



# Civil Info



## Civil Engineering Magazine 2018-19



# Events

## INTERNATIONAL YOGA DAY CELEBRATIONS

On the eve of 4th International yoga day 21st JUN 2018, College NSS unit have organized Yoga Session at college Auditorium premises, the session have received encouraging response from student volunteers of NSS. The session was headed by Mrs.L.Shanthi secretary of women yoga for Krishna District.



## SWACHH DHANEKULA

NSS unit have organized SWACHH DHANEKULA on 31-07-2018 to promote healthy & hygienic atmosphere in the college. Towards this NSS student volunteers have collected and show cased the garbage in front of the canteen such students will be aware of the amount of garbage disposed outside the dustbin.



## AWARENESS PROGRAM ON STEM CELLS DONATION

An Awareness Program on STEM CELLS DONATION was organized by DhaneKula NSS Unit in Association with DATRI Foundation on July 20<sup>th</sup> 2018. Almost 400 students voluntarily have participated and registered as donors



## PARENTS MEET

The Department of Civil Engineering had conducted a PARENTS MEET on 21 - 07 - 2018 for 2nd, 3rd and 4th year students of CE. The Parents meet was conducted at the CE department seminar hall which is started at 02:00 Pm and completed by 04:30 PM evening. Head of the department Dr. P. Siva Prasad guru, addressed the parents for an hour addressing different activities, policies and procedures following in the department and later parents interacted with the respective class in charges, counselors and the subject teachers and collected suggestions and feedback forms from parents.



## 72<sup>ND</sup> INDEPENDENCE DAY CELEBRATIONS

We celebrate our Independence Day on 15th August every year.



In our college 72<sup>nd</sup> Independence Day had been celebrated patriotically. Our respected Chairman Sri.D Ravindranath Tagore Garu had hoisted National Flag. The teachers address the students and explain the importance of Independence. Students gave patriotic speech. There was a guard of honor by NCC students. On Occasion on Independence Day, cultural activities have been conducted by College Cultural Cell and students were give prizes on this auspicious day.



## FRESHER DAY CELEBRATIONS

Civil Department organize fresher's party to the fresher's every year. This year we organized on September 1<sup>st</sup>. The main aim of this party is to give a warm welcome to the new comers. Such parties not only build their confidence but also add creativity to their levels. It is accompanied with so many colorful events and programs like ramp walk, traditional, fusion, and western dances, exhilarating singing performances, and splendid decoration, thus making it a soulful evening.

A little music, new faces, smiles all along, clamouring for the party time! College provides moments to chill out in the form of orientation day, fresher party and bidding farewell. Fresher's Day is a platform where the juniors showcase their talents.



## JNANA BHERI

The JnanaBheri Program is been conducted by the Andhra Pradesh state govt. for the creative and innovative ideas for the students of all engineering and science streams.

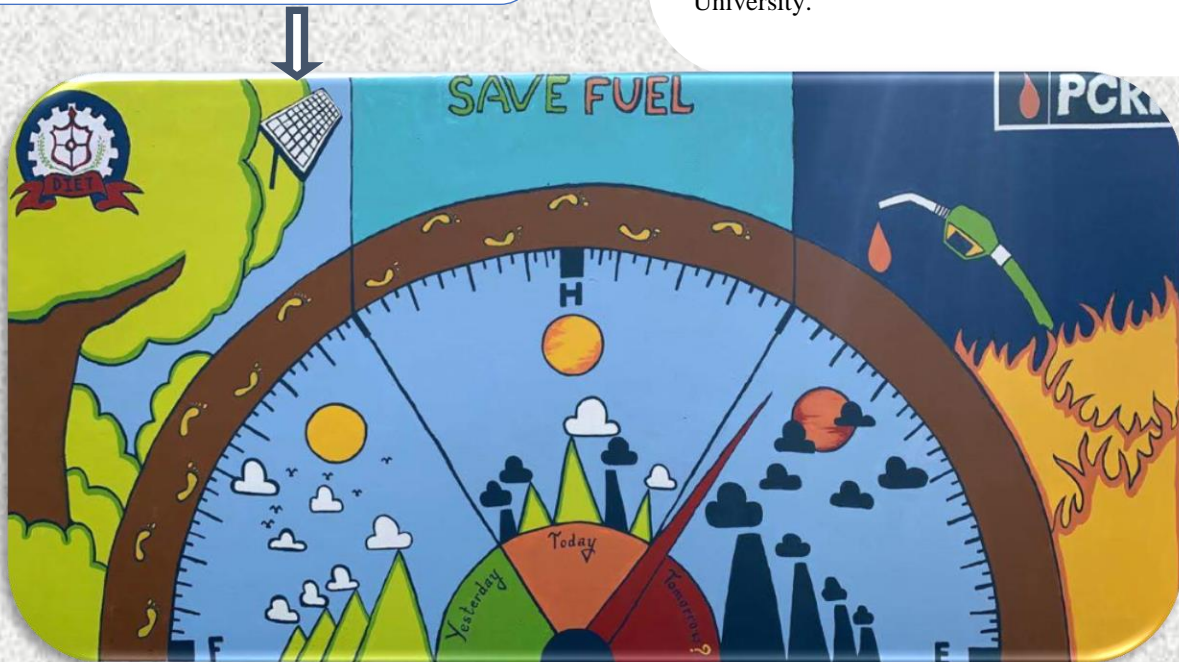
The JnanaBheri program held in Vijayawada in Indira Gandhi Municipal Stadium on 20 September 2018. Several models, projects is been displayed in the program. Many medical camps for the awareness programs and many engineering collages attended the program with new ideas.

The prizes for the competitions held on 15 September was given by our Honorable Chief Minister Sir. N. Chandra Babu Naidu. HE gave the motivational speech to the students. Many innovations and creative and new projects or modal where introduced in the program.

Thus the JnanaBheri Program gave a lot of experience and new thinking gave me a new knowledge. The whole program was newly decorated and innovative ideas gave me a lot of knowledge.



We the people, With the people at Dhanekula Institute of Engineering and Technology. Wall painting was made about fuel conservation on 15.2.2019.



## BLOOD DONATION CAMP

On 05-09-18 DIET- National Service Scheme (NSS) in association with Lions Club – Vja have organized a blood donation camp in DIET-T&P HALL about 72 members have attended this event on 5-09-18 and 448 students have checked their blood group on 06-09-2018



## YOUTH EMPOWERMENT

On January 5th 2019, College NSS unit have organized a session on Youth Empowerment.



Almost 500 above Students have participated along with NSS Program officer and staff coordinators have participated in this and made the session fruitful. The session was headed by Prof Viswanathan –Osmania University.

## Sankranti Celebrations



On January 11th 2019, SAMSKRUTHI unit have organized Sankranti Celebrations. They conducted Rangoli and kite flying

## FAREWELL DAY CELEBRATIONS

Civil Engineering department III year students organized Farewell party “NEVER SAY GOODBYE” on 8th March 2019 in the civil seminar hall where students of III-year bid farewell to the outgoing students of IV year with great enthusiasm and off course nostalgia.

