

2<sup>nd</sup> INTERNATIONAL CONFERENCE

# TIMBERBRIDGES

LAS VEGAS 2013



## CABLE-STAYED TIMBER FOOTBRIDGE WITH TWO TOWERS

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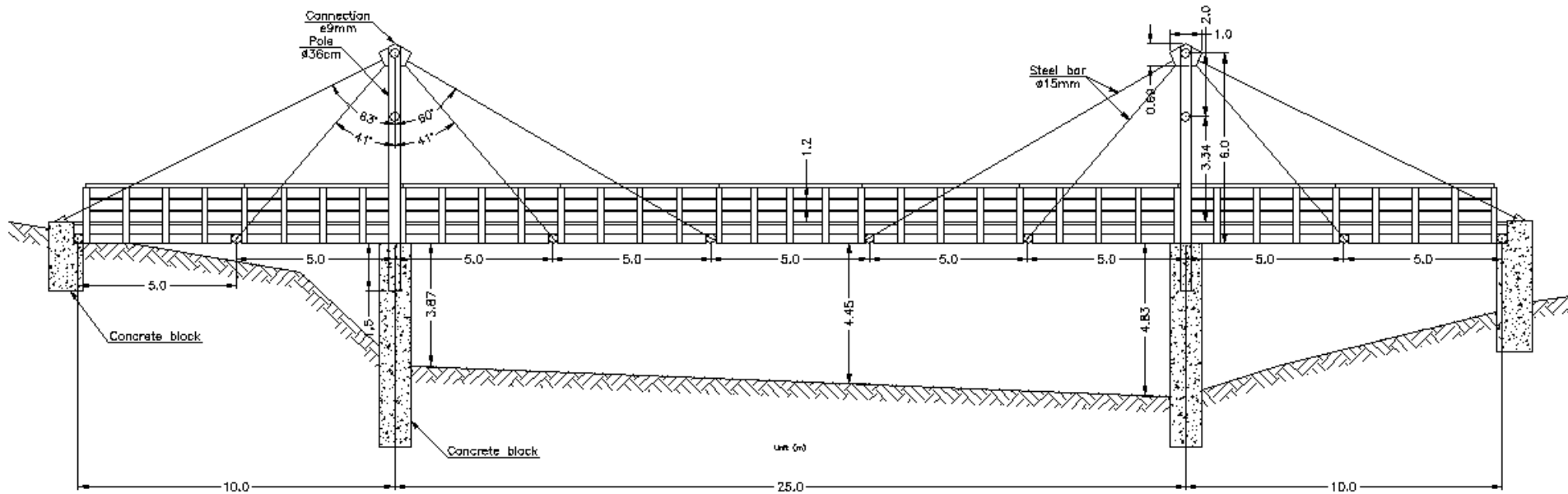


# 1. Introduction

The structure of the cable-stayed footbridge designed in Laboratory of Wood and Timber Structures consists of foundation and basis for support made of reinforced concrete, the pieces from *Eucalyptus citriodora* CCA treated in autoclave: two main towers with two masts each 36 cm in diameter and 6.10 m in height; locking the mast 30 cm in diameter and 2.6 m in length; stringers diameter of 30 cm with 10 me 7.5 m in length; beams 30 cm in diameter and 3.4 m in length; support the railing with 12 cm diameter and 2 m in length; banister railing about 12 cm in diameter and 5 m in length; closing the umbrella body with 8 cm diameter and 2 m long. The tray was made of sawn *Mezifaurus itauba* gauge 4 x 16 x 280 cm receiving painting process. The Dywidag steel bar 15 mm in diameter. Metal parts and special connections: plates, threaded rods, bolts, nails, steel bars galvanized and painted with fire.



