

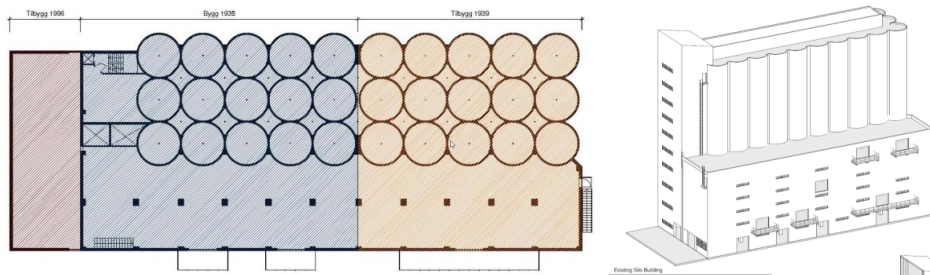
Structural design of the new Sørlandets Kunstmuseum, Kristiansand – Rehabilitation of 1930s concrete silos

Alejandro CLEMENTE*, Alberto ORDIÑANA, Gaute MO, Mario RANDO, Manuel SÁNCHEZ-SOLIS

*Degree of Freedom
C/ Colon 18 5B, Valencia (Spain) 46804
a.clemente@dofengineers.com

Abstract

Degree of Freedom as structural engineers, in collaboration with main consultants Rambøll and contractor Kruse-Smith, with architects Mestres Wåge Arquitectes, BAX Studio, and Mendoza Partida are currently working on the revised preliminary design of the new Sørlandets Kunstmuseum in Odderøya, Kristiansand. The museum will be centered around the structure of the existing grain silos, constructed in separate blocks in 1935 and 1939, at the proposed site.

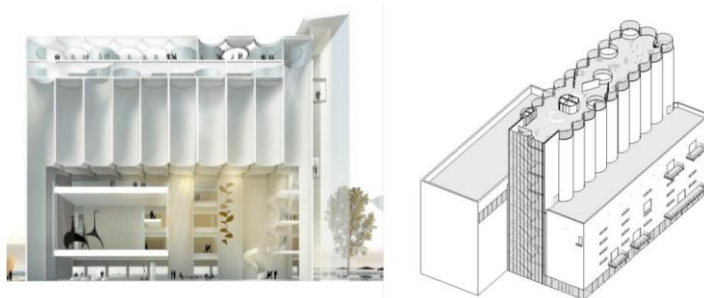


Existing silo building – plan and 3D view

The new building has three volumes; an eight-storey central part based on the existing silos, a new four-storey structure to the west replacing the original extension and a new five-storey annex building to the east. The architectural proposal is to create an impressive, open exhibition area, the Silo Hall, by demolishing extensively the cylindrical silos below level 5. There will also be a new glass-walled restaurant space, that replicates the silo geometry located on the top floor.

The existing silo walls are 150mm thick with an inner diameter of 4.4m. Original drawings show the older silos have only a central layer of reinforcement whereas the 1939 silos have two reinforcement layers. The silos are supported on reinforced concrete columns at ground floor transferring directly to rock, or to rectangular RC piles founded at a variable depth of up to 10m.

Major structural challenges include the demolition, repair and strengthening of the silos and the