ABSTRACT

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Program Study : *Construction Management*

Tittle : **"ANALYSIS COST PERFORMANCE IMPROVEMENT OF GREEN RETROFITTING BASED ON SYSTEM DYNAMIC AND VALUE ENGINEERING IN HIGH-RISE OFFICE BUILDINGS"**

Councillor : Dr. Ir. Albert Eddy Husin, M.T.

The increase in energy consumption in the operation of the building construction industry globally has increased by a percentage of 35%, so that this increase can lead to an increase in carbon emissions which was originally at a percentage of 28% to 38%. Factors of increased costs can also occur in the stages of preparation, planning and project monitoring of the commissioning of the implementation of green ratings which reach up to a percentage of 23.9%. Researchers applying the concepts of Green Retrofitting, Dynamic Systems and Value Engineering can be studied based on the influence on improving the cost performance of Green Retrofitting in high-rise (existing) office buildings and connected with the Structural Equation Modelling-Partial Least Square (SEM-PLS) analysis model . The results of this study show that in the application of the Green Retrofitting concept in high-rise office buildings using Dynamic Systems and Value Engineering has a significant effect on improving the cost performance of Green Retrofitting and get the most influential factors are Top Management Support, Energy Efficiency, Water Efficiency, Indoor Air Quality, Retrofitting Planning , Initial Cost of Retrofitting, Bill Of Quantity, Dynamic System Model Manufacturing, Alternative Material Selection, and Material Cost Reduction. The application of the Green Retrofitting concept using Dynamic Systems and Value Engineering received savings of 7,26% or Rp. 419.951.911,09.

Keyword : *Highrise Building, Office, Green Retrofitting, Dynamic System, Value Engineering, SEM-PLS*

ABSTRAK

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Konsentrasi : Manajemen Konstruksi

Judul : **"ANALISIS PENINGKATAN KINERJA BIAYA *GREEN RETROFITTING* BERBASIS SISTEM DINAMIK DAN *VALUE ENGINEERING* PADA BANGUNAN KANTOR BERTINGKAT TINGGI"**

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Peningkatan konsumsi energi terhadap pengoperasian industri konstruksi bangunan secara *global* meningkat hingga presentase 35%, sehingga dari adanya peningkatan tersebut dapat menyebabkan suatu peningkatan emisi karbon yang semula berada di presentase 28% menjadi 38%. Faktor peningkatan biaya juga dapat terjadi pada tahapan persiapan, perencanaan dan pemantauan proyek terhadap *commissioning* penerapan *green rating* yang mencapai *presentase* 23,9%. Peneliti menerapkan konsep *Green Retrofitting*, Sistem Dinamik dan *Value Engineering* dapat diteliti berdasarkan pengaruh terhadap peningkatan kinerja biaya *Green Retrofitting* pada bangunan kantor bertingkat tinggi (*eksisting*) dan dihubungkan dengan model analisa *Structural Equation Modelling-Partial Least Square* (SEM-PLS). Hasil penelitian menunjukkan bahwa penerapan konsep *Green Retrofitting* pada bangunan kantor bertingkat tinggi menggunakan Sistem Dinamik dan *Value Engineering* berpengaruh signifikan terhadap peningkatan kinerja biaya *Green Retrofitting* dan faktor-faktor yang paling berpengaruh adalah Dukungan Top Manajemen, Efisiensi Energi, Efisiensi Air, Kualitas Udara Dalam Ruang, Perencanaan *Retrofitting*, Biaya Awal *Retrofitting*, *Bill Of Quantity*, Pembuatan Model Sistem Dinamik, Pemilihan Material Alternatif, dan Pengurangan Biaya Material. Penerapan konsep *Green Retrofitting* menggunakan Sistem Dinamik dan *Value Engineering* mendapatkan penghematan sebesar 7,26% atau Rp. 419.951.911,09

Kata Kunci : Gedung Bertingkat Tinggi, Kantor, *Green Retrofitting*, Sistem Dinamik, *Value Engineering*, SEM-PLS