

Studi perilaku jembatan cable-stayed terhadap beban gempa dengan analisa non-linear pushover = The behavioral study of cable-stayed bridge towards earthquake load using non-linear pushover analysis / Dwi Rian Setianto

Dwi Rian Setianto, author

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Abstrak

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Beban gempa merupakan salah satu beban yang harus diperhatikan dalam perancangan jembatan. Jembatan harus dirancang sedemikian hingga dapat memiliki kinerja yang optimal. Hal ini diukur dari parameter kekuatan serta daktilitas jembatan itu. Oleh karena itu, analisa yang mendalam hingga perilaku inelastis struktur jembatan perlu dilakukan. Dengan analisa non-linear pushover, perilaku inelastis jembatan akibat beban gempa rencana dapat diprediksi. Kemudian hasil analisa tersebut dapat menjadi acuan apakah jembatan tersebut sudah optimal atau memerlukan penanganan lebih lanjut seperti perkuatan struktur. Pada studi ini jembatan yang menjadi objek penelitian adalah jembatan cable-stayed di Maluku. Berdasarkan studi yang dilakukan, jembatan ini memiliki kekuatan yang memadai namun memiliki daktilitas yang cukup rendah. Hal ini terlihat dari besarnya beban ultimit yang dapat diterima serta besarnya displacement yang terjadi tepat sebelum jembatan mengalami kegagalan.

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ABSTRACT

Earthquake load is one of the load that must be considered in the design of the bridge. The bridge should be designed so that can have an optimum performance. It is measured on the parameters of the strength and ductility of the bridge. Therefore, in-depth analysis of the inelastic behaviour of the structure of the bridge needs to be done. Inelastic behaviour of the bridge due to earthquake load can be predicted with non-linear pushover analysis. Then, the results of the analysis can be a reference to whether the bridge is optimum or require further treatment such as structure retrofitting. The bridge that becomes the object of this study is a cable-stayed bridge in Maluku. Based on study conducted, this bridge has adequate strength but has low ductility level. It is evident from the ultimate load that can be received and the amount of displacement that occurs just before the bridge failed., Earthquake load is one of the load that must be considered in the design of the bridge. The bridge should be designed so that can have an optimum performance. It is measured on the parameters of the strength and ductility of the bridge. Therefore, in-depth analysis of the inelastic behaviour of the structure of the bridge needs to be done. Inelastic behaviour of the bridge due to earthquake load can be predicted with non-linear pushover analysis. Then, the results of the analysis can be a reference to whether the bridge is optimum or require further treatment such as structure retrofitting. The bridge that becomes the object of this study is a cable-stayed bridge in Maluku. Based on study conducted, this bridge has adequate strength but has low ductility level. It is evident from the ultimate load that can be received and the amount of displacement that occurs just before the bridge failed.]