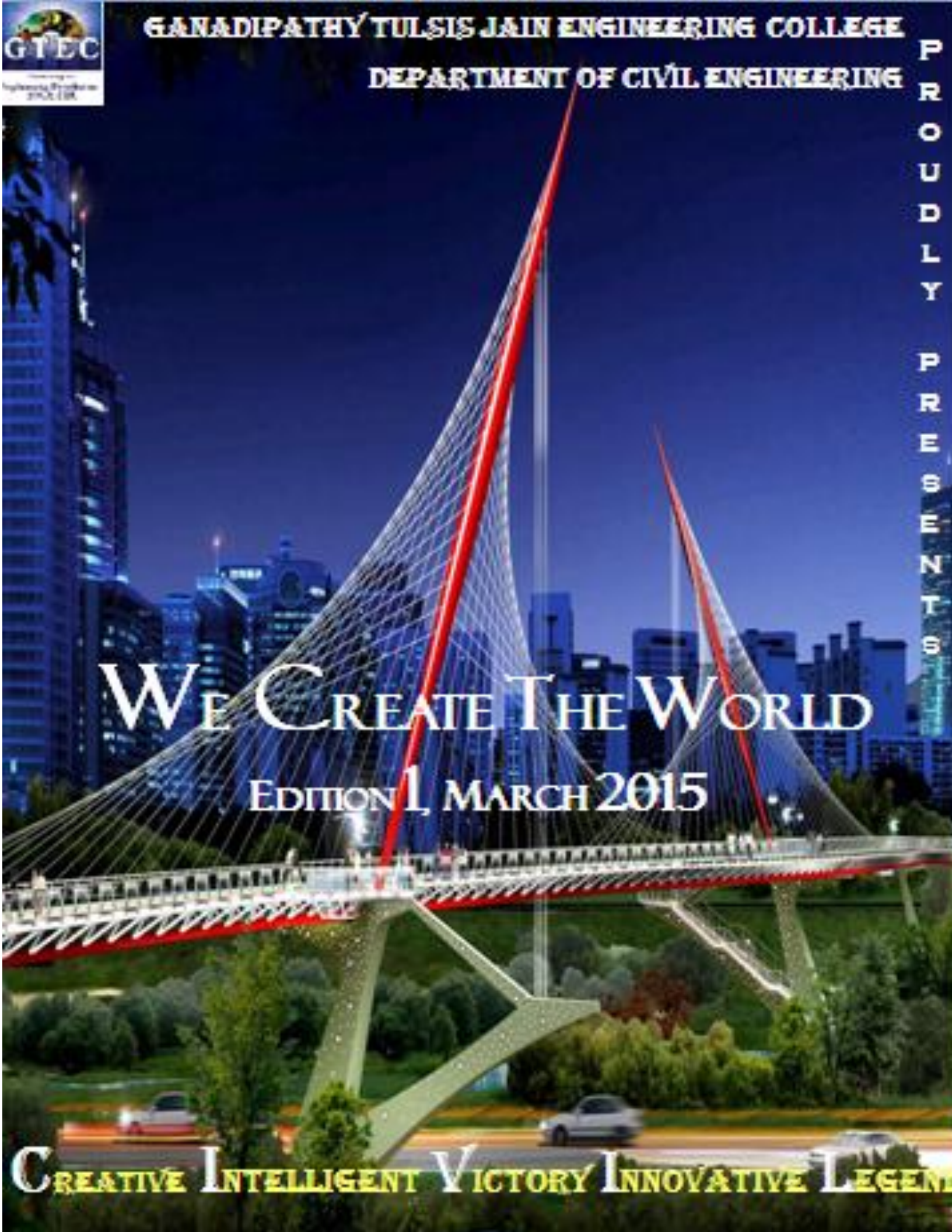
GTEC

GANADIPATHY TULSIS JAIN ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

PROUDLY PRESENTS



WE CREATE THE WORLD

EDITION 1, MARCH 2015

CREATIVE INTELLIGENT VICTORY INNOVATIVE LEGEN

PRINCIPAL'S MESSAGE

"Civil Engineering the art of intelligence"

It gives an immense pleasure to write a few words about first Civil Engineering magazine "WE CREATE THE WORLD" let the magazine shine as light and bring out the talents of students and faculty members.

I congratulate all the contributors and editorial team for bringing out this wonderful magazine.

In this magazine the budding engineers will have useful, interesting and informative ideas which can enhance their knowledge in academic and industrial activities as Civil engineers who decide the world's infrastructures too.

I extend my warm and sincere greeting to the faculty and students of civil engineering department.

Wish you all the Best

Dr.R.Varatharajan

HOD'S MESSAGE

"Civil Engineers the best creator next to god"

The department of civil engineering proud to release the first magazine "We Create the World" the magazine is planned to publish each six months once in order to encourage students and faculty members to bring out their talents in technical and non technical activities.

Let this magazine help the students in updating the latest technologies in civil engineering field and to make the students to write articles, poems, essays, designing the building, modeling the structures, framing civil engineering drawing and nontechnical discussions like current affairs, awareness drawings, tamil kavithaikal, quotes, logical thinking, reasoning, Meanings, jokes, aptitude.

This magazine will also surely help the students for their communication skills developments.

I thank our management and principal for their kind support to bring out our department magazine to be published; I thank all departments HOD's for their supports and encouragement, and I thank our faculty members of civil department and editorial team.

I am sure, it is just a beginning and there is lot more in store reserved for the days to come.

J.Anne Mary

Head Incharge/Civil

Greetings and Messages from all HOD's

Greetings ! ! ! ! ! !

There are many career paths for civil engineers. Civil engineers can work in Government departments (ranging from municipality, corporation, state and central governments and defence), public sector undertakings like SAIL, GAIL, NTPC, NHPC, BHEL etc. and various private sector organizations (contracting and consulting firms). Initially, the nature of job may be construction supervision, design, marketing or production. As they gain more experience, they manage projects.

Today, the world is undergoing vast changes-the technological revolution, population growth, environmental concerns, and more. All create unique challenges for civil engineers. The next decades will be the most creative, demanding, and rewarding times for civil engineers and now is the best time to find out if Civil Engineering.

Wish You Good Luck and All the Best!

Prof.G.Ilanchezhiapandian,
Dean (Academics),
Head of Department,
CSE & MCA

Greetings,

I am extremely happy to know that the department of Civil Engineering is releasing a magazine. I wish every student and faculty of this department should equip with knowledge relating to the latest developments in the field of civil engineering.

I appreciate the sincere efforts taken by the HOD along with all their faculty members in this continuous endeavor to uplift their department.

Dr. N. Vinayagam,
Head of the Department
Mechanical Engineering

We shape our buildings, thereafter they shape us.
– Winston Churchill.

I have great pleasure in conveying my best wishes to all of you. I am very glad to hear that the Civil department of our college is inaugurating the department association and releasing a first magazine. I am privileged to wish that our students will outshine in their respective field with new and innovative ideas to make the event a grand success. I hope that the department magazine will make the students skills will glow in all dimensions. My hearty congratulations to the creative building of young aspirants (Civil Engineering Association).

Prof.A.Manimegalai
Head of the Department,
Electronics and Communication Engineering

Engineers play the most vital and important role in nation building. Civil Engineers play a major role in the innovative infrastructure development of a country. They create new inventions using best engineered technologies to make human life more comfortable, secure. We have excellent potential to grow in diversified areas, very positive sign not only to provide domestic needs but provide manpower to the entire world and become biggest technically trained community. I know the Department of Civil Engineering has already started to play its power play. However, success will require more than broad based education and research.

At the outset my best wishes to the Head, faculty members and students and the Editorial members of this Magazine, for working on magazine best in all the aspects. This magazine should be a good source of guidance for faculty and coming batches of students in choosing activities of their choice in future for building their careers.

I am sure, it is just a beginning and there is lot more in store reserved for the days to come. Go ahead, continue the Good Work. Best Wishes….

D. Durai kumar,
Head of the Department,
Information Technology.

I have immense pleasure in extending my heartiest felicitation and best wishes for the grand success of release of Magazine and the inauguration of Civil Engineering Association. Learning is a continuous process and does not end with the acquisition of a degree, especially because steady and rapid advancement is required. So interdisciplinary team work, communication skills, tools and skills for professional practice, and lifelong learning. We strive to ensure that our graduates understand professional ethics and the value of service to their profession and society through involvement in community, state, and national organization. World's flat opportunities are immense; it's just a question of identifying opportunities and making the best of them. I wish a very best of luck to the students.

Dr.S.Jayakumar.
Head of the Department,
Science and Humanities

I am very happy to know that Civil Engineering Department is releasing a first magazine. I wish and congratulate all the faculty and students of civil department and they should equip the practical knowledge and skill to the latest innovative developments in area of civil engineering.

I wish the civil engineering department.

All the best . . . !

Dr.Murugan,
Head of Department,
Master of Business Administarrion.

Indeed, it's a great pleasure to know about the inauguration of Civil Engineering Association in GTEC. As good infrastructure is the backbone of economic development of any country, India is also working towards becoming a country with high standards of infrastructure. At this juncture, it becomes important to produce talented civil engineers who can translate the wishes of millions for a better infrastructure into reality. This can be achieved by quickly adopting modern technologies and innovating new methods through research and development. Particularly, there is a huge need to explore and innovate in the areas of Transportation systems, Water distribution networks, Sustainable ground water use, Fiber reinforced concrete and Seismic safety systems. I am confident that the inauguration of Civil Engineering Association will sow the seeds for great accomplishments from the budding civil engineering students and the motivated faculties. I wish all the best for the Civil Engineering Association to excel in all their endeavors.

Dr. R. K. Vimal Nandhan,
Head In-Charge,
Research and Development.

ARTICLES

CIVIL ENGINEERING- FUTURE SCOPE

Dr. M S Varadarajan,
Head of Department,
Electrical and Electronics Engineering

1. Introduction

From the beginning of the existence of human being, some form of structures was built to protect from sun, rain and animals. From hutments made of mud to Taj Mahal, we have definitely come a long way in perfecting the art of construction. From cave dwellings, human beings had moved on to construct houses, palaces, canals, dams, highways, and stadia. These civilian structures played a significant role in the development of human race and gave various dimensions to human life such as social, political, economic and recreational. The range and application of civil engineering is the broadest and the most visible. In fact, the entire infrastructural framework of a modern nation is the creation of civil engineers. The credit of building mighty power plants, dams, airports, sea ports, railways, highways, inland waterways and industrial plants goes to civil engineers in the name of infrastructure for nation building.

The civil engineering education was in lime light for a very long period until the IT boom took dominance in late 90s. This resulted in removing the civil engineering subject from the academic curriculum for want of students, The job opportunities actually vanished and new avenues were created in IT areas. Until recently, it was not realized the IT is only a service function and IT cannot survive on its own without infrastructural developments. Now the demand for civil engineering education has increased. There will be an endless demand for civil engineers both in the private as well as in public sector undertakings in our country.

2. Job Opportunities

The job opportunities for qualified civil engineers are very good if the infrastructure development takes place in a developing nation. Many opportunities are in inter disciplinary areas and the curriculum is catering to the needs of such areas.

- **Construction engineering:** Project planning and execution of construction of highways, railroads, airports, power plants, bridges, tunnels, skyscrapers and so on, capability of withstanding earthquakes and tsunami.
- **Hydraulic engineering:** setting up structures associated with different water bodies such as hydroelectric plants, dams, irrigation and navigable canals, reservoirs etc.
- **Coastal and ocean engineering:** monitoring coastal areas and taking adequate steps to protect them from sea storms, tsunami and flooding and erosion.
- **Transportation engineering:** development of city roads, interstate highways, railroads, airfields, pavements, canals and urban mass rapid transport systems
- **Materials engineering**: To ensure the quality and durability of a vast variety of materials such as cement, concrete, concrete additives, metals and alloys, polymers and paints .used in the development of different edifices
- **Structural engineering**: analyzing different types of stresses and strains that a structure has to endure during and after it has been built such as transmission towers for power transmission, microwave towers for communications etc.
- **Earthquake engineering:** Seismic study of earthquake on different types of edifices and implement quake resistant measures
- **Urban engineering:** design and development of urban public utilities such as city roads, pavements, fresh water pipelines, waste water disposal systems, public parks and so on.
- **Environment engineering:** for environment such as air, water and land pollution. protection and sustainability
- **Remote sensing:**. method of acquiring information without physical contact, usually satellite moving around the world for detection of natural resources like, oil, coal, metals etc for the welfare of human kind.

