



INTISARI

Perencanaan jembatan yang ramah lingkungan menjadi aspek tersendiri yang harus diperhatikan, seiring berkembangnya isu pemanasan global dan krisis energi. Penelitian ini mengkaji tentang perencanaan jembatan pejalan kaki menggunakan material kayu hutan rakyat. Analisis dilakukan dengan pemodelan 3D pada *software* bantu SAP2000. Tahapan penelitian terdiri dari pengujian *mechanical properties* kayu dan optimasi bentang maksimum jembatan. Hasil pengujian sifat mekanik didapatkan hasil bahwa kayu jati hutan rakyat Blora memiliki nilai E_{min} 5757 MPa. Berdasarkan SNI-7973:2013 nilai tersebut termasuk dalam kode mutu E11. Desain jembatan pejalan kaki menggunakan tipe rangka *Warren Truss*. Berdasarkan hasil pengujian kapasitas jembatan diperoleh defleksi maksimum ditengah bentang sebesar $9,8 \text{ mm} < L/300$ (20mm), sedangkan hasil pengujian dinamik diperoleh frekuensi alami arah vertikal sebesar 18,65 Hz dengan percepatan puncak sebesar $0,037 \text{ m/s}^2$. Hasil ini menunjukkan bahwa desain jembatan kayu pejalan kaki dari kayu jati hutan rakyat memenuhi batas kenyamanan menurut EN 1990:2002, yang membatasi frekuensi alami arah vertikal $> 5 \text{ Hz}$ dan percepatan puncak $< 2 \text{ m/s}^2$.

Kata kunci: perencanaan, jembatan pejalan kaki, kayu jati hutan rakyat

ABSTRACT

Eco-friendly bridge planning is an important aspect to be considered, as global warming and energy crisis develops. This study examines the planning of pedestrian bridges using teak wood of community forest. The analysis was done with 3D modeling of SAP2000 assisted software. The research stages consist of mechanical properties wood testing and optimization of the maximum span of the bridge. Test results of mechanical properties obtained results teak wood of community forest Blora have value of E_{min} 5757 MPa. Based on SNI-7973: 2013 the value is included in the E11 quality code. The design of the pedestrian bridge uses the Warren Truss frame type. Based on the result of bridge capacity test, there is a maximum deflection in the middle of the span of $9.8 \text{ mm} < L / 300$ (20mm), while the dynamic test results obtained natural frequency vertical direction of 18.65 Hz with peak acceleration of $0.037 \text{ m} / \text{s}^2$. These results indicate that the design of pedestrian wooden bridges of teak wood forest meets the limits of comfort according to EN 1990: 2002, which limits the natural frequency of vertical direction $> 5 \text{ Hz}$ and peak acceleration $< 2 \text{ m} / \text{s}^2$

Keywords: design, pedestrian bridge, teak wood of community forest