News Letter - 22

July to December 2020

Civil Quest

Department of Civil Engineering

SR Engineering College

Ananthasagar (V), Hasanparthy (M), Warangal 506371

Vision

To be a leader in developing competent Civil Engineers.

Mission

- Build Civil Engineering knowledge in students by implementing novel educational strategies
- Develop effective instructional infrastructural resources.
- Promote interdisciplinary learning
- Contribute to the growth of Civil Engineering through community service, consultancy and research

Program Educational Objectives (PEO's)

PEOs (Program Educational Objectives) relate to the career and professional accomplishments of students after they graduate from the program. The Civil Engineering graduates from S R Engineering College, Warangal are expected to

- **Build knowledge and skill** set required for solving Civil Engineering problems
- **Create innovative technical ventures** in Civil Engineering.
- **Promote Research and consultancy activities** to solve Real world Civil Engineering problems.

Program Outcomes (PO's)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO's)

- Apply knowledge of mathematics, science and engineering to analyze, design and execute the Civil Engineering structures for the betterment of the society and the nation.
- Acquire the knowledge about various techniques, skills and modern Engineering tools required for the construction of Civil Engineering structures.

Publications

1. Kumar, K. R., Shyamala, G., Awoyera, P. O., Vedhasakthi, K., & Olalusi, O. B. (2020). Cleaner production of self-compacting concrete with selected industrial rejects-an overview. Silicon, 13(8), 2809-2820. doi: 10.1007/s12633-020-00636-6.

2. Prasad, M. G., Golla, S. Y., Prabhanjan, N., Krishna, A. S., & Alok, G. (2020). Mechanical properties of rubberized concrete using truck scrap rubber. Materials Today: Proceedings, 39, 849-854. doi: 10.1016/j.matpr.2020.10.358.

3. Yadav, G. S., Ayyappa, R. A., Guruprasad, M., Prasad, G. H., Vyshnavi, S., & Pragnya, C. (2020, September). Compressive Strength of PPC Based Quaternary Blended Concrete. In IOP Conference Series: Materials Science and Engineering (Vol. 925, No. 1, p. 012007). IOP Publishing. doi: 10.1088/1757-899X/925/1/012007

4. Shyamala, G., Rajesh Kumar, K., & Olalusi, O. B. (2020). Impacts of nonconventional construction materials on concrete strength development: case studies. SN Applied Sciences, 2(11), 1-11. doi: 10.1007/s42452-020-03687-x

5. Prabhanjan, N., Golla, S. Y., Sahithi, G., Chandu, B., Rathore, R. S., Guruprasad, M., & Swetha, M. (2020, December). The Effect of Partial Replacement of Micro Silica in Asphalt Mix. In IOP Conference Series: Materials Science and Engineering (Vol. 981, No. 3, p. 032054). IOP Publishing. doi: 10.1088/1757-899X/981/3/032054

6. Prabhanjan, N., Sahithi, G., Golla, S. Y., Preethi, S., Ramya, G., & Anuhya, D. (2021). Strength evaluation of glass powder impregnated asphalt mix. Materials Today: Proceedings, 39, 771-775. doi: 10.1016/j.matpr.2020.09.506

7. Golla, S. Y., Kumar, K. R., Khan, M. I., Rahul, C., & Raj, K. P. (2021). Structural performance of exterior beam-column joint using biochar impregnated pond ash concrete. Materials Today: Proceedings, 39, 467-471. doi: 10.1016/j.matpr.2020.07.722

8. Yadav, G. S., Sudarshan, D. S., Sahithi, G., & Prasanna, E. L. (2020, June). Predicting the characteristics of pond ash concrete using artificial neural networks. In IOP Conference Series: Materials Science and Engineering (Vol. 872, No. 1, p. 012176). IOP Publishing. doi: 0.1088/1757-899X/872/1/012176

Impacts of nonconventional construction materials on concrete strength development: case studies

