



INTISARI

Jalan penghubung Desa Wonolelo dan Desa Wukirsari hanya terbuat dari timbunan tanah dengan gorong-gorong di bawahnya. Tanah timbunan mulai tergerus akibat hujan deras. Hal tersebut menghambat lalu lintas sehingga jembatan baru yang aman, awet, dan memenuhi kaidah perancangan struktur perlu dibangun. Tugas akhir ini membahas mengenai perencanaan jembatan meliputi perancangan struktur atas, struktur bawah, hingga biaya pembangunan jembatan.

Pembebanan jembatan dan kombinasi pembebanan ditentukan sesuai ketentuan. Analisis struktur berupa analisis linear dan pembebanan gempa menggunakan metode respon spektrum. Desain elemen girder, diafragma, pelat, dan pilar memperhitungkan penulangan lentur, geser, dan torsi. Fondasi dirancang aman terhadap geser, lentur, dan memperhatikan daya dukung tanah. Revetment juga aman terhadap guling, geser, dan keruntuhan tanah dasar. Penulis menggunakan aplikasi berbasis *Building Information Modeling* untuk mengintegrasikan gambar kerja dan *material take off*. Biaya pembangunan jembatan didapatkan dari total perkalian antara volume pekerjaan dengan harga satuan dengan pajak pertambahan nilai 11%.

Jembatan dengan panjang total 10 m dan lebar 4 m dirancang menggunakan sistem struktur mirip seperti struktur portal. Jembatan bertipe T-girder ini memakai material utama beton. Dimensi balok girder dan diafragma adalah 50 cm x 35 cm, tebal pelat 20 cm, dimensi tiang sandaran 15 cm x 15 cm, serta dimensi pilar 40 cm x 40 cm. Tipe fondasi yang digunakan adalah fondasi telapak berdimensi 1,5 m x 1,5 m dan tebal 0,4 m. Revetment ditambahkan sebagai perkuatan lereng tanah di ujung jembatan menggunakan pasangan batu kali. Gambar kerja terdiri dari gambar landscape, arsitektural, dan struktural. Biaya total pembangunan jembatan adalah Rp121.533.573,00.

Kata kunci: Jembatan antardesa, T-girder, fondasi telapak, revetment, BIM



ABSTRACT

The road that connects Wonolelo and Wukirsari Village is only made of heaps of soil that have begun to be eroded due to heavy rains. This hampers traffic, so a new bridge structure that is safe, durable, and meets structural design principles needs to be built. This study discusses the design of the upper and lower structures and the cost of the bridge.

Bridge loading are determined according to the provisions. Structural analysis uses the linear analysis and earthquake loading uses the response spectrum method. The design of beams, plates, and pillars considers bending, shear and torsional reinforcement. The foundation is designed to be safe against shear, bending, and subgrade collapse. Retaining walls are also safe against overturning, shearing and subgrade collapse. The author uses a BIM-based software to integrate working drawings and materials take off. The cost of building the bridge is obtained from the total multiplication between the volume of work and the unit price with an 11% value added tax.

The bridge with a total length of 10 m and a width of 4 m is designed using a structural system like the portal. This T-girder type bridge uses concrete as the main material. The dimensions of the beams are 50 cm x 35 cm, the thickness of the plate is 20 cm, the dimensions of the backrest are 15 cm x 15 cm, and the pillars are 40 cm x 40 cm. Spread footing is used with dimensions of 1.5 m x 1.5 m and is 0.4 m thick. The retaining wall was added as a reinforcement of the slope at the end of the bridge using river masonry. Working drawings consist of landscape, architectural, and structural drawings. The total cost of building the bridge is IDR 121,533,573.00.

Keywords: Intervillage bridge, T-girder, spread footing, retaining wall, BIM