

PARTHIBAN.D D.C.E., B.E., M.E.,(Ph.D., Geotechnical)

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Tamil Nadu, India.

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Orcid ID- <https://orcid.org/0000-0002-8827-1889>

Scopus ID- 57216655744

Web of Science- AAY-3488-2021

Career Objective

Seeking for a challenging position in the field of Civil Engineering, where I can use my planning, designing and overseeing skills in construction and help grow the company/Institution to achieve its goal. I have a stated objective and firing desire to achieve it. My goals are not the ultimate stop, but are just award in my promising career. I am confident that I can give the ultimate out of me.

Education Qualification

S.No	Qualification	Year of Passing	Percentage Secured	Name of Institute Studied
1	M.E., Structural Engineering	2018	82.2	ARS college of Engineering, Chennai- Anna university
2	B.E., Civil Engineering	2014	68	Tagore Engineering College, Chennai- Anna university
3	Diploma in civil Engineering	2011	85	Bhaktavatchalam polytechnic college, Kanchipuram- Directorate of Technical Education

Work Experience

(I) Teaching experience [3.5 years]

ORGANISATION : Aarupadai Veedu Institute of Technology [AVIT] Chennai
DESIGNATION : Assistant Professor/Civil
PERIOD OF WORKING : 07 Jan 2019 to Till Dated.
RESPONSIBILITY : 1. PG coordinator
2. Handling class for B.E., [F/T & P/T]., M.E., [F/T]. B.Arch.,
3. Project Guided for B.E., [F/T & P/T]., M.E., [F/T]

4. Survey lab In charge, Department Admission cell coordinator
5. PMKVY Co-ordinator [Department]
6. Department discipline Co-ordinator
7. Virtual Lab Co-ordinator
8. Practical Exam Co-ordinator
9. Academic centre for continuing education [Dept Coordinator]

(II) Teaching experience [2 years]

ORGANISATION	: Adhi college of Engineering & Technology [ACET],Kanchipuram
DESIGNATION	: Lecturer /Civil
PERIOD OF WORKING	: 10 June 2014 to 10 Jan 2016 [2 Years].
RESPONSIBILITY	: 1. Handled class for B.E., [F/T] 2. Project Guided for B.E., [F/T] 3. Exam cell Co-ordinator [Assist] 4. NAAC Co-ordinator [Department] 5. Department discipline Co-ordinator

Subjects Handled

1. Soil Mechanics
2. Foundation Engineering
3. Ground Improvement Technique
4. Environmental Engineering [I & II]
5. Mechanics of Solids
6. Surveying I & II
7. Ground Water Engineering
8. Soil Mechanics Lab
9. Survey lab [I & II]
10. Project work

Achievements

- ✓ Published 17 journal papers so far in web of science, Scopus journals and various other journals with high impact factor.
- ✓ Received Funding support from TNSCST of Rs.50,000/- for the Bioplastic Training program for poor background women for the year 2019-20
- ✓ Working as a Reviewer in Scopus Journal of “Material today Proceedings” from 2019 onwards and reviewed 9 research papers so far.
- ✓ Obtained Certificate of Merit for giving 100% result in the subject handled “concrete Technology” in Anna

University Exam, from Adhi college of Engg., and Tech, 2018

- ✓ Organized an International conference in Aarupadai Veedu institute of Technology, Chennai [NCRACE-19]
- ✓ Organized an National Symposium in Aarupadai Veedu institute of Technology, Chennai [INNOV AVIT-19]
- ✓ Organized 3 Guest lectures and 1 workshop in the Department of Civil Engineering, AVIT
- ✓ Conduct Real time Employment Enhancement course for the student in the course such as Advance surveying, staddpro, Etabs and Revit architecture in AVIT
- ✓ Organized PMKVY Mason and Surveyor training program for the rural people in AVIT.
- ✓ Bring 2 MOU's and conduct events from the Leading survey Training institute in both the colleges.

Funded Projects Applied :

- ✓ Applied a project on "Evaluating the effectiveness of bacteria in water purification systems by Bio-Encapsulation" Under the scheme of DSIR on March 2019.
- ✓ Applied a funded project on "An Experimental Study on properties of Sustainable Eco- friendly based cement from Natural constituents" Under the scheme of TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY, for the project amount of Rs.13,000/- on August 2019
- ✓ Applied a funded project on " Manufacturing of eco-friendly clay bricks by bottom ash Geo-polymerization" under the scheme of Support for entrepreneurial and managerial development of MSME'S through incubators for the project amount of Rs.14,50,000/- on January 2020
- ✓ Applied a funded project on " Manufacturing of eco-friendly clay bricks by bottom ash Geo-polymerization" under the scheme of Swarna Jayanti Fellowship Cell- DSIT for the project amount of Rs. 31,91,870/- on April 2020
- ✓ Applied Internal seed money funded project on "Investigation on Eco-friendly Lightweight paver block using Bottom ash Geopolymer concrete" under the scheme of AVIT-Research for the project amount of Rs. 2,00,000/- on August 2020.
- ✓ Applied funded project in TNSCST on the topic " Synthetization of geopolymer dry cement using industrial precursor" for the year 2020-2021

Funded Project Received :

- ✓ Received Grant support from TNSCST of Rs.50,000/- for the "**Short term awareness and training program on Eco- friendly starch based green plastic**" for the year 2019-2020

Patent Details :

- ✓ Having an Australian Innovation patent on "**Manufacture of green concrete by partial replacement of Ferrock powder as an alternative to conventional cement**" with patent number- 2020104412, on 31st December 2020.

