



INTISARI

Lintasan kereta cepat di beberapa negara umumnya menggunakan sistem *slab track*. Perkembangan analisis teoritis mengenai *slab track* masih terbatas pada permasalahan dan penyelesaian sederhana. Pengaruh bentang, lubang dan *prestress* pada *slab* tidak dapat dianalisis dengan penyelesaian teoritis. Metode numerik diperlukan untuk menggambarkan respon sistem *slab track* yang lebih *real*. Respon sistem *slab track* berupa defleksi rel, gaya *fastener* dan tegangan struktur *slab track* dievaluasi pada penelitian ini.

Analisis statik linier model elemen hingga menggunakan *software* ABAQUS dilakukan pada sistem *slab track* adopsi dari CRTS III. Idealisasi analisis model berupa elemen *beam* untuk rel, elemen *spring connector* untuk *fastener*, elemen *3-D Solid* untuk komponen *slab*, elemen *contact surface* untuk hubungan komponen *slab* dan elemen *elastic foundation* untuk dukungan tanah. Beban akibat LM-71 dan koefisien faktor beban (k_L) diterapkan pada struktur *slab track* dengan koefisien faktor *prestress* (k_{ps}) di atas dukungan koefisien reaksi *subgrade* (k_s).

Prilaku respon struktur *slab track* akibat pengaruh koefisien faktor beban dan *prestress* membentuk fungsi linier, sedangkan akibat pengaruh nilai dukungan koefisien reaksi *subgrade* membentuk fungsi power. Detail variabel pengaruh dari masing-masing respon struktur antara lain: (1) Defleksi pada rel dipengaruhi oleh koefisien faktor beban dan koefisien reaksi *subgrade*; (2) Gaya *fastener* dan tegangan rel hanya dipengaruhi oleh faktor koefisien beban; dan (3) Tegangan pada komponen *slab* dipengaruhi oleh koefisien faktor beban, koefisien reaksi *subgrade* dan koefisien faktor *prestress*.

Kata Kunci : slab track CRTS III, load model 71, analisis elemen hingga



ABSTRACT

High-speed tracks in several countries generally use the slab track system. The development of a theoretical analysis of the slab track is still limited to simple problems and simple solution. The effect of span, hole and prestress on the slab cannot be analyzed with theoretical solutions. Numerical methods are needed to explain the more real slab track system response. Response slab track system in the form of deflection rails, fastening force and stress of the slab track structure was evaluated in this study.

Linear static analysis of finite element models using ABAQUS software was carried out on the adoption slab track system of CRTS III. The idealization of the model analysis is in the form of beam elements for rails, spring connector elements for fasteners, 3-D Solid elements for slab components, contact surface elements for the relation of slab components and elastic foundation elements for soil support. The load due to LM-71 and the load factor coefficient (k_L) is applied to the slab track structure with the prestress factor coefficient (k_{ps}) above the support for the subgrade reaction coefficient (k_s)

Behavioral responses track slab structure under the influence of the load factor and prestress coefficient forming a linear function, while under the influence of subgrade reaction coefficient values support forming a power function. Details influence variables of each of the structural response, among others: (1) The deflection of the rails is influenced by the load factor and the coefficient of subgrade reaction coefficient; (2) Fastener force and rail stress are only influenced by load coefficient factors; and (3) The stress on the slab component is influenced by the load factor coefficient, the coefficient of the subgrade reaction and the coefficient of prestress factor.

Keywords: *slab track CRTS III, load model 71, finite element analysis*