The function began with the welcoming Head of Department, staff and IV-year students. Later they played a video clip for IV-year students in which all the memories of students have been recalled.

Many events were conducted on that all the seniors and juniors has joined and enjoyed the event well. Also, students shared their views and experience about the department.



# Annual Day Celebrations

The Annual Day was celebrated in our college on 2<sup>nd</sup> March of 2019 At 6:00pm in the open auditorium. The chief guest's for the annual day is **Mr. K. V. S. Baba Chairman & Managing Director(POSOCO)** and **Dr.Arja Sri kanth Commissioner Andhra Pradesh Bhavan, New Delhi**. Many events were conducted on that event and prizes were distributed to the winners in the sports and cultural competitions on that occasion and medals were distributed to the toppers in the academics.

## Academic Awardees

CHIMATA DIVYA(158T1A0118)  
SECURED GOLD MEDAL



PARVATANENI SHESHIDHAR (158T1A01A6)  
SECURED SILVER MEDAL



# Dhanush-2K18

Bhanekula Hshass

DHANUSH-2K18 was held on 2018 December 14<sup>th</sup> and 15<sup>th</sup>. 237 students from 60 colleges took active participation in technical events conducted by Civil department. The non-technical events are conducted by Samskruthi in the college level. The following are the technical events conducted by Civil Department in the department level. **Technical Events**

S.No	Events	No. of students Participated
1	Paper Presentation	55
2	Tech Trix (Technical Exhibition)	13
3	Theme Ballet (Postar Presentation)	15
4	Technical Quiz	34
5	Spot Model Making	56
6	CAD Expertise	24



# Sports

A NIKHIL SATYA SAI (178T1A0101) of the second year was selected for JNTUK Cricket Team.



EENADU Cricket Tournament has held from 26.12.2018 and 02.01.2019 at DJR college our college won runners under the captaincy A.Nikhil Satya Sai

Congratulations to all the members of the cricket team



JNTUK C-Zone Inter Collegiate men tournament has held from 15.02.2019 to 16.02.2019 at DIET college, our college won runners in kho-kho under the captaincy Satish.

Congratulations to all the members of kho-kho

Volley Ball – VITOPIA has on 29.12.2019 at VIT Amaravathi our college won runners under the captaincy of J Rja Kumar

Congratulations to all the members of the volley ball





# JNTUK C -ZONE INTER COLLEGIATE

JNTUK C-Zone Inter Collegiate men tournament 2018-19 was organized by Dhanekula Institute of Engineering and Technology during February 15<sup>th</sup> and 16<sup>th</sup> 2019. Dr. N. Srinivasa Rao Garu Secretary, University Sports council, Krishna University was the chief guest, Dr. G. Syam Kumar Garu Secretary, University Sports council, JNTUK was the Guest of Honour

More than 900 students from 26 Engineering Colleges affiliated by JNTUK, participated in various team events such as Kabbadi, Kho-Kho, Volley Ball, Basket Ball, Tabel tennis and badminton.



## **INNOVATION DAY:**

Entrepreneurship Development Cell of Dhanekula Institute of Engineering and Technology (DIET), in association with Global Business Incubator (GBI), celebrated Innovation Day, Innovate Dhanekula2k19 in the institution campus at Ganguru village, in the Krishna district on 9th March 2019.

Young engineers of various streams discussed on creativity and on how to work on innovative ideas and projects to be successful as good entrepreneurs in the global market.

The Chief guest was Mr. Tomoyuki Yamato, Director World1 solutions from Japan. The team interacted with the students about entrepreneurship along with sharing their life experiences.

Principal Kadiyala Ravi advised students to take up field visits, acquaint themselves with modern technology which is the need of the hour.

“Students who come up with innovative ideas can only sustain in the market. The new projects should help to find out a solution for the challenges being faced by common man in the society,” said Mr. Ravi. Student ideas are presented in the afternoon session. DIET faculty others participated in the programme.



# Workshop's

## REVIT WORKSHOP BY APSSDC

Revit is the design a building and structure and its components in 3d and access building information from the building model's database. It is the workshop conducted by the APSSDC for the students in Andhra Pradesh. The workshop is for 6 days from 11-6-2018 to 16-6-2018. The workshop was held by Mr. C Veerababu.

On the day 1, the installation, introduction, shortcut keys, basics of that software is been explained.

On the day 2, they started with a modeling of structure of columns, footings and beams and continued with reinforcement in columns and footings.

On the 3 day, the reinforcement of beams, stairs. Each candidate drew a building or structure. The doubts were been clarified by them.

On the 4 and 5 day, the design of slab, roof, lintels and collaboration of files and importing of CADD Files is been explained.

The Revit Structure is the most useful software for the Architecture purpose of the Civil Engineering now-a-days

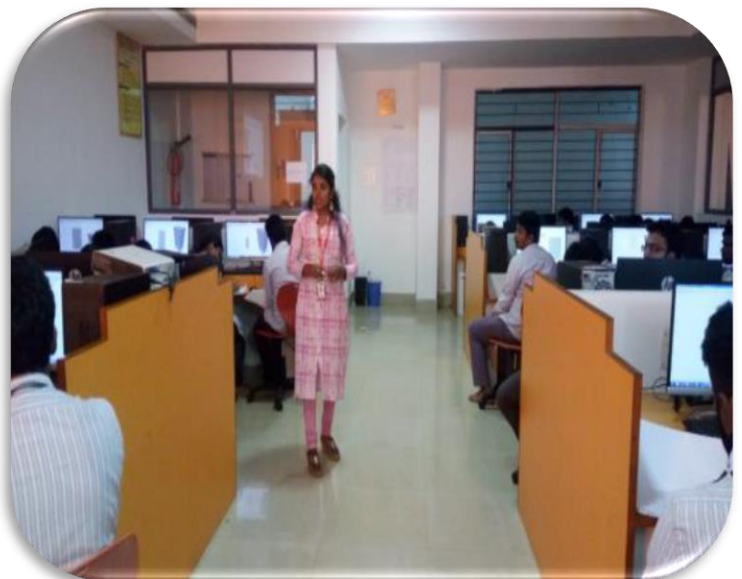


## ETABS WORKSHOP

The workshop is on ETABS. The workshop is been held on 08-09-2018 to 09-09-2018 .

The workshop is conducted by the college *Dhanekula Institute of Engineering and Technology* with the collaboration of CADDESK . In workshop the main discussed topics are the analysis of the Buildings & Bridges.