3. Career Requirements:

A Civil engineer will have to plan out, design and supervise the construction of different types of buildings. He needs to posses good knowledge of mathematics and science. and also has good supervisory and administrative skills. Some of the jobs require interaction with other disciplines and he needs to appreciate the other branches of engineering to coexist as a team member. Several software has been developed to

design, simulate and understand in depth the reliability of design and implementation easiness.

4. Career Opportunities:

4.1 Teaching and research Career

This requires innovative thinking and analytical ability to bring new technological invention for the future. A research degree is a must and continued interest in teaching and research is a must for the success of the career.

4.2 Construction Management Career

This is a normal; career everyone enters in the beginning of the career, having opportunity in all construction sites of real estate companies. There is enough scope to practise supervisory and management techniques for moving into other career opportunities.

4.3 Geotechnical Engineering Career

It is a specialty that is responsible for pipelines, water mains and other related infrastructure including urban planning and transportation. With the government planning to build 100 smart cities, there will be good opportunity in this area.

4.4 Transportation Engineering Career

With the increase in population mass transportation is the biz of today's talk. whether it a surface transportation or air transportation. The old Trams were replaced by buses and cars which might vanish after few years as the population increases. New concepts such as Metro trains, big bodied aircrafts, and high speed dual purpose personal vehicles are the future of transportation system offering huge career potential.

4.5 Sea and River Engineering Career

This includes career in Navy, Coast guards, Merchant Navy, inland water transportation etc.

4.6 Public Health Engineering Career

This includes state PWDs and central PWD job opportunities. The selection is done through competitive examination.

4.7 Energy and power Engineering Career

This is relatively a new field with vast career opportunity for civil engineers specialized in structural engineering, design specialization and hydraulics. The areas are wind farms, transmission towers, microwave towers etc and is a inter disciplinary work area.

4.8. Remote sensing Career

In civil engineering applications Remote sensing and Geographic Information System techniques can become potential and indispensable tools. Various civil engineering application areas include regional planning and site investigation, terrain mapping and analysis, water resources engineering, town planning and urban infrastructure development, transportation network analysis, landslide analysis, etc.

5. Conclusion

With the recent change in Government and the priorities for infrastructure development have taken the leading position, the requirements of civil engineers both in public and private sectors will definitely grow in all the above areas. What is required is to develop oneself in any of the areas of interest.

Wish you all a Prosperous Future

INDUSTRIAL WASTE IN HIGHWAY CONSTRUCTION

J.Anne Mary,
Assistant Professor
Department of Civil Engineering

1.Introduction

Civilization also produces waste products. Disposal issue of the waste products is a challenge. Some of these materials are not biodegradable and often leads to waste disposal crisis and environmental pollution. The present article seeks the possibilities of whether some of these waste products can be utilized as highway construction materials.

The following table presents a partial list of industrial waste materials that may be used in highway construction:

Waste product	Source	Possible usage
Fly ash	Thermal power station	Bulk fill, filler in bituminous mix, artificial aggregates [1]
Blast furnace slag	Steel industry	Base/ Sub-base material, Binder in soil stabilization (ground slag) [1]
Construction and demolition waste	Construction industry	Base/ Sub-base material, bulk-fill, recycling [2]
Colliery spoil	Coal mining	Bulk-fill [2]
Spent oil shale	Petrochemical industry	Bulk-fill [2]
Foundry sands	Foundry industry	Bulk-fill, filler for concrete, crack-relief layer [4]
Mill tailings	Mineral processing industry	Granular base/sub-base, aggregates in bituminous mix, bulk fill
Cement kiln dust	Cement industry	Stabilization of base, binder in bituminous mix [5]
Used engine oil	Automobile industry	Air entraining of concrete [6]
Marble dust	Marble industry	Filler in bituminous mix [7]
Waste tyres	Automobile industry	Rubber modfied bitumen, aggregate. [3]
Glass waste	Glass industry	Glass-fibre reinforcement, bulk fill [3]
Nonferrous slags	Mineral processing industry	Bulk-fill, aggregates in bituminous mix [3]
China clay	Bricks and tile industry	Bulk-fill, aggregates in bituminous mix [8]

Material acceptability criteria

Roads are typically constructed from layers of compacted materials, and generally its strength decreases downwards. For conventional materials, a number of tests are conducted and their acceptability is decided based on the test results and the specifications. This ensures the desirable level of performance of the chosen material, in terms of its permeability, volume stability, strength, hardness, toughness, fatigue, durability, shape, viscosity, specific gravity, purity, safety, and temperature susceptibility etc., whichever are applicable. There are a large number tests suggested by various guidelines specifications; presently the performance based tests are being emphasized, rather than the tests which estimate the individual physical properties.

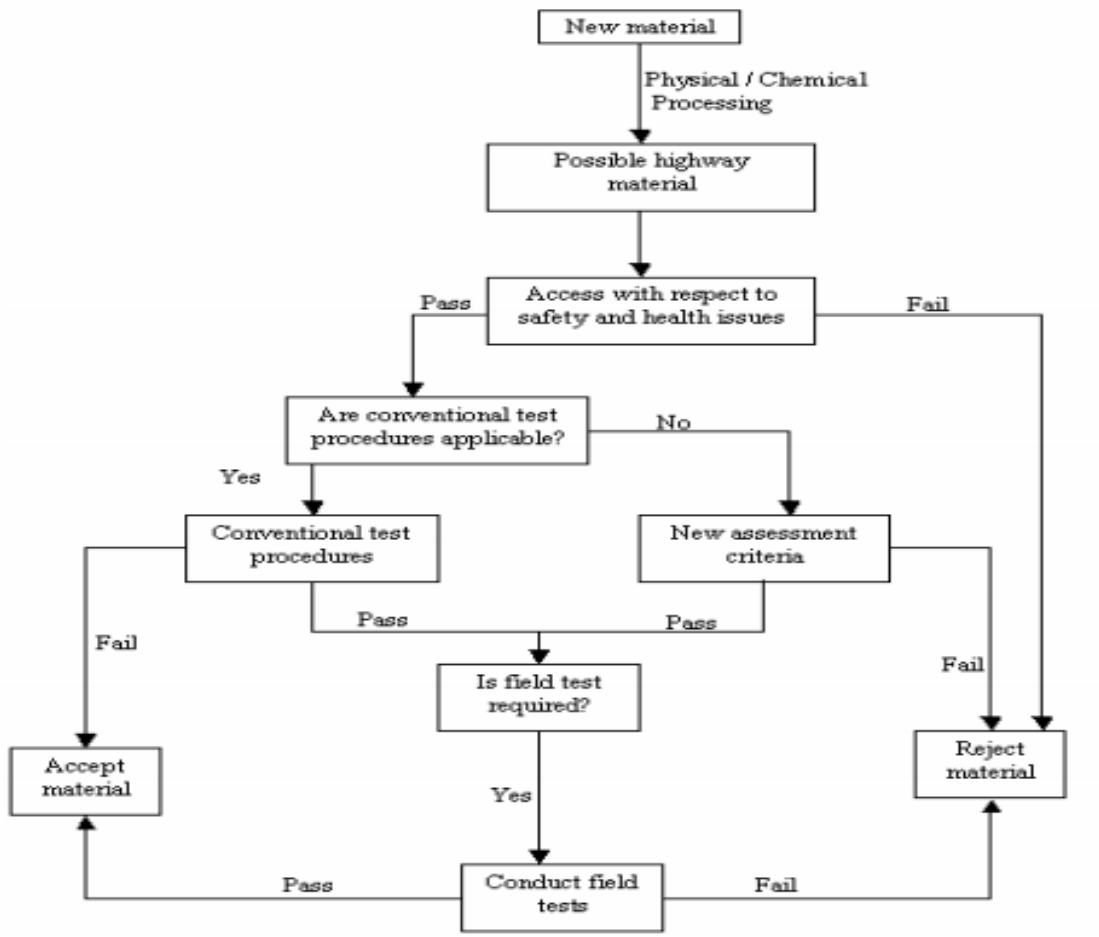


Table-1 Evaluation industrial waste for suitability in highway construction

Suitability of industrial wastes as highway material Limited information is available on suitability of individual industrial wastes for its utilization in highway

construction. The following table (Table-2) summarizes the advantages and disadvantages of using specific industrial wastes in highway construction.

Material	Advantages	Disadvantages
Fly ash	Lightweight, can be used as binder in stabilized base/ sub-base because of pozzolanic properties.	Lack of homogeneity, Presence of sulphates, slow strength development [2].
Metallic slag (a) Steel slag	Higher skid resistance	Unsuitable for concrete works and fill work beneath concrete slabs.
(b) Nonferrous slag	Light weight (phosphorus slag) [3]	May show inconsistent properties.
Construction and demolition waste	Being strong can be used as aggregates granular base.	May show Inconsistent properties.
Blast furnace slag	Used in production of cement, granular fill.	Ground water pollution due to Leachate in used as unbound aggregates [9]
Colliery spoil	-	Combustion of unburnt coal, Sulphate attack in case of concrete roads [2].
Spent oil shale	-	Burning of combustible materials.
Foundry sands	Substitute for fine aggregate in asphalt mixes.	Presence of heavy metals in non ferrous foundry origin, less affinity to bitumen [4].
Mill tailings	Some are pozzolanic in nature.	Presence of poisonous materials (e.g., cyanide from gold extraction).
Cement kiln dust	Can be used in soil stabilization because of its hardening property when exposed to moisture [5].	Corrosion of metals (used in concrete roads) in contact because of significant alkali percentage.
Used engine oil	Being very good air entertainer could be used in concrete works [6].	Requires well organized oil collection system [6].

Table-2 Suitability of using industrial waste products in highway construction

Conclusion

It appears that some of the industrial waste materials may find a suitable usage inhighway construction. However, environmental consequences of reuse of such materialsneeds to be thoroughly investigated.

References

1. Mroueh, U. M. and Wahlström, M., “By-products and recycled materials in earth construction in Finland—an assessment of applicability,” Resources, Conservation and Recycling, No. 35, 2002, pp. 117–129

2. Sherwood, P. T., Alternative materials in road construction, Thomas Telford Publications, London, 1995.

CHOCOLATE BEING STUDIED AS A BUILDING MATERIAL

Kiran Mai.R, ii year, Civil

I am making my own house by chocolate: 'DO YOU'

Two Princeton university researchers are studying the use of a compound chocolate as a building material. The ingredient were sugar, coca powder, milk permeate and vegetable oil. They looked at various combination of fat and smaller particles to discover the strongest material. "although modest this pavilion will acts as a proof of concept for large scale chocolate structures", the researchers wrote. However, "chocolate may have a compressive strength to weight ratio 24 times less than concrete.

Chocolate may have a compressive strength to weight ratio 24 times less than concrete but that hasn't stop us scientist probing its potential as a building material and ever building a "chocolate pavilion"

Writing in the April 2015 issue of computer aided design, Alexander Jordan and civil engineering and architectural colleagues at Princeton university, assisted by barry

callebaut north America, examine novel designs to create a structural system that used chocolate as an "experimental building material". Emphasizing the fact that they used compound chocolate as their 'chocolate'- where the fat constituent is another type of vegetable fat, instead of cocoa butter, the scientist said that while countless studies have assessed chocolates taste, texture, appearance, rheology, production and shelf life none have need performed on its structural material properties including its strength and elasticity. Jordon et al conducted tests with various chocolate formulations, designed using the hypothesis that less fat and smaller particles with greater surface area for cohesion, both make a chocolate stiffer.

The first full-scale use of the team's chocolate design methodology was designed as a pavilion for a café space, still awaiting construction, this intended for display over 2-4 weeks in a temperature vontrolled environment in what jordan et al, describe as a typical newyork city building.

To avoid exposure to direct sunlight coming through the south facing windows, obstruction of customers and staff traffic and accidental collisions, the shell was designed to use the vertical space and span between the fixed pavilions that separate the café's tables.

Jordon et al write.

