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Strength Behaviour of Geopolymer Concrete by using Different Mineral Admixtures

M. Chaitanya Nava kumar¹, Dr. K. Chandramouli², G. Hymavathi³, J. Sree Naga Chaitany⁴,

A. Venkata Suresh Reddy⁵

Assistant Professor, Department of Civil Engineering^{1,3&4} Professor & HOD, Department of Civil Engineering³

B. Tech Student, Department of Civil Engineering⁵

NRI Institute of Technology, Visadala (V), Medikonduru (M), Guntur, Andhra Pradesh, India

Abstract: The world is developing rapidly and therefore the construction of buildings takes vital role. If we bear thoroughly the usage of concrete gets raised up so it ends up in the shortage of the natural resources. so as to save lots of our natural resources, by replacing a number of the proportions within the concrete with the subsequent measures. By using ash and GGBS as admixture in geopolymer concrete in equal percentages (50-50%). The results obtained from compressive strength, split durability test for the age of 7-and 28-days strength-polymer concrete is one among the building materials that became more popular in recent years thanks to the very fact that it's significantly more environment friendly than standard concrete-polymer concrete could be a variety of concrete that's made by reacting aluminates and silicate bearing materials with a caustic activator. Commonly, waste materials like ash or slag from iron and metal production are used, which helps result in a cleaner environment. Geo-polymer concrete completely replaces cement by ash, ground granulated furnace slag and therefore the polymer materials.

Keywords: Fly Ash, GGBS, Sodium Hydroxide and Sodium Silicate

REFERENCES

- [1]. Sujatha, Kannapiran. K and Nagan.S., "Strength assessment of heat cured geopolymer concrete slender column", Asian Journal of civil Engineering 13(5) (2012), 635-646.
- [2]. P. Chindaprasirt, Homwuttiwong.S, and Sirivivatnanon.V, "Influence of fly ash fineness on strength, drying shrinkage and sulfate resistance of blended cement mortar," Cement and Concrete Research, 34 (7) (2004), 1087–1092.
- [3]. Hussin M., et al., Performance of blended ash geopolymer concrete at elevated temperatures. Materials and Structures, 48(3) (2015), 709-720.
- [4]. P. Chindaprasirt, T. Chareerat, S. Hatanaka and T. Cao, "High Strength Geopolymer Using Fine High-Calcium Fly Ash", Journal of Materials in Civil Engineering, 23(3) (2011), ASCE Journal.
- [5]. Pattanapong Topark-Ngarm, PrinyaChindaprasirt and VanchaiSata, "Setting Time, Strength, and Bond of High-Calcium Fly Ash Geopolymer Concrete", Journal of Materials in Civil Engineering, 27(7), ASCE Journal, July 2015
- [6]. "Experimental Study on Partial Replacement of Cement with admixture", is published in IJER, 5(3), May-June, 2017, ISSN: 2321-7758.
- [7]. Study on Recycled Coarse Aggregate Concrete with is published in IJER, 8, (3), (2017), ISSN: 2321-7758.
- [8]. Du Haiyan, Yang Lina, Gao Wanqi, Liu Jiachen, "Effects of characteristics of fly ash on the properties of geopolymer", Transactions of Tianjin University, Springer, 22(3) (2016), 261–267.
- [9]. C.S. Maneeshkumar, G. Manimaran, S. Prasanth, "An Experimental Investigation on GGBS and Flyash Based Geopolymer Concrete with Replacement of Sand by Quarry Dust", International Journal of Engineering Research and Applications, ISSN: 2248-9622, 5(5), 91-95 May 2015,
- [10]. Y.M. Liew, A.M. Mustafa Al Bakri, M. Bnhussain, M. Luqman, I. Khairul Nizar, C.M. Ruzaidi, Constr. Build. Mater., 3(7) (2012), 440.

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- [11]. K.Arul priya, "Strength and Durability Studies of M-Sand and Fly Ash Based Geopolymer Concrete", International Journal of Trend in Research and Development, 3(3) (2016), ISSN: 2394-9333.
- [12]. Provis J L, Kilcullen A, Duxson P, Brice D G and van Deventer J S J 2012 Industrial & Engineering Chemistry Research 51(5) 2483-2486.
- [13]. Jun N H, Minciuna M G, Abdullah M M A, Jin T S, Sandu A V, Ming L Y 2017 Revista de chimie 68(10) 2367-72.
- [14]. Chen X, Sutrisno A and Zhu L 2017 Journal of the American Ceramic Society 100(5) 2285-2295.
- [15]. Chiu Y P, Lu Y M and Shiau Y C 2015 Materials Research Innovations 19(5) 642-649.
- [16]. O. Boukendakdji, S. Kenai, E. H. Kadri, and F. Rouis, "Effect of slag on the rheology of fresh selfcompacted concrete," Construction and Building Materials, 23(7) (2009)2593–2598,.
- [17]. H. Yan, W. Sun, and H. Chen, "effect of silica fume and steel fiber on the dynamic mechanical performance of high strength concrete," Cement and Concrete Research, 29(3) (1999)423–426.
- [18]. S. Aydin and B. Baradan, "effect of fiber properties on high performance alkali-activated slag/silica fume mortars," Composites Part B: Engineering, 45 (1) (2013), 63–69.
- [19]. R. Detwiler and P. K. Mehta, "Chemical and physical effects of silica fume on the mechanical behavior of concrete," Aci Materials Journal, 86 (6) 609–614, 1989.
- [20]. T. Bakharev, "Resistance of geopolymer materials to acid attack," Cement and Concrete Research, 35(4) (2005) 658–670.