Abstract: Sustainable building technology is a new approach adopted in built environment, which is focused on significantly reducing impact of the construction industry on the environment. Moreover, the world is largely driving development of sustainable and smart products to mitigate global pollution issues. In this study, assessment of the impacts of using alternative constituents such as crumb rubber, coconut shell, recycled aggregate, GGBS, human hair, banana fiber, industrial sludge, saw dust, rice husk, wood waste, textile, copper slag, textile, glass powder, plastic etc., on concrete strength development using case studies has been performed. The paper explores the research work carried out towards sustainable approach in replacement of basic composition of concrete. It focuses on various waste materials used as a substitute options in concrete and characteristic strength development along with potential challenges. Leading researches relating to sustainable materials were also explored. The results show that the alternative aggregates, mostly with minimally usage of about 20% increased the compressive strength properties of concrete. Usage of fibres to about increased the flexural property of concrete and the replacement of waste sludge didn't show appreciable increased of compressive strength.

Keywords: *Sustainable materials, Industrial waste, strength properties, Mix proportion, Performance of concrete*

Citation: Shyamala et al., 2020, SN Appl. Sci. 2, doi. 10.1007/s42452-020-03687-x

Cleaner production of self-compacting concrete with selected industrial rejects-an overview

Abstract: Sustainability issues have been a major concern in the construction field, owing to the over exploration of natural raw material sources. The high demand of natural materials is traceable to increasing urbanization and industrialization. Various landmark research achievement has been made in the production of self-compacting concrete in recent years. The focus has been on the use of wastes emanating from agricultural, construction, and industrial activities. However, finding a workable framework for the use of the alternative materials is still an issue. This study presented procedures for cleaner production of self-compacting concrete with selected industrial rejects. The use of waste materials (supplementary cementitious materials (S.C.M.) and recycled materials) were explored. The materials, according to research trend, were either utilized as a partial or total replacement of conventional materials. From the available data, the study found that industrial by-products demonstrated potential to serve as an alternative material in production of self-compacting concrete. It is shown from the study that greener, and sustainable S.C.C. with enhanced properties could be achieved by using industry rejects. The presented procedures will serve as a guide for industrial application of the materials, and also foster economic benefits to the construction sector..

Keywords: *Sustainable, Green Self-compacting concrete, Industrial waste materials, Fibers*

Citation: Rajesh., et al 2020, Silicon 13, 2809–2820. doi: 10.1007/s12633-020-00636-6

Mechanical properties of rubberized concrete using truck scrap rubber

Abstract: Concrete is becoming most widely used construction material owing to its versatility and dynamic nature of adopting addition of any admixture into it. Numerous research works were being undertaken by several researchers across the globe to study the inherent nature of concrete with and without various admixtures, replacement agents and chemicals. Usage of natural resource consumption is steadily on raise which is a point to ponder and this is also widely studied in context of concrete generation which is one of the prominent CO2 emitting industry. Usage of alternate materials in concrete production is a trend gaining impetus, many materials studied in laboratory were being used in field already. This work primarily focusses on production of concrete using crump rubber as an additive material in concrete to increase its toughness and durability. Two different strengths of concrete (M25 and M35) are studied in this work with varying proportion of rubber added to the concrete. With the results obtained via design of experiments we had added crump rubber from 10 to 30% with reference to the weight batching and conducted experiments in M35 grade concrete. Strength characteristics such as compressive, tensile (split) and modulus of rupture is calculated which is found to be decreasing with the increasing percentage of crump rubber. This may be the effect of voids created due to the crump rubber addition which can be filled via addition another admixture. Comparing with the control concrete a decrease in strength of about 18%, 39% and 26% is obtained for M25 grade of concrete concerned with Compressive, Tensile and Flexural strengths, respectively. Concerned with the M35 grade of concrete the same is found to be at 20%, 47% and 33% for Compressive, Tensile and Flexural strengths respectively comparing to the respective controlled concrete. Hence usage of crump rubber is suggested only at an optimal level above which the strength seems to be reducing.