Made of sugar, cocoa powder,, milk permeate and vegetable oil coca butter is excluded to result temperature changes – the team built a prototype with an 80cm span made form 6mm thick chocolate piece in 2013.

Individual pieces of chocolate with a melting point of 52°c/125°f were "cast" in a chocolate factory then assembled over a model; with seem welded using a syringe to deposit molten chocolate this structure then stood for two months at a temperature of 20°c/68°f

Modest concept proof for large scale chocolate structures.

"Although modest, this pavilion will act as a proof of concept for large scale chocolate structures ", Jordon et al write.

"In an unfamiliar building material, like chocolate, established design and construction processes need to be revisited and adjusted", they add

"Although we have associations with chocolate as a highly refined food, there are few precedents of how to translate its familiar sensation into architectural and engineering language", the scientists say chocolate rheology (the science dealing with its deformation and flow) suggests four physical models that generate material-driven, force-modeled shapes, they write – a pneumatic form, an inverted branching form, a saddle form and an inverted hanging cloth form

"An approach that integrates hanging cloth model as, a form, chocolate as a material, a segmented gride shell as a structure and prefabrication as a manufacturing technique, emerges and finds its way into a parametric digital design to construction, work flow", Jordan et al

Modern Architecture

G.Sowmiya, ii year, Civil

ARCHITECTURE : Is the Art and science of designing buildings .The discipline dealing with the principles of design and construction and ornamentation of fine buildings.The profession of designing buildings and environments with consideration for their esthetic effect. Greek and romance influenced the world's architecture.

Ancient Greece is considered by most Historians to be the cultural foundation of western Civilization. Greek culture was a powerful influence in the Roman Empire, which carried a version of it to many parts of Europe. Ancient Greek civilization has been immensely influential on the language, politics, educational systems, philosophy, art and architecture of the modern world. The Roman Empire's influence on Government, law, and monumental architecture, as well as many other aspects of western life remains visible today.

INDIAN ARCHITECTURE no doubt we have a great architectural heritage of temples, mosque, palaces and forts. So much so that whenever architecture is thought of in Conjugations with India, images of the Tajmahal, Fatehpur sikri and south Indian temples are conjured up in minds.

The fundamental of modern architecture are clean and simple. its ever-present philosophy abides to the ideal that form follows function .therefore ,modern architecture express themselves through simplicity, clear views of structural elements and by eschewing unnecessary design details

MODERN ARCHITECTURE boats the actual structure and materials used in the building vs. covering them up with ornate designs. That is why most modern designs feature elements of wood, steel and glass, in order to show-off these industrial structural materials

TRADITIONAL and MODERN Mix well together they can co - exist. Mixing traditional and modern architectural elements works well when done properly and with a slight hand of restraint. There are numerous examples of successful meshing of these two, seemingly opposing, styles together into

one cohesive design. Look to the image below - it's a exemplary illustration of a modern and traditional Union. The mixture of cedar shingles with modern structural elements creates a very unique and appealing home .of course; this is not design marriage for the faint of heart. One would have to be daring in order to have the never to try it. Obviously, it is best attempt this only under the supervised watch of a skilled design architect .the good news is that we can have the best of both worlds – modern and traditional.

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GLASS FIBER REINFORCED CONCRETE

P.Priyanka, ii year, Civil

Glass fiber reinforced concrete in an engineered concrete that has numerous applications in concrete products including material like ornamental structures fountains and planters. GFRC is also used intensively for decorative panels.

COMPOSITION OF GLASS FIBER REINFORCED

Glass fiber reinforced concrete composites contain high strength glass fiber that is surrounded by a comentitious medium. In this shape, both the fiber and the environment maintain their natural individual chemical characteristics however the concretes procedure has improved resultant properties that cannot be attained if either of the components is used individually. The glass fiber is the main element that carries the load, while the enclosed matrix keys the fibers in the proffered position and direction. The medium faculties transfer of the load on the fibers, and shield them from the damage due to environment. Glass fiber can be integrated into matrix in constant or irregular lengths.

The most widespread shape in which glass fiber reinforced composites are used in structural application in known as laminate. This form is achieved by consolidating the fine fiber layer and a matrix into the desired size. The orientation of fiber in each layer, and the stacking sequence of the layer, can be used to Froude a range of mechanical properties of composite material.

All these properties are combined with the fact that GFRC looks like solid concrete, although it weighs only one-third of the original solid concrete weight. This makes it deals for outdoor or indoor applications where lightweight and durable concrete is needed. Such application may include decorative structures foundations, domes, blanters .

GLASS FIBER

Glass fiber consists of 200-400 individual silaments, lightly bounded in order to form a stand. These stands can then be chopped into various lengths and be used for a variety of application. The main industrial application of glass fiber is cement or mortar matrix reinforcing, used for thin-sheet product manufacture. The conventional mixing techniques for concrete only allow about 2% of fibers of length of 25 mm to be used. The mast common types of fiber used for general application in c-glass. Polymers may also be added in the glass fiber mixes in order to improve physical properties. Such as moisture event or moment.

ADVANTAGES OF GLASS FIBER REINFORCED CONCRETE:

1. GFRC has the characteristic to be cast into almost any shape.The concrete takes the role of thermal regulator while exposed to fire and protect the materials from the flame beat.
2. Relatively light in weight compared to the traditional stones its installation is fast and comparatively simple.Superior strength enhances the ability to ensure seismic loads.
3. GFRC is less vulnerable to weather effects of more resistant to freeze that the normal concrete

COMPARISON OF GFRC TO PRECASTE CONCRETE

The elasticity of density of the GFRC is greater than precaste concrete. The cement to sand ratio fir GFRC is approximately 1:1, while for precaste concrete it is 1:6 the glass fibers included to reinforce the concrete procedure considerably greater impact strength and lower permeability to water and air than precaste concrete. GFRC looks like a natural stone and permits the designer greater flexibility in for, color extensive.

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HISTORY OF ARCHITECTURE

Kabila.G, ii year civil.

Ancient rome-Is the really period of the Roman Empire?

Extensive use was made of ancient Greek architectural ideas, particularly those of the Corinthians order (see pp.460-461). As a result, many early roman building. Such as the temple of vesta (opposite) – closely resemble ancient Greek building. A distinct roman style began to evolve in the first century AD. This style developed the interiors of building (the Greeks had concentrated on the exterior) by using arches, vaults and domes inside the building and by ornamenting internal walls. Manu of these features can be see in the pantheon. Exterior columns were often used for decorative, rather than structural purpose as in the colosseum and the porta nigra (see pp 464 – 465) smaller buildings had timper frames with wattle- and daub walls, as in the mill (see pp 464 – 465). Roman architecture remained influential for man centuries, with some of its principles being used in the 11th century in Romanesque building (see pp 468 – 469) and also in the 15th and 16th centuries in Renaissance buildings.

Medieval castle and houses

Warfare was common in Europe in the middle ages and many monarchs and nobles built castles a form of defense. Typical medieval castles have outer walls surroundings a moat. Inside the moat is a bailey protected by a chemise. Te innermost and strongest part of a medieval castle is the keep: towers called donjons, such as the tour de cesar and coucy - le – chateau, and rectangular keeps (hall keeps), such as the tower of longs, casteles were often guarded by balrents (projecting fortifications) like those of the bastille. Medieval houses typically had timber cruck (tent – like) frames – waltles and daub walls, and pitched roofs like those on medieval London bridges

Medieval churches

During the middle ages, large numbers of churches were built in Europe. European churches of this period typically have high vaults supported by massive piers and columns. In the 10th century, the Romanesque's style developed. Romanesque architects adopted many roman or early Christian architectural ideas, such as cross-shaped ground plane like the of Angouleme cathedral and basilican system of a nave with a central vessel and side aisle. In the mid-12th century, the flying bultresses and pointed caults appeared, these features later became widely used in gothic architecture. Bagneuz church has both styles a Romanesque tower, and the gothic naue and cholr

Ancient Egypt

The civilization of the ancient Egyptians from about 310 BC until it was finally observed into the Roman Empire in 30 BC is famous for its temples and tombs. Egyptian temples were often huge and geometric like the temples of amon-re. They were usually decorated with hieroglyphs relief's depiction gods, pharoachs and queens. Tombs were practically important to the Egyptians, who believed that the dead were resurrected in the after-life. The tombs were often decorated as for examples, the surround of the false door opposite in order to give comfort to the dear. The best known ancient Egyptian tombs are the pyramids which were designed to symbolize the lays of the sun. Many of the architectural forms used by the ancient Egyptians were later adopted by other civilization for example, columns and capitals were later used by the ancient Greeks and ancient romans.

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CONSTRUCTION LAW

Manimegala.A,*ii year civil.*

Construction along ontario highway 401 windening the road from six twelve travel lanes

A constrution projects must fit into the legal framework governing the property these include governmentel reulations on the use of property and obligations that are created in the process of construction.

The project must adhere to zoning and building code requirement constructing a project that fails to adhere to codes will not benefit the owner some legal requirement come from malum prohibitam considerations or things that are a matter of cestom orexpectations such as isolating busnesses to a business direct and residences to residential districl .Anattomey may seck changes or exemptions in the law governing the land where the building will be bult ,either by arguing that a rule is inapplicable, or that the custom is no longer needed.

A construction project is a complex net of contracts and other legal obligations, each of which must be carefully considered. A contract is the exchanges of a set of obligations between two or more parties but it is not so simple a matter as trying to get the other side to agree to as much as possible in exchange for as little as possible.

Legal advisors in the beginning of a construction project seck to identify ambigulties and other potential sources of trouble in the contract structure and to present options for preventing problems throughout the process of the project, they work to avoid and resolve confcicts that arise in each csse the lawyer an exchange of obligations that matches the reality of the project.

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SEEDING-A NEW KIND OF CONCRETE

G.POOVARASI, *ii year civil.*

Sunflower seed husk a wage huge waster produce of the vegetable oil and food industry could be used as an environmentally friendly filler, or aggregates, for concrete according to Turkish researchers. The team demonstrates that the use of husks reduces the density of concrete as well as boosting the material resistance to cracking the after exposure to icy ten thawing conditions

Explain how the accumulation of unmanaged waste from the food industries, particularly in developing countries is becoming increasingly problematic.

As such researchers are hoping to find new application for such waste in the creation of environmentally friendly materials and composites in the road building and construction industries for instance. This is particularly pertinent given rising cost and chronic shortages of conventional materials. Engineers are thus being challenges to covert industrial wasters to replacement for certain materials.

Concrete is perhaps one of the most energy and resource intensive material and researches have investigated and applied waster rubber, glass powder and paper waster sludge as alternative fillers and bulking agents. The addition of such material can affect significantly the properties of concrete altering its strength density and water resistance detrimentally in some instances.

The team has turned to the sunflower seed and more specifically its inedible husk as a possible alternative materials for concrete. Turkey is the ninth largest sunflower producer in the world. Generating almost a million tons of produce from 58400hectares the bulk of which is used in the manufacture of sunflower oil in the Thrace region. The by product is approximately 300000 tons of fibrous seed husk. The team has therefore experimented with different formulation of seed husk in the concrete mix.

They produced concrete samples with the lowest density could be classified as “Light Weight”. Since samples had low compressibility suitable for construction use although higher husk content meant the resulting concrete could be used only for insulation applications. Team suggests that the sunflower seed concrete be most suitable for the construction of agricultural buildings that are usually only one floor and do not to be as sufficiently load bearing as domestic or office buildings

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ROAD SAFETY

GAYATHRI.P,*ii year civil.*

India is said to be the fastest developing countries today only after china. India has a total of about 2 million kilometers of roads out of which 960,000 kilometers are surfaced roads and about 1million kilometers of

roads in India are the poorly constructed ones. India is also home to fifty-three national highways which carry about 40percent of the total road traffic.

Incidentally, India holds the distribution of registering the highest number of road accidents in the world. According to the experts at the national transportation planning and research centre[NTPR] the number of road accidents in India is three times higher than that prevailing in developed countries. The number of accidents for 1000 vehicles in India is as high as 35 while the figure ranges from 4 to 10in developed countries. So, why do accidents happen? 80%of road accidents are caused human error say senior police officials, according to a new report in the TOI today.

Well, we all know has easy it is to get a driving license in India. Also punishment for errant drivers is light. A bride is all that needs to be given and the rash drivers are free to go. Indians are known for their degree of patience, but do we have to be patient where rash driving is concerned?

