw coupling or welded overlapped seam supplied in lengths of 5 and 6 m respectively are used as a standard. Ducts are connected to each other by an external screw coupling and sealed with PE tape. Plastic ducts are also available in the market these days which are water tight, frictionless and fatigue resistant.

TENTONS:

The basic element of a post-tensioning system is called a tendon. A post-tensioning tendon is made up of one or more pieces of prestressing steel, coated with a protective coating, and housed inside a duct or sheathing. The prestressing steel is manufactured as per the requirements of ASTM A-416 and typical strand sizes are 0.50 and 0.60 inch in diameter.

ANCHORS:

Anchors are used to anchor the tendons into the concrete while terminating or joining two tendons. Main function of anchorage is to transfer the stressing force to the concrete once the stressing process is completed.



CONSTRUCTION OF POST TENSIONED SLABS:

- The installation of post tensioning tendons in the concrete and stressing it requires skilled labor and personnel who are certified in doing the tensioning works.
- The tendons are laid down along with the conventional rebars. The position of laying of the tendons is decided by the engineer. These tendons are encased in plastic or steel ducts so that they do not come in contact with the water in concrete.
- One end of the tendons is anchored with the help of anchor and the other end is left open with plastic pocket former, where the tendons are stressed. Couplers are used in between if any construction joint is formed.
- Concrete is poured and the alignment of these tendons are taken care of so as to let their positions unaltered. Once after the concrete has achieved its 75% of strength, that is around 20 - 23 days, these tendons are stressed with the help of stressing jacks.

- The tensioning is done to a force equal to 80% of a strand's tensile strength. For a typical ½-inch grade 270 strand, the strand is tensioned to a force of 33,000 pounds. As the tensioning comes into effect, the steel gets elongated, and the concrete is compressed.
- When the proper tensioning force is reached, the prestressing steel is anchored in place. The anchors are designed to provide a permanent mechanical connection, keeping the steel in tension, and the concrete in compression.
- The extra tendons that are left out at one end are trimmed and non-shrink grouting is put in the anchor pocket.

S. PRIYADHARSHANI

III-Year- B.E.(Civil Engineering)

STUDENTS SPECIAL TALENTS

மரம் வளர வளர மனத்தையும் கணத்தையும்,மாற்றி கொண்டே வளர்கிறது
மனிதன் வளர வளர மனம் மட்டும் மாறுகிறது
இதுதான் இயற்கையின் கணம்.

By

Hari Prakash .J
III Year Civil Engineering

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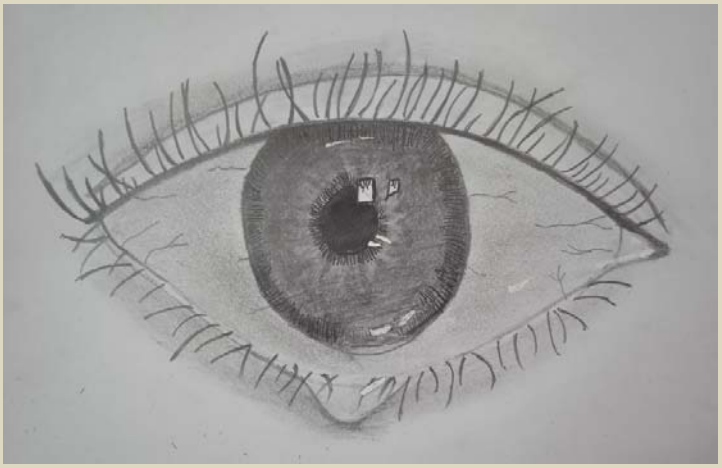


EACH DROP OF TEAR YOU SHED… MAKE SURE THAT'S YOUR HAPPY TEAR

Srilekha.N
II Year – B.E(Civil Engineering

Dream, Dream, Dream.
Dreams transform into thoughts
and thoughts result in action.”
— Dr. A.P.J. Abdul Kalam

Logeswari.N
IV-Year -B.E (Civil Engineering

“The first duty of a revolutionary is to be educated.”

— Che Guevara

Logeswari.N
IV-Year -B.E (Civil Engineering

FACULTIES ARTICLES

HEALTHY EATING HABITS

In the midst of the COVID-19 pandemic, eating healthy food remains an important part of maintaining your health. While there are no specific foods that can help protect you from the virus, a nutritious diet can boost your immune system or help you fight off symptoms. You may not be able to share meals with friends and loved ones, but there are lots of other ways to eat well and support your health at this difficult time.