Publication Details

- ✓ Published a review paper "**Role of industrial based precursors in the stabilization of weak soils with geopolymer – A review**" in the journal Case Studies in Construction Materialsthis link is disabled, 2022, with the impact factor of **3.328** - January 2022 [Web of science- Scopus]
- ✓ Published a research paper "**journal Science and Engineering of Composite Materials**" in the

journal of Science and Engineering of Composite Materials - July 2022 [Scopus]

- ✓ Published a review paper “**Health assessment of dams under various environmental conditions using structural health monitoring techniques: a state-of-art review**” in the Environmental Science and Pollution Research, 2021, with the impact factor of **5.190** - January 2022 [Web of science- Scopus]
- ✓ Published a research article “**Study on engineering behavior of conventional cement concrete by partially replacing sea shell as fine aggregate**” in the Journal of Physics: Conference,2021 [Scopus]
- ✓ Published a review paper “**Evaluation of the impact of thermal performance on various building bricks and blocks: A review**” in the journal Environmental Technology and Innovation, with the impact factor of **5.263** - April 2021 [Web of science- Scopus]
- ✓ Published a review paper “**Effect of Solid waste based stabilizing material for strengthening of Expansive soil- A review**” in the journal Environmental Technology and Innovation, with the impact factor of **3.356** - June 2020 [Web of science- Scopus]
- ✓ Published a research paper “**Experimental studies on strength and durability of sustainable concrete using bottom ash by replacement of fine aggregate**” in the journal of green Engineering, with the impact factor of **0.550** - Oct 2020 [Scopus]
- ✓ Published a research paper “**Performance evaluation of Fly ash based GPC with partial replacement of RHA as a cementitious material**” in the journal of Material today Proceedings, with the impact factor of **0.576** – May 2020 [Scopus]
- ✓ Published a research paper “**Performance study on clayey soil stabilized by lime and geopolymer with partial replacement of sodium bentonite as an additive**” in the journal of AIP Conference Proceedings, with the impact factor of **0.40** – Sep 2020 [Scopus]
- ✓ Published a research paper “**Sustainable efficiency of hypo sludge in concrete**” in the journal of International Journal of Emerging Trends in Engineering Research, with the impact factor of **0.23** – Oct 2020 [Scopus]
- ✓ Published a research paper “**An experimental study on mechanical and durable properties of self-curing concrete by adding admixture**” in the journal of Material today Proceedings, with the impact factor of **0.576** – Oct 2020 [Scopus]
- ✓ Published a research paper “**Study on Stress-Strain effect of reinforced Metakaolin based GPC under Compression**” in the journal of Material today Proceedings, with the impact factor of **0.576** – Oct 2019 [Scopus]
- ✓ Published a research paper “**Strength Characteristics of Preformed Foam Concrete**” in the journal of International Journal of Recent Technology and Engineering, in the year 2019
- ✓ Published a research paper “**Utilization of Waste Materials in Soil Stabilization**” in the journal of International Journal of Innovative Technology and Exploring Engineering , in the year 2019 [Scopus]
- ✓ Published a research paper “**Bond Behaviour of Steel and Concrete with Pull-Out Test**” in

the journal of International Journal of Innovative Technology and Exploring Engineering , in the year 2019

- ✓ Published a research paper “**Enhancement of Expansive Soil with Addition of Wood Husk Ash and Silica Fume**” in the journal of International Journal of Innovative Technology and Exploring Engineering , in the year 2019
- ✓ Published a research paper “**Experimental investigation on compression and tensile behaviour of cement concrete replacing fine aggregate by brick and quarry dust**” in the journal of International Journal of Advanced in Management, Technology and Engineering , in the year 2017

Book Publication details:

- ✓ Published a Book on the topic “Building Foundational Engineering” with Notion press, With ISBN number of 9781685237226 in Feb 2021
- ✓ Published a Book on the topic “ Structural Design and drawing” with Shanlax Press with ISBN number of 978-93-93737-09-0 in April 2022

Book Chapter details :

- ✓ Published a Book chapter “ **Critical Study on bond behavior of steel and concrete with Pull out test**” in Recent trends in Engineering research, volume 3, With ISBN number of 987-81-947979-4-4 on Sep 2020

Professional Bodies Membership:

- ✓ Having life time membership in “ Indian society of Technical Education”
- ✓ Having life time membership in “ National Information Centre of Earthquake Engineering”
- ✓ Having yearly renewal membership in “American Society of Civil Engineering”
- ✓ Member in International Association of Engineers from Nov-2016
- ✓ Member in International Society of Environmental Information Sciences from Nov-16
- ✓ Member in Institute of Research Engineers and Doctors from 2020
- ✓ Member in Institute for Engineering Research and Publication from 2020

Event Participation Details:

FDP attended details :

1. Attend One week AICTE approved FDP program on “ICT tools for teaching, Learning process and Institutes” Conducted by Sri sankara Arts and science college combined with MeitY, Govt of india, Jan 2020
2. Attend One Week FDP on “INSIGHTS INTO QUALITY RESEARCH AND INNOVATION” organized by Indian society of Non-destructive testing, Hyderabad - May 2020.

3. Attend One Week FDP on “Advanced NDT techniques and its applications in industry” organized by Research & Development Cell and Institution’s Innovation Council of Vivekanandha College of Engineering for Women- May 2020.
4. Attend ISRO approved One Week FDP on “Remote sensing application and current trends in machine learning” conducted by Dr. MGR Educational and Research institute, Chennai- June 2020
5. Attend One week FDP program on “ Advancement of science and its application in Engineering” Conducted by Hyderabad institute of Technology and Management, June 2020
6. Attend Five days Atal-AICTE FDP program on “GIS & Remote Sensing” conducted by Siksha 'O' Anusandhan (Deemed to be University) on Oct 2020
7. Attend Five days Atal-AICTE FDP program on “Smart cities” conducted by Kumaraguru college of Engg and technology on Oct 2020
8. Attend and complete 8 week FDP course on “Plastic Waste management” on NPTEL, Apr 2019
9. Attend and complete 8 week FDP course on “Reinforced Concrete Road bridges” on NPTEL, Sep 2019
10. Attend Five Days FDP program on “Concrete Technology” Conducted by Rajalakshmi Engineering College, Chennai- Dec 2018

Workshop & Seminar Attended :

1. Attend one day Workshop on “ Research Road map for Engineers” conducted by AVIT, july 2019
2. Attend one day Workshop on “ Total station and Advanced Surveying” conducted by Dhanalakshmi College of Engineering, Chennai, August 2019
3. Attend Two days workshop on “ Cognitive framework to edifice sustainable Research Culture” Conducted by St.Peters institute of Higher Education and Research, Chennai- Jan 2020
4. Attend One day workshop on “ Precast concrete lightweight EPS panels for mass housing” Conducted by CSIR-SERC, Chennai- March 2020
5. Attend Six days workshop on “ Contour drafting- 3D printing Technology” Conducted by Easwari Engg College, Chennai- May 2020
6. Attend one day seminar on “ 2nd National Seminar on Emerging Technologies in Engineering” Conducted by Valliammai Engg college, Chennai- Apr 2018

Conference Attended :

1. Attend Conference on “International Virtual Conference on SUSTAINABLE CONSTRUCTION MATERIALS AND TECHNOLOGIES (IVCSCMT-2020) and present paper on "Evaluation on Modulus of elasticity under axial load of reinforced GPC using Metakaolin as cementitious material”

Technical Skills

- ✓ Certification in Auto Cad [2D, 3D & Structural Detailing] and Revit Architecture [Archi cad]
- ✓ Doing consultation structural works for RC buildings using Stadd pro and Etabs to near by local Construction firms.
- ✓ Electronic Surveying: GPS and Total Station Sokkia
- ✓ GIS Software : QGIS and Arc GIS
- ✓ Proficiency in MS office [Estimation, Documentation, Presentation and Budgeting]
- ✓ Certification in Lower type writing [English]

Area of Interests:

- ✓ Practical Oriented Teaching
- ✓ Structural design and detailing of RC and Steel structures
- ✓ Geo Technical Investigation
- ✓ Quality control
- ✓ Planning
- ✓ Estimation

Personal Details

Date of Birth : 12-June-1992

Father Name : L.Devarajan

Marital Status : Married

Nationality : Indian

Languages known : English & Tamil

Strong points About My-self : (i) Creativity
(ii) Committed towards Research oriented jobs.
(iii) Listening and evaluating new ideas.
(iv) Easily adapt to any working environment.


