

# ANUPAMA V.A.



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A passionate and prudent civil engineer, enthusiastic in the conservation of heritage structures. A researcher by passion and profession, seeking honourable Prime Minister's Research Fellowship for research excellence and accomplishment.

## EDUCATION

- 1. PhD** [January 2020 - Present]  
Division : Building Technology and Construction Management  
Institute/University : Indian Institute of Technology, Madras  
CGPA (in the scale of 10) : **10**
- 2. Master of Technology** [July 2017 – May 2019]  
Division : Building Technology and Construction Management  
Institute/University : Indian Institute of Technology, Madras  
CGPA (in a scale of 10) : **9.06**
- 3. Bachelor of Technology** [July 2013 – May 2017]  
Department : Civil Engineering  
Institute/University : National Institute of Technology, Calicut  
CGPA (in a scale of 10) : **8.79**

## RESEARCH INTERESTS

- Microstructural characterization
- Repair and Rehabilitation
- Chemistry of construction materials
- Concrete technology
- Heritage structures
- Microanalytical techniques

## POSITIONS OF RESPONSIBILITY

- Associate Secretary of Civil Engineering Association, NITC (2016-'17)
- Elected member of Students Activity Council (2016-2017)
- Chief Student Editor of NITC College Magazine ((2016-'17)
- Senior Executive-Media Committee-Tathva, Ragam (2015, 2016 and 2017)
- Executive of the hospitality and public relation committee as part of the national conference TISI-2015.
- Senior executive of Literary and Debating Club, NITC.
- Founder organizer of I-INK, Literature festival of NITC.
- Student Member of Indian Concrete Institute and NITC NSS team.
- Coordinator of civil technical event 'Labyrinth'.
- Higher secondary school leader (2012-2013), High school head girl (2010-2011)

**INTERESTS**

- Literature- passionate about fictions and travelogues
- Experimentation in classical dance
- Music lover

**RESEARCH EXPERIENCES****1. Earthen vault historic structures of Ancient Egypt**

- Case study project work as part of the six-week virtual summer internship on heritage conservation organized by conservation architects, Dharaohar and Kalakriti: June 2020

The case study project focussed on the storerooms of Ramesseum temple and the Temple of Sety I in Abydos. History of the place, characteristics of the brick units used for construction, types of bonds present, intricacies in vault construction, admixtures used were studied for both the locations. The damages observed through the literature review were segregated, and causes for each damage was identified. The repair works conducted by various teams including architects, conservationists, scientists and historians were analyzed. Alternate repair methodology and intervention proposals were suggested for both locations after scrutinizing the current state of repair works.

**2. Sandwich technique in Reinforced Earth wall construction.**

- M.Tech major project work under the guidance of Dr. R.G. Robinson (Professor, Indian Institute of Technology Madras, Chennai, India) and Mr. R. Ranjith (CPM, Kerala-Kanyakumari Road Project, Transportation Infrastructure IC, Larsen&Toubro): June 2018 – May 2019

The utilization of marginal soil as backfill in the Reinforced Earth (RE) wall construction is practically impossible as the properties of the base soil does not adhere to the requirements specified by the MoRTH and IRC SP-102 (2014). From the results obtained from the preliminary characterization tests on the soil collected from Nagercoil, it is seen that the base soil has high Plasticity Index (PI = 24%) whereas the specification states to have a PI < 6%. The higher fines content is also not satisfying the requirement. To allow the maximum usage of the local soil available, and minimize the consumption of granular aggregates, design alteration of adopting Sandwich technique was considered. The numerical modelling using PLAXIS 2D was focussed on comparing the effect of different backfill materials on the factor of safety, facing displacement and deformed mesh of the RE wall. Three types of backfills were used for the analysis: marginal soil alone, marginal soil and aggregate mixed at a ratio of 70:30 and aggregate alone. Geogrid spacing followed were 0.5m, 0.8m and 1m for all these backfill combinations. From the numerical modelling and cost analysis, it was concluded that the sandwich technique could be adopted with a geogrid spacing of 1m in the construction of RE wall in the functional and economic point of view.