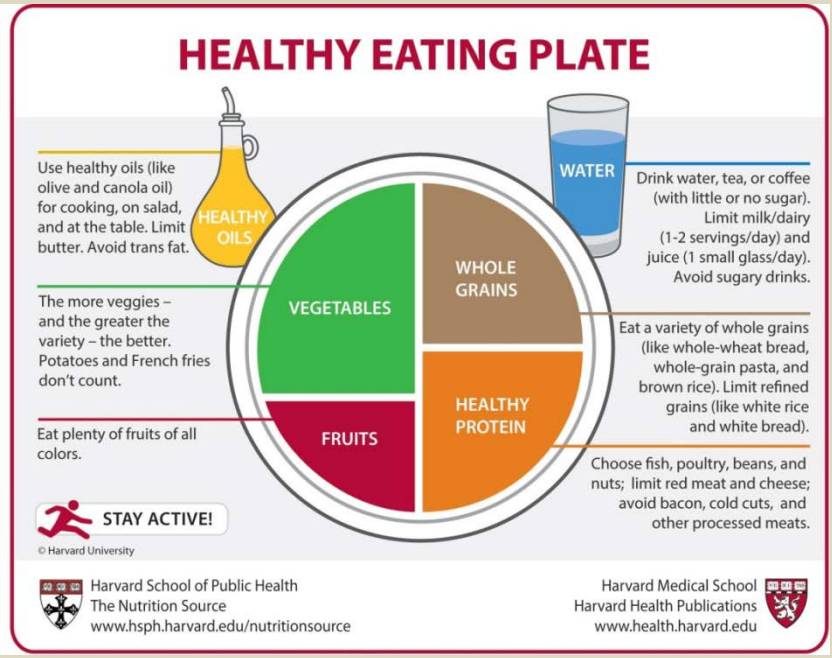
Healthy Diet

Eating a healthy diet is not about strict limitations, staying unrealistically thin, or depriving yourself of the foods you love. Rather, it's about feeling great, having more energy, improving your health, and boosting your mood.

Healthy eating doesn't have to be overly complicated. If you feel overwhelmed by all the conflicting nutrition and diet advice out there, you're not alone. It seems that for every expert who tells you a certain food is good for you, you'll find another saying exactly the opposite. The truth is that while some specific foods or nutrients have been shown to have a beneficial effect on mood, it's your overall dietary pattern that is most important. The basis of a healthy diet should be to replace processed food with real food whenever possible. Eating food that is as close as possible to the way nature made it can make a huge difference to the way you think, look, and feel.

The fundamentals of healthy eating

While some extreme diets may suggest otherwise, we all need a balance of protein, fat, carbohydrates, fiber, vitamins, and minerals in our diets to sustain a healthy body. You don't need to eliminate certain categories of food from your diet, but rather select the healthiest options from each category.



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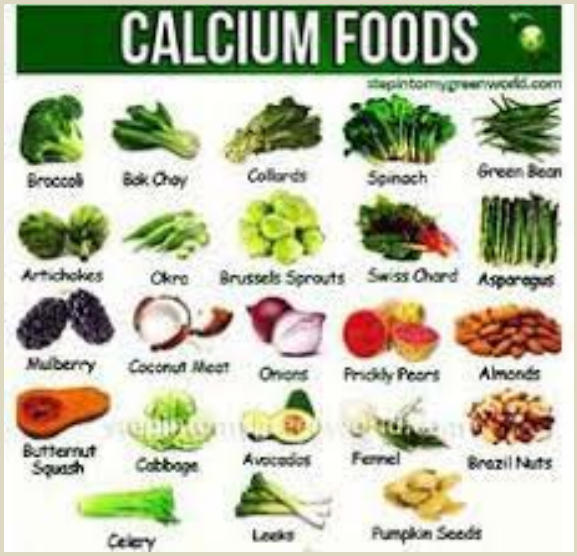
Protein gives you the energy to get up and go—and keep going—while also supporting mood and cognitive function. Too much protein can be harmful to people with kidney disease, but the latest research suggests that many of us need more high-quality protein, especially as we age. That doesn't mean you have to eat more animal products—a variety of plant-based sources of protein each day can ensure your body gets all the essential protein it needs.

Fat. Not all fat is the same. While bad fats can wreck your diet and increase your risk of certain diseases, good fats protect your brain and heart. In fact, healthy fats—such as omega-3s—are vital to your physical and emotional health. Including more healthy fat in your diet can help improve your mood, boost your well-being, and even trim your waistline.

Fiber. Eating foods high in dietary fiber (grains, fruit, vegetables, nuts, and beans) can help you stay regular and lower your risk for heart disease, stroke, and diabetes. It can also improve your skin and even help you to lose weight.

Calcium. As well as leading to osteoporosis, not getting enough calcium in your diet can also contribute to anxiety, depression, and sleep difficulties. Whatever your age or gender, it's vital to include calcium-rich foods in your diet, limit those that deplete calcium, and get enough magnesium and vitamins D and K to help calcium do its job.



