

Studi perilaku tangki silinder beton pratekan dengan berbagai macam perletakan

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Abstrak

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Tangki silinder beton prategang merupakan pilihan yang terbaik dalam desain tangki saat ini. Tekanan hidrostatik mengakibatkan terjadinya beban aksisimetris pada dinding sehingga desain klasik memerlukan analisis dengan teori cangkang silindris. Dari hasil penelitian dengan memperhitungkan tekanan hidrodinamik terhadap rasio tinggi dengan diameter tangki melalui permodelan dengan menggunakan SAP2000 disimpulkan bahwa rasio 1 : 4 merupakan rasio yang paling ekonomis. Hubungan dinding dan dasar dinding yang dapat bergerak bebas (free sliding) juga menunjukkan perilaku yang paling optimal dibandingkan perletakan lainnya untuk dimensi tangki yang besar. Disamping itu, penggunaan prategang arah melingkar dan vertikal memperkecil kemungkinan terjadinya retak akibat tegangan tarik saat tangki penuh maupun kosong.

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ABSTRACT

Cylindrical Prestressed Concrete is the best choice of tank design these days. Hydrostatic pressure implies on axissymmetrical loading on the tank wall that cylindrical shell analysis should be done for classical design. Considering the hydrodynamic pressure and using SAP2000, this research concludes that the most economical ratio height-diameter of tank is 1 : 4. Free sliding wall base also shows the most optimum behaviour among other base supports on large dimension. At the other side, circular and vertical prestressing decreases the probability of crack due to tension stress when the tank in full or empty condition.;Cylindrical Prestressed Concrete is the best choice of tank design these days. Hydrostatic pressure implies on axissymmetrical loading on the tank wall that cylindrical shell analysis should be done for classical design. Considering the hydrodynamic pressure and using SAP2000, this research concludes that the most economical ratio height-diameter of tank is 1 : 4. Free sliding wall base also shows the most optimum behaviour among other base supports on large dimension. At the other side, circular and vertical prestressing decreases the probability of crack due to tension stress when the tank in full or empty condition.