

Application of woven waste tires gabion wall as slope reinforcement for preventing landslide in laboratory

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Background

Landslide Hazards in
Indonesia

>500 occurrences
>100 fatalities
>100 displaced

Landslide
Mitigation?

Many landslides area
has no mitigation
work <> High Cost

How to reduce the
cost?

We need alternative
material for landslide
mitigation

Application of woven waste tires gabion wall as
slope reinforcement for preventing slope failure





Objective



What is the most effective stripe distance?





Methodology

1. Preliminary Test



Testing process



Before test



After test

Waste tire tensile strength test with UTM





Methodology

2. Loading Test



Loading test were applied to five stripe distance variations of woven tires gabion wall – i.e. 3, 4, 5, 6 and 7 cm





Result and Discussion

The result of the tensile strength test

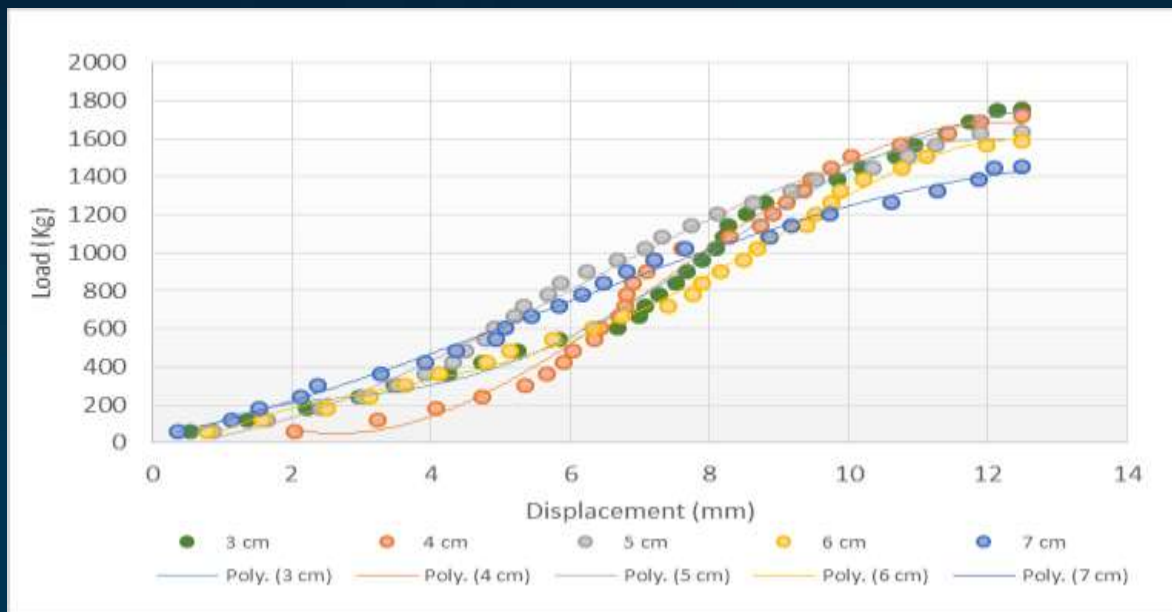
No	width (cm)	thin (cm)	length (cm)	Max Load (kN)	Tensile Strength (MPa)
1	3.0	0.2	9.0	1.50	25.00
2	3.0	0.2	9.0	1.85	30.83
3	3.0	0.2	9.0	1.65	27.50
Average					27.78

Considering the tensile strength of galvalume wire (± 400 MPa), a higher area of woven waste tires was applied to reach the same tensile force.



Result and Discussion

Loading test result for each stripe distance variation

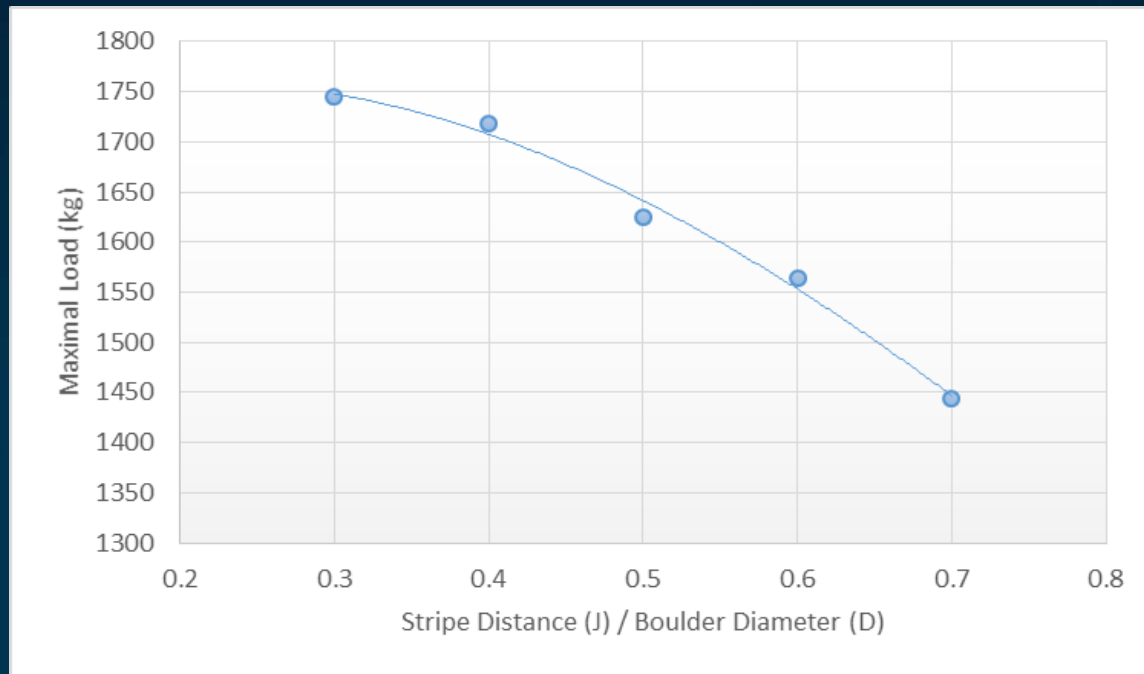


Every variation of stripe distance has the same pattern of displacement-load correlation. When load was applied on the sample, the gabion wall almost reached failure, though the box endured it until the real failure



Result and Discussion

Correlation between J/D and Maximum load



The strength slightly declines when the J/D increases from 0.3 to 0.4 cm (1 %). On the other hand, the strength decreases steeply when the J/D increases more than 0.4 (+ 5%)





Conclusion

- Based on the laboratory model test, woven waste tires are worthwhile as an alternative material for gabion wall boxes with respect to both tensile strength and environmental effect.
- The correlation between displacement and load from the loading test shows that the gabion wall has strength hardening models of failure.
- In the field application, the most recommended J/D is less than 0.4.



 **Terima Kasih**