Carbohydrates are one of your body's main sources of energy. But most should come from complex, unrefined carbs (vegetables, whole grains, fruit) rather than sugars and refined carbs. Cutting back on white bread, pastries, starches, and sugar can prevent rapid spikes in blood sugar, fluctuations in mood and energy, and a build-up of fat, especially around your waistline.

Source:
https://www.helpguide.org/articles/healthy-eating/healthy-eating.htm
https://millennialmagazine.com/2013/10/14/how-to-maintain-healthy-eating-habits/

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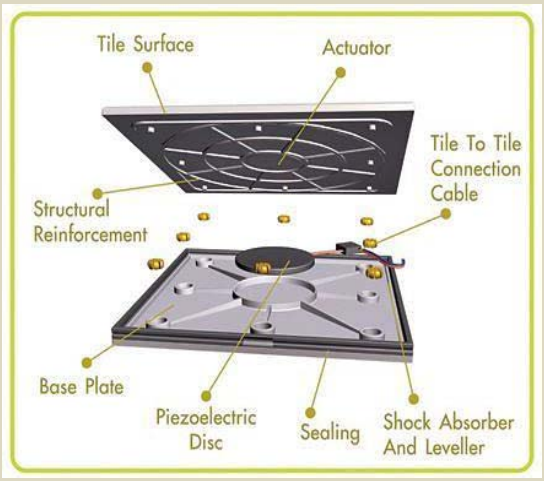
LET'S GENERATE ELECTRICITY BY WALKING

Harvesting kinetic energies is a sustainable method for generating electricity without depleting natural resources. Energy harvesting or scavenging is the process of capturing the wasted energy from naturally occurring energy sources, accumulating and storing it for later use. The main mechanisms for kinetic energy harvesting are piezoelectric, electromagnetic, electrostatic or by using magnetostrictive materials.The idea of harvesting energy from human motion is based on the fact that the amount of energy used by the body per day is 1.07×107 J, an amount equivalent to around 800 AA (2500 mAh) batteries.

In Recent Years…!!!

Kohei Hayamizu has a bold vision for the future: a city that is in itself an electric power station. A place where all roads, bridges and sidewalks generate electricity from the vibrations produced by the cars and people that move over them. He is starting small by transforming one square meter into an electricity generator. But he has chosen the locaton wisely. He has placed four sheets in the pavement in one of the world's busiest pedestrian areas – the Shibuya train station crossing, where everyday 900,000 people pass by. The system is based on the technology Hayamizu developed at Keio University's Graduate School of Media and Governance, and makes use of "piezoelectricity", a property certain materials have to generate an electric current when they are squeezed or pressed.



The Shibuya location was chosen to make sure a high number of people would walk over the installation, thus generating a good amount of power. Hayamizu says that during the entire 20 day period of the installation, they will generate enough electricity to power 1,422 televisions for one hour (which is the same as one television for 1,422 hours if you could store the electricity somehow). But it also has the purpose of reminding us in a positive and playful way of the pressing need we have to find new and cleaner sources of energy.

In India, IIT Mandi has announced that a team of its researchers has come up with a technique of building roads with Piezoelectric Materials, which will generate electricity on simple human walking. The researchers have been studying and finding piezoelectric materials that can convert mechanical energy into electrical energy. After the research, they have proposed the idea of using these piezoelectric materials in floor tiles to build the roads, which will generate electricity on human walking. Also, the weight from vehicles can power up the road lights and traffic signals. Dr. Rajeev Kumar, Associate Professor, IIT Mandi, explains, “Piezoelectric materials can generate electrical energy when a force is applied on them, and are thus extremely useful.” “We have developed a technique known as “graded poling” to enhance the power output of piezoelectric materials by more than 100 times”, says Dr. Rahul Vaish, Associate Professor, IIT Mandi.

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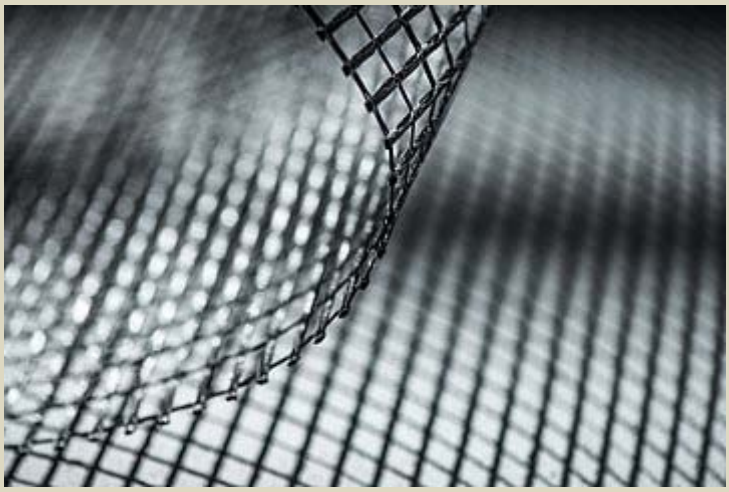
CARBON CONCRETE

Carbon reinforced concrete is a composite material consisting of two high-performance materials. The innovative combination of carbon fibre fabrics or bars with fine-grained concrete simultaneously enables significantly more varied shapes and a high load-bearing capacity.