The institute of health systems has a few solutions:

1. Be more stringent in issuing licenses.
2. Think of ways to reduced the number of vehicles on the roads.
3. Be strict about usage of helmets.
4. Make repartee lanes for heavy vehicles.
5. Study how these issues are tackled in advanced countries.

The world back has some suggestions as well:

1. Increase awareness about road safety among road users, planners and engineers. In fact, the world back sees public awareness campains as a vital part of its efforts to improve road safety. They had designed one such project for the national highway authority of India.
2. Introduction of road safety audits.
3. Speed controlling measures such as speed bumps, rumble strips, road markings, traffic signs, and roundabouts.
4. Building of separate non-motorized traffic and motorcycle lanes to ensure the smooth flow of traffic.

Well, there are always solutions and in since some ways we are moving towards that. Better and wider roads for example. States are making wearing of helmets compulsory. But road accidents are not reducing. For example one of our best roads, the Mumbai pune express way, sees a fair amount of accidents. In 2006 more than sixty people died on this road. We've seen cars travelling at 140 km per hour(speed limit is 80) on this road. In fact there speeds are a regular feature. Also, inspite of the right have meant purely for overtaking, many cars lone to hog this lane.

As a result others overtake from the left at high speeds. If the expressway is crowded, drivers simply weave in and out at dangerous speeds. There are rarely any cops to be seen.

If educated people aware of traffic rules and with proper licenses break traffic rules, what can we expect from those who are unaware of traffic rules, and those who have not passed a driving test before getting their licenses? What can we expect from drunk drivers? What can we expect from drivers who suffer from road rage? Why, murder of course. And if they have canned, they can get away with it.

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CRUSH THOSE CLINKER WHILE THEY ARE HOT

Madhavan,*ii year civil.*

Clinkers pulverized to make cement should be processed right out of the kiln to save the most energy. The environmentally friendly advice is the result of a computational study.

A cut way illustration of clinker, a pellet manufactured in kiln and the found to make cement, shows a defect called a screw dislocation. Tice university scientists studied the effect of such defects on the quality of cement used in concrete and how many energy could be saved by modifying the manufacturing process

Making cement is a centuries-old art that has yet to be perfected, according to researchers at Rice University who believe it can be still more efficient.

Former Rice graduate student Lu Chen and materials scientist RouzbehShahsavari calculated that fine-tuning the process by which round lumps of calcium silicate called clinkers are turned into cement can save a lot of energy. Their new findings are detailed in the American Chemical Society journal Applied Materials and Interfaces.

Manufacturers of Portland cement, the most common type in use around the world, make clinkers by heating raw elements in a rotary kiln and grinding them into the fine powder that becomes cement. Mixed with water, cement becomes the glue that holds concrete together. An earlier study by Shahsavari and his colleagues that viewed the molecular structure of cement noted that worldwide, concrete manufacturing is responsible for 5 to 10 percent of the carbon dioxide, a greenhouse gas, released into the atmosphere.

The researchers analyzed the crystal and atomic structures of five phases of clinkers representing stages of cooling after they leave the kiln. They focused on the internal stresses that make some more brittle (and easier to grind) than others. They also looked at the unavoidable defects called screw dislocations, shear offsets in the raw materials that, even when ground, influence how well the powders mix with water. That reactivity determines the cement's ultimate strength.

They found that clinkers were not only most brittle when hottest, but also the most reactive. In ranking the five samples' qualities, they suggested their research could lead manufacturers to consolidate processes and cut grinding energy that now absorbs around 10-12 percent of the energy required to make cement. Equally important, for each ton of produced cement, the grinding energy accounts for roughly 50 kilograms of carbon dioxide emissions into the atmosphere, they determined.

"Defects form naturally, and you cannot do anything about them," Shahsavari said. "But the more brittle the clinkers are, the better they are for grinding. We found that the initial phase out of the kiln is the most brittle and that defects carry through to the powder. These are places where water molecules want to react."

The National Science Foundation supported the research. Shahsavari is an assistant professor of civil and environmental engineering and of materials science and nanoengineering and a member of the Richard E. Smalley Institute for Nanoscale Science and Technology at Rice. Chen is now a structural engineer at Arup.

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'GREENER' CEMENT

Ravi Kumar,*ii year civil.*

Concrete is the world's most-used construction material, and a leading contributor to global warming, producing as much as one-tenth of industry-generated greenhouse-gas emissions. Now a new study suggests a way in which those emissions could be reduced by more than half -- and the result would be a stronger, more durable material

The findings come from the most detailed molecular analysis yet of the complex structure of concrete, which is a mixture of sand, gravel, water, and cement. Cement is made by cooking calcium-rich material, usually limestone, with silica-rich material -- typically clay -- at temperatures of 1,500 degrees Celsius, yielding a hard mass called "clinker." This is then ground up into a powder. The decarbonation of limestone, and the heating of cement, are responsible for most of the material's greenhouse-gas output.

The new analysis suggests that reducing the ratio of calcium to silicate would not only cut those emissions, but would actually produce better, stronger concrete. These findings are described in the journal *Nature Communications* by MIT senior research scientist Roland Pellenq; professors Krystyn Van Vliet, Franz-Josef Ulm, Sidney Yip, and Markus Buehler; and eight co-authors at MIT and at CNRS in Marseille, France.

"Cement is the most-used material on the planet," Pellenq says, noting that its present usage is estimated to be three times that of steel. "There's no other solution to sheltering mankind in a durable way -- turning liquid into stone in 10 hours, easily, at room temperature. That's the magic of cement."

In conventional cements, Pellenq explains, the calcium-to-silica ratio ranges anywhere from about 1.2 to 2.2, with 1.7 accepted as the standard. But the resulting molecular structures have never been compared in detail. Pellenq and his colleagues built a database of all these chemical formulations, finding that the optimum mixture was not the one typically used today, but rather a ratio of about 1.5.

As the ratio varies, he says, the molecular structure of the hardened material progresses from a tightly ordered crystalline structure to a disordered glassy structure. They found the ratio of 1.5 parts calcium for every one part silica to be "a magical ratio," Pellenq says, because at that point the material can achieve "two times the resistance of normal cement, in mechanical resistance to fracture, with some molecular-scale design."

The findings, Pellenq ads, were "validated against a large body of experimental data." Since emissions related to concrete production are estimated to represent 5 to 10 percent of industrial greenhouse-gas emissions, he says, "any reduction in calcium content in the cement mix will have an impact on the CO_2." In fact, he says, the reduction in carbon emissions could be as much as 60 percent.

In addition to the overall improvement in mechanical strength, Pellenq says, because the material would be more glassy and less crystalline, there would be "no residual stresses in the material, so it would be more fracture-resistant."

The work is the culmination of five years of research by a collaborative team from MIT and CNRS, where Pellenq is research director. The two institutions have a joint laboratory at MIT called the Multi-Scale Materials

Science for Energy and Environment, run by Pellenq and Ulm, who is director of MIT's Concrete Sustainability Hub, and hosted by the MIT Energy Initiative.

Because of its improved resistance to mechanical stress, Pellenq says the revised formulation could be of particular interest to the oil and gas industries, where cement around well casings is crucial to preventing leakage and blowouts. "More resistant cement certainly is something they would consider," Pellenq says.

So far, the work has remained at the molecular level of analysis, he says. "Next, we have to make sure these nanoscale properties translate to the mesoscale" -- that is, to the engineering scale of applications for infrastructure, housing, and other uses.

ENVIRONMENT FRIENDLY CEMENT IS STRONG THEN ORDINARY CEMENT

The IRIS instrument is viewed from above the cement sample is lowered about 120cm into a cryostat so that it is hit by the Newton beam. The crystal is emptied of air to avoid signal notice from air.

Now research from the Niels Bhor institute show that cement made width waste ash from sugar production is stronger than ordinary cement. The research shows that the ash helps to bind water in the cement so that it is stronger, can withstand higher pressure and crumbles less, at the same time energy is saved and position from cement production is reduced.

Cement is composed of chalk and clay which are mixed together and heated at high temperature in a cement kiln. The mixture is then clushed into a powered. When the cement powder is mixed with water a chemical process takes place, cement is used as building material throughout the world.

In the same countries where sugarcane is grown agricultural waste product from sugar production has been added to the cement mixture to many years. Once the sugar has been extracted from the sugarcane you are left with lot of fiber waste which is used as fuel from energy production . From the energy production you get a lot of ash, which needs to be disposed

of. In some countries like Cuba and Brazil the ash is added into cement Mixture.

I have been studying cement using Quasi elastic Newton scatlering for several years and researchers from Brazil asked whether wanted to analyse samples of cement mixed with waste product in the form os sugarcane ash.

I decided to say yes to the prohect, which aimed to investigate the properties of nano-scale and map the mobility of water in the cement is directly located to how much of the water is chemicaly bonded. The more the water can move around. The waste it is for the strength of durablity "explain" Helois a Bordauo who does research in nano physics at the viels bhor insitude at the University of WQPENHAGEN.

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PRESTRESSED NANO CONCRETE

P.Sarath Kumar,*ii year civil.*

Construction industry uses large quantities of Portland cement for infrastructure development throughout the world. Better understanding of the extremely complex structure of cement based material at the nano level will apparently results in a new generation of concretes with improved strength and durability. The new concrete with should not be sustainable, but also be cost and energy effective and at the same time meet the demands of the modern society nano binders or nano engineered cement based materials with the nano sized cementations components or other nano sized particles from the next groundbreaking research domain. At present, developed countries like USA, Japan, Germany USSR and France are spending billions of dollars per year on nano technology research funding for the creation of new materials devices and system at molecular, nano and micro level.

Nano technology of concrete is set on a path to revolutionize the construction industry by changing the structural properties of concrete to better suit the requirements of structural components. Already several

innovative nano products are available in the market which is of immense value in the construction industry dealing with prestressed concrete structural elements. The rapid development of the field of materials science on the nano scale has opened up a new window of understanding into traditional construction materials like cement and concrete.

Nano cements are concretes with their associated benefits like overall cost savings and energy consumption coupled with increase in strength and durability plays a significant role in the future of prestressed construction Industry.

Nano cements are particularly suitable as coatings and repair materials. Tx Active™ is a quality label developed by Heidelberg cement and Italicement, which shows the durability and photo catalytic functionality of the finished product. This is self-cleaning cement due to its special formula which is efficient in destroying atmospheric pollutants

Portland cement is the most widely used materials in the construction industry with an estimated production surpassing 6 billion cubic meters per year. The prominent advantages of this material are availability of raw materials for production throughout the world, low-cost, ease of construction, setting at room temperature and desirable properties. In addition to these advantages of this material in a modern day concrete made with cement and aggregates has an excellent performance record of over 180years. Om general, Portland cement is typically used as a cementing material with fine and coarse aggregates to create products that is a few mm to several mm thick.

The average size of the Portland cement particles is in the range of 50microns. In some applications requiring thinner and stronger products with faster setting time, micro cement with a maximum particle size of about 5micorns has been. By reducing the particle size by an order of magnitude, it is possible to obtain nano-Portland cement.

Major development in the performance of concrete was achieved with applications of superfine particles of fly ash or silica fume. Nam=no technology has made it possible to introduce nano silica to improve the

properties of concrete. At the micro level, there is a good analogy between reinforce concrete and fiber reinforced composites.

The difference in the particle size distribution and specific area of ingredients in conventional, high strength/high performance and nano engineered concretes are graphically illustrated

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Glass Fiber Reinforced Concrete (GFRC)

J.Arun Kumar,*ii year civil.*

GFRC is an engineered concrete that has numerous applications in concrete products including ornamental structures, fountains, domes, and planters. GFRC is also used extensively for decorative panels.

Composition of Glass Fiber Reinforced Concrete (GFRC)

Glass fiber reinforced concrete composites contain high strength glass fibers that are surrounded by a cementitious medium. In this shape, both the fibers and the environment maintain their natural individual chemical characteristics. However, the concrete produced has improved resultant properties that cannot be attained if either of the components is used individually. The glass fibers are the main elements that carry the load, while the enclosed matrix keeps the fibers in the preferred position and direction. The medium facilitates transfer of the load on the fibers, and shields them from the damage due to environment. Glass fibers can be integrated into the matrix either in constant or irregular lengths. The most widespread shape in which glass fiber reinforced composites are used in structural applications is known as laminate. This form is achieved by consolidating fine fiber layers and a matrix into the desired size. The orientation of fiber in each layer, and the stacking sequence of the layers, can be used to produce a range of mechanical properties of the composite materials.