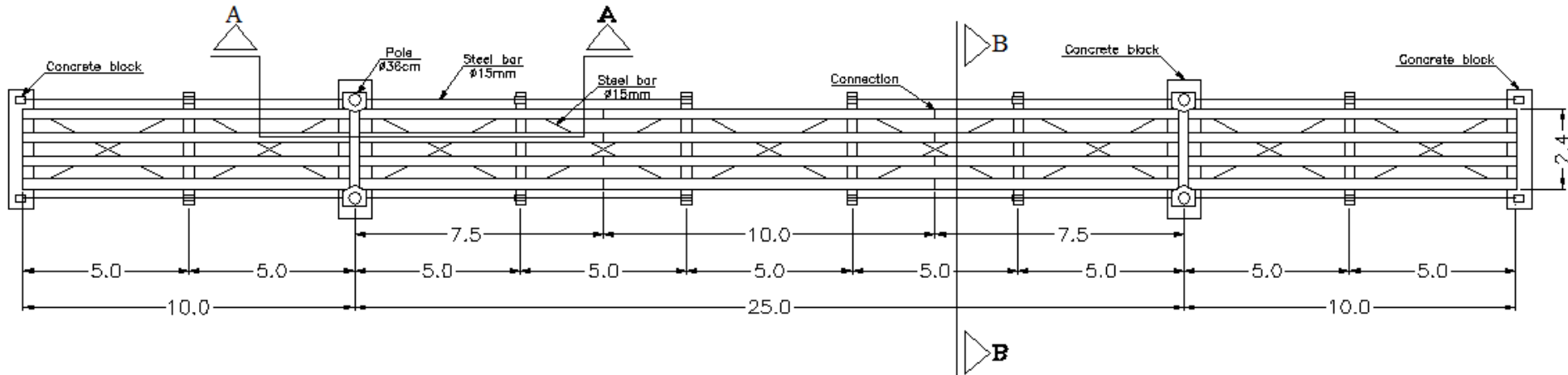
## 2. Geometrical characteristics of the footbridge



The structure of the central footbridge with stretch span of 25 m was designed with double stringers of 7.5 m and 10 m in length attached to tower. The side spans with span of 10 m were also designed with double stringers 10 m in length.

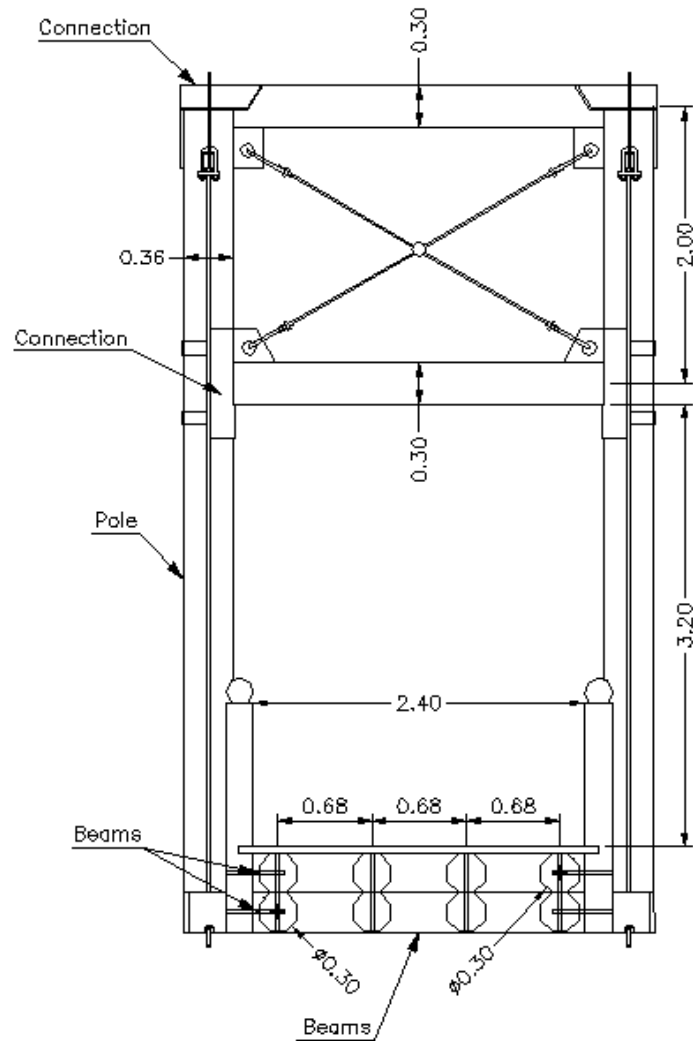


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## 2. Geometrical characteristics of the footbridge



Four out of every mast stays, two for each side, and you are one of the external is docked in the cradle supporting the footbridge to avoid tipping the tower to the inside of the river.