STEEL REINFORCED CONCRETE VS. CARBON REINFORCED CONCRETE (A SUSTAINABLE ALTERNATIVE)

Since its introduction, steel reinforced concrete as a load-bearing building material has made possible the construction of important buildings and that in a very short time and in robust designs. However, due to their susceptibility to corrosion, the service life of steel reinforced concrete structures falls far short of earlier expectations. Many buildings are hardly older than the people who use them. With more than 100 million cubic metres used in construction each year, steel reinforced concrete is the most important building material in Germany.

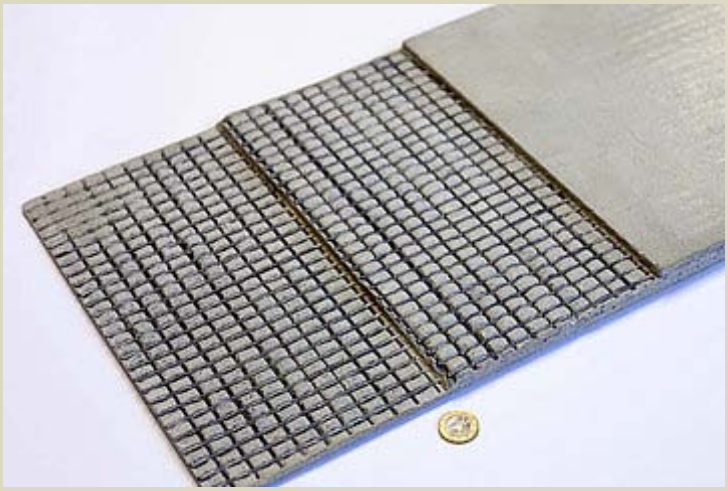
The use of concrete as the world's most frequently used building material after water has always led to a high consumption of raw materials and energy. In addition, steel is subject to enormous price fluctuations due to its versatile use in construction and other industries. This is exactly where the new carbon reinforced concrete comes in. It reduces the total consumption of materials and replaces steel with carbon. Since carbon does not rust, less concrete is required to protect the steel from corrosion. Carbon reinforced concrete can be used for sustainable, resource-saving, less material-intensive and lighter construction.



Mat Reinforcement

Rebars made of carbon, basalt, glass or combinations of materials are used. CARBOCON develops the materials together with its partners and manufacturers and applies them specifically in construction projects. Rebars made of carbon fibre-reinforced plastic are among the high-performance materials and can withstand up to 6 times higher tensile forces than comparable steel rebars.

50,000 individual carbon fibres are combined in a special manufacturing process to form a yarn, processed into a lattice structure and impregnated. These fabrics or mats are characterised by a wide variety of properties in terms of load-bearing capacity, flexibility, formability and also resistance to temperatures. CARBOCON always selects the most suitable materials for a specific project



Fine Grained Concrete

Concrete has several functions in the composite material of carbon reinforced concrete. The selection of the right concrete type is therefore important. An example of a specially developed product and application is TF10 TUDALIT from PAGEL (grain size 0-1 mm). In addition to the special fabric, this fine-grained concrete is the central element for strengthening with carbon reinforced concrete according to the existing national technical approval.

Hybrid application

The current state of the art and the requirements of bridge technology prompted CARBOCON developers and engineers to incorporate hybrid applications of different types of reinforcement into the projects. A combination of the fabrics/mats and bars offers a multitude of possibilities to achieve the best solution for the application.

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ALUMNI MESSAGE

Few Lines about SVCE:

SVCE has helped me to identify my inner skills and nurtured my civil engineering knowledge to excel in my future endeavours. Faculties and study environment provided by the college was excellent, which guided me through to achieve my goal.

Mr.Aravind Kumar K
(2013-2017 Batch)
Masters in Construction Management ,
UNIVERSITY OF AUCKLAND,New Zealand

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The department of Civil, Structural and Environmental Engineering at UB is one of the best in the world. It is a dream come true for budding earthquake engineers to pursue this course here. I'd recommend this program to everybody who is interested in Structural dynamics and wants a career in that field. I thank my college, SVCE, for all the support they have given me throughout my undergraduate studies.

Mr.Vignesh Sridhar
M.S(Civil Engineering with specialization in Structural and Earthquake Engineering)
University at Buffalo,The State University of New York.

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It was such a blessing to graduate from one of the most prominent universities in Tamil Nadu. The management and staff at SVCE are of utmost quality and they provide you with a great learning experience, which paves the way for a great career.

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