DEPARTMENT OF CIVIL ENGINEERING

CIVILIZATION

.....Designing the world

VOLUME 02/ ISSUE 04 / JUNE'18

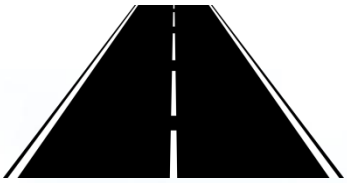
VISION:

To be a department imparting knowledge in Civil Engineering education, research, entrepreneurship and industry outreach services for creating sustainable infrastructure and enhancing quality of life with professional and ethical values.

MISSION:

- **To provide an effective teaching – learning environment enabling students to be a competent civil engineer.**
- **To motivate research and entrepreneurial initiatives in the field of civil engineering.**
- **To inculcate ethical values to serve the society with high order professionalism.**

COMPOSITE PAVEMENTS



Composite pavements combine a Portland cement concrete sub layer with an asphalt layer. They are usually used to rehabilitate the existing roadways. Asphalt overlays are laid over distressed concrete to restore a smooth wearing surface.

A disadvantage in this method is that the movement of joints between the underlying concrete slabs, either from thermal expansion or contraction, or from the deflection of concrete slabs due to truck axle loads, which usually causes reflective cracks in the asphalt. In order to decrease this reflective cracking, the concrete pavement is broken apart through a break and seat, crack and seat, or rubblization process. Geo-synthetics can be used for reflective crack control. In the break and seat and crack and seat, crack control processes, a heavy weight is dropped on concrete to induce cracking. Then a heavy roller is used to seat the resultant pieces into the sub-base. The main difference between these two processes lies in the equipment used to break the concrete and the size of the resulting pieces. The theory is that, frequent small cracks will spread thermal stress over a wider area than infrequent large joints, thus reducing the stress on overlying asphalt pavement. Rubblization process is a more complex fracturing of the old worn out concrete, effectively converting the old pavement into an aggregate base for a new asphalt road. White-topping uses Portland cement concrete to resurface a distressed asphalt road.

Source: April 2018 Master Builder

GEOGRID USAGE IN PAVEMENT

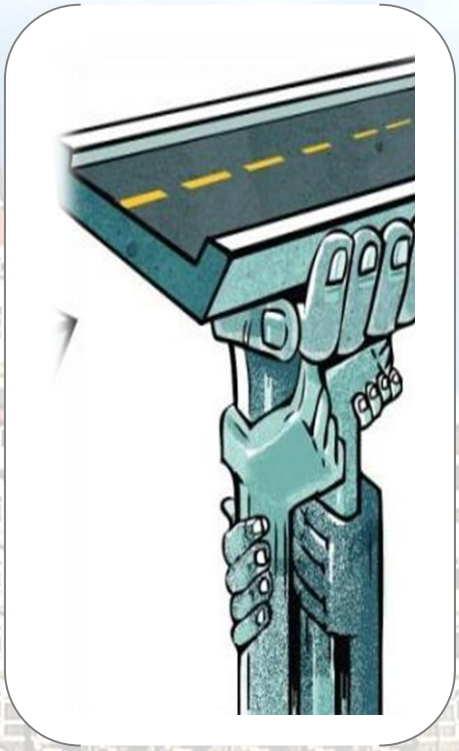
Geo-grids used within a pavement system perform two of the primary functions of geo-synthetics: separation and reinforcement. The primary function of geogrids used in pavements is reinforcement, in which the geo-grid mechanically improves the engineering properties of the pavement system. Research has shown that the required base course thickness for a given design may be reduced when a geogrid is included in the design. Relative agreement exists that substantial benefits can be achieved from the inclusion of geogrids within pavement systems.

They have been used in three different pavement applications: (a) mechanical sub-grade stabilization, (b) aggregate base reinforcement and (c) asphalt concrete overlay reinforcement. For the first two, the geo-grid should be placed at the bottom of the base for aggregate layers less than 14 in. If geotextile is to be used for separation, it should be placed directly on top of the subgrade. For thicknesses greater than 14 in., the geogrid should be placed in the middle of the base course. A cost analysis between the usage and non-usage of the material should be done taking into consideration site mobility, ease of construction, hauling costs, compaction requirements, etc.