**3. Evaluation of properties of aerated lightweight concrete with rice husk ash as partial replacement of sand.**

- B.Tech major project work under the guidance of Dr. J Sudhakumar (Professor, National Institute of Technology, Calicut, Kerala, India) and Ms. Reesha Bharath (Assistant Professor, National Institute of Technology, Calicut, Kerala, India): July 2016 – May 2017

The project focussed on the variation of the fresh and hardened properties of aerated concrete when the fine aggregate was replaced with residual rice husk ash (RHA) and controlled burnt rice husk ash (CBRHA). Specimens with RHA and CBRHA with different replacement levels were tested for compressive strength, water absorption, and fresh density. The results indicated that a replacement level of 75% of residual RHA and CBRHA and 0.05% Al powder dosage yielded aerated concrete specimens having favourable strength and parametric durability values. A replacement of 50% will give strength greater than second class brick strength (IS 1077:1992). To reduce the water absorption, maintain the compressive strength, full replacement of sand with polymer-coated residual RHA was carried out. The compressive strength test values were comparable to that of residual RHA, and CBRHA added specimens.

**4. Effect of Corrosion Inhibitors on Durability Parameters of Cement Mortar**

- Summer internship project work along with Oviya Pugal (co-intern) under the guidance of Dr. Sripriya Rangaraju, Mr. Sundar Rathnarajan (PhD scholars, IIT Madras, Chennai, India) and Dr.

Radhakrishna G. Pillae (Associate Professor, Indian Institute of Technology Madras, Chennai, India):  
May 2015 – June 2015

Corrosion inhibitors can be used as admixtures to increase the corrosion resistance of the reinforcements used in RCC structures. The project focussed on investigating the effect of three commercially available bipolar corrosion inhibitors on the strength and durability parameters of the mortar. Oxygen Permeability Index and Water Sorptivity were tested for 3 different dosages of each inhibitor. The results indicated that the compressive strength and resistance to water absorption of the mortar are significantly affected by the addition of corrosion inhibitors. The strength and durability characteristics were affected by the type of inhibitor and dosage.

## PUBLICATION

- A conference paper on 'Effect of Corrosion Inhibitors on Durability Parameters of Cement Mortar', presented in CORCON-2015.

## PROFESSIONAL EXPERIENCES

- Teaching assistant for the NPTEL Course on Basic Construction Materials, managing 4500+ enrolled students (January 2020 – Present)
- Teaching assistant for the NPTEL Course on Advanced Concrete Technology, managing 11000+ enrolled students (July 2020 – December 2020)
- Half time research assistant for the courses- Construction materials laboratory (January 2020 – July 2020)
- Served as a senior planning engineer in the Transportation Infrastructure Independent Company of Larsen and Toubro (July 2019 - November 2019)
- Half time research assistant for the courses- Construction contracts and specifications, Construction software laboratory (June 2018 – May 2019)
- Visited tribal colonies of Muthanga in the district of Wayanad, Kerala, exploring the social settlement and topographic influence on the lifestyle of people as part of National Service Scheme, NIT Calicut (December 2014 - January 2014)

## INTERSHIPS AND WORKSHOPS

- An online workshop on lime plastering- traditional material and technique for historic structures organized by The City Palace Museum, Maharana of Mewar Charitable Foundation, Udaipur (October 17, 2020)
- An online workshop on the microscopic techniques to study mineral materials in cultural heritage organized by the University of Vienna and Fwswral Monuments Authority, Austria (September 7, 2020 – September 12, 2020)
- A virtual summer internship on heritage conservation organized by conservation architects Dharohar and Kalakriti (May 2020 - July 2020)
- Industrial internship in the Kerala-Kanyakumari Road Project of Larson and Toubro (May 2018 - June 2018)
- Summer Fellowship Program in the Building Technology and Construction Management Division, IIT Madras (May 2015 - July 2015)

## PERSONAL DETAILS

Date of Birth	:	30-05-1995
Linguistic competencies:	:	English, Malayalam, Tamil and Hindi

**REFERENCES**

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- Dr. Radhakrishna G. Pillai,  
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**DECLARATION**

I hereby declare that the above-mentioned information is correct up to my knowledge and I bear the responsibilities for the correctness of the above-mentioned particulars.

Anupama V.A.