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Little Kanchipuram
Kanchipuram- 631501

Mobile number : +91-7094073343, +91-9994450424

E – Mail ID : parthi92bhde@gmail.com

I hereby declare that the above-furnished details are true to the best of my knowledge

Yours Truly



[D.PARTHIBAN]



தமிழ்நாடு அறிவியல் தொழில்நுட்ப மாநில மன்றம்
TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

(Established by Government of Tamilnadu)
Directorate of Technical Education Campus, Chennai - 600 025

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Telefax : 044 - 2230 1552

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DR. R. SRINIVASAN, M.Sc., Ph.D., F.I.C.S., M.A.C.S. (USA).
Member Secretary

Letter No.TNSCST/DIT/13/VR/2019-2020

2995

09.10.2020

To
Mr D.Parthiban
Assistant Professor of Civil Engineering
Aarupadaai Veedu Institute of Technology, Paiyanoor,
Kancheepuram- 603104

Sir/Madam,

Sub: Your proposal on Dissemination of Innovative Technology (DIT) -
Approval - Reg.
Ref: Approval of 57th Executive Committee Meeting dated 09.09.2020

With reference to the above, I am happy to inform that your proposal on DIT has
been approved for financial support as per the details given below:

Title of the Programme	Duration & Amount (Rs)
Short term awareness and training program on eco friendly starch based green plastic	3 days 50000/-

- The Programme may be conducted following Government guidelines for COVID-19 .
- Date, venue and final details of the programme should be informed to us well in advance.
- The sponsorship of the Council must be acknowledged as "Catalyzed and financially supported by Tamilnadu State Council for Science and Technology, Dept. of Higher Education, Government of Tamilnadu."
- Co-ordinators meeting will be conducted by the Council in due Course to discuss about implementation of the programme.
- Programme Schedule may be prepared after the Co-ordinator's meeting and sent to the Council along with session details for release of grants.

Yours sincerely,

(Signature)
Member Secretary

Copy to:
The Principal
Aarupadaai Veedu institute of Technology, Paiyanoor,
Kancheepuram- 603104

To
Hoo/and.
R. Suresh
KFE
3/4/20



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Role of industrial based precursors in the stabilization of weak soils with geopolymer – A review

Parthiban, Devarajan^a ; Vijayan, Dhanasingh Sivalinga^a ; Koda, Eugeniusz^b ; Vaverkova, Magdalena Daria^{b,c} ; Piechowicz, Konrad^b ; Osinski, Piotr^b ; Duc, Bui Van^d Save all to author list

^a Department of Civil Engineering, Aarupadai Veedu Institute of Technology, VMRF, Chennai, Tamil Nadu, India
^b Institute of Civil Engineering, Warsaw University of Life Sciences, Poland

Cited by 2 documents

Influence of alccofine and polypropylene fibers on stabilization of soil – An investigational study

Reshma, T.V. , Patnaikuni, C.K. , Manjunatha, M. (2022) *International Journal of Advanced Technology and Engineering Exploration*

Influence of Multiple Factors on the Workability and Early Strength Development of Alkali-Activated Ash and Slag-Based Geopolymer-Stabilized Soil

Li, X. , Zhao, Y. , Hu, Y. (2022) *Materials*

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Environmental Science and Pollution Research • 2021

Document type Review

Source type Journal

ISSN 09441344

DOI 10.1007/s11356-021-16749-3

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Health assessment of dams under various environmental conditions using structural health monitoring techniques: a state-of-art review

Sivasuriyan, Arvindan^{a,b} ; Vijayan, Dhanasingh Sivalinga^c ; Munusami, Ravindiran^d ; Devarajan, Parthiban^e Save all to author list

^a Aarupadai Veedu Institute of Technology, Vinayaka Missions Research Foundation, Paiyanoor, Chennai, 603104, Tamilnadu, India
^b Anand School of Architecture, Chennai, 603103, Tamilnadu, India

Cited by 2 documents

A review on rheological characteristics, serviceability and failure analysis of steel fiber impregnated concrete

Vijayan, D.S. , Monisha, S. , Suneesh, S. (2022) *Materials Today: Proceedings*


A review of the implementations of glass fiber in concrete technology

Devi, C. , Vijayan, D.S. , Nagalingam, R. (2022) *Materials Today: Proceedings*

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 Open Access Published by De Gruyter July 11, 2022

Finite element analysis of behavior and ultimate strength of composite column

Leema Rose Ayyasamy, Anbarasu Mohan, Dhanasingh Sivalinga Vijayan, Agoramoorthy Sattainathan Sharma, Parthiban Devarajan and Aravindan Sivasuriyan

From the journal *Science and Engineering of Composite Materials*
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Cite this

Abstract

Composite sections are found to be a novel technique in modern day scenario of construction. This stands tall than the ordinary and conventional type of constructions. Columns as a structural element play a vital role in structural frame. This research comments on the behavior of composite columns. The main objective of this study is to analyze the behavior of steel-encased concrete composite columns as experimentally under axial compression and the mode of failure under ultimate failure and yield point. The steel-concrete composite system combines the formability and rigidity of reinforced

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Environmental Technology and Innovation • Volume 23 • August 2021 • Article number 101577

Evaluation of the impact of thermal performance on various building bricks and blocks: A review

Vijayan D.S.^a ; Mohan A.^b; Revathy J.^c; Parthiban D.^a; Varatharajan R.^d

 Save all to author list

^a Department of Civil Engineering, Aarupadai Veedu Institute of Technology, VMRF, Chennai, India

^b Easwari Engineering College, Department of Civil Engineering, Ramapuram, Chennai, India