All these properties are combined with the fact that GFRC looks like solid concrete, although it weighs only one-third of the original solid concrete weight. This makes it ideal for outdoor or indoor applications where lightweight and durable concrete is needed. Such applications may include decorative structures, fountains, domes, planters, etc.

Advantages of Glass Fiber Reinforced Concrete

GFRC is an engineered material. Its properties can change depending upon the design of mix, fiber content, and the techniques used for manufacture. The use of GFRC has become popular due to its numerous favorable properties:

- GFRC has been tested in the laboratory and also in the actual installations, and can be anticipated to survive as long as pre-cast concrete. In numerous environmental conditions, like when exposed to salts or moisture, GFRC is likely to function better due to the absence of steel reinforcement that may corrode.
- Relatively light in weight compared to the traditional stones. Its installation is fast and comparatively simple.
- GFRC has the characteristics to be cast into almost any shape.
- GFRC consists of materials that are unlikely to burn. The concrete takes the role of a thermal regulator while exposed to fire and protects the materials from the flame heat.
- GFRC is thin and strong, with weight being 75% to 90% less compared to solid concrete. Less weight facilitates easy and rapid installation, and also decreases the load applied on the structure. The light weight and tough material also minimizes the transportation expenditures, permits flexibility in design, and reduces the impact on environment.
- Superior strength enhances the ability to endure seismic loads.
- GFRC is less vulnerable to weather effects and more resistant to freeze thaw than the normal concrete.

- **Comparison of GFRC to Precast Concrete**

The elasticity and density of the GFRC is greater than precast concrete. The cement to sand ratio for GFRC is approximately 1:1, while for precast concrete it is 1:6. The glass fibers included to reinforce the concrete produce considerably greater impact strength and lower permeability to water and air than precast concrete. GFRC looks like a natural stone and permits the designer greater flexibility in form, color, and texture.

Metakaolin

Lingeshwaran, *ii year civil.*

Metakaolin is a dehydroxylated form of the clay mineral kaolinite. Stone that are rich in kaolinite are known as china clay or kaolin, traditionally used in the manufacture of porcelain. The particle size of **metakaolin** is smaller than cement particles, but not as fine as silica fume.

Considerably in recent times because of the demands from the construction industry. In the last three decades, supplementary cementitious materials such as fly ash, silica fume and ground granulated blast furnace slag have been judiciously utilized as cement replacement materials as these can significantly enhance the strength and durability characteristics of concrete in comparison with ordinary Portland cement (OPC) alone, provided there is adequate curing (Neville 1997). Hence, high-performance concretes can be produced at lower w/b ratios by incorporating these supplementary materials

PROPERTIES

Materials The following materials were employed: • The cement used in all mixture was normal OPC (53 grade) conforming to IS: 12269 (BIS 1987). Commercially available MK was used as mineral additive. Their chemical composition is specified in Table 1. The X-ray diffraction (XRD) pattern of the MK used in this study is shown in Fig. 1. • Good quality aggregates have been procured for this investigation. Crushed granite with nominal grain size of 20 mm and well-graded river sand of maximum size 4.75 mm were used as coarse and fine aggregates, respectively. The specific gravities of aggregates were determined experimentally. The coarse aggregates with 20, 12.5 mm fractions had specific gravities of 2.91 and 2.80, whereas the fine aggregate had specific gravity of 2.73, respectively. • Commercially available poly carboxylate ether (PCE)- based super-plasticizer (SP) was used in all the concrete mixtures.

Chemical composition Cement (%) Metakaolin (%) Silica (SiO_2) 34 54.3 Alumina (Al_2O_3) 5.5 38.3 Ferric oxide (Fe_2O_3) 4.4 4.28 Calcium oxide (CaO) 63 0.39 Magnesium oxide (MgO) 1.26 0.08 Sodium oxide (Na_2O) 0.1 0.12

Potassium oxide (K2O) 0.48 0.50 Sulphuric anhydride (SO3) 1.92 0.22 Loss on ignition (LOI) 1.3 0.68 Blaine (m2 /kg) 360 15,000a Specific gravity 3.15

Specimens and Curing The following specimens were cast from each mixture: • Three 100 9 100 9 100 mm cubes for the compressive strength. • Three 100 9 200 mm cylinders for the splitting tensile test. • Three 150 9 300 mm cylinders for the modulus of elasticity test. • Two 100 9 100 9 100 mm cubes for water absorption study. • Two 150 9 150 9 150 mm cubes for the GWT water permeability test. • Three 150 9 150 9 150 mm cubes for the water penetration depth test. • Two 100 9 200 mm cylinders for the rapid chloride penetrability test. Samples of 100 9 52 mm were prepared from these cylinders.

Chemical Analysis of Cementititous Materials Cementitious Materials Chemical Composition, % Type 1 Cement Metakaolin Silica Fume Silicon dioxide, SiO2 20.1 51.34 93.6 Aluminum oxide, Al 2O3 4.51 41.95 0.06 Ferric oxide, Fe2O3 2.50 0.52 0.45 Calcium oxide, CaO 61.3 0.34 0.50 Loss on Ignition 2.41 0.72 2.26 Zhang & Malhotra (1995)

USES

Metakaolin ! Increases water demand ==> superplasticizers for workability; may require less SP than SF, have better finishability and being less sticky than SF concrete • Could be very beneficial in ternary systems ! PC + GGBFS + MK ! PC + FA + MK ! The contrasting behaviours of FA and MK can be utilized with maximum benefit in terms of the finished products with respect to the flow behaviour, strength development and cost.

Metakaolin • Pozzolanic reaction in concrete ! C3S / C2S (clinker) + H2O ----> Calcium Silicate Hydrates (C-S-H) + Ca(OH)2 ! Ca(OH)2 + MK ---> C-S-H pouzz. + crystalline products (C2ASH8 , C4AH13, C3AH6) ! Highly-reactive pozzolan with high specific surface

USES IN CONCRETE

Metakaolin • When used in concrete ! Replacement level of PC will depend on the nature of the constituents and the To and reaction time ! Produces significant pore refinement --> modifies water transport properties

and diffusion rates of harmful ions ! Enhances several mechanical (early-age compressive strength, flexural strength) and durability properties (chemical attack, ASR expansion, sulphate resistance, F/T cycles) of concrete

Type of concrete Investigated • Type of concrete investigated ? Control ? 10% Metakaolin ? 10% Silica Fume • Mixture proportioning ? W / C + SCM = 0.40 ? Cementititous materials content: 390 kg/m3 • Properties of fresh concrete ? Slump : 80 - 170 mm ? Air Content: 5.5 - 6.1 % Zhang & Malhotra (1995)

Results of De-icing Salt Scaling Tests Concrete Mixture Visual Rating, ASTM C 672 Scaling Residue, kg/m2 Control 2 0.3 MK, 10% 3 0.9 SF, 10% 3 0.8 Rating 0 Rating 1 Rating 3 Rating 5 Zhang & Malhotra (1995)

Conclusion

•Metakaolin is a highly pozzolanic and "reactive" material

• Metakaolin improves most mechanical and durability properties of concrete

• Properties of concrete incorporating MK are comparable and sometimes better than SF concrete.

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TALLEST BUILDING IN THE WORLD

S.Sudhagar, *ii year civil.*

(BURJ KHALIFA)

The world tallest artificial structure is the 829.8m(2722ft)tall burj khalifa Dubai,united emirates, the building gained the official title of "tallest building in the world",at its opening on January 4,2010.the council of tall building and urban habitat,an organization that certifies building only if at least 50% of its height is made up of floor plates containing habitable floor area

GENERAL INFORMATION

The architectural style : neo futurism

Co-ordinates : 251149.7 N 551626.8E

Construction started : 6 Jan ,2010

Cost : USD $ 1.5 Billon

HEIGHT

Architectural : 823 meters(2717 ft)

Tip : 830 meters(2723 ft)

Roof : 828 meters(2717 ft)

Top floor : 585 meters(1919 ft)

TECHNICAL DETAILS

Floor count : 163 floors plus 46 maintainance levels in the spire & two parking levels basement total 211 floors

Floor area : 309473(3331100 sq.ft)

IN INDIA

The list of the tallest building in different cities in india enumerates tallest building of each and every big cities in india based on official height .currently "Imperial Towers"(located in Mumbai) are the tallest building in country with a total height of 254 meters (833 ft & 60 floors

GENERAL INFORMATION

Former name	: 5D Towers
Location	: MP mills compound,Tardeo,MUMBAI.
Type	: Resdential condominimum
Construction started	: 2005 & 2010(completed)
Owner & management	: SD Corporation Pvt.Limited

HEIGHT

Antenna spire	: 254 meters(833 ft)
Roof	: 210 meters(690 ft)

TECHNICAL DETAILS

Floor count : 2*60

Floor area : 2*120000m(1300000 sq.ft)

Lift/elevator : 17

DESIGN & CONSTRUCTION

Architect : Hafeez contractor

Developer : Shapoorji pallonjii & Co ltd

Structural engineer : J+W Consultants & BM Engineer

TOP 3 TALLEST BUILDING IN THE WORLD

RANK	BUILDING NAME	HEIGHT
1	BURJ KHALIFA	828 M
2	SHANGHAI TOWERS	632M
3	MAKKAF CLOCK ROYAL TOWERS	601 M

TOP 3 TALLEST BUILDING IN INDIA

RANK	NAME	CITY	FLOORS	HEIGHT	YEAR
1	IMPERIAL TOWERS 1	MUMBAI	61	254 M	2010
2	IMPERIAL TOWERS 2	MUMBAI	61	254M	2010
3	AHUJA TOWER	MUMBAI	53	250M	2014

The Pinnacle tower

M.Logeswari,*ii year civil.*

The Pinnacle (formerly known as the DIFA Bishopsgate development) will be a 63 storey landmark building toweer of tall buildings in the City.

The proposed redevelopment will comprise the demolition of the existing 5 to 8 storey office buildings and the construction of a 290m high tower. Existing basements and ground levels across the site will be deepened and a new site wide basement constructed to a level common with the existing basement slab level of 38 Bishopsgate. The building has a gross floor area of 138,000m2 including 3 basement levels.

The Pinnacle (formerly known as the DIFA Bishopsgate development) will be a 63 storey landmark building in London. It will join The Gherkin, Tower 42, Heron Tower, and 122 Leadenhall St to form a distinctive cluster of tall buildings in the City. The proposed redevelopment will comprise the demolition of the existing 5 to 8 storey office buildings and the construction of a 290m high tower. Existing basements and ground levels across the site will be deepened and a new site wide basement constructed to a level common with the existing basement slab level of 38 Bishopsgate. The building has a gross floor area of 138,000m2 including 3 basement levels.

Overview of the Geotechnical Solution

The proposed building will be founded on a combination of piles founded in the London Clay and the Thanet Sand strata. Where required, the new basement walls are to be constructed within a secant pile wall.

The foundations consisted of the deepest and largest built to date in the City of London at 2.4m diameter, 63m long bored piles base grouted in the Thanet Sand. Reuse of the existing underreamed piled foundations in London Clay supplemented by new large diameter bored piles and minipiles was adopted over part of the site.

Foundation Design

Pile loads from this structure were up to 45MN, and this meant that the piles had to extend into the Thanet Sand stratum, 63m below ground level. The decision to have single deep base grouted bored piles per column also

meant that not only were the piles the deepest but also the largest ever built in the City, at 2.4m diameter.

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The Burj Al Arab

S.Malathi,*ii year civil.*

The Burj Al Arab is one of the world's most luxurious hotels and is located in Dubai, United Arab Emirates. Burj Al Arab is managed by the Jumeirah Group and built by Said Khalil. Burj Al Arab's stands at a height of 333m. The Burj Al Arab stands on an artificial island 280 metres (919 ft) out from Jumeirah beach, and is connected to the mainland by a private curving bridge.