Source: March 2018 Master Builder

INDIAN BRIDGE MANAGEMENT SYSTEM (IBMS)

Abbreviated as IBMS, is a means for managing bridges throughout the design, construction, operation and maintenance of the bridges by performing rational and systematic approach to the functional activities. As funds available become tighter, road network authorities are facing challenges related to bridge management and the escalating maintenance requirements of large infrastructure assets. BMS help agencies to meet their objectives, such as assimilation of inventories and inspection databases, planning for Maintenance, Repair/Rehabilitation, Strengthening or Replacement (MR & R) interventions in a systematic way, optimizing the allocation of financial resources, and increasing the safety of bridge users. BMS provides the owners with system assisted decision making during the Life



Taking data information from the BIS, we move ahead to apply various other functionalities within IBMS. The first logical step post-BIS is to create a subset of bridges which show distress. Within this subset, a bridge specific cause identification and confirmation of the distress is identified. This cause confirmation is based on the prognosis established within the inspection database and the results of testings done on the bridge. The results of the cause identification process provides data to two other functions of IBMS namely Deterioration modelling and MRSR interventions. The main function of IBMS is its ability to predict the fund required in short and long-term to manage all the bridges on the network in an optimised manner. To achieve Fund Optimization we have to ensure that the funds are allocated to the most deserving bridges and to the most essential MRSR intervention.

Source: March 2018 Master Builder

CLIMBING FORMWORK FOR TALL STRUCTURES

With rapid growth of urbanization, High rise structures are seen everywhere across India. Modern construction, demands technologies which are faster, safer and innovative. To meet such demands, ground breaking formworks and scaffolding technologies have been developed. Climbing system is one such an example of innovation in formwork technology. It is used for construction of vertical as well as inclined structural elements at great heights e.g. high-rise building walls, bridge piers and dams. In this system, brackets, platforms and formworks are connected to form securely mounted units which can be lifted as one unit to the next concreting section after striking has taken place. With the Climbing formwork (crane-climbing), units are moved by crane and attached to climbing anchors, which have been concreted in advance. If a hydraulic climbing device lifts the units to the next storey, then this is called self-climbing

For different building shapes and tasks, optimized system variants have also been developed: climbing systems for facade areas, building cores and shafts as well as inclined bridge pylons. Climbing SCs also serves as a load-bearing structure for supporting single-sided, non-tied or double sided, anchored wall formwork. The system is characterized by a high level of cost-effective modular concept with multi-piece brackets facilitating optimum adaptation to suit project specific requirements and geometries

By
Mr. Aanandh N. / Assistant Professor

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LIGHT GAUGE STEEL FRAMING SYSTEM

The proven performance and quality of steel have caused it to dominate commercial interior framing applications for many years now. Commercial and retail buildings continue to benefit from its diverse capabilities, using it as a cladding system which can be formed into many different shapes. In that way, LGSF system has the biggest advantage of reducing construction time period by a third which incurs benefits through timely project delivery.

In lighter structures, the technology saves foundation and material cost. Locations affected by bad weather and difficult terrain may rely on this. And it also offers a better seismic stability. The lighter steel material can resist impact without breaking apart. The technology uses galvanized steel which is rust proof, mould resistant and water proof. Adding to all, the material is environment friendly. Its applications ranges from multi-storey buildings, affordable housing, government housing projects, hotels & resort, apartment buildings, large villa projects and rebuilding after disasters.

Advantages:

- **Lessens field works**
- **It saves upto 30% of the project time period**
- **It possess high strength to weight ratio**
- **Ease in remodelling**
- **Offers flexibility in design as larger span lengths are available**
- **Price fluctuations are minimum**
- **Aesthetically appealing**

Source: March 2018 Master Builder

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EMERGING TRENDS IN FORMWORK TECHNOLOGY

The Indian construction Industry is growing at a very rapid rate. It is estimated that the current concrete production is about 300 million cubic meter per annum and it is going to be doubled in the very near future. Advancements in concrete technology has resulted in many innovations and emerging trends which have occurred as a result of two major driving forces namely – Speed of Construction and Durability. These advancements in concrete technology have posed new challenges in the area of Formwork System. In the current scenario, as structures grow taller and floor plates are bigger, end users are looking for formwork systems that are cost effective, light, reusable, safe, easy to assemble and dismantle, durable and flexible.

Classifications:

Depending upon the material used while manufacturing, forms are generally classified as:

1. *Aluminium forms*
2. *Plastic forms*
3. *Fibre forms*
4. *Fabric forms*
5. *Timber forms*
6. *Steel forms*
7. *Form liners*
8. *Com Shells*
9. *Inflated forms*