Keywords: *Fine aggregate, Crumb rubber, Volume/volume replacement, Mechanical properties, Truck scrap.*

Citation: Guru Prasad., et al 2020, Materials Today – Proceedings, 39(1) doi: 10.1016/j.matpr.2020.10.358

Performance Management of Transmission Line Tower Foundations against Corrosion by Non Destructive Testing

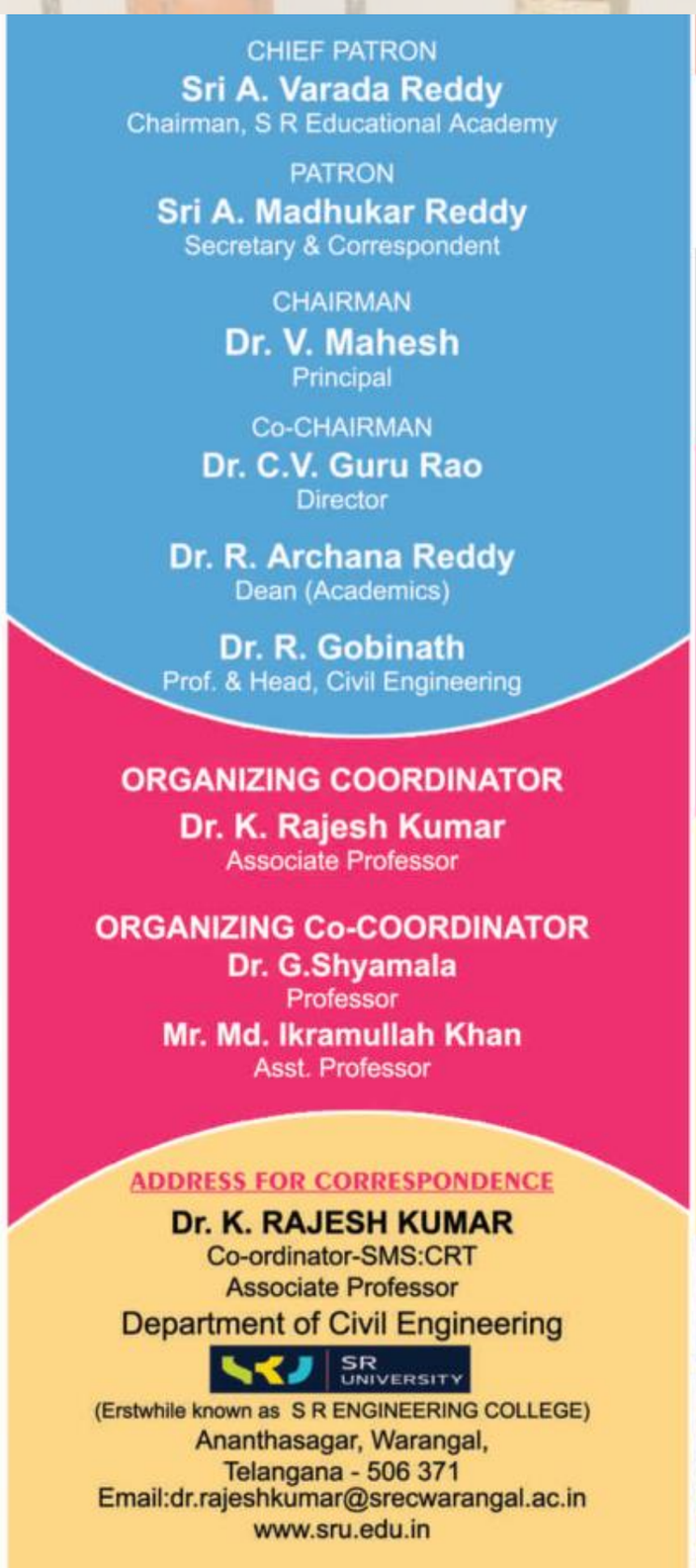
Abstract: Highways are laying with two sorts of materials like Bituminous and Concrete. The need to change customary asphalt because of the high support cost of the framework. World producing enormous number of waste glass yearly on the planet. This paper speaks to an exertion taken to create altered bituminous blending, in which waste squashed glass powder was supplanted in partial total. Various moulds were set up with various blends and contrasted by leading marshal stability tests to check its quality. Most noteworthy dependability is accomplished with 15% of squashed glass, fulfilling the outcomes contrasted with ordinary bitumen was researched.