^c Department of Civil Engineering, B.S.Abdur Rahman Crescent Institute of Science & Technology, Chennai, India

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Evaluation of building integrated with phase change material considering of ASHRAE classification using seasonal and annual analysis

Chu, H.-H., Almojil, S.F., Almohana, A.I. (2022) *Journal of Building Engineering*

Cement-glass composite bricks (CGCB) with interior 3D printed PET-G scaffolding

Matek, M., Grzelak, K., Łasica, W. (2022) *Journal of Building Engineering*

Role of industrial based precursors in the stabilization of weak soils with geopolymers – A review

Parthiban, D., Vijayan, D.S., Koda, E. (2022) *Case Studies in Construction Materials*



Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

Study on Stress-Strain effect of reinforced Metakaolin based GPC under compression

D. Parthiban*, D.S. Vijayan

Department of Civil Engineering, Anna'salai Vardar Institute of Technology-VMIT, Chennai, India

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Geopolymer concrete

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ABSTRACT

The main aim of the present study is to comparatively evaluate Stress-Strain properties of Reinforced alkali activated Metakaolin based Geopolymer concrete with Conventional concrete of M25 grade prepared with 3 and 4 number of hoop steel reinforcement. For studying Stress-Strain behavior under compression totally the 36 cylinders were tested out of which the 24 cylinders was prepared with Metakaolin based GPC and the remaining with conventional concrete M25 Grade. The flexure think was measured in this study is that the volumetric percentage of Reinforcement. The results exposed that confinement with hoop reinforcement significantly enhanced the strength of Metakaolin based GPC but not more than OPC and also it was found that the rate of stress increases when the percentage of the number of hoop reinforcement increased, similarly in case of strain it was decreased when the percentage of the number of hoop reinforcement increased. Hence it was concluded that the Metakaolin based GPC is not profitable that using instead of OPC along with any major form of reinforcement work.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Materials Engineering and Characterization 2019.

1. Introduction

Geopolymer concrete is the inventive and ecological building material and a substitute to Ordinary Portland cement concrete. The usage of a geopolymer diminishes the plea of Portland cement which is in charge of great Carbon dioxide emission. Geopolymer was the name given by Inventor Davidovits in 1978 to ingredients that are considered by connection or networks of inorganic fragments [1]. Geopolymer cement concrete is prepared by exploitation of Mineral material Called Metakaolin. Metakaolin is treated by suitable skill and utilize for concrete works. In the method of geopolymer concrete. The usage of this concrete supports to reduce carbon release by reducing the Ordinary Portland cement demand. The main ingredients of geopolymer is basis of silicon and aluminum are provided by thermally triggered natural constituents (e.g. Metakaolin) or industry manufacture spin-offs (e.g. fly ash or slag) and an alkaline triggering solution which polymerizes these ingredients into molecular connection and networks to form hardened binder[3]. It is also said as alkali-triggered cement or mineral polymer cement.

2. Materials and methods

2.1. Metakaolin

The Metakaolin is a dehydroxylated method of the earthen crystal kaolinite. An aluminosilicate mineral such as kaolinite can be dissolved in an alkali-silicate solution to form a rock hard brittle ceramic. By the chemistry, solitary can reach a high strength material that can set as slight as a few hours at room temperature. During the last few decades, fly ash, slag, kaolinite, mine tailings, etc. are used as raw materials to synthesize geopolymers. Between them metakaolin is the utmost common raw material due to its comparatively purer mechanisms [8]. In its fresh form, Metakaolin can respond and set up a fully toughened geopolymer.

2.2. River sand

In this experimental work Natural sand is used as fine aggregate and it is obtained from local Palar River Bed, Kanchipuram. The specific gravity of sand is obtained by pycnometer test. Sieve analysis was performed to find the fineness modulus of sand. Results show that satisfy for the above work.

* Corresponding author.

E-mail address: p.parthiban@annaai.edu.in (D. Parthiban).<https://doi.org/10.1016/j.matpr.2019.10.1162>

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Materials Engineering and Characterization 2019.



Contents lists available at ScienceDirect

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journal homepage: <http://ees.elsevier.com>

Effect of Solid waste based stabilizing material for strengthening of Expansive soil- A review

D.S. Vijayan*, D. Parthiban

Civil Engineering Department, Anna's Institute of Technology, Vengaloor, Chennai Research Foundation (VMRF), Tamil Nadu, India

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ABSTRACT

Expansive soils are usually stated in terms of its property such as unexpected expansion and contraction, prolonged water retains capacity, low rate of permeability, poor load transfer mechanism, and high compressibility. Due to these properties, the rate of failure mechanisms such as excessive settlement and subgrade failures attain at a very fast rate, and the expansive soils are declared as more vulnerable than other types of soils. Hence it becomes difficult for a Civil Engineer to make the construction using this type of soils. In Modern standard of life, the growth of industrialization leads to increase the uncontrollable rate of effluence and generation of solid waste and the clearance of waste become a huge challenge to all the countries. The construction material production industries are showing major interest for utilizing this waste and the researchers tried to prepare a new kind of material for construction activities in large scales. In this paper, an effort is taken to investigate the variety of solid wastes that have been utilized in soil stabilization as a strengthening agent with or without lime and cement, in order to find the possible ways of utilizing the solid waste in huge practice for geotechnical applications.

