

# EVALUASI INTEGRITAS PONDASI *BOREPILE* BERDASARKAN KORELASI UJI *CROSSHOLE SONIC* *LOGGING (CSL)* TERHADAP MUTU BETON

Nama : Muhammad Izza Prasetya  
NIM : 202009  
Nama : Amelia Sukmawati  
NIM : 202012  
Pembimbing : Juandra Hartono, ST., M.Eng.

## ABSTRAK

Permasalahan yang terjadi pada saat konstruksi *borepile abutment* 1 proyek pembangunan duplikasi jembatan Pulau Balang bentang pendek adalah terjadinya kelongsoran di area sekitar lubang bor ketika *preboring*, adanya pembengkakan volume beton yang mencapai 36% saat proses pengecoran, dan penggunaan pipa *casing* yang tidak mencapai kedalaman maksimum. Penelitian ini bertujuan untuk mengetahui integritas beton pada 5 tiang *borepile*, mengetahui kondisi tanah pada kedalaman maksimum setelah pengecoran, dan mengetahui korelasi antara hasil uji *Crosshole Sonic Logging (CSL)* terhadap mutu beton yang di capai. Metode yang diterapkan berfokus pada pengujian *Non Destructive Testing (NDT)* berupa *Crosshole Sonic Logging* yang hasilnya dikorelasikan terhadap mutu beton *borepile*, selain itu dilakukan juga analisa geoteknik untuk mengetahui stratifikasi tanah pada lubang bor. Hasil dari analisa menunjukkan kondisi integritas beton pada 5 tiang *borepile abutment* 1 masuk dalam kategori *Good* dengan nilai *velocity* di rentang  $>3,66 \text{ km/s}$  s.d.  $4,57 \text{ km/s}$  sedangkan kondisi tanah pada ujung *borepile* masuk dalam kategori sangat padat dengan plastisitas rendah, dimana tanah pada kondisi tersebut memiliki kuat geser yang tinggi. Hasil korelasi nilai *velocity* 5 tiang *borepile* terhadap kuat tekan ( $f_c'$ ) menunjukkan bahwa semakin tinggi cepat rambat gelombang (*velocity*) maka nilai kuat tekan cenderung semakin meningkat, dan semakin berat *massa / density* beton, nilai cepat rambat gelombang dan kuat tekan cenderung semakin tinggi.

**Kata kunci** : *Borepile*, Integritas beton, *Crosshole Sonic Logging*, *Korelasi*, *Velocity*

***EVALUATION OF BOREPILE FOUNDATION INTEGRITY  
BASED ON CORRELATIONS OF CROSSHOLE SONIC  
LOGGING (CSL) TEST ON CONCRETE QUALITY***

***Name*** : Muhammad Izza Prasetya  
***NIM*** : 202009  
***Name*** : Amelia Sukmawati  
***NIM*** : 202012  
***Advisor*** : Juandra Hartono, ST., M.Eng.

***ABSTRACT***

*The problems that occurred during the construction of borepile abutment 1 of the Balang Island short span bridge duplication project were the occurrence of landslides in the area around the borehole during preboring, an increase in the volume of concrete until 36% during the casting process, and the use of temporary casing that did not reach the maximum depth of the borehole. This study aims to determine the integrity of the concrete on five borepiles, determine soil conditions at the maximum depth after casting, and determine the correlation between the results of the Crosshole Sonic Logging (CSL) and concrete compressive strength. The method applied focuses on non-destructive testing (NDT) in the form of Crosshole Sonic logging, whose results are correlated to the quality of borepile concrete. In addition, geotechnical data was analysed to determine soil stratification in the borehole. The results of the analysis show that the integrity of the concrete on the 5 borepiles abutment 1 piles is in the good category with velocity values in the range of >3,66 km/s to 4,57 km/s. Meanwhile, the soil conditions at the end of the borepile fall into the very dense category with low plasticity, where the soil in these conditions has a high shear strength. The results of the correlation of the velocity value of the 5 borepile piles to the concrete compressive strength ( $f_c'$ ) show that with a higher propagation speed (velocity), the compressive strength value tends to increase. And the heavier the density of the samples, the higher the velocity and concrete compressive strength tend to be.*

***Keywords*** : Borepile, Concrete Integrity, Crosshole Sonic Logging, Correlation, Velocity.