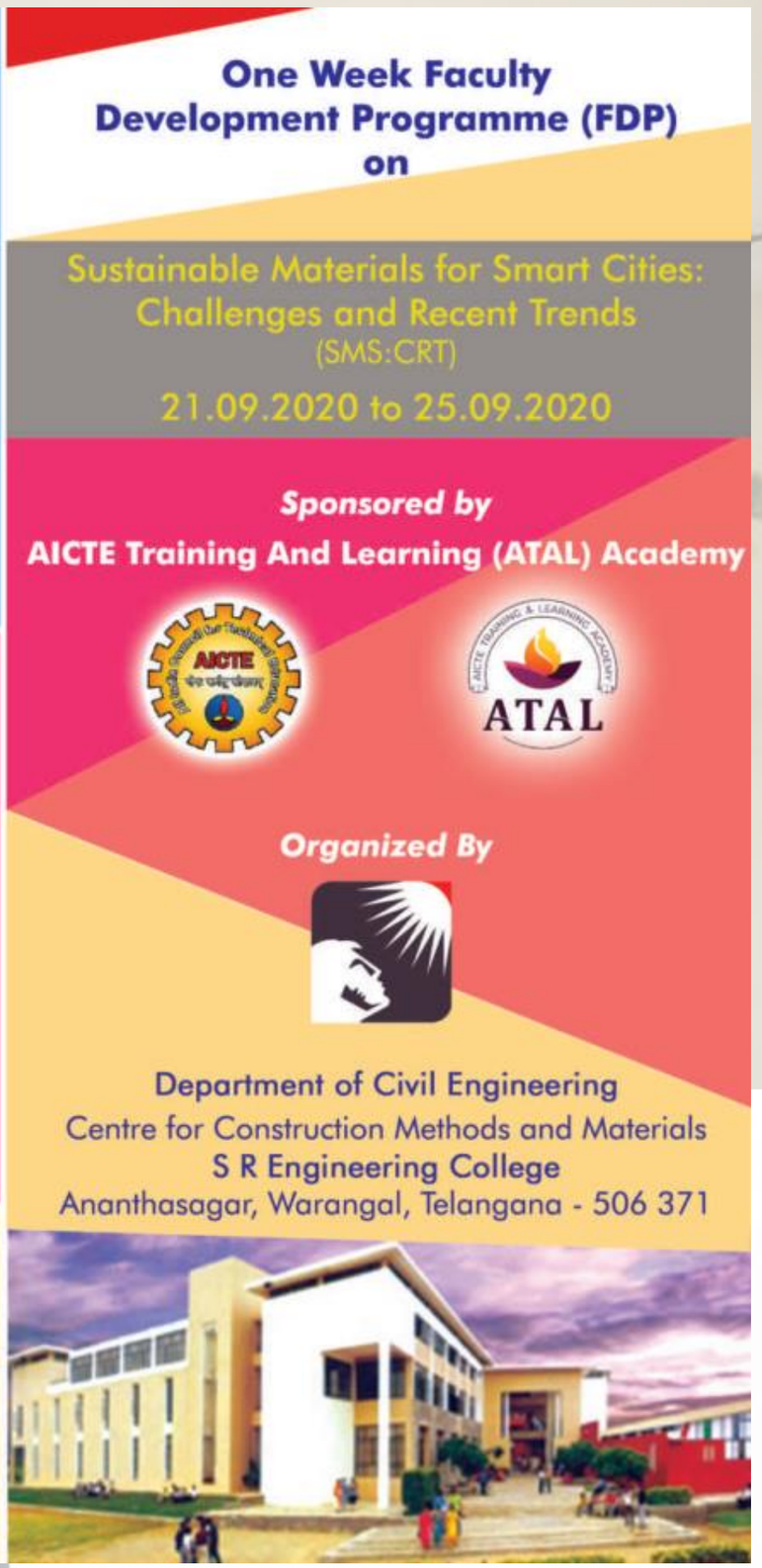
Keywords: *Asphalt, Bitumen, Waste glass, Marshal stability, Flow value.*

Citation: Prabhanjan., et al 2020, Materials Today – Proceedings, 39(1) doi: 10.1016/j.matpr.2020.09.506

Departmental & Student Activities

1. Five Days Online Faculty Development Programme (FDP) on "Sustainable Materials for smart cities : Challenges and Recent trends", between 21st and 25th September 2020, Organised by the Department of Civil Engineering, Centre of Construction Methods and Materials, and Sponsored by AICTE Training and Learning (ATAL) Academy.





