

## ABSTRAK

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**Judul** : Aplikasi Teknologi Form Traveler Underslung Pada Supporting Formwork Main Deck Proyek Jembatan Cable Stayed Teluk Kendari  
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Penggunaan teknologi *Form Traveler Underslung* pada pengecoran *in situ* main deck Jembatan Cable Stayed merupakan salah satu alternatif Metode Pelaksanaan Pembangunan Jembatan yang melintasi atau membentangi laut, selat, sungai atau jurang. Aplikasi Teknologi Form Traveler pada pengecoran *in situ* deck jembatan cable stayed berawal dari konsep design form Traveler, detail fabrikasi dan assembly, erection, launching dan operasional form Traveler. Komponen utama form traveler terdiri dari : Main Girder, Transverse Truss, Casting Hanger, Main Kicker, Launching Hanger dan Komponen Bekisting Form Traveler terdiri dari Edge Beam Formwork, Inner Formwork, Platform Bracket, Inner Formwork Support System, Gantry. Pekerjaan pengecoran segmen deck jembatan yang menggunakan Form Traveler meliputi : Persiapan launching, Release Bekisting Bawah Edge Beam, Release Bekisting Dalam, Launching ke Segmen berikutnya, Fixing FT (CH, Kicker, LH), Formwork Setting, Install Guide Pipe , Install Stay Cable Tahap I, Install Pembesian, Install Post Tensioning, Pengecoran Slab Segmen (SS/MS), Curing. Perhitungan Kekuatan Batang Tarik Form Traveler saat pengecoran per segmen Deck Jembatan sepanjang 9 m dengan volume beton : 185,91 m<sup>3</sup> dan beban (Pu) : 4461,84 KN lebih kecil dari kekuatan batang tarik kondisi fraktur  $Q_t P_n$  : 5.378,91 KN, sehingga kekuatan batang tarik pada Form Traveler tersebut aman dan kuat. Dari hasil perhitungan didapatkan kelangsingan ( $\lambda$ )  $60,40 < 300$  (memenuhi). Analisis *biaya konstruksi* form traveler ditentukan berdasarkan komponen : Material Baja Struktur dan Fabrikasi, Design, Assembly dan Hidraulic System, Operasional, Transportasi/Delivery, dan peralatan bantu sebesar Rp. 62.694.825.971. Hasil perhitungan *produktivitas* pekerjaan pengecoran deck yang menggunakan form traveler dituangkan pada *Gantt-chart* /schedule dalam bentuk bar-chart Microsoft Project. Pengecoran Segmen Deck Jembatan yang menggunakan Form Traveler sebanyak 32 Segmen didapatkan durasi Pekerjaan Pengecoran : 11-14 hari tiap segmen dari target rencana awal di 13 hari tiap segmen. Penerapan Teknologi Form Traveler perlu didukung site management antara lain : Pengaturan shift pekerja yang efektif dan efisien serta skill, kompetensi, keahlian tenaga kerja, Arrangement peralatan kerja utama, Inovasi Metode Kerja, Optimasi Pelaksanaan Pekerjaan dengan siklus durasi waktu kerja yang cepat sehingga dapat menurunkan biaya operasional.

*Kata Kunci* : Form Traveler, Underslung, in situ, biaya konstruksi, produktivitas, Gantt-chart.

## ABSTRACT

The use of *Underslung Traveler Form* technology *in situ* main deck casting Cable Stayed Bridges is one alternative method of implementing bridge construction that crosses or stretches the sea, straits, rivers or ravines. The application of Traveler Form Technology *in situ* deck casting of cable stayed bridges originated from the concept of Traveler form design, detailed fabrication and assembly, erection, launching and operation of the Traveler form. The main components of the traveler form consist of: Main Girder, Transverse Truss, Casting Hanger, Main Kicker, Launching Hanger and Formwork Components. The traveler form consists of Edge Beam Formwork, Inner Formwork, Platform Bracket, Inner Formwork Support System, Gantry. Bridge deck segment casting work using Form Traveler includes: Launching Preparation, Release Formwork Under Edge Beam, Release Deep Formwork, Launching to the next Segment, Fixing FT (CH, Kicker, LH), Formwork Setting, Install Guide Pipe, Install Stay Cable Phase I, Install Ironing, Install Post Tensioning, Casting Slab Segment (SS/MS), Curing. Calculation of Tensile Rod Strength of Form Traveler when casting per segment of Deck The 9 m long bridge with concrete volume: 185.91 m<sup>3</sup> and load (Pu) : 4461.84 KN is smaller than the strength of the tensile rod QtPn fracture condition: 5,378.91 KN, so that the tensile rod strength on the Traveler Form is safe and strong. From the calculation results obtained slenderness ( $\lambda$ )  $60.40 < 300$  (meet). The analysis of the *construction cost* of the traveler form is determined based on components: Steel Structure and Fabrication Materials, Design, Assembly and Hydraulic System, Operations, Transportation / Delivery, and auxiliary equipment amounting to Rp. 62,694,825,971. The results of the calculation of the *productivity* of deck casting work using the traveler form are poured on the *Gantt-chart* /schedule in the form of a Microsoft Project bar-chart. Bridge Deck Segment Casting using the Traveler Form as many as 32 Segments obtained the duration of Casting Work: 11-14 days per segment from the initial plan target of 13 days per segment. The application of Traveler Form Technology needs to be supported by site management, including: Effective and efficient worker shift arrangements as well as skills, competencies, workforce expertise, Arrangement of main work equipment, Work Method Innovation, Work Implementation Optimization with a fast work time duration cycle so as to reduce operational costs.

*Keywords* : *Form Traveler, Underslung, in situ, construction cost, productivity, Gantt-chart.*

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Mengetahui

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