

# **THE EFFECT OF NIPAH SHELL ASH ON THE COMPRESSIVE STRENGTH OF CONCRETE WITH $f'_c$ 30 MPa QUALITY USING GROLLEN HP 19R ADDITIVE**

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## ***ABSTRACT***

*Concrete is a construction material that plays a crucial role in infrastructure development due to its strength and durability. One approach to improving concrete performance is by utilizing organic waste-based additives such as nipah shell ash, which has pozzolanic properties, and the chemical admixture Grolen HP 19R, which functions as a superplasticizer. This study aims to analyze the effect of combining nipah shell ash and Grolen HP 19R on the slump value and compressive strength of concrete with a target strength of  $f'_c$  30 MPa, determine the optimal mix proportion, and evaluate the potential use of organic waste in sustainable construction. The variations of nipah shell ash used were 0.1%, 0.3%, 0.5%, and 0.7% by weight of cement, while Grolen HP 19R was consistently used at 0.2%. Testing was conducted at the concrete age of 28 days. The results showed that adding 0.5% nipah shell ash and 0.2% Grolen HP 19R maintained workability within the standard range (slump  $12 \pm 2$  cm) without additional water and achieved an average compressive strength of 30.01 MPa, representing a 1.23% increase compared to normal concrete. In contrast, the use of nipah shell ash without Grolen HP 19R reduced compressive strength by up to 32.33%. Therefore, the combination of nipah shell ash and Grolen HP 19R is recommended as an eco-friendly innovation capable of improving concrete quality while reducing organic waste.*

**Keywords:** *Nipah shell ash, pozzolanic material,  $f'_c$  30 MPa concrete, Grolen HP 19R, compressive strength, slump, superplasticizer.*