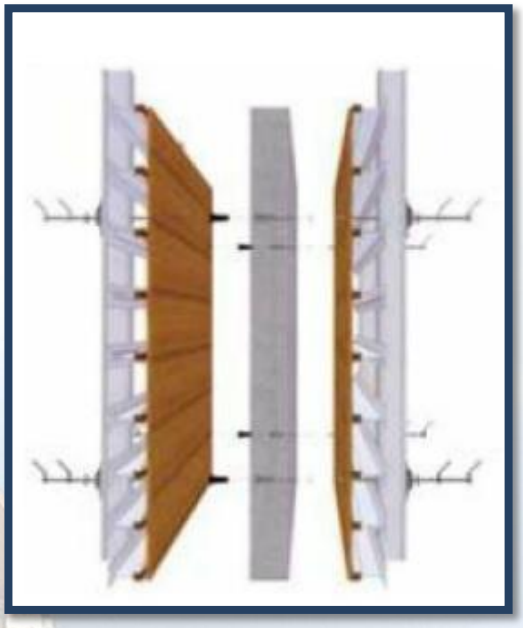
Depending upon the function and use, Forms are generally classified as:

1. *Foundation forms*
2. *Column and Beam forms*
3. *Slab and Beam forms*
4. *Wall forms*
5. *Fly forms*
6. *Gang forms*
7. *Slip forms*
8. *Climbing forms*
9. *Jump forms*
10. *Cantilever forms*
11. *Single sided forms*
12. *Tunnel forms*
13. *Bridge deck forms*
14. *Shaft Lining forms*
15. *Arch forms*
16. *Suspended Slab forms*
17. *Insulating Concrete forms*
18. *Architectural forms*

In this article, we can see two types of forms elaborately as follows:

WALL FORMS

With the explosive growth in high-rise residential construction, the Load-Bearing Wall (LBW) system is gaining recognition. The walls and slab are poured simultaneously when using the innovative tunnel form construction method. This system is made of extruded aluminium sections, welded to an aluminium sheet and hence very light with an excellent stiffness to weight ratio, yielding minimal deflections under concrete loading. Panels are manufactured in standard sizes with non-standard elements produced to the required size and shape to suit the project requirements. The panels are made from a high strength aluminium alloy, with the face or contact surface of the panel, from 4mm thick plate, which is welded to a framework of specially designed extruded sections, to form a robust component. Manufacturers claim that this system can have approximately 250 repetitions.



COM-SHELLS

A Com-shell roof is a steel-concrete composite shell roof formed by pouring concrete on a thin stiffened steel base shell which serves as both the permanent formwork and the tensile steel reinforcement. The steel base shell is constructed by bolting together modular steel units in the form of an open-topped box consisting of a flat or slightly curved base plate surrounded by edge plates. The edge plates may have lip stiffeners for enhanced local buckling resistance.

By
Mr. M. Manoharan, Assistant Professor

DEPARTMENTAL ACTIVITIES & ACHEIVEMENTS

INTERNATIONAL CONFERENCE

*Dr. S. Geetha and Dr. M. Selvakumar, presented a research paper titled "**Service Life Prediction of Concrete Composite with Carbon Fibres for Marine Environment**" in the **VII International Conference on Researches in Science and Technology (ICRST 2018)** held at **Nanyang Technological University, Nanyang Executive Centre, Singapore** and organized by World Association for Scientific Research and Technical Innovation (WASRTI).*

FACULTY DEVELOPMENT PROGRAMMES ATTENDED

1. Mr. Aanandh N., Assistant Professor attended a MHRD sponsored 4-weeks Induction Program organized by Teaching Learning Centre, IIT Madras from 23rd April to 18th May 2018.
2. Mr. E. S. Karthic, attended a FDP on Problem solving and Python Programming organized by Rajalakshmi Engineering College from 21st May to 31st May 2018.
3. Mrs. P. Ramya attended a FDP on Introduction to Autodesk AutoCAD conducted by ICT Academy and organized by Panimalar Institute of Technology from 27th June to 28th June 2018.
4. Mr. J. Jasper Daniel attended a FDP on Introduction to Autodesk Inventor conducted by ICT Academy and organized by Sairam Institute of Technology from 4th June to 8th June 2018.

WORKSHOPS ATTENDED

1. Dr. S. Geetha, Professor, attended an AICTE sponsored Workshop on Construction Automation and Robotics organized by IIT Madras from 11th May to 16th May 2018.

2. Mr. N. Mahamood ul Hasan, attended an L&T sponsored workshop on Precast and Prefabricated structures at ACCE on 29th June 2018.