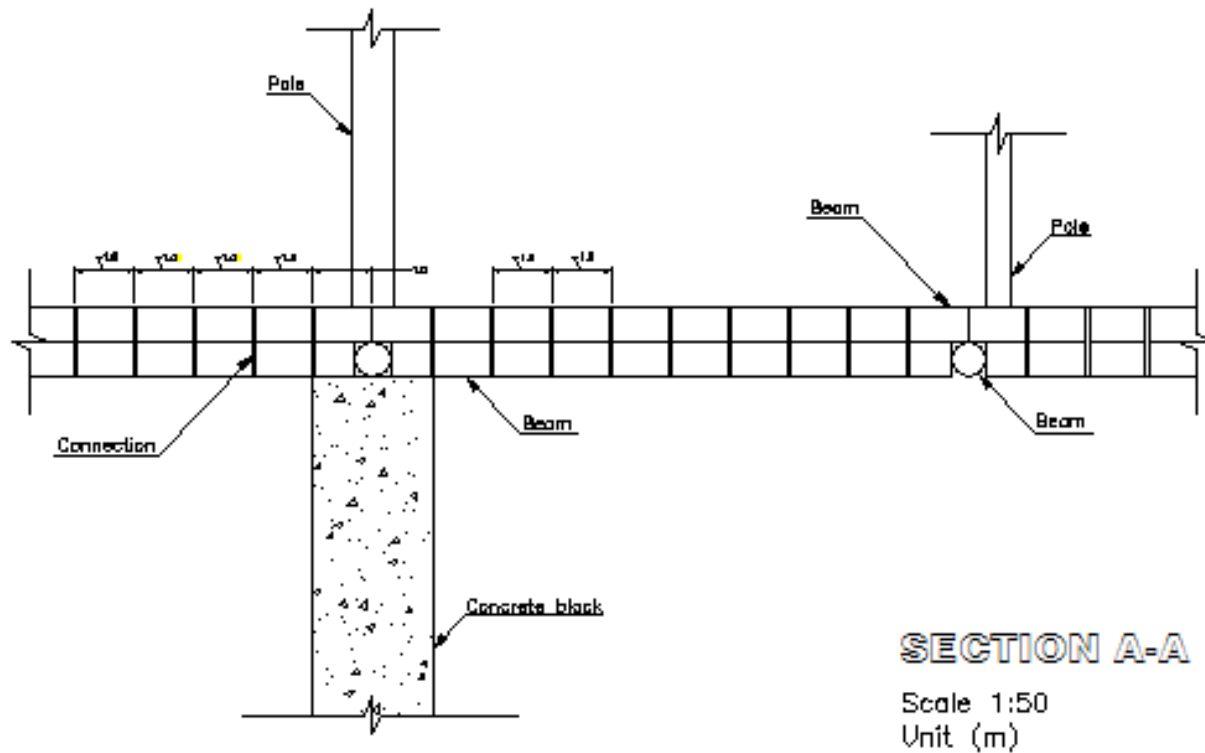
SECTION B-B

Scale 1:50

Unit (m)