The construction of Burj Al Arab began in 1994. It was built to resemble the sail of a dhow, a type of Arabian vessel. Two "wings" spread in a V to form a vast "mast", while the space between them is enclosed in a massive atrium. Architect Tom Wright said "The client wanted a building that would become an iconic or symbolic statement for Dubai; this is very similar to Sydney with its Opera House, or Paris with the Eiffel Tower. It needed to be a building that would become synonymous with the name of the country." The architect and engineering consultant for the project was Atkins, the UK's largest multidisciplinary consultancy. The hotel was built by South African construction contractor Murray & Roberts. The hotel cost $650 million to build.

The foundation used in this hotel is Pile Foundation and a total of 230 – 40 meter long concrete piles were drived into the sand. The foundation is held in place not by bedrock, but by the friction of the sand and silt along the length of the piles. Engineers created a surface layer of large rocks, which is circled with a concrete honey-comb pattern, which serves to protect the foundation from erosion. It took three years to reclaim the land from the sea, but less than three years to construct the building itself. The building contains over 70,000 cubic meters of concrete and 9,000 tons of steel. The tennis court at the top of the hotel

NEW COMPOSITE MATERIAL PREVENTS METAL CORROSION

Muthamizh,*ii year civil.*

New composite material prevents metal corrosion in an environmentally friendly way, even under extreme conditions. It can be used wherever metals are exposed to severe weather conditions, aggressive gases, salt, heavy wear or high pressures.

"The key is the structuring of this layer -- the protective particles arrange themselves like roof tiles. As in a wall, several layers of particles are placed on top of each other in an offset arrangement; the result is a self-organized, highly structured barrier," says the chemical nanotechnology expert. The protective layer is just a few micrometers thick and prevents penetration by gases and electrolytes. It provides protection against corrosion caused by aggressive aqueous solutions, including for example salt solutions such as salt spray on roads and seawater, or aqueous acids such as acid rain. The protective layer is an effective barrier, even against corrosive gases or under pressure.

After thermal curing, the composite adheres to the metal substrate, is abrasion-stable and impact-resistant. As a result, it can withstand high mechanical stress. The coating passes the falling ball test with a steel hemispherical ball weighing 1.5 kg from a height of one meter without chipping or breaking and exhibits only slight deformation, which means that the new material can be used even in the presence of sand or mineral dust without wear and tear.

The composite can be applied by spraying or other commonly used wet chemistry processes and cures at 150-200°C. It is suitable for steels, metal alloys and metals such as aluminum, magnesium and copper, and can be used to coat any shape of plates, pipes, gear wheels, tools or machine parts. The specially formulated mixture contains a solvent, a binder and nanoscale and platelet-like particles; it does not contain chromium VI or other heavy metals.

GEOPOLYMER CONCRETE

P.Priyanka ,*ii year civil*

Geopolymer concrete, an innovative and environmentally-friendly building material developed at Louisiana Tech University's Trenchless Technology Center (TTC), will be featured in a transportation exhibition taking place at the Detroit Science Center.

Developed by Dr. Erez Allouche, research director for the TTC, and his team, geopolymer concrete is an emerging class of cementitious materials that utilize "fly ash," one of the most abundant industrial by-products, as a substitute for Portland cement, the most widely produced man-made material on earth.

"Presenting geopolymer concrete at a widely-attended public exhibition provides essential exposure to this emerging green construction technology," said Allouche. "If the public is aware that there are more sustainable ways to construct our highways and bridges, it will expect its government agencies to explore and promote these 'greener' technologies."

"This sort of political pressure is essential for new materials, such as geopolymer concretes, to overcome the multitude of bureaucratic barriers that exist between the laboratory and the construction site."

In comparison to ordinary Portland cement, geopolymer concrete features greater corrosion resistance, substantially higher fire resistance (up to 2400° F), high compressive and tensile strengths, a rapid strength gain, and lower shrinkage.

The fly ash used in the specimen for the Detroit Science Center exhibit was obtained from Cleco Power's Dolet Hills coal-fired power station near Mansfield, Louisiana. Mr. Ivan Diaz-Loya oversaw the preparation of the mix design and cast with the assistance of TTC technicians Chris Morgan and Ben Curry.

"Geopolymer concrete technology is here to stay," Allouche said. "We expect to see a growing number of commercial applications of this green and innovative technology across the construction industry, with applications in the area of transportation infrastructure leading the way."

Allouche says the Alternative Cementitious Material research group at the TTC is one of the top groups in the country in this field and will be a key player in the development and commercialization of geopolymer concrete technology for years to come.

Geopolymer concrete's greatest appeal may be its life cycle greenhouse gas reduction potential -- as much as 90% when compared with ordinary Portland cement. Researchers at the TTC continue to work on ways to replace

Portland cement with cementitious binders made from industrial waste. Some next generation geopolymer concrete could last several times longer than ordinary concrete.

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GROUND GRANULATED BLAST FURNACE SLAG

Pandiyarajan.M,*ii year civil.*

Abstract

Durability of concrete is defined as it ability to resist weathering action, chemical attacks, abrasion or any other process of detoriation. It also includes the effect of quality and serviceability of concrete when exposed to sulphate and chloride attacks.

Fly ash and ground granulated burnt slag are chosen mainly based on the criteria of cost and their durable qualities.

Not only this, environmental pollution can also be decreased to some extent because the emission and carbon dioxide are very limited

The effect of 1% of H_2SO_4 and sea water on these concrete mixes are determined by immersing these cubes for 7-days, 28-days and 60days in above solution and the respective changes in both compressive strength and GGBS good strength, durable properties and aggregate in severe environment

Introduction

Now-a-days most suitable and widely used construction material is concrete. This building material until this days, went through lot of development. The most important part of concrete is cement. The production process of this raw material produces a lot of CO_2. It is well known, that CO_2 emission initiates harmful environmental changes

In this study we describe the results of examination with GGBS and FA, we present the experimental program the further activities and works.

Environmental related causes of concrete durability problems.

- Freeze-thaw damage (physical effect, weathering)
- Alkali-aggregate reactions (chemical effect)
- sulphate attack(chemical effect)

- abrasion(physical effect)
- mechanical loads(physical effects)

Brief History of GGBS

- 1862: Hydraulic potential of GGBS discovered in Germany
- Early 1900's -Portland Blast Furnace Cements had an established place in the concrete market
- 2004: More than 5,000,000 tonnes of GGBS produced in Germany
- 2006: Approximately 2,000,000 tonnes of GGBS produced in UK
- 2008: Over 400,000 tonnes available in Ireland

Working

Water Demand

GGBS allows for water reduction of 3 to 5% in concrete without any loss in workability. Water should not be added to GGBS concrete after dispatch from the concrete plant as it reduces strength and durability of the concrete.

Placing, Compacting and Pumping

GGBS makes concrete more fluid, making it easier to place into formwork and easier to compact by vibration. GGBS concrete remains workable for longer periods allowing more time for placing and vibrating. Pumping is also easier due to the better flow characteristics.
Concrete with 50% GGBS

Strength development

GGBS concrete has slightly slower strength development at early ages, but will have equal if not greater strength at 28 days compared to non GGBS concrete. At 7 days GGBS concretes will have 50 to 60% of its characteristic strength compared to 70 to 80% for Portland cement

only concrete at the same time. At 28 days GGBS concrete will have fully developed its characteristic strength and will continue to develop strength past 90 days. It is good practice to make 56 day cubes when using GGBS concrete at 50% and above should there be any concern over later strength development.

Heat of Hydration

- GGBS lowers peak and overall heat
- Substitution level 70%

Controlling thermal cracking

- Maximise use of GGBS to reduce heat generated
- Install and monitor thermocouples
- Insulate if required
- Minimise placing temperature
- Cover with plastic sheeting to protect from wind
- Remove insulation in stages

Summary

Environmental

- Positive PR
- Assist with planning applications
- Consistent ethos

Reduced risk of cracking

- Longer life
- Reduced maintenance

Increased long term strength

Improved durability

- Increased resistance to attack in peaty/acidic environments
- Increased resistance to attack in marine environments

Conclusion

The early strength is compared to less in fly ash and GGBS concrete than conventional aggregate concret

The result of fly ash and GGBS concrete when replaced with 20% of cement more than compared to CAC at the end of 28days and 60 days for normal water curing.

In sea water curing the GGBS when replaced with 20% of cement shows good response for durability criteria.

In H_2SO_4 solution curing the fly ash when replaced with 20% of cement shows good response for durability criteria

Industrial Visit

IHH,Poondi.

Students of II year civil have visited Institute of Hydrology and Hydraulic Engineering, and Poondi Resevoir on 21.02.2015.

The structures explained are:

- Poondi reservoir
- Dam
- Aqueduct
- Superpassage
- Reservoirs
- Syphon aqueduct
- Irrigation structures
- Weir
- Notches

Total no of 65 students were visited the institute and secured the knowelge we thank
our Mangement , Principal and Placement & training for orgainsing this event to be happened

LOGICAL THINKING

1 × 8 + 1 = 9

1 2 × 8 + 2 = 9 8

1 2 3 × 8 + 3 = 9 8 7

1 2 3 4 × 8 + 4 = 9 8 7 6

1 2 3 4 5 × 8 + 5 = 9 8 7 6 5

1 2 3 4 5 6 × 8 + 6 = 9 8 7 6 5 4

1 2 3 4 5 6 7 × 8 +7 = 9 8 7 6 5 4 3

1 2 3 4 5 6 7 8 × 8 + 8 = 9 8 7 6 5 4 3 2

1 2 3 4 5 6 7 8 9 × 8 + 9 = 9 8 7 6 5 4 3 2 1

G.Dinesh Kumar,

Lecturer/Civil

CIVIL MEANINGS

Concrete:

Concrete is a composite material composed mainly of water, aggregate, and cement. Often, additives and reinforcements (such as rebar) are included in the mixture to achieve the desired physical properties of the finished material.

Soil:

Soil is the mixture of minerals, organic matter, gases, liquids, and myriad organisms that together support plant life.

Surveying:

Surveying is the technique and science of accurately finding out the position of points and the distances and angles between them. These points are usually, but not always, associated with positions on the surface of the Earth. They are often used to make land maps and boundaries for ownership of land.

Hydraulics:

Hydraulics is a topic in applied science and engineering dealing with the mechanical properties of liquids. At a very basic level, **hydraulics** is the liquid version of pneumatics. Fluid mechanics provides the theoretical foundation for **hydraulics**, which focuses on the engineering uses of fluid properties.

Mix Design:

The process of selecting suitable ingredients of concrete and determining their relative amounts with the objective of producing a concrete of the required, strength, durability, and workability as economically as possible, is termed the concrete mix design.