JOURNAL PUBLICATIONS

S. NO.	PAPER AUTHORS	PAPER TITLE	NAME OF THE JOURNAL	VOL/PP
1	Dr.S.Geetha	Geogrid Reinforcement in Aerated Concrete	International Journal of Innovative Research in Science, Engineering and Technology	Volume 7, Special Issue 5, April 2018 / pg 66-71
2	N.Mahamoodulhasan, S.Premkumar, A.J.Jeya Arthi	Experimental Investigation Of Bricks Using Flyash And Marbel Powder	International Journal Of Innovative Research Explorer	April 2018 VOLUME 5, ISSUE 4,25-30
3	S. Muthu Lakshmi, S. Gayathri, K. Divya Susanna, M. Ammaiappan, M. Manoharan	An Experimental Study On Soil Strength Enhancement Using Geosynthetics	International Journal Of Innovative Research Explorer	April 2018 VOLUME 5, ISSUE 4,433-442
4	S. Muthu Lakshmi	Utilization of Coconut Coir Fibre For Improving Subgrade Strength Characteristics Of Clayey Sand	International Research Journal of Engineering and Technology (IRJET)	April 2018, Volume: 05 Issue: 04 ,2873-2878
5	V. J. Vedhanayagi	Developing Seismic Fragility Curves for Masonry Structures	International Journal of Scientific Research and Reviews (IJSRR)	March 2018, Volume: 7, pp: 603-613

STUDENT ACHIEVEMENTS

- ***Sumithra L. And Suja S. of IV Year B Section (2014 Batch) won the second prize by presenting a paper in PAALAM 2018, A National Conference held at Dr. MGR Educational and Research Institute.***

STUDENT – SUMMER VACATION IN-PLANT TRAINING

S. No.	Student Name	Year/Section	Name of the Company
1	Suryanarayana Murthy S	II/B	Chennai Port
	Shyam Kumar K G		
	Swetha G		
	Viren Dave Y		
	Unish Kumar V		
	Tharun Varshan K C		
	Yogesh V		
	Yamini G		
	Kaaviya B		
	Vasantha K		
	Pragadeeshwaran S		
	Yashwantha Sathya Narayan P K		
	Sandhiya P		
	Mithran K	II/A	
	Mohan Ram K E		
	Aishwarya M		
	Korra Sathya Priya		
2	Keerthana S	II/A	Allied Investments & Housing Pvt. Ltd., Chennai
	Keerthana S		
3	Kaaviya Priya	II/B	Highway Research Station, Guindy, Chennai
4	Karthick N	III/A	Kellar Ground Engineering
	Gokul P		
	Harikrishnan S		
	Balakumar R		
	Akash K		
5	Karthick N	III/A	Highway Research Station, Guindy, Chennai
	Gokul P		
	Dhivakar P		
	Karna Prabhu S		
	Jeyakumar S		
	Mahendiran T		
6	Nithyasri S	III/B	L & T, Manapakkam, Chennai
	Tejasri G		
	Subhashini I		

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INDUSTRY-INSTITUTE INTERACTION

S. No.	Faculty Name	Client Organization	Title of the Consultancy work	Date
1	S.Muthulakshmi	PWD, K.W.S.P. DIV. I,Chepauk	Soil Test	29-Jun-18
2	S.Muthulakshmi	PWD, K.W.S.P. DIV. I,Chepauk	Soil Test	07-Jun-18
3	Dr.S.Geetha	SHANSCO PACKAGING PVT. LTD.	Concrete Cube Test	04-Jun-18
4	Dr.S.Geetha & Mr.P.Krishnakumar	KWSP Subdivision I / III, PWD, Thiruvallur	Mix design, Cement, Steel, Fine & Coarse Aggregate Test	19-May-18
5	Ms.S.Muthulakshmi	KWSP SUB DIVISION I /VIII, PWD	Soil Test	09-May-18
6	Dr.S.Geetha	Krishna Water Supply Project Subdivision II, PWD	Mix Design for M15 & Compressive test for Concrete Cubes	05-May-18
7	Dr.S.Geetha	MPN CONSTRUCTION	Compressive Cube Test	27-Apr-18
8	Dr.S.Geetha	Krishna Water Supply Project Subdivision II, PWD	Mix Design for M15, M20 & M25	11-Apr-18
9	Dr.S.Geetha	REC - CONSTRUCTION	Structural Design for Chemical Lab, REC	10-Apr-18
10	Dr.S.Geetha	REC - CONSTRUCTION	Structural design details for Boys Hostel I Extension, REC	05-Apr-18
11	Dr. S. Geetha & Dr. M. Selvakumar	ILJIN Automotive Private Limited	ILJIN Plant – Grinding Sludge Project	03-Jul-18

EDITORIAL BOARD

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1. **Dr. S. Geetha / Professor**
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3. **Manoharan M. / Assistant Professor**

STUDENT INCHARGES

1. ***Mohan Ram Kumar R.***
2. ***Koushik R.***
3. ***Naveena R.***
4. ***Sahithya B.***
5. ***Rameez Mohamed N M***
6. ***Mohamed Zameel***
7. ***Lokesh S.***
8. ***Alwin Y A***
9. ***Janani V S***

PLEASE SEND YOUR FEEDBACK TO

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