Petroleum as an energy source that still has a lot of demand in the world, has a floating tank storage system called FSO (floating storage and offloading). Floating tank, usually made from the former tanker ship, which still has a good quality to be operated. In Indonesia, generally FSO has had more than 25 years old. Therefore, according to Ministerial Decree No. 33/2001 ships that do not meet the requirements must be improved to meet the requirements of the vessel or qualified to do the maximum to the rise and dock maintenance. Treatment with up Doc will inhibit the production of oil and could provide no additional loss due to costs. Because of that loss came from an idea to make FSO concrete materials. FSO from concrete materials have a relatively cheaper price (approximately 12.29% of the total cost of the purchase and conversion of steel FSO) and age operational longer without repairs done (approximately 30 years - DNV - OS - C502, Sec 6A.101) compared with the former steel FSO. The final construction is designing FSO of concrete materials based on DWT capacity of the former steel FSO, then performed full calculations (the laws of physics), examination of the stomach arise, namely stability and ship strength stress, modulus and moment of inertia boat at midship section of the restriction rules applicable from SNI-03-2847-2002 for marine construction. From the calculations, the primary measure of concrete FSO Lwl = 266 802 m, B = 64.07, H = 18.52 m, T = 12.531 m with a profit of 27.16 % more than steel FSO operations after 20 years end FSO operation.

Keywords: floating, storage, concrete, and oil