

## **ABSTRAK**

# **ANALISIS RISIKO JADWAL KONSTRUKSI TIPE KONTRAK RANCANG BANGUN PADA PROYEK PEMBANGUNAN MRT JAKARTA FASE-2 PAKET PEKERJAAN CP201**

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Proyek Mass Rapid Transit Jakarta (MRT Jakarta) dilaksanakan dengan tipe kontrak Rancang Bangun yang relatif masih baru di Indonesia. Pembangunan fase-1 Proyek MRT Jakarta memberikan catatan bahwa risiko-risiko yang tidak diperhitungkan pada saat sebelum konstruksi berpotensi menyebabkan terjadinya kemunduran jadwal penyelesaian proyek. Pada konstruksi fase-2 khususnya paket CP201 yang mencakup lokasi antara Bundaran HI dan Harmoni, dilakukan penelitian atas peristiwa risiko dan penyebab risiko yang berpotensi menyebabkan mundurnya jadwal proyek sekaligus simulasi perkiraan waktu penyelesaian proyek.

Penelitian dilakukan menggunakan metode campuran, yaitu metode kualitatif untuk pemutakhiran *risk register* termasuk tingkat risiko (*risk rating*) dan metode kuantitatif untuk penghitungan perkiraan waktu penyelesaian proyek dengan menggunakan metode simulasi distribusi probabilitas Monte Carlo. Pemutakhiran *risk register* dilakukan dengan mengundang 13 orang narasumber yang memenuhi kriteria sebagai ahli pada pengerjaan konstruksi sistem perkeretaapian perkotaan bawah tanah dalam sebuah *focus group discussion* sekaligus memberikan perkiraan jadwal pada setiap aktifitas yang teridentifikasi sebagai kategori *extreme* dan *high* pada risk register.

Hasilnya, apabila identifikasi dan perlakuan risiko tidak dijalankan, maka dari hasil simulasi diperkirakan konstruksi MRT Jakarta fase-2 paket pekerjaan CP201 dapat diselesaikan paling cepat pada Mei 2026, rata-rata pada Oktober 2026 dan paling lama Maret 2027. Sedangkan apabila identifikasi dan perlakuan risiko dijalankan, diperkirakan konstruksi MRT Jakarta fase-2 paket pekerjaan CP201 diselesaikan paling cepat pada Januari 2025, rata-rata pada Mei 2025 dan paling

lama Agustus 2025. Selain itu didapatkan kegiatan-kegiatan yang dianggap paling berpengaruh terhadap waktu penyelesaian proyek adalah *Sarinah Station Construction Works (Korelasi 0,96)*, *Civil Works-Main Building (0,83)*, *Testing and Trial Run (0,63)* dan *Participate/On Standby During Integrated Testing and Commissioning (ITC) and Trial Run (0.63)*.

Kata Kunci: *risk management, monte carlo simulation, design build, task sensitivity*

## ABSTRACT

### CONSTRUCTION SCHEDULE RISK ANALYSIS ON THE DESIGN-BUILD CONTRACT TYPE IMPLEMENTED AT JAKARTA MRT CONSTRUCTION PROJECT PHASE-2 CP201 WORK PACKAGE

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*The Jakarta Mass Rapid Transit (MRT Jakarta) project has been being implemented with a relatively new type of Design-Build construction contract in Indonesia. The completion of Phase-I construction of the Jakarta MRT Project has brought records that when risks are not taken into account prior to construction works, they may lead delay on targeted completion schedule. For the Phase-2 of the MRT Jakarta Construction Project in particularly with the CP201 Work Package which scopes covers the area between Bundaran HI and Harmoni, this study has been carried out on risks that may effect the project schedule and the eventual completion date of the project as well.*

*The study was conducted using a mixed method of qualitative method for developing updated risk registers including risk rating and quantitative methods for calculating the estimated time of project completion by implementing the Monte Carlo probability distribution simulation method. Updating the risk register was done by inviting 13 subject matter experts who meet the criteria as experts in the construction of the underground urban railroad system in a focus group discussion forum who further providing a schedule estimate for each activity identified as extreme and high categories in the risk register.*

*The result shows that if identification and risk treatment is not carried out, fit is estimated that the construction of the Jakarta MRT phase-2 CP201 work package will be completed the fastest in May 2026, on average in October 2026 and the longest in March 2027. Whereas if identification and risk treatment is carried out, it is estimated that the construction of the Jakarta MRT phase-2 CP201 work package will be completed the fastest in January 2025, on average in May 2025 and the longest in August 2025. Besides that, it is found that the activities that*

*are considered to have the most influence on the project completion time are Sarinah Station Construction Works (Correlation 0.96), Civil Works-Main Building (0.83), Testing and Trial Run (0.63) and Participate / On Standby During Integrated Testing and Commissioning (ITC) and Trial Run (0.63)*

*Keywords: risk management, monte carlo simulation, design build, task sensitivity.*