Modified hyperbolic model for capturing undrained shear behavior

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Abstract: The hyperbolic and modified hyperbolic models are proposed to predict the stress-strain response of the uncemented, naturally cemented and induced cemented clays under undrained shear so as to suggest the simple analysis and assessment. The hyperbolic responses of stress ratio and shear strain (η, ε_s) as well as of effective mean principal stress and shear strain (p prime , ε_s) are introduced to assess the undrained shear behavior of the uncemented and naturally cemented clay. The modified hyperbolic responses are employed for the induced cemented clays. These models consist of the parameters, which control the constitutive behavior of the uncemented, naturally cemented, and induced cemented clays in undrained situation. These parameters are easily determinable from standard triaxial tests. The predicted and laboratory responses are in good agreement.

Keyword: Clay - Shear stress - Strain - Mechanical testing -Mathematical models