The workshop is held in CAD LAB,DIET by the CADDESK officials on 08-09-2018 to 09-09-2018. It is two day programme on the introduction towards the software by the CADDESK. E-Tabs is a software company with headquarters in London, England. The company develops and delivers data visualization and report automation software and services tailored for the market research industry. The founder of the E TABS is Benjamin Rietti and founded in the year 1999 on December 21. The First day is about the Introduction to the E TABS, Centre Line method for a Building Plan. Followed by the Commands and hot keys of the E TABS, Design of the building.The Second Day is followed by the Analysis and Design of the Building and Bridge .The conclusion of the workshop is that the Design of the Buildings and the massive structures is been done easily than the other software such as STAAD Pro, Revit Architecture etc,. It is extended three-Dimensional analysis of building system. The workshop was useful for the analysis and perfect design of the high rise structures in the upcoming generation of the high growing structures. Modelling can be done with various standard codes with accurate results. To make the task easier with more complex calculation.



# Seminar's

## **AWARENESS PROGRAMME CONDUCTED ON SMART CITY AMARAVATHI-PEOPLE'S CAPITAL**

An awareness programme conducted on smart city Amravati-people's capital in diet auditorium. The speaker has delivered future prospects of GREEN-BLUE, Energy Efficient and digital capital city. A power point presentation and videos showed on Layout and present developments happenings in the CRDA region.

Govt has taken a special day- Wednesday for review meetings and visits to Amravati City Developments. A lecture on voluntary land pooling process and benefits for the land donors. Details of CRDA area, Network of roads and Infrastructure, Population, Govt. policy support initiatives to mitigate risks, 27,577 no of farmers given 33,740 acres of land for CRDA. 25% of pooled land given as plots by APCRDA to farmers. 8,275 acres of land was ear marked by APCRDA for investment grounding.

Various smart initiatives undertaken for economical development in this region is also explained. Various upcoming employment opportunities and start-up companies' details highlighted. Opportunities for ease of doing of business in future have been explained. APCRDA planned Amravati city with Happiness through various path breaking initiatives. Also discussed about the various agencies associated with APCRDA. APCRDA planned higher FAR (Floor Area Ratio) up to 5 to ensure developer returns. Amravati capital region economy will be INR 120,000 Cr in the next 25 years.



## **SEMINAR ON WATER RESOURCES DEVELOPMENT AND MANAGEMENT**

The seminar is on the present challenges and issues in Water Resources Development and Management. The seminar is being held by P Lakshmi Narayana on 25/7/2018 on Wednesday.

The seminar was conducted by the college Dhanekula Institute of Engineering and Technology. In seminar the main discussed topics where about the water scarcity in India by the year 2050 and implementation of water for the people by 2050.

India has 18% of World Population in which it consist of 2 percent of land and 4 percent of freshwater. By the year 2025 3.4 billion people will be living in water scarce countries.

The seminar explains about the water supply in the present new capital of Andhra Pradesh, Amravati and usage in it with modified Technology. The seminar also explains about the usage of water from the past decades of the years in India. It also explains about the groundwater, increase in groundwater quality problems, issues, future increase in water pollution.

Presently India uses 230- 250 cubic kilometer per year of groundwater. More than 60% of irrigated and surface water is of 60 to 75 mg per litre and groundwater is of 100 200 300 mg per litre.

Groundwater quality problems such as floor problem arsenic problem nitrate problem salinity pollution problems. Attenuation of pollution filtration, sorption, chemical, dilution and general.



# INDUSTRIAL VISITS

## ANDHRA PRADESH POLLUTION CONTROL BOARD VISIT BY FINAL YEAR STUDENTS

Driven by the vision to foster economic growth with efficient environmental management for an improved quality of life, the Andhra Pradesh Pollution Control Board has been playing a pioneering role in the field of environment protection. The Board works relentlessly in efficient implementation of environmental policies, laws, regulations, and develops frameworks to manage both wastes and natural resources of the State. APPCB as a state-wide presence with its Head Office at Vijayawada, and 3 Zonal and 9 Regional Offices covering the entire the State.

The Board is a statutory organization entrusted to implement Environmental Laws and rules within the state of Andhra Pradesh, India. The Board was constituted as State Board for Prevention and Control of Water Pollution, in 1976, under the Water (Prevention and Control of Pollution) Act, 1974, but was later rechristened as A.P. Pollution Control Board, subsequent to the enactment of the Air (Prevention and Control of Pollution) Act, 1981.

An Air Pollution Control Board of Andhra Pradesh was here to check the pollution percentage in the atmosphere. There are different areas around Vijayawada to check the air pollution at the regarding places.

There are two different types in the dust collecting one collects the particle matter of size 10microns and the other collects the particle matter of size 2.5microns .A filter paper is placed in the equipment which collects the dust particles, the air which is collected is left through the outlet by extracting the gases like sulphur,phosphate, Aluminium.



Final year Civil Engineering students at APPCB.

## ANDHRA PRADESH MINERAL DEVELOPMENT CORPORATION LIMITED VISIT BY THIRD YEAR STUDENTS

“APMDC” means Andhra Pradesh Mineral Development Corporation Limited. It was incorporated on 24<sup>th</sup>Feb,1961 as a wholly owned undertaking of the Government of Andhra Pradesh for the development of mineral resources and promotion of minerals leased industries in Andhra Pradesh including exploration, exploitation, conservation, processing beneficiation and conversion in to value added products.

### The objectives of the corporation are:

1. Development of mineral resources including exploration and beneficiation.
2. Develop of minerals industry with private participation.



3. Best technology identification and investment for development of mineral resource.



## INDUSTRIAL VISIT TO POLAVARAM IRRIGATION PROJECT

Total 110 students are attended from IV year to polavaram Irrigation Project



Polavaram is a multi-purpose irrigation project which is under construction and located on river Godavari near Ramayyapet village of Polavaram Mandal of West Godavari district in Andhra Pradesh. The project has been on cards for almost 75 years. This project is a dream for the 5 crore people of Andhra Pradesh. The project will be a one-stop solution for all the water needs of the state.

The project reservoir has live storage 75.2 TMCs at canal's full supply level of 41.15 metres (135 ft) MSL and gross storage of 194 TMCs thereby enabling irrigation of 23,20,000 acres (including stabilisation of existing irrigated lands).

**Polavaram will benefit all the 13 districts of A.P, directly and indirectly.**

Polavaram project dam being built on River Godavari can help divert and utilise Godavari water to Krishna and other rivers. If executed well, this project can make the state drought-free forever.

AP Government is very keen to finish this mammoth project by 2019 at any cost. The progress of the project is being monitored at the highest levels of Government on weekly basis.



## INDUSTRIAL VISIT TO PATTISEEMA LIFT IRRIGATION PROJECT

Total 110 students are attended from IV year to Pattiseema Lift Irrigation Project



The project has one of the largest pump houses in Asia with 24 pumping units spread across an area of 7,476 sq m. The project has a combined capacity to discharge 240 cumecs of water. These pumps deliver water drawn from the river Godavari in Pattiseema into the Polavaram Project Right Main Canal for the benefit of farmers in the Krishna river delta. Under the Bachawat tribunal and inter-state agreement between Maharashtra, Madhya Pradesh and Andhra Pradesh, 100 tmc of water can be diverted from River Godavari to River Krishna. Pattiseema project will bring the 100 TMC water to River Krishna. This project has faced lot of hurdles in initial days as it was opposed by YSRC party citing that it had no storage component. Though there were objections from opposition parties chief Minister of Andhra Pradesh Nara Chandrababu Naidu has decided to take up this project. The bold decision taken by chief Minister has helped thousands of farmers cultivating 1.3 million acres in krishna delta which faces water shortage in the period June to August. The water pumped into canal from River Godavari would take 7 – 8 days to reach Prakasam Barrage after travelling by Gravity for about 160 km.



