

ABSTRAK

Jembatan Sengkaring adalah sebuah jembatan rangka baja tipe *warren* yang dibangun di atas Sungai Sengkaring di Kecamatan Bantur, Kabupaten Malang. Jembatan ini terletak pada STA 68 + 125 dan menghubungkan dua daerah yaitu Balekambang dan Blitar. Jembatan yang memiliki satu bentang sepanjang 45 m ini dirancang ulang untuk memberikan alternatif desain sesuai standar terbaru.

Perancangan ulang dilakukan menggunakan penampang *box girder* beton prategang sesuai standar AASHTO-PCI-ASBI dan pembebanan sesuai SNI 1725:2016. Bentang jembatan yang dirancang sepanjang 45 m dengan *external post tensioned segmental concrete box girder* metode *span-by-span*. Pemodelan dilakukan menggunakan *software* CsiBridge.

Hasil perancangan ulang adalah penampang *box girder* dengan tinggi 2100 mm berdasarkan *AASHTO-PCI-ASBI Segmental Box Girder Standards* dapat digunakan sebagai alternatif desain. Kuat tekan beton yang digunakan 40 MPa. Baja prategang yang digunakan jenis *low relaxation 7-wire strands (ASTM A416) grade 270*. Jumlah tendon yang digunakan 10 buah dengan jumlah masing-masing *strands* sebanyak 27 buah. Tulangan nonprategang menggunakan BJTS55 dengan diameter 19 mm untuk tulangan longitudinal dan diameter 14 mm untuk tulangan geser. Berdasarkan analisis batas layan dan ultimit, nilai tegangan beton, kapasitas lentur, geser, dan puntir, serta batas lendutan memenuhi persyaratan.

Kata kunci: *box girder*, beton prategang, segmental, jembatan

ABSTRACT

Sengkaring bridge is a warren steel truss type of a bridge that constructed above Sengkaring River in Bantur sub-district, Malang regency. This bridge is located in STA 68 + 125 and connects two areas that are Balekambang and Blitar. The bridge that has one span with 45 m long was redesigned to give alternative bridge design based on the latest standards.

The redesign was calculated with pre-stressed box girder cross section that defined from AASHTO-PCI-ASBI Segmental Box Girder Standards and bridge loads refer to SNI 1725: 2016. The span of the redesign bridge is 45 m long with external post tensioned segmental concrete box girder and span-by-span method. The bridge is modeled using CSiBridge software.

The result is that the 2100 mm box girder cross section from AASHTO-PCI-ASBI Segmental Box Girder Standards are compatible to use. The materials that are used consist of 40 MPa of concrete compressive strength, low relaxation 7-wire strands (ASTM A416) grade 270 type of pre-stressed cable, and BJTS55 reinforced steel with a diameter of 19 mm in longitudinal rebar and diameter of 14 mm in transversal rebar. Based on the analysis of both service limit state and ultimate limit state, the top and bottom concrete stress, capacity of longitudinal, transversal, also torsion, and the limit of deflection are qualified.

Keywords: box girder, prestressed concrete, segmental, bridge