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1. Introduction

In today's scenario, due to rapid urbanization and infrastructure development and unavailability of land, it becomes essential to construct the buildings on-site under unfavorable conditions (James, 2016b). In worldwide the availability of expansive soil was found in very vast areas, out of that Pakistan is having the huge resource of expansive soil (Ali, 2014). The expansive soil is the type of soil that has swelling and shrinking nature which was based on the rate of absorption and evaporation of water present in it. When compared to wet state, the expansive soil possesses large extent of strength in the dry form. But when the soil becomes wet, their strength starts to decline suddenly. While the foundation construct over this type of soil, it exerts pressure considerably due its swelling nature. The rate of volume expansion of those soils depends upon its natural moisture content, initial dry density, size of particles and presence of minerals. Usually those type of soils are considered as complex and difficult to analyze, having an unstable condition like frequently altered into a dry and hard state at every seasonal variation due to the presence of minerals with high montmorillonite (Pandiyam, 2014).

The property of expansive soil was getting altered at a different location, by its type and its origin and also possess the property of plasticity, compressibility and very low bearing capacity (Nivetha, 2019). Because of all these behaviors, the soil undergoes a volumetric change that applied pressure over the structure and it results in the development of crack, differentiation settlement leads to structural deterioration (Petry, 2002). Along with this, one more property called as swelling that has more influence and complex in nature which also considered as important factor to cause the structural damage. While designing the heavy structures like bridges, embankments, towers, and highways, etc., the role of soil plays as a major one (Khamde, 2009). As an Engineer, it is very difficult to avoid the construction activities in expansive soil. When constructing the pavements, the soil beneath the road that acts as a load transfer member, if the stability of soil is not well then, the soil becomes inadequate to resist the wheel load acting transfer on it (Mo-

* Corresponding author.

E-mail addresses: vijayan.haseena@gmail.com (D.S. Vijayan), parthi92bhd@gmail.com (D. Parthiban).

Performance study on clayey soil stabilized by lime and geopolymer with partial replacement of sodium bentonite as an additive

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D. Parthiban, D. S. Vijayan, J. Kausik, A. Anisur Rahman, and K. Veerachandru



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Performance evaluation of Fly ash based GPC with partial replacement of RHA as a cementitious material

D. Parthiban*, D.S. Vijayan, R. Sanjay Kumar, Anandhu P. Santhu, Glenison Abraham Cherian, Mohammed Ashiq

Assistant Professor, Department of Civil Engineering, Anna Polytechnic Institute of Technology-IMPET, Chennai, India

ARTICLE INFO

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Alkaline activated
Rice husk ash
Alumino-silicate mineral
Molarity

ABSTRACT

The evaluation of geopolymer concrete means that does not utilize cement in its manufacturing it can be seen as an important achievement in this context. This experimental investigation shows that the experimental tests are carried out on fly ash and Rice husk ash-based GPC. Geopolymer solutions are prepared to make an alkaline medium based on sodium compounds. The molarity value was fixed at 8 to prepare the sodium-based hydroxide solution and the alkaline ratio between sodium-based silicate to sodium-based hydroxide was fixed as 2.5 to prepare an alkaline solution. The effects over the substitutes of FA with RHA were studied by conducting the compressive test, split tensile test and Stress-strain behavior of cylinder with and without confinement were studied at the ages of 7, 14, and 28 days curing respectively. Test results of workability in fresh concrete and GPC mixes indicate that in the fresh state were cohesive and stiffness with a medium degree of workability slump value of 73 mm is obtained. The study concludes that the replacement of FA with RHA in various proportions is not shown any positive result when compared to conventional concrete, Hence the usage of RHA with GPC shouldn't be prescribed one. © 2020 Elsevier Ltd. All rights reserved.

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1. Introduction

Annually, the cement industries have consumed about one and a half tons of natural raw materials are utilized in the manufacture of single ton of Portland cement. On another side for about 1 ton of harmful gases is being evacuated into the atmosphere consist of rich in greenhouse increasing gases like carbon dioxide (CO₂), carbon monoxide (CO) which are considered as major gases to increase global warming. Hence to eradicate this Pollution issue the geopolymer technology is adopted instead of Portland cement in cement concrete. Geopolymer fits the group of materials with great interest due to the option of decreasing carbon dioxide and carbon monoxide emission as well as low energy consumption. The major role of a geopolymer is to provide the alternative solution of cement. Geopolymer is the process of exothermic reaction combined alkaline solution prepared based on Sodium or Potassium based on aluminosilicate material which binds the concrete ingredients together by the process of polymerization. An