# Student Articles

## WHITE PORTLAND CEMENT

White Portland cement or white ordinary Portland cement (WOPC) is similar to ordinary, gray Portland cement in all aspects except for its high degree of whiteness. Obtaining this color requires substantial modification to the method of manufacture, and because of this, it is somewhat more expensive than the gray product.

### Uses of white cement

- 1- White cement is used for joining marbles and ceramic tiles of wall and floors.
- 2- It can be used for preparing joints of sanitary wares.
- 3- It is also used for architectural works.
- 4- It is used in manufacturing of mosaic tiles.
- 5- White cement is used to manufacture the colored cement by adding some color dye into it.
- 6- It can be used as waterproofing agent.

### Chemical composition of white cement

- The resulting white cement has the following chemical composition:

Table YYY: Cement compositions

Composition	Percent by weight, for various cements			
	Gray (type I)	White (textbook)	Aalborg White (types I, II, III, V)	Middle East White
$C_3S$	45 – 55	59.4	62	48.5
$C_2S$	20 – 30	23.5	25	30.5
$C_3A$	8 – 12	12.9	4	13.4
$C_4AF$	6 – 10	0.6	1	0.8

### Points to be noted

Strength of white cement lower than opc but Price of white cement higher than opc. It is also known as snowcrete.

By

CH.PRAKHYA (168T1A0116)

## PHOTO-CATALYTIC CEMENT

This is a patented Portland cement developed by Italcementi Group. The photo-catalytic components use the energy from ultra-violet rays to oxidize most organic and some inorganic compounds. Air pollutants that would normally result in discoloration of exposed surfaces are removed from the atmosphere by the components, and the residues are washed off by rain. This cement can be used to produce concrete and plaster products that save on maintenance cost while they ensure a cleaner environment.

In addition to Portland cement binders, the product contains photo-catalytic titanium dioxide particles. The cement is already being used for sound barriers, concrete paver blocks and façade elements. Other applications include pre-cast and architectural planners, pavements, concrete masonry units, cement tiles etc.

BY

J.V LAHARI (158T1A0192)

## CENTRAL PARK TOWER IS TO BE 'SUPER-SUSTAINABLE'

Construction works began: 2014

Expected completion date: 2020

Defining feature/innovation/emerging technology/new technology: Currently under construction, the new Central Park Tower in New York has been designed under the philosophy of Global Environmental Contextualism. Its construction is taking advantage of cutting-edge engineering to reduce emissions, optimize air circulation and internal climate control.



BY-ABDUL RASHID KHAN(158T1A0102)

## ZERO ENERGY BUILDING

A zero-energy building, also known as a zero net energy (ZNE) building, net-zero energy building (NZEB), net zero building or zero-carbon building is a building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site, or in other definitions by renewable energy sources elsewhere. These buildings consequently contribute less overall greenhouse gas to the atmosphere than similar non-ZNE buildings. They do at times consume non-renewable energy and produce greenhouse gases, but at other times reduce energy consumption and greenhouse gas production elsewhere by the same amount. A similar concept approved and implemented by the European Union and other agreeing countries is nearly Zero Energy Building (nZEB), with the goal of having all buildings in the region under nZEB standards by 2020. Zero-energy buildings are becoming more widespread for new construction but are still fairly rare as upgrades to existing houses.



### Advantages

- isolation for building owners from future energy price increases
- increased comfort due to more-uniform interior temperatures (this can be demonstrated with comparative isotherm maps)
- reduced requirement for energy austerity
- reduced total cost of ownership due to improved energy efficiency
- reduced total net monthly cost of living
- reduced risk of loss from grid blackouts
- improved reliability
- extra cost is minimized for new construction compared to an afterthought retrofit
- higher resale value as potential owners demand more ZEBs than available supply
- the value of a ZEB building relative to similar conventional building should increase every time energy costs increase
- future legislative restrictions, and carbon emission taxes/penalties may force expensive retrofits to inefficient buildings

### Disadvantages

- initial costs can be higher – effort required to understand, apply, and qualify for ZEB subsidies, if they exist.
- very few designers or builders have the necessary skills or experience to build ZEBs
- new photovoltaic solar cells equipment technology price has been falling at roughly 17% per year – It will lessen the value of capital invested in a solar electric generating system – Current subsidies will be phased out as photovoltaic mass production lowers future price
- challenge to recover higher initial costs on resale of building, but new energy rating systems are being introduced gradually.
- while the individual house may use an average of net zero energy over a year, it may demand energy at the time when peak demand for the grid occurs. In such a case, the capacity of the grid must still provide electricity to all loads. Therefore, a ZEB may not reduce the required power plant capacity.
- without an optimised thermal envelope, the embodied energy, heating and cooling energy and resource usage is higher than needed. ZEB do not mandate a minimum heating and cooling performance level thus allowing oversized renewable energy systems to fill the energy gap.
- solar energy capture using the house envelope only works in locations unobstructed from the sun. The solar energy capture cannot be optimized in north (for northern hemisphere, or south for southern Hemisphere) facing shade, or wooded surroundings.



## INTERNET OF THINGS IN CIVIL CONSTRUCTION

The Internet of Things, or IoT, is the new buzz word used to describe how more and more things are connecting to the internet. Things like your fridge, your phone, washing machine and almost anything else you can think of.

This also includes your machinery, though connecting your fleet to the office is not a new concept to those aware of [the Trimble Connected Site](#).

IoT is starting to play a large role in the building industry. Already designers are starting to include smart features into their buildings, like blinds that automatically move to block the sun using its connection to the internet. Or a building using this connection to conserve energy by finding a way to heat or cool naturally.

This type of interaction with the structures we use on a daily basis can easily be extended into the civil area.

Imagine a bridge that will provide you with up-to-date information on its congestion. What about solving traffic and congestion issues, as well as parking in cities. Solutions like this could ease the way for the next generation of connected, autonomous vehicles. The IoT is already being tested in the USA to synchronize traffic signals. They are also testing sensors in the roads to provide up-to-date parking information.

With the IoT growing and expanding into all areas and its solutions becoming expected conveniences, it becomes important for those in all areas to be aware of it and that it almost certainly will impact their work in the future.



Reinforced and pre-stressed concrete is, and will be, the main construction material for civil engineering infrastructure – bridges crossing valleys, tunnels under mountains, high skyscrapers – but also the less spectacular infrastructure for water and energy essential for society.