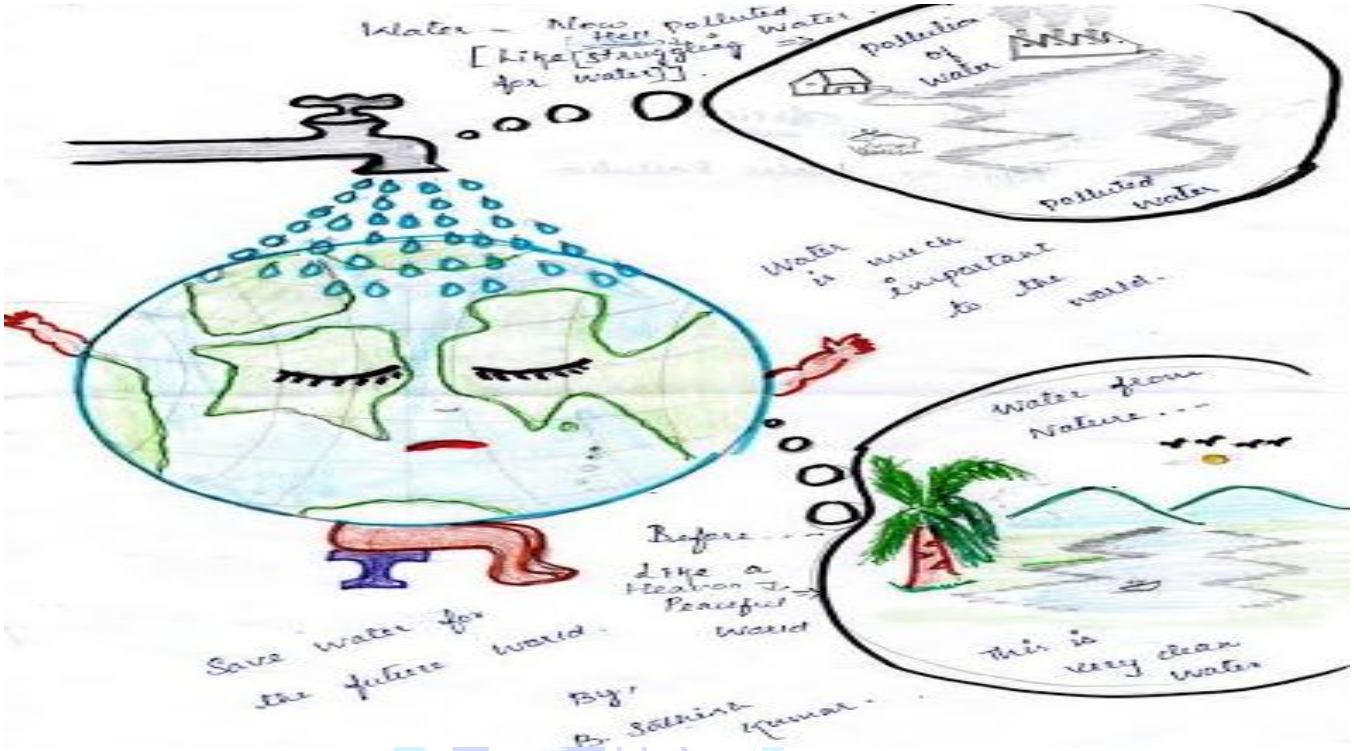
Void Ratio:

Void ratio. where is **void ratio**, is porosity, V_V is the volume of **void**-space (such as fluids), V_S is the volume of solids, and V_T is the total or bulk volume. This figure is relevant in composites, in mining (particular with regard to the properties of tailings), and in soil science

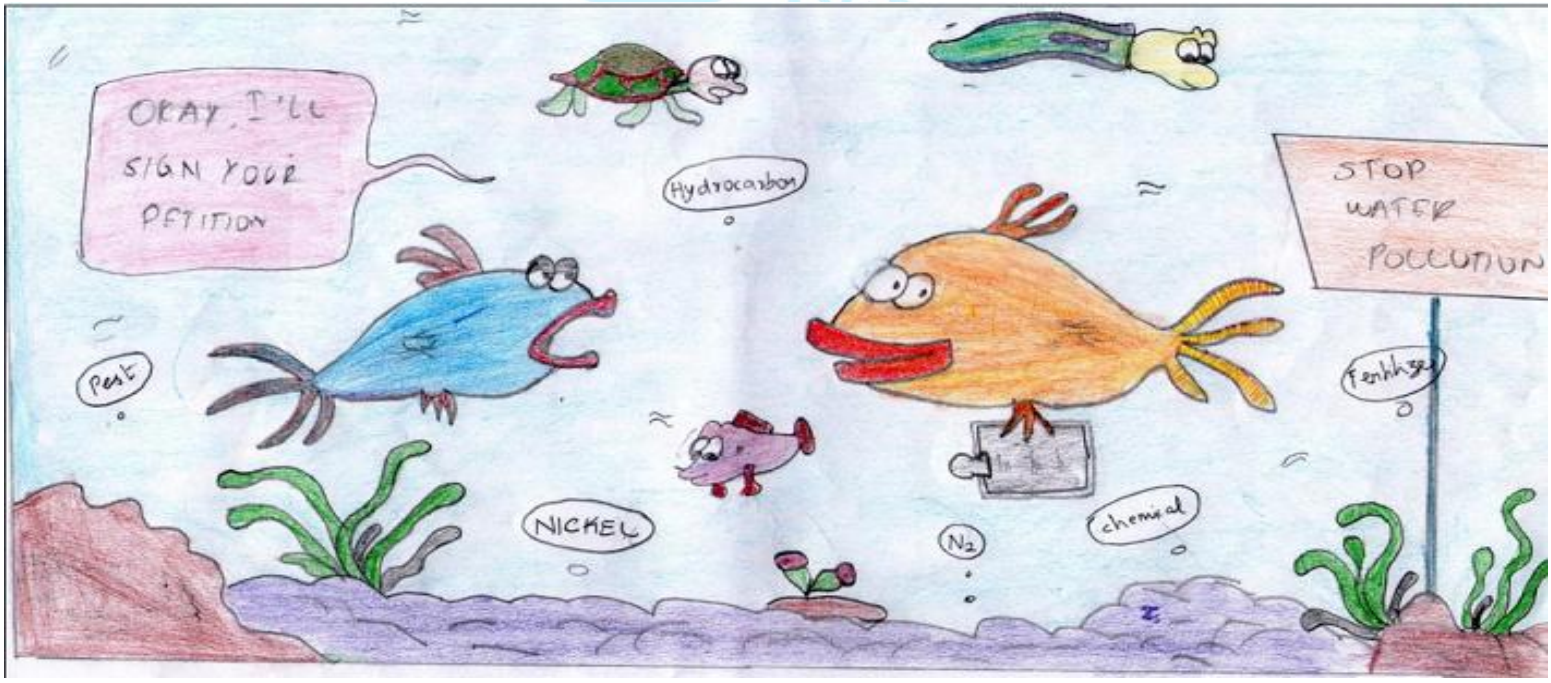
K.P.Pavithra

Lecturer/ CIVIL

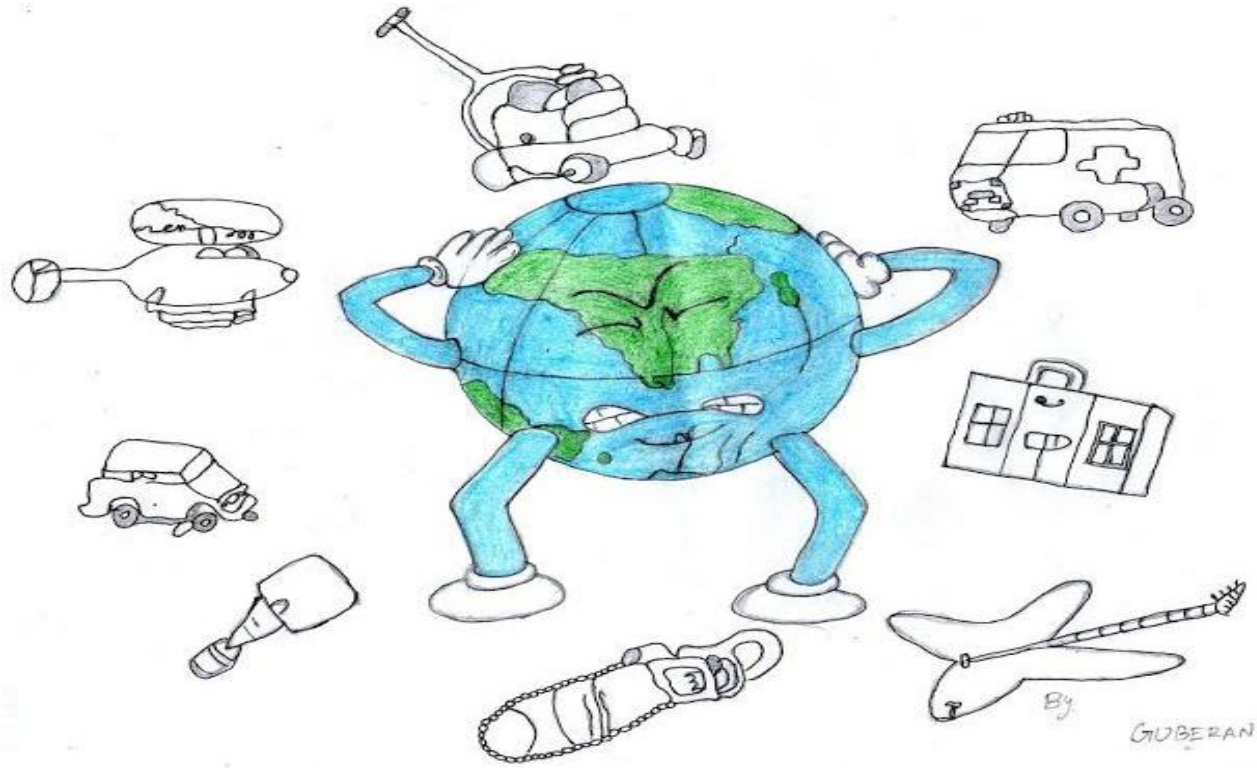
AWARENESS CARTOONS . . .



B. Sathish Kumar, II Year



Jagadeesan/II year



Guberan.D, II year, Civil

Guptha.D, II year

TAMIL KAVITHAIKAL

கட்டிடப் பொறியாளன்

அழகான கட்டிடங்கள் பல இருந்தாலும்,
அழகான அணைகள் பல அமைந்தாலும்,
அழகான சாலைகள் பல படைத்தாலும்,
அழகான ஆலயங்கள் சில உருவாக்கப்பட்டாலும்,
இவையாவும் இவன் இல்லாமல் முழுமை பெறாது.

– இவன் கட்டிடப் பொறியாளன்

கட்டிடப் பொறியாளன்

எனக்கு மட்டும் நிலவிற்கு செல்ல வாய்ப்பு கிடைத்தால்
நிலவை விட அழகான கட்டிடங்களை உருவாக்குவேன்

– கட்டிடப் பொறியாளன்

Parimelzhager

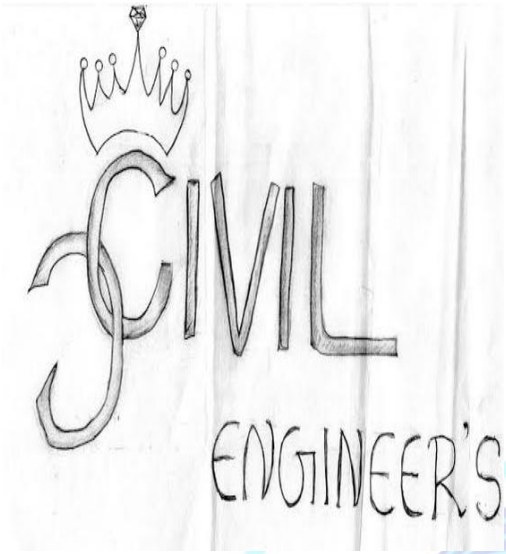
TECHNICAL EVENTS

Logo Contest *was held on 21.02.2015 inorder to select logo for Civil engineering Association*

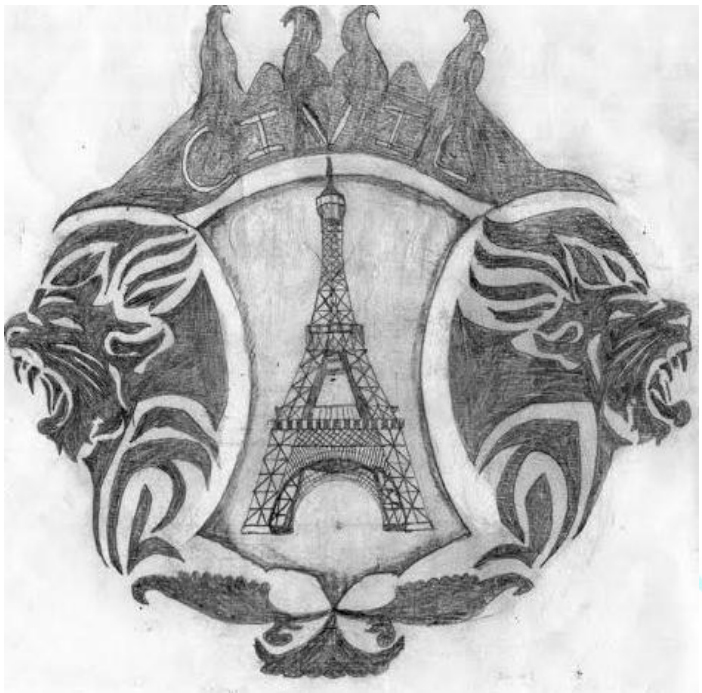
The selected logo was created by M.Sowmiya, B.Pavithra and B.Sathish Kumar.

Congratulations to the winners . . . !