extensive collection of natural Alumina content and Silicate content minerals can help as probable resources for the synthesis of geopolymers [1]. During the process of polymerization, its progression consists of three conditions. The initial condition is the closure of mixed bonds in the alkaline portion, the second condition is rearranging and dispersal of dissolved ions with the development of small gelatinous structures and the final condition is the step of strengthening of the structures to construct with this hydrated products. Dependent on the natural resource assortment and condition of treating, geopolymers can unveil a wide variety of assets and characteristics, comprising high strength of compression, low shrinkage, fast or slow setting, acid resistance, fire resistance and low thermal conductivity [2]. The mechanical strength of a Geopolymer is not only be decided by its material and also by the curing and it is done by letting the geopolymer specimens initially in ambient curing at room temperature for one day and then kept it between 40° and 90 °C in an oven for one to two days in dry or vapor conditions. In this paper, we examine and compare the effects of fly ash and partially replaced Rice husk ash in GPC as an alternative for normal OPC cement as well to find the suitable industrial waste used to prepare geopolymer concrete and to reduce disposal problem.

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Natural aggregates used for Light weight concrete – A Review

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Abstract. Lightweight concrete is comparatively lower weight than conventional concrete which helps to reduce the dead load in structures and act as an insulation against sound and heat however the strength of lightweight concrete is low compared with normal concrete, but it will be highly used for such requirement where the concrete is not expected to bear more loads. This paper provides more information about natural aggregates used for lightweight concrete furthermore it gives an insight of aggregates such as vermiculite, rice husk, volcanic cinder, saw dust, scoria, pumice and diatomite. This article also gives some of the research ideas for future approach in this area.

Keywords: vermiculite, rice husk, volcanic cinder, saw dust, scoria, pumice, diatomite, lightweight concrete

1. Introduction

In the present scenario, the construction industry needs more advancement in materials to reduce self-weight as well as adequate performance, so lightweight concrete has been demonstrated and basic approach to developing lightweight concrete is inducing air in concrete hence, it could be achieved by replacing conventional aggregates by natural aggregates therefore in this article few natural aggregates such as vermiculite, rice husk, volcanic cinder, sawdust, scoria, pumice and diatomite have been discussed.

Adilson et al. (2014) discussed the differentiation between the thermal and mechanical composition and their properties of concrete aggregates, light in weight like EPS, and vermiculite through the air-entraining substance. So, as a result, come out like EPS, lightweight concrete is having higher thermal conductivity than vermiculite, and it has had more strength than vermiculite. Lightweight concrete too containing 55% content is more reliable than any other lightweight aggregate [1]. Blessen et al. (2018) concluded the utilization and advantages of the ash made of Rice husk as a concrete material which more sustainable and eco-friendly because Rice husk can be only made use of in this way as it is not that much useful in another usage like animal feeding, using as dispose of. If we set fire to it, the produced ash can be more hazardous for locality and environment. Besides, some RHA amounts in concrete may prevent erosion by chemical actions, porosity, chemical attacks, fracture development, and RHA having higher parameters in strength. Substantial to sulfate, chloride, and carbonation and lower in permeability and depreciation [2].

Celik et al. (2014) investigated an analysis of laboratory which presents about the improvement of workability strength and stability of self-compacting concrete by substitution of Portland cement instead of high volumetric natural volcanic pozzolan and limestone powder. Furthermore, the NP in the concrete examined with scanning electron microscopy & petrographic Tests [3]. Vinita et al. (2018) presented that to promote solid waste treatment to





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An experimental study on mechanical and durable properties of self-curing concrete by adding admixture

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ABSTRACT

In this investigation the river sand was replaced with Manufactured Sand (M-Sand) by 50% and 100% mix. Self-curing of concrete is enhanced by polyethylene glycol which increases hydration and strength properties of concrete. It also shows the effect of Polyethylene glycol on compressive strength, split tensile strength by 0.3% percentage of PEG(1500) by weight of cement were studied for 50% and 100% replacement of manufactured Sand with different grades of concrete. For the specimen with 1% of self-curing agent, the mix showed highest compressive strength when compared to other mixes with self-curing agent (i.e. 1.5% and 2%). The mix with 1% of PEG showed compressive strength marginally greater than the compressive strength of conventional concrete.

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1. Introduction

1.1. General

Concrete is that the most generally used building material. It's the excellence of being shaped into desired form most handily. It's a man-made material consisting of ingredients like cement, fine aggregates, coarse aggregates and water. Aggregates are the most important ingredients of concrete. Any construction activity needs many materials like concrete, steel bricks, stone, glass, clay, mud, wood so on. For its property and flexibility with relevancy the dynamic surroundings the concrete should be specified it will conserve resources, protected atmosphere, economize and result in correct utilization of energy [1]. Plain concrete has a truly low rigidity, confined variability, and little opposition splitting. Inward little splits are inalienably blessing inside the solid and its poor rigidity is a direct result of the engendering of such little breaks, in the long run bringing about fragile disappointment of the solid [13]. The preeminent wide acknowledged solution for the present solution for the present flexural shortcoming of cement is that the standard fortification with high quality steel. Furthermore the fortification embedding's and practical compaction of RCC is

amazingly extreme if the solid is of low usefulness especially inside the instance of cement.