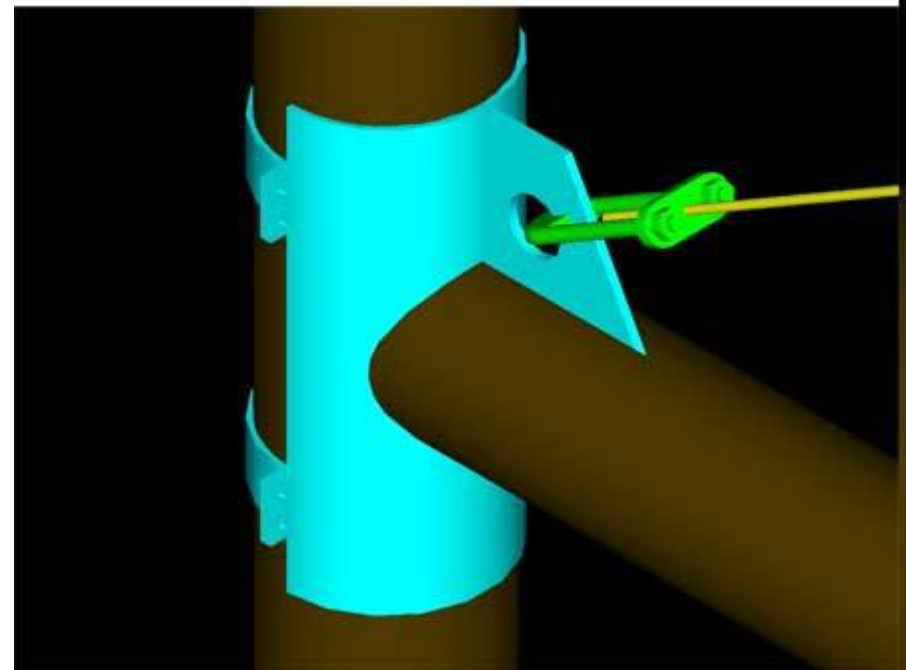
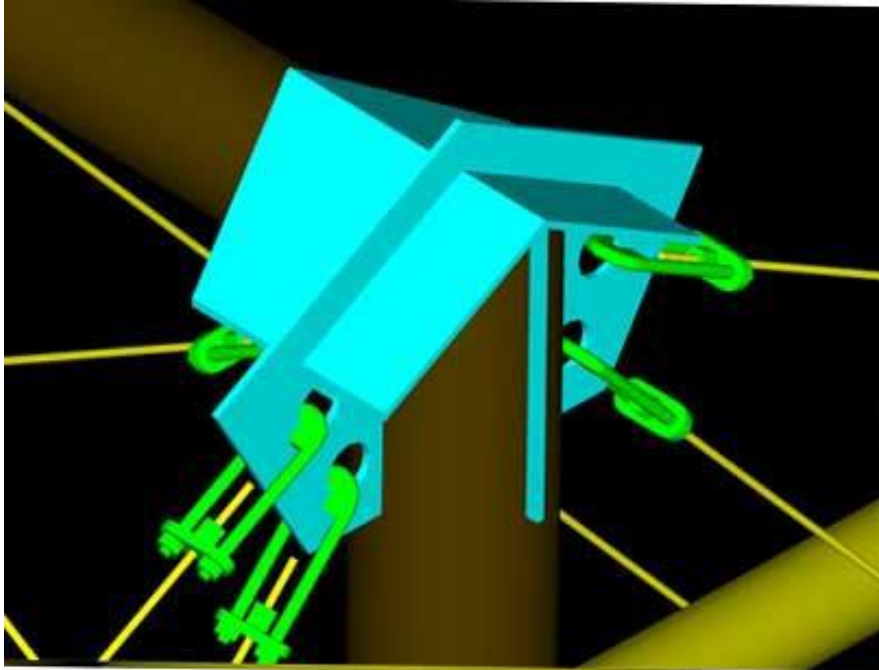


### 3. Geometrical characteristics of the footbridge



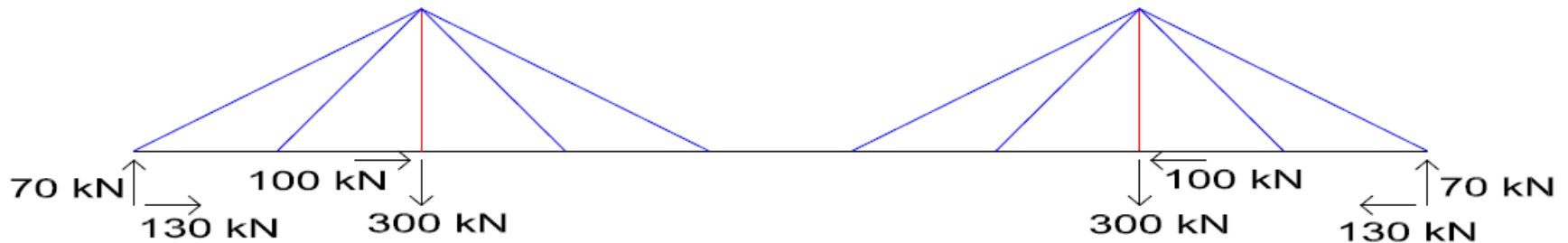
The foundation was executed in reinforced concrete, whose masts were set: the foundation blocks.

## 4. Connection



The connecting pieces, especially of the art in mast are designed in 3D graphical environment through the program AutoCAD®, in order to visualize how these parts would connection after finished.

## 5. Structural analysis and design



The survey of efforts used in the preparation design were obtained through structural analysis program SAP2000® [2], based on finite element method. The secondary structural elements and were sized following the guidelines of the Brazilian Standard Design Timber Structures.