THE PARTICIPANTS ARE



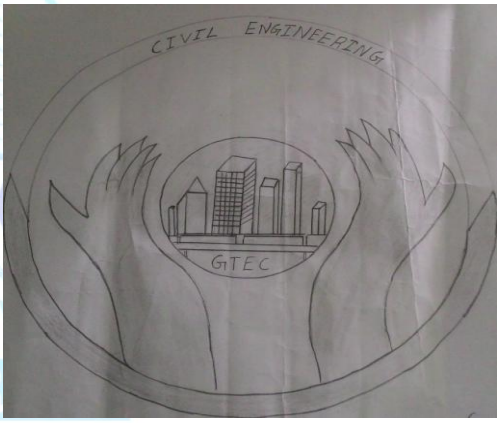
Parimelazager.M



S.Vignesh

Arun Kumar.J

P.Logeswari



M.Sudhakar

Gayathri.P

A.Pavitha

POEMS. . .

CIVIL ENGINEERING

Who are very good creators next to god

Who can groove the sky and build skyscrapers

Who are dare to excavate extreme earth and build tunnel ways

Who create an island in centre of sea and build cities

Who store plenty of water and build dam and reservoirs

Who level the ground and build highway

Who made the past

Who work for present

Who plan for future

Proud to bean civil engineer. . . . !

J.Anne Mary,

Assistant Professor,

Department of Civil Engineering

CIVIL ENGINEERING ASSOCIATION

The inaugural of Civil Engineering Association was held on 18.03.2015 which was preside by Principal R.Varadharajan along with our managing trustee, Advisor and chief guest Er.P.J.Murali, Adhi Sakthi Associate, all department HOD's, Faculty members and Civil Engineering students.

The Logo for Civil Engineering Association was released on the same day

The Civil Engineering Association members have been selected Chairmen **G.Poovarasi**, Vice Chairmen **A.Vivekachandrian**, Secretary **A.Pavithra** and Join Secrtary **B.Sathish Kumar.**

After the inaugural the model making competition was conducted by Civil Engineering Association and winners have selected. The models are displayed in entrance of ECE block.

The models are as follows

Vellore Fort,

Ram Kumar,D.V.Raju,Prem Kumar

Glass House Building,

S.Vignesh,R.John Humbleson, Vinoth kumar. S.vivekandan

Turning Bridge

Rohinipathy,ManiKanadan.R,DineshT, Baskar.A,

Suspension Bridge,

Yuvaraj

Pisa tower.

Gayathri, M.Sowmiya

Dam Model

Sathya Narayanan.R, Vivekachandrian.A, Sarath Kumar.M, K.Arun Kumar

Plank Tower

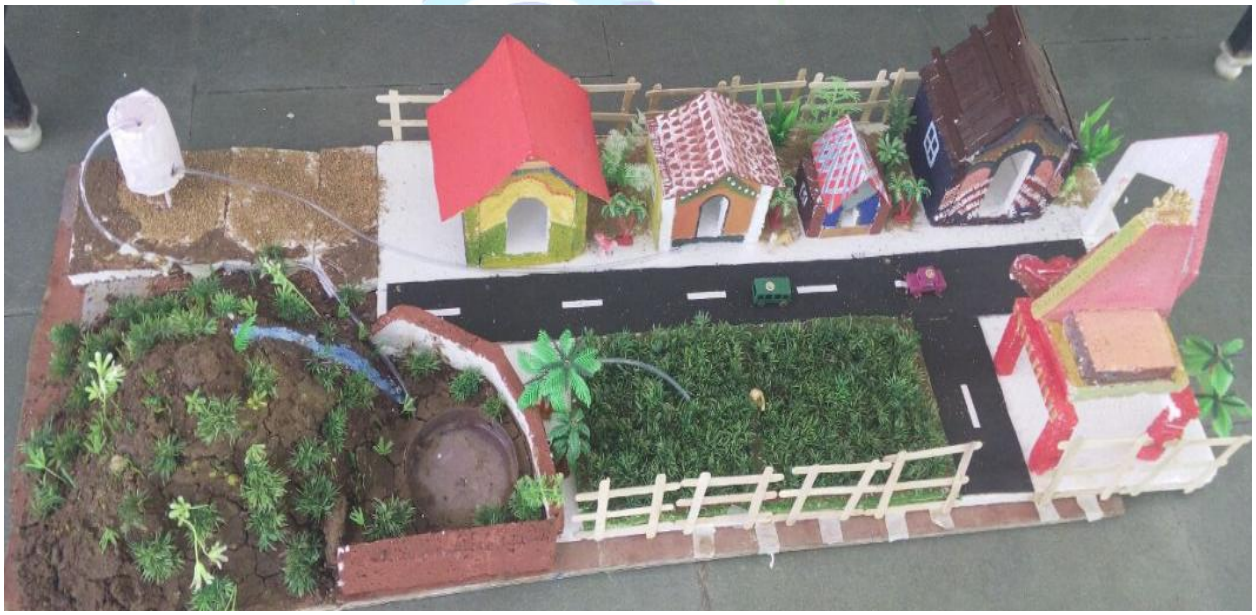
A.Sandeep, M.Sudhakar,Parimelazher.A,Surendiran.S, K.Vignesh

Burj kalifa, kudupminar, Types of Houses

B.sathish Kumar,santhosh, Ravi Kumar, Madhavan

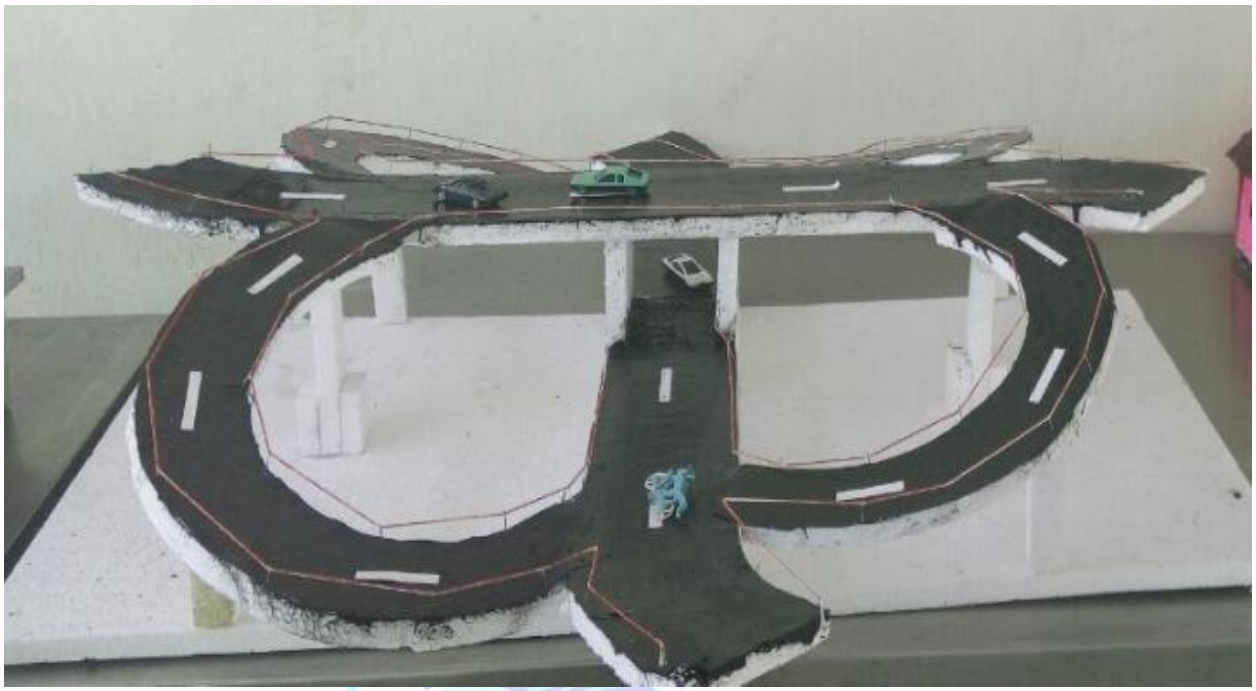
Lotus temple

B.pavithra, A.Manimegalai,Vishnu Priya.M,kabila.A.logeswari.M



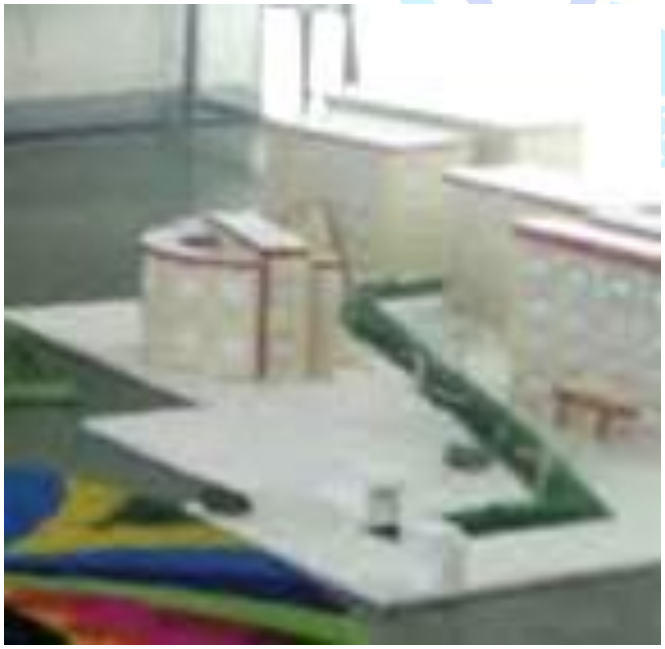
Dam with hydraulic power plant

a.pavi,anu,Kiran,S.Malathi.S.Priyanka, Muthamizhil



Butterfly bridge

Guberan.D, Jagadeesan.S,Magesh Kumar.K



College model

Hariharan, Vivekanandan, Soundar, Karthikeyan

The Awarness Drawing Competition was conducted on 20.3.15 for second year civil students. All the department hods have encouraged the students and selected the winners for this competition.

P.Gayathri, R.Nivetha, P.Priyanka, J.Arun Kumar, V.Dinesh

Sathya Narayanan.K, M.Sudhakar, E.Sandeep, R.Vivekachandrian, K.Arun Kumar, Surendrian.S, K.Vignesh, Parimelazher.A

Kabila.A, Logeswari.M, Pavithra.B, Vishnu Priya.R, Manimegalai.A

S.Priyanka, Muthamizh, A.Pavithra, S.Malath, Anu Priya

Sathish Kumar.B, RaviKumar.M, Madhavan.V, Parthasarathi.S, Naveen Kumar.V, P.Sarath kumar

S.vignesh, Ram Kumar.R. Raju.D.V, Premkumar

Guberan.D, S.Sudhagar, Guptha.D, Pandiyarajan.M, Magesh Kumar.S

ENVIRONMENTAL AWARENESS RALLY

Environmental Awareness rally was conducted on 20.03.15 by Civil Engineering Asssociation from our college to Kaniyambadi bus stop. We thank NSS coordinator, PD masters for their kind support.

MEMORABLE MOMENTS

Rangoli

S.Vignesh, Sathish kumar.B, Raju.D.V, Ram Kumar.R, Manikandan, P.Sarath kumar, V.Dinesh, J.Arunkumar, Naveen.V, K.Nandha kumar, Yuvaraj, sowmiya, Vishnu Priya, R. Kiran mai, Kabila.A, Manimegalai, Gayathri.P, P.Priyanka

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M.SARATH KUMAR
S.VIVEKANANDAN
P.SARATH KUMAR


CONCEPT
PLAN
CONSTRUCTION
DETAIL
ENGINEERING
BUILD
PROJECT
ARCHITECTURE
TECHNOLOGY
URBAN
CONCRETE
CIVIL
PLANNING
Civil Engineering
The profession for intelligent people
IT'S MY DESIGN UNLESS IT FALLS DOWN... THEN IT'S YOURS
Life's Great When You're A Civil Engineer
"No one else is exactly as you are! Explore this it's amazing!" ~ Josh S. Hinds
WE CREA
THE WORL
The harder you work the Luckier you get
Heal the past; Live the present; and dream the fut
CIVIL ENGINEER
LICENSE
BY REFLECTIONS AND PRAYERS
IF GOD DIDN'T BUILD IT AN ENGINNER DID!
Civil Engineering Genius
The best creator next to god is a CIVIL ENGINEER.