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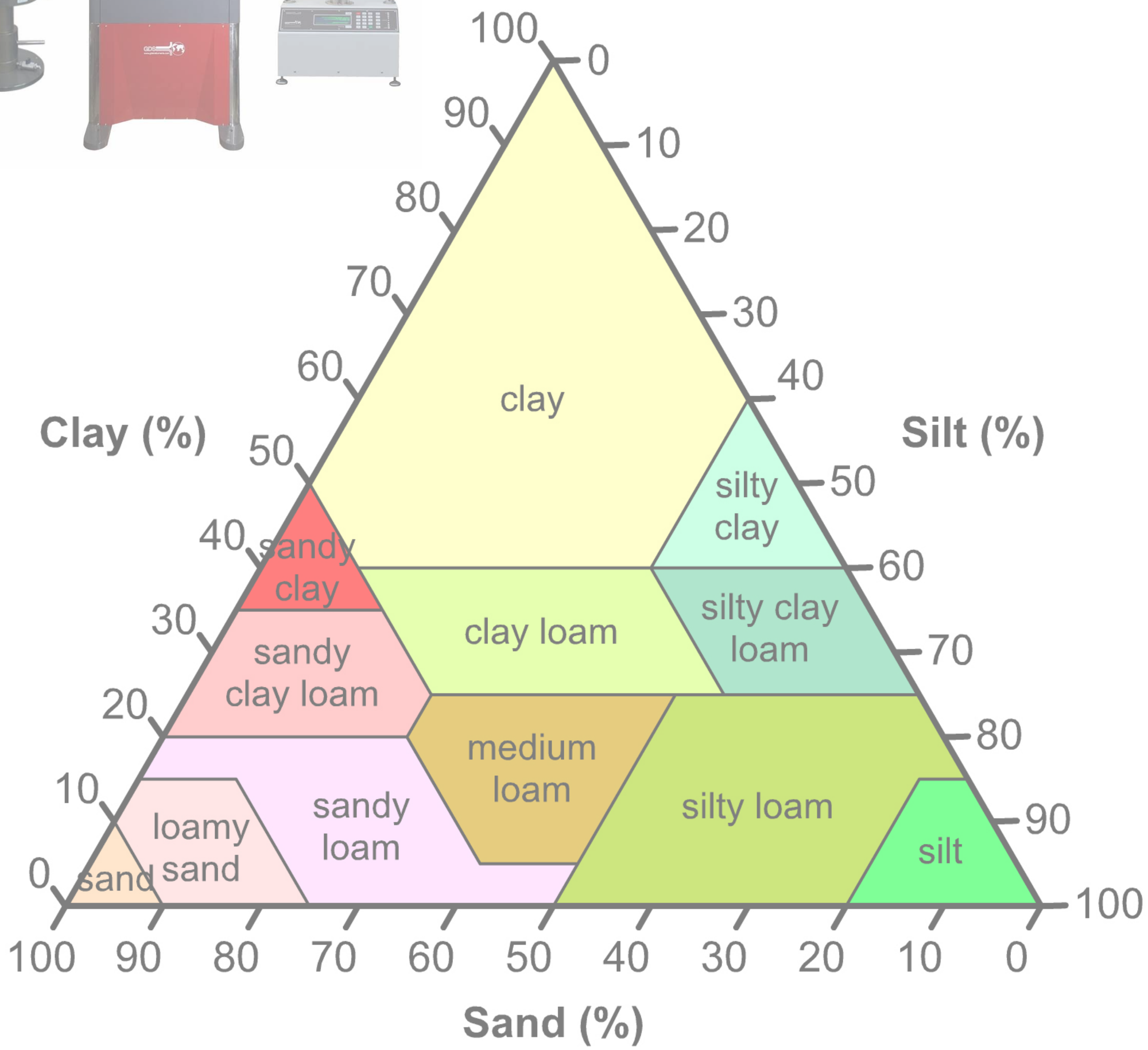

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