ABSTRAK

Proyek MRT Jakarta Fase 2A CP 203 menerapkan metode *Tunnel Boring Machine* (TBM) sebagai alternatif terbaik pada pekerjaan terowongan karena mampu menyesuaikan kondisi eksisting, meningkatkan efektivitas kerja, dan tingkat keamanan tinggi. Proyek akhir ini bertujuan untuk mengevaluasi pelaksanaan pekerjaan terowongan di lapangan dalam menyesuaikan kondisi eksisting, mengacu pada dokumen perencanaan. Fokus pembahasan adalah analisis pekerjaan persiapan terkait kondisi eksisting dan manajemen alat berat, analisis manajemen SHC, serta membandingkan metode pelaksanaan di lapangan mengacu pada dokumen perencanaan. Pengumpulan data dilakukan dengan pengamatan di lapangan terkait survei *critical lifting plan*, wawancara, dan pengumpulan data sekunder dan internal proyek. Langkah pertama adalah meninjau kondisi eksisting, menganalisis pekerjaan pengangkatan, meninjau pelaksanaan pekerjaan terowongan, serta meninjau penerapan SHC di lapangan.

Berdasarkan hasil analisis, kondisi eksisting didominasi tanah *silty clay* dengan MAT 1,49 – 3,18 meter dari permukaan tanah, juga terdapat terakota drainase dan Kanal Molenvliet. Tanah pendukung alat berat terbesar, *crawler crane* 250 ton dinyatakan aman dengan nilai daya dukung tanah ijin 397,81 kN/m^2. Berdasarkan analisis kapasitas angkat di lapangan, baik *crawler crane* 250 ton dan *rough terrain crane* 80 ton dinyatakan tidak aman dalam mengangkat material angkat terbesar. Tahapan metode pelaksanaan sesuai dengan dokumen perencanaan, tetapi terjadi keterlambatan hingga $\pm$ lima bulan yang sebagian besar diakibatkan karena penyesuaian kondisi eksisting. Dalam pengendalian manajemen SHC di lapangan dengan metode HIRAC, didapatkan bahwa pengendalian risiko dinyatakan efektif menekan tingkat risiko dengan *rating* risiko 39,2% *low*, 47,8% *moderate*, 13,00% *high*, dan 0% *extreme*.

Kata Kunci : Terowongan, *Tunnel Boring Machine*, Metode Pelaksanaan, Daya Dukung Tanah, Alat Berat, Metode HIRAC

ABSTRACT

MRT Jakarta Phase 2A CP 203 project employs the Tunnel Boring Machine (TBM) method as the best alternative for tunnel work due to its ability to adapt to existing conditions, enhance work effectiveness, and ensure high safety levels. This final project aims to evaluate the implementation of tunnel work in the field, adjusting to existing conditions and referring to planning documents. The focus of the discussion is the analysis of preparatory work related to existing conditions and heavy equipment management, SHC management analysis, and comparing field implementation methods with planning documents. Data collection was carried out through field observations related to critical lifting plan surveys, interviews, and the collection of secondary and internal project data. The first step is to review existing conditions, analyze lifting work, review the implementation of tunnel work, and review the application of SHC in the field.

Based on the analysis results, the existing conditions are dominated by silty clay soil with a MAT of 1.49 – 3.18 meters from the ground surface, and there are terracotta drainage and the Molenvliet Canal. The largest heavy equipment support soil, a 250-ton crawler crane, was declared safe with an allowable soil bearing capacity value of 397.81 kN/m^2. Based on the lifting capacity analysis in the field, both the 250-ton crawler crane and the 80-ton rough terrain crane were declared unsafe for lifting the heaviest materials. The implementation method stages are in accordance with the planning documents, but delays of up to ± five months occurred, mostly due to adjustments to existing conditions. In the SHC management control in the field using the HIRAC method, it was found that risk control effectively reduced the risk level with a risk rating of 39.2% low, 47.8% moderate, 13.00% high, and 0% extreme.

Keywords *: Tunneling, Tunnel Boring Machine, Implementation Method, Soil Bearing Capacity, Heavy Equipment, HIRAC Method*