In plain concrete and comparative fragile materials, auxiliary breaks (miniaturized scale splits) grows even before stacking, remarkably in light of biting the dust shrinkage or elective reasons for volume changes. Restoring of solid structures is essential to affirm they meet their exhibition and implied sturdiness necessities. Interior relieving (IC) could be a horrendously encouraging method which will offer additional wetness in concrete for an increasingly functional hydration of the concrete [7]. All through hydration of concrete, void pores are made at interims the concrete glue, bringing about a decrease in it's inside proportion and cause breaks to create at the early-age. This case is exceptional in HPC which may be settled by utilizing oneself restoring operators like 'polyethylene glycol' they will hold the wetness for an all-encompassing measure of your time.

The ACI-308 Code expresses that "Interior Curing" alludes to the technique by that the relationship of concrete happens on account of the stockpile of extra inner water that is not a piece of the mixing water [4]." Conventionally, solidifying solid implies that creation conditions determined water isn't lost from the surface i.e., restoring is taken to happen 'from the surface to inside'. In differentiation, 'inward relieving' is giving restoring 'from the inside to outside' through the internal repositories (polyethylene glycol) made. 'Inward relieving' is ordinarily moreover alluded as 'Self-restoring'.

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Sustainable Efficiency of Hypo Sludge in Concrete

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ABSTRACT

The paper producing industry generates various wastes which are said to be hypo-sludge. Cement with Hypo sludge reduces the permeability of concrete and dense calcium silicate hydrate. The mix designed for M20 and M40 grade of concrete. The Research is concerned with Environmental-friendly Usage of hypo sludge as replacement to cement for 10, 20 and 30%. The compressive strength and flexural strength is found for 7 and 28 days. The strength achieved for compressive strength is increased till 20%. The young's modulus is found for 10 and 20%. The strength achieve for young's modulus is increased till 10% for both the grade. The project is based on sustainable development of concrete technology with eco-friendly environment.

Key words : Cementitious material, Compressive strength, Eco-friendly environment, Flexural strength, Permeability.

1. INTRODUCTION

More than 300 million tons of mechanical waste are being delivered per annum by concoction and farming procedure in India [1]. These materials present issues to wellbeing risks. Paper making by and large creates enormous measure of strong waste. Paper filaments can be reused just a predetermined number of times before they become excessively short or powerless to make top notch paper. The sparkling completion on lustrous magazine created utilizing a fine kaolin dirt covering, which additionally gets strong waste during reusing [7]. The strong squanders for paper industry are utilized in creating stream and vitality in power station. The expected outcome of the hypo Sludge which is extracted from the factory is shown in the figure 1.

Use either SI (MKS) or CGS as primary units. (SI units are



Figure 1: Hypo Sludge Production from Factory

To deliver 1 tons of Portland Pozzolanic Cement tremendous measure of carbon-di-oxide is discharged into air which is unsafe to human wellbeing. Almost 10% to 30% of hypo muck can be utilized rather than concrete in solid street development [4]. The sparkling completion on lustrous magazine delivered utilizing a fine kaolin mud covering. Which additionally gets strong waste during reusing. The strong waste for paper industry are utilized in delivering stream and vitality in power station. To create 1 tons of Portland Pozzolanic Cement enormous measure of carbon-di-oxide is discharged into environment which is dangerous to human health. Nearly 10% to 30% of hypo slop can be utilized rather than concrete in solid street development

2. EXPERIMENTAL PROGRAM

2.1. Cement

The Cement makes concrete more impermeable, denser as compared to make the concrete[5]. Cement is the most valuable material to prepare the concrete which is used for the binding property of the materials used in the concrete. In this research we have used ordinary Portland cement which is not contain any fly Ash in the cement.

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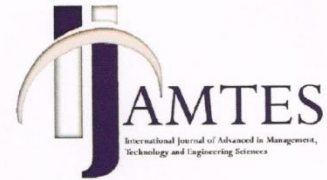
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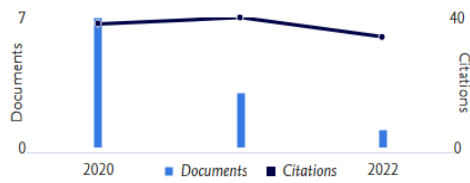
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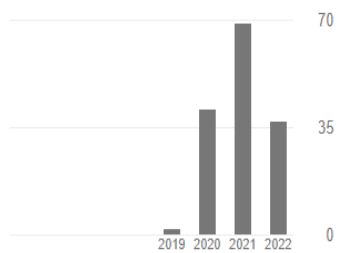
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