One characteristic of the structure construction of bulk carrier ships is the large hatch opening, because the structural design like that causes the bulk carrier ships are very weak when exposed to external loads. This is causes the need for more calculations than other type because if the resulting stress exceeds the allowable permitted the ship will be damaged. Finite element modeling for stress calculations using ANSYS software. And the stress value obtained by using the formulas listed in the regulation of the Common Structural Rules (CSR) where to get the stress value in calculating the loads induced on the ship. Where the loads have been calculated included into the ship model that was created in software ANSYS, loads are applicable to the ship models include: bending moment, the external load (hydrostatic & hydrodynamic), payload, etc. Where stress is obtained from software compared with the stress allowable permitted by the regulation of the Common Structural Rules.

Keyword: Finite element, Stress, Bending moment, External load, Internal load, Common Structural Rules