The civil engineering industry is currently, in many industrialised countries, in a transition phase from building new constructions to maintaining the large stock of valuable assets. These reinforced concrete structures are aging and very often show premature deterioration due to corrosion of the reinforcement, with increasing costs for maintenance and repair.

Taking into account that the average lifetime of a repair is shorter than that of the original, a dramatic increase in the number of structures that have to be repaired and the associated costs, can now be predicted. This prediction however, does not include indirect costs such as energy consumption, pollution, traffic jams etc. that are equally relevant for society.

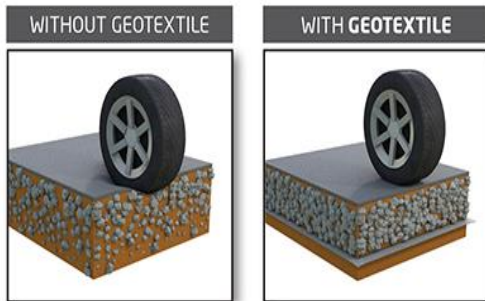


Today, engineers and owners try to extend the service life of these assets with a minimum of interventions, with sophisticated management systems – maybe with more effective and durable repair methods – but a new approach is lacking. Life-cycle thinking is urgently needed for education and the continuous formation of professionals, for both stakeholders and society.

## GEOTEXTILE

Geotextiles are permeable fabrics which, when used in association with soil, have the ability to separate, filter, reinforce, protect, or drain. Typically made from polypropylene or polyester, geotextile fabrics come in three basic forms: woven (resembling mail bag sacking), needle punched (resembling felt), or heat bonded (resembling ironed felt).

Geotextile composites have been introduced and products such as geogrids and meshes have been developed. Geotextiles are able to withstand many things, are durable, and are able to soften a fall if someone falls down. Overall, these materials are referred to as geosynthetics and each configuration—geonets, geosynthetic clay liners, geogrids, geotextile tubes, and others—can yield benefits in geotechnical and environmental engineering design.



Geotextiles and related products have many applications and currently support many civil engineering applications including roads, airfields, railroads, embankments, retaining structures, reservoirs, canals, dams, bank protection, coastal engineering and construction site silt fences or geotube. Usually geotextiles are placed at the tension surface to strengthen the soil. Geotextiles are also used for sand dune armoring to protect upland coastal property from storm surge, wave action and flooding. A large sand-filled.

Geotextiles can improve soil strength at a lower cost than conventional soil nailing. In addition, geotextiles allow planting on steep slopes, further securing the slope. Geotextiles have been used to protect the fossil hominid footprints of Laetoli in Tanzania from erosion, rain, and tree roots. In building demolition, geotextile fabrics in combination with steel wire fencing can contain explosive debris. Coir (coconut fiber) geotextiles are popular for erosion control, slope stabilization and bioengineering, due to the fabric's substantial mechanical strength. Coir geotextiles last approximately 3 to 5 years depending on the fabric weight. The product degrades into humus, enriching the soil.

- A Sasi Kumar(168T1A0102)

## 500-YEAR-OLD LEANING TOWER OF PISA MYSTERY UNVEILED BY ENGINEERS

Why has the Leaning Tower of Pisa survived the strong earthquakes that have hit the region since the middle ages? This is a long-standing question a research group of 16 engineers has investigated, including a leading expert in earthquake engineering and soil-structure interaction from the University of Bristol.

Professor George Mylonakis, from Bristol's Department of Civil Engineering, was invited to join a 16-member research team, led by Professor Camillo Nuti at Roma Tre University, to explore this Leaning Tower of Pisa mystery that has puzzled engineers for many years.

Despite leaning precariously at a five-degree angle, leading to an offset at the top of over five metres, the 58-metre tall Tower has managed to survive, undamaged, at least four strong earthquakes that have hit the region since 1280.

Given the vulnerability of the structure, which barely manages to stand vertically, it was expected to sustain serious damage or even collapse because of moderate seismic activity. Surprisingly this hasn't happened and until now this has mystified engineers for a long time. After studying available seismological, geotechnical and structural information, the research team concluded that the survival of the Tower can be attributed to a phenomenon known as dynamic soil-structure interaction (DSSI).

The considerable height and stiffness of the Tower combined with the softness of the foundation soil, causes the vibrational characteristics of the structure to be modified substantially, in such a way that the Tower does not resonate with earthquake ground motion. This has been the key to its survival. The unique combination of these characteristics gives the Tower of Pisa the world record in DSSI effects.

Professor Mylonakis, Chair in Geotechnics and Soil-Structure Interaction, and Head of Earthquake and Geotechnical Engineering Research Group in the Department of Civil Engineering at the University of Bristol, said: "Ironically, the very same soil that caused the leaning instability and brought the Tower to the verge of collapse, can be credited for helping it survive these seismic events."

By

S Ashok(158T1A0107)

## **TECHNIQUE OFFERS ADVANCE IN TESTING MICRO-SCALE COMPRESSIVE STRENGTH OF CEMENT**

*Researchers have, for the first time, used a 'micropillar compression' technique to characterize the micro-scale strength of cement, allowing for the development of cement with desirable strength properties for civil engineering applications.*

Cement is used to make concrete, one of the most widely used construction materials in the world. The compressive strength of cement is a primary factor in determining how much load concrete can bear -- a critical consideration for civil engineering projects. Engineers have long known that cement derives its strength from an ingredient called calcium silicate hydrate (C-S-H) -- the primary product formed when cement powder is mixed with water. Researchers, however, have not been able to measure the compressive strength of the C-S-H in a cement sample -- the sample sizes needed for isolating and testing the C-S-H components are too small to fabricate by conventional sample preparation methods.

To address this challenge, the researchers turned to a technique used in materials science called micropillar compression. Normally used on crystalline materials, micropillar compression uses very small samples to determine the compressive strength of a material.

Because cement is a heterogeneous material, made up of multiple components, Shahrin used a scanning electron microscopy/X-ray technique to find the areas in cement samples that had the highest ratio of C-S-H relative to other constituent materials.

Once the C-S-H sites were identified, they were milled into cylinders 2 micrometers wide and 4 micrometers in height. These samples could then be subjected to micropillar compression.

"There are lots of ways to make cement, and it can be made with different constituents in different ratios," Shahrin says. "We've shown that the micropillar technique can be used to give us precise measures of C-S-H compressive strength in these different types of mixtures. This information can be used to help us understand how various processes, and the constituents added during cement production, can affect the cement's strength. It's basically a tool that can be used to develop better, stronger cement."

By

M Ravichandra Reddy(168T1A0147)

## **POLLUTION-ABSORBING CEMENT**

It's a health concern that's easy to ignore because we often can't see it, but air pollution kills roughly 4.6 million people each year. In Italy alone, nearly 100,000 people died in 2012 as a result of poor air quality. For this reason and more, Italian scientists have teamed up with the building company Italcementi to create a type of concrete that draws pollutants right out of the air.

Here's how it works: When the sun's ultraviolet light comes in contact with the cement, it interacts with a titanium catalyst. This chemical reaction pulls in toxins and forms harmless salts that wash away when it rains. "Additionally, the mortar is made from 80% recycled aggregates, part of which consist of scraps from the cutting of Carrara marble, and therefore provide a superior brilliance compared to traditional white cements," the company said in a statement.

This invention isn't just in its early stages either. Designers built the Palazzo Italia in Milan in 2015 using the pollution-absorbing cement in an attempt to reduce the city's apocryphal smog levels. According to innovation director Enrico Borgarello, the building used 9,000 square meters (or 2,200 tons) of the cement, which can remove the equivalent of smog emitted by 300 gas-powered cars each year. As an added bonus, the building uses 40% less energy than other high-rises and generates its own energy with the help of a solar-panel roof. According to early projections, using the material on 15% of Milan's light-exposed surfaces could reduce the city's smog levels by half.

On top of all that, the building looks as futuristic as its materials would imply. With a bright white webbed design on its surface, the building is a novel addition to Milan's stone-paved streets. Looking at it, you'd never know it is cleansing the air of harmful particles.

By

P Seshidhar(158T1A01A6)

## **GREEN ROOFS COULD REDUCE INDOOR AIR POLLUTION**

*Green roofs -- roofs that are planted with vegetation -- may improve the indoor air quality of commercial buildings by cutting the amount of ozone coming into the buildings from the outside, according to new research from Portland State University.*

The findings add to the already known environmental benefits of green roofs, including reducing carbon dioxide, decreasing storm water runoff and cutting down on urban heat, according to PSU researchers.

The researchers from PSU's departments of Mechanical and Materials Engineering, Biology and the university's Honors College, set up measuring devices on the roof of a big-box retail store in North Portland that was split between a green roof and a more conventional white membrane roof.

They measured the air coming into the building from outdoor intake vents, and found that the air coming in from the green roof area had modestly lower ozone levels than the air coming in from the unplanted area. They found that the vegetation trapped and filtered the ozone in the outdoor air.

The trapping effect is a process known as dry deposition, in which airborne particles collect or deposit themselves on solid surfaces. It's a natural process that is key to removing pollutants from the atmosphere.

The study was conducted over a two-day period. The authors said the findings warrant a longer-term study -- one that could include measuring other pollutants as well as ozone.

By

G Naga Venkata Ravi Teja(168T5A0107)

## **TERNARY BLENDS**

Ternary blends of mineral admixtures are now recommended for improving the durability of important concrete structures. An outstanding example is the Reconstruction of the New I-35 W St. Anthony Falls Bridge crossing the Mississippi River in Minneapolis, US. The new bridge has been opened to traffic in September 2008, less than 14 months after the collapse. HPC has been used for reconstruction with a target 100 year life span. High Performance Concrete containing silica fume and fly ash was used for low permeability.

Two gleaming white concrete sculptures tower 9 m high at each end of the bridge. The sculptures were pre-cast using an SCC mix that included photocatalytic cement with self cleaning and pollution reducing characteristics. The photo-catalytic cement is one of the new developments in the construction materials industry. The SCC concrete resulted in a marble-like, smooth white finish to the concrete surface. With a low water cementitious material ratio (w/cm), air entrainment and a rapid chloride permeability test (RCPT) value of less than 1500 coulombs at 28 days, the monument will also be a durable feature in the severe environment adjacent to the I-35 W Roadway.

For the drilled shaft foundations of the I-35 Bridge, SCC was used. To control temperature during curing, fly ash and slag were incorporated as the majority of the cementitious material. This reduced the heat of hydration by approximately 50%. The concrete mixes for the footings and piers were proportioned for mass concrete and durability through the use of fly ash and slag. As the components were massive in size, concrete mixes were modified by cementitious materials, chilled water and cooled aggregates, use of form insulation and internal cooling pipes.

By

K Naga Samhitha(158T1A0144)

# Faculty Articles

## FOOTFALL ENERGY HARVESTING FLOOR

An emerging technology in the industry is the footfall energy harvesting floor, which generates energy from the routine human activities, such as walking, running, jumping, dancing etc. The technology works on the basic principle of converting kinetic energy, obtained from the pressure applied on the floor surface, into electrical energy. The “footfall energy harvesting floor” comprises a floor covering that encloses a transducer mechanism for converting the applied pressure into electrical energy and a means for transmitting the electrical energy for storage or load consumption. Among the other technologies that promote sustainable energy, energy harvesting floor is considered to be the most productive as it does not depend on any of the natural resources, such as wind, water or sun that are not consistently available. Energy harvesting floors, which take input from human footsteps without affecting pedestrians’ normal life, are easy to install, environment friendly, and are truly sustainable.



-Ch.Hema Sindhusa Asst.Prof.

## REMOTE SENSING TECHNIQUES IN WATER RESOURCES QUALITY MONITORING

Remote sensing techniques are been used extensively for solving the real-world problems in many aspects. One among them is the water resources monitoring, which gains its importance in recent advancements. The remotely sensed images are captured by sensors fitted to satellites (and at times below aircrafts) that work on two basic technologies. One of these, the Passive System, records the reflected electromagnetic energy of the earth, the source of the energy being the radiation of the Sun. The other, called the Active System, employs its self-generated pulses and records the reflected pulse. These two systems may be compared to taking photographs in sunlight and with flashlight respectively. The active remote sensing systems mostly use radars that emit radiation in the microwave band of the electromagnetic spectrum. This system is useful in cases where passive systems do not give enough information.

Here are the few water quality issues and corresponding techniques adopted to measure them. Colour/material isolation can be recognized by LASER SPECTROMETER which may not be possible to detect through satellite imagery, ground based LASER spectrometers can be used for identification of chemical composition of the solution/water. Municipal and industrial discharges (effluents) are exposed by the satellite/air borne TIR imagery. Oil pollution can be spotted by ultraviolet (UV) photography, thermal infrared (TIR) scanners and passive microwave sensors. Good weather condition and low altitude aerial survey is required to monitor oil pollution, limited to day time monitoring. Water depth can be identified by blue/green portion of visible spectrum by using LASER profile technique (LIDAR). Apart from these, change in vegetation can be identified, monitored through colour infrared photography(CIR), B&W IR image also be used to detect the agricultural pollution.

By

M S N Kanya Asst. Prof

On its 61st foundation day NEERI has dedicated the first of its kind waste management park to the Nagpur city. Aimed at creating mass awareness about importance of reuse, recycle and segregation of waste, the park itself is an exemplary of best out of waste. Water fountain is created from a waste laboratory sink, a walking bridge built with discarded water pipes, artefacts made from scrapped iron or flower beds made from broken slides and discarded timber. As per the information displayed in the park, an average person generates 500gm to one kg of solid waste daily.

By

B Vijaya Lalitha Asst. Prof.

## **GREEN CONCRETE**

### **What is Green Concrete?**

A concrete that uses less energy in its production and produces less carbon dioxide than normal concrete is green concrete. Green Concrete is taken to mean environment-friendly concrete.

### **Why Green Concrete?**

The main ingredient in concrete is cement and it consists of Limestone (Calcium Carbonate  $\text{CaCO}_3$ ). During manufacture of cement, its ingredients are heated to about 800 – 10000 C. During this process the Carbon Dioxide is driven off. Approximately 1 kg of cement releases about 900 gms of Carbon Dioxide into the atmosphere. Therefore, green concrete came into existence to reduce the emission of carbon dioxide.

### **Materials for Green Concrete**

- 1- Locally available: Construction materials, components, and systems found locally or regionally, saving energy and resources in transportation to the project site.
- 2- Salvaged, re-furnished, or re-manufactured: Includes saving a material from disposal and renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality, or value of a product.
- 3- Reusable or recyclable: Select materials that can be easily dismantled and reused or recycled at the end of their useful life.
- 4- Recycled Demolition Waste Aggregate
- 5- Recycled Concrete Aggregate
- 6- Blast furnace Slag
- 7- Manufactured Sand
- 8- Glass Aggregate
- 9- Fly ash

### **Mix Design**

- 1- Optimizes void space between aggregates by optimizing particle proportions and packing of materials. This makes more effective use of the cement binder.
- 2- Aggregates replace excess cement paste to give improved stability, less shrinkage and increase in strength and durability.
- 3- Less cement also generates less heat of hydration.
- 4- The slump of the concrete and its flow are a function of the shape and the quantity of the predominant size of the aggregate in the mix.
- 5- Use of more fine aggregate gives higher slump and flow. So the optimum proportions of coarse and fine aggregate must be critically found to have the best and dense concrete in both fresh and hardened stage of concrete.

### **Improved Properties**

- 1- Mix can result in a reduced paste volume within the concrete structure resulting in a higher level of protection against concrete deterioration.
- 2- Higher strength per kilogram of cement
- 3- Increased durability and lower permeability
- 4- More aggregates typically mean higher Modulus of elasticity.

### **Advantages**

- 1- User-friendly
- 2- Optimized mix designs mean easier handling, better consistency and easier finishing
- 3- Reduction in shrinkage and creep
- 4- Green Concrete uses local and recycled materials in concrete.
- 5- The heat of hydration of green concrete is significantly lower than traditional concrete
- 6- This result in a lower temperature rise in large concrete pours which is a distinct advantage for green concrete.



By T.Rajini Devi Asst.Prof.

## **STRUCTURAL HEALTH MONITORING**

All structures, including critical civil infrastructure facilities like bridges and highways, deteriorate with time due to various reasons including fatigue failure caused by repetitive traffic loads, effects of environmental conditions, and extreme events such as an earthquake. This requires not just routine or critical-event based inspections (such as an earthquake), but rather a means of continuous monitoring of a structure to provide an assessment of changes as a function of time and an early warning of an unsafe condition using real-time data. Thus, the health monitoring of structures has been a hot research topic of structural engineering in recent years.

### **Structural health monitoring (SHM)**

refers to the process of implementing a damage detection and characterization strategy for engineering structures. Here damage is defined as changes to the material and/or geometric properties of a structural system, including changes to the boundary conditions and system connectivity, which adversely affect the system's performance. The SHM process involves the observation of a system over time using periodically sampled response measurements from an array of sensors (often inertial accelerometers), the extraction of damage-sensitive features from these measurements, and the statistical analysis of these features to determine the current state of system health. For long term SHM, the output of this process is periodically updated information regarding the ability of the structure to perform its intended function in light of the inevitable aging and degradation resulting from operational environments.

Fig: Application of Structural Health

## **CLEANER SURFACES AND LESS POLLUTION**

Mixing active titanium dioxide with cement produces a binder that maintains its entire normal performance characteristic when used to make concrete. The photocatalytic action makes the surfaces not only to a significant self-cleaning; it also improves the quality of surrounding environment. Using titanium dioxide in glass fiber reinforced concrete offers more efficient and economical way to achieve the benefits of photocatalytic. The environmentally active e-GRC offers the most economical way to achieve cleaner, brighter facades.

### Applications for the e-GRC include

- Cladding panels and facades elements
- Permanent formwork and form liners
- Roofing tiles
- Motorway and Railway sound barriers

### **Insulated Concrete Form (ICF)**

ICF structural elements allow maximum clear spans. The ICF elements are used for large commercial buildings, residential buildings etc.

## **UNMANNED AERIAL VEHICLE**

An **unmanned aerial vehicle (UAV)** (or **uncrewed aerial vehicle**, commonly known as a **drone**) is an aircraft without a human pilot on board. UAVs are a component of an unmanned aircraft system (UAS); which include a UAV, a ground-based controller, and a system of communications between the two. The flight of UAVs may operate with various degrees of autonomy: either under remote control by a human operator or autonomously by onboard computers. Their use is to monitor the rapidly expanding commercial, scientific, recreational, agricultural, and other applications, such as policing, peacekeeping, and surveillance, product deliveries, aerial photography, smuggling, and drone racing.

### **UAV components**

Crewed and uncrewed aircraft of the same type generally have recognizably similar physical components. The main exceptions are the cockpit and environmental control system or life support systems. Some UAVs carry payloads (such as a camera) that weigh considerably less than an adult human, and as a result can be considerably smaller. Though they carry heavy payloads, weaponized military UAVs are lighter than their crewed counterparts with comparable armaments.

Small civilian UAVs have no life-critical systems, and can thus be built out of lighter but less sturdy materials and shapes, and can use less robustly tested electronic control systems. For small UAVs, the quadcopter design has become popular, though this layout is rarely used for crewed aircraft. Miniaturization means that less-powerful propulsion technologies can be used that are not feasible for crewed aircraft, such as small electric motors and batteries.

Control systems for UAVs are often different than crewed craft. For remote human control, a camera and video link almost always replace the cockpit windows; radio-transmitted digital commands replace physical cockpit controls. Autopilot software is used on both crewed and uncrewed aircraft, with varying feature sets.

### **Body**

The primary difference for planes is the absence of the cockpit area and its windows. Tailless quadcopters are a common form factor for rotary wing UAVs while tailed mono- and bi-copters are common for crewed platforms

### **Power supply and platform**

Small UAVs mostly use lithium-polymer batteries (Li-Po), while larger vehicles rely on conventional airplane engines. Scale or size of aircraft is not the defining or limiting characteristic of energy supply for a UAV. At present the energy density of Li-Po is far less than gasoline. The record of travel for a UAV (built from balsa wood and mylar skin) across the North Atlantic Ocean is held by a gasoline model airplane or UAV. Manard Hill in "in 2003 when one of his creations flew 1,882 miles across the Atlantic Ocean on less than a gallon of fuel" holds this record. Electric power is used as less work is required for a flight and electric motors are quieter. Also, properly designed, the thrust to weight ratio for an electric or gasoline motor driving a propeller can hover or climb vertically. Botmite airplane is an example of an electric UAV which can climb vertically

Battery elimination circuitry (BEC) is used to centralize power distribution and often harbors a microcontroller unit (MCU). Costlier switching BECs diminish heating on the platform.

### **Computing**

UAV computing capability followed the advances of computing technology, beginning with analog controls and evolving into microcontrollers, then system-on-a-chip (SOC) and single-board computers (SBC). System hardware for small UAVs is often called the flight controller (FC), flight controller board (FCB) or autopilot.

### **Sensors**

Position and movement sensors give information about the aircraft state. Exteroceptive sensors deal with external information like distance measurements, while exproprioceptive ones correlate internal and external states. Non-cooperative sensors are able to detect targets autonomously so they are used for separation assurance and collision avoidance. Degrees of freedom (DOF) refers to both the amount and quality of sensors on-board: 6 DOF implies 3-axis gyroscopes and accelerometers (a typical inertial measurement unit – IMU), 9 DOF refers to an IMU plus a compass, 10 DOF adds a barometer and 11 DOF usually adds a GPS receiver.

### **Actuators**



## **MICRO CONCRETE**

Micro Concrete is supplied as a ready to use dry powder which requires only addition of clean water at site to produce a free flowing non shrink repair micro concrete. This is a cementitious material, with additives, which impart controlled expansions characteristics in the plastic state while minimizing water demand. This is specially designed for repairs to damaged reinforced concrete elements, particularly where areas is restricted and where vibration of the placed material is difficult or impossible.

### **Areas of Application**

- 1- Repair to damaged reinforced concrete elements like slabs, beams, columns, wall etc., where access is restricted, and compaction is not possible.
- 2- For Jacketing of RCC columns to increase load taking capacity (strengthening of a vertical member).

### **Features and Benefits**

- 1- Can be pumped or poured into restricted locations.
- 2- Flow able mortar hence does not require compaction.
- 3- Develop high initial and ultimate final strengths.
- 4- Offers excellent resistance to moisture ingress.
- 5- Makes repaired sections highly durable
- 6- Can be applied at 100 mm thickness at one stroke
- 7- Contains no chloride admixture.
- 8- Rapid strength gain to facilitate early reinstatement.
- 9- Gaseous expansions system compensates for shrinkage and settlement in the plastic state.

### **Method of Application**

- 1- Clean the surface and remove loose concrete, any dust, oil, paint, grease etc.
- 2- Expose fully any corroded steel in the repair area and remove all scale and corrosion deposits. Shot blasting is highly recommended
- 3- Apply Dubond's Hydro Zinc Primer over the clean re-bars and allow dry before continuing.
- 4- Saturate the substrate with water to prevent absorption of water from the mixed material of Dubond's Micro Concrete
- 5- For a dry substrate, it should be primed by applying one coat of Dubond's Hydro Prime.
- 6- Mix Dubond's Micro Concrete with water (3.75 to 4 liters per 25 kg bag) till homogeneous mix is obtained, at 30 C
- 7- Mixing should be done thoroughly with a forced action mixer of adequate capacity, at least for 5 minutes.
- 8- Pour or pump the mixed Dubond's Micro Concrete into a watertight shuttering in the repaired area, when primer area becomes tacky.
- 9- Cure the repaired surface for minimum 7 days.

### **Precautions and Limitations**

- 1- Micro Concrete can applied in section up to 100 mm deep.
- 2- For thickness more than 100 mm, addition of pre-calculated aggregates may be required.
- 3- Ensure that the shuttering is 100 % water tight.
- 4- Ensure full exposure of reinforcement steel.
- 5- Consult structural engineer if the diameter of rebar is reduced by more than 20% than original diameter.



# Placements

S. No	Name of the Student	ID Card Number	Name of the Employer	Designation	Package (LPA)	ON/OFF
1	N.Ashok Kumar	158T1A0106	CINIF Technologies	Trainee Engineer	3.6	ON
2	Gopala Krishna.T	158T1A0124	CINIF Technologies	Trainee Engineer	3.6	ON
3	Nabeel.Ahmed	158T1A0142	CINIF Technologies	Trainee Engineer	3.6	ON
4	Gopala Krishna Tadvika,	158T1A0124	Pathfront Pvt Ltd	Technology - Specialist	3	ON
5	Niddana Ashok Kumar,	158T1A0106	Pathfront Pvt Ltd	Technology - Specialist	3	ON
6	Nabeel Ahmed	158T1A0142	GlenWood	Client Care Analyst	2.7	ON
7	Jetty.Venkata.Lahari	158T5A0192	GlenWood	Client Care Analyst	2.7	OFF
8	U.Divya Sai	168T5A0127	GlenWood	Client Care Analyst	2.7	ON
9	Nabel Ahmed	158T1A0142	Vee Technologies	Medical Coder Trainee	2.16	ON
10	Jaswanth. Vellanki	158T1A0130	TALENTIO	Training Specialist(Verbal trainer)	3	ON
11	Nabel ahmed	158T1A0142	Amazon	CRM	2.6	ON
12	Nabel Ahmed	158T1A0142	Aliens Space Station	Procurement Engineer	2	ON
13	Abdul rashid Khan	158T1A0102	Aliens Space Station	Procurement Engineer	2	ON
14	S.Sai Supraja	158T1A0168	Aliens Space Station	Procurement Engineer	2	ON
15	Saurav Roy	168T5A0124	Aliens Space Station	Procurement Engineer	2	ON
16	T.Sai Pranav Keerthan	158T1A0166	Aliens Space Station	Procurement Engineer	2	ON

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18	K.Naga Poojitha	158T1A0108	Aliens Space Station	Procurement Engineer	2	ON
19	T.Vimala Priya	158T1A01A2	Aliens Space Station	Procurement Engineer	2	ON
20	V.Divya Sai	168T5A0127	Aliens Space Station	Procurement Engineer	2	ON
21	B.Reshma	158T1A0161	Aliens Space Station	Procurement Engineer	2	ON
22	Jetty.Venkata Lahari	158T5A0192	Aliens Space Station	Procurement Engineer	2	ON
23	Samardha Lakshmi.D	158T1A0171	Aliens Space Station	Procurement Engineer	2	ON
24	Ganta Ravi Teja	168T5A0107	Aliens Space Station	Procurement Engineer	2	ON
25	Sudheer Kanna	168T5A0105	Aliens Space Station	Procurement Engineer	2	ON
26	Gopili Naveen	168T5A0108	Aliens Space Station	Procurement Engineer	2	ON
27	Gopili Naveen	168T5A0108	Eleation	CAE Trainee	2.4	ON
28	Nabel Ahmed	158T1A0142	Techmahindra	Technical support associate	2.6	ON
29	Abdul rashid Khan	158T1A0102	nouveau medicament	Medical representative	2.4	ON
30	Hari prasad	158T1A0125	nouveau medicament	Medical representative	2.4	ON
31	K.Krishna mohan	158T1A0131	nouveau medicament	Medical representative	2.4	ON
32	T.Sai Pranav Keerthan	158T1A0166	nouveau medicament	Medical representative	2.4	ON

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