

## ABSTRAK

Jalan tol Semarang - Demak merupakan salah satu proyek strategis nasional yang terdapat di Provinsi Jawa Tengah bagian utara. Pembangunan proyek ini ditujukan untuk meningkatkan mobilitas penduduk dan memperlancar lalu lintas serta mendukung upaya pencegahan penurunan permukaan tanah yang terjadi di Kota Semarang beberapa tahun belakangan. Dalam perancangan perkerasan kaku, perlu dilakukan berbagai analisis sehingga perancangan menjadi lebih efisien dan efektif untuk melayani beban kendaraan selama umur layanan yang telah ditetapkan.

Penelitian ini dilakukan untuk merancang ulang struktur perkerasan kaku tipe *Jointed Plain Concrete Pavement* (JPCP) dan *Jointed Reinforced Concrete Pavement* (JRCP) pada Jalan Tol Semarang - Demak STA. 10+690 sampai STA. 27+000 dengan metode empirik menggunakan metode AASHTO 1993 dan metode Manual Desain Perkerasan Jalan 2017 dengan umur rencana 40 tahun.

Hasil analisis kedua metode tersebut menunjukkan perbedaan struktur perkerasan kaku. Pada metode AASHTO 1993 diperoleh tebal perkerasan pada pelat beton sebesar 29,5 cm dilengkapi dengan *tie-bar* diameter 13 mm (ulir), jarak antar *tie-bar* 665 mm, panjang *tie-bar* 650 mm dan *dowel* dengan diameter 36 mm (polos), jarak antar *dowel* 300 mm, panjang *dowel* 450 mm untuk tipe perkerasan *Jointed Plain Concrete Pavement* (JPCP) sedangkan untuk tipe *Jointed Reinforced Concrete Pavement* (JRCP) ditambahkan tulangan memanjang dan melintang diameter 12 mm dengan jarak antar tulangan 350 mm. Pada metode Manual Desain Perkerasan Jalan 2017 diperoleh tebal perkerasan pada pelat sebesar 31,0 cm dilengkapi dengan *tie-bar* diameter 16 mm (ulir), jarak antar *tie-bar* 750 mm, panjang *tie-bar* 700 mm dan *dowel* dengan diameter 32 mm (polos), jarak antar *dowel* 305 mm, panjang *dowel* 460 mm untuk tipe perkerasan *Jointed Plain Concrete Pavement* (JPCP) sedangkan untuk tipe *Jointed Reinforced Concrete Pavement* (JRCP) ditambahkan tulangan memanjang dan melintang diameter 12 mm dengan jarak antar tulangan 350mm.

**Kata kunci:** Struktur perkerasan kaku, AASHTO 1993, MDPJ 2017, JPCP, JRCP

## ABSTRACT

*Semarang - Demak toll road is one of the national strategic projects located in the northern part of Central Java province. The construction of this project is aimed at increasing population mobility and facilitating traffic as well as supporting efforts to prevent land subsidence that has occurred in the city of Semarang in recent years. In designing rigid pavements, it is necessary to carry out various analyses so that the design becomes more efficient and effective to serve vehicle loads during the specified service life.*

*This research was conducted to redesign rigid pavement structures of the Jointed Plain Concrete Pavement (JPCP) type and the Jointed Reinforced Concrete Pavement (JRCP) type on Semarang - Demak toll road STA.10+690 to STA.27+000 with empirical method using AASHTO 1993 method and MDPJ 2017 method with design life of 40 years.*

*The analysis with both methods showed different values of rigid pavement structures. In the method of AASHTO 1993, rigid pavement obtained on a concrete slab by 29.5 cm equipped with tie-bar of 13 mm diameter (threaded steel bars), distance between tie-bar is 665 mm, length of tie-bar is 650 mm and dowel of 36 mm diameter (plain steel bars), distance between dowel is 300 mm, length of dowel is 450 mm for the Jointed Plain Concrete Pavement (JPCP) type while the Jointed Reinforced Concrete Pavement (JRCP) type added longitudinal and transverse reinforcement with 12 mm diameter and spacing of 350 mm. In the method of MDPJ 2017, rigid pavement obtained on a concrete slab by 31.0 cm equipped with tie-bar of 16 mm (threaded steel bars), distance between tie-bar is 750 mm, length of tie-bar is 700 mm and dowel of 32 mm diameter (plain steel bars), distance between dowel is 305 mm, length of dowel is 460 mm for the Jointed Plain Concrete Pavement (JPCP) type while the Jointed Reinforced Concrete Pavement (JRCP) type added longitudinal and transverse reinforcement with 12 mm diameter and spacing of 350 mm.*

**Keywords:** *Rigid pavement structures, AASHTO 1993, MDPJ 2017, JPCP, JRCP*