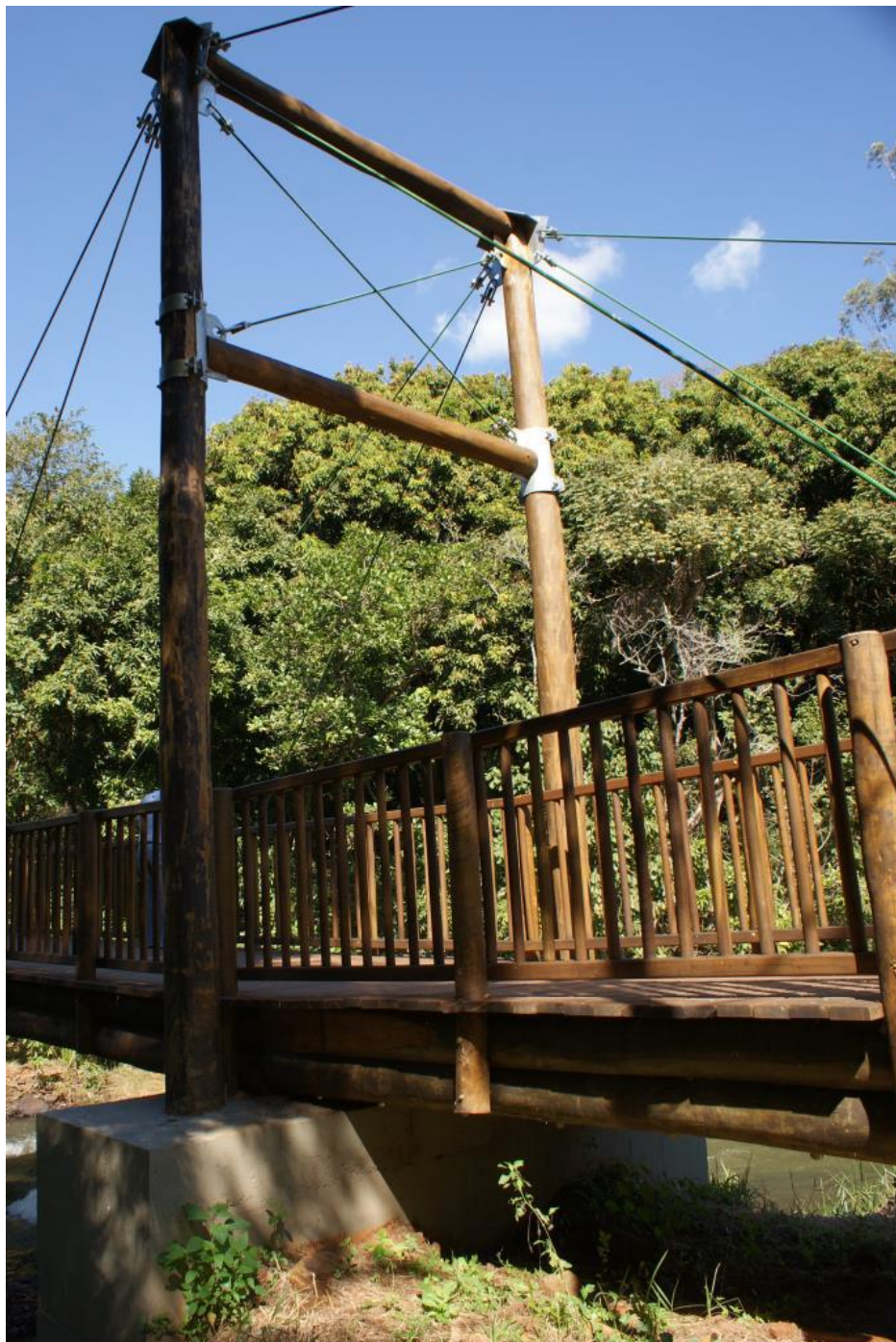


## 6. Details of Construction



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## 7. Conclusions

The cable-stayed footbridge wood shows the feasibility of using wood from reforestation, renewable, particularly *Eucalyptus citriodora* as being an excellent structural material, which features low power consumption, great relationship weight / resistance and durability when treated.

The Brazilian Standard Design Timber Structures presents all the concepts for the design and dimensioning of timber structures.

The structure was adequate to the environment, because the material used in the construction does not contrast with the proposal to the use of this public work. Undoubtedly, the wooden structures could be used in these projects.

Evaluation after 5 years of foot bridge construction showed a good structural and durability performance.





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**Thank you!!!!**  
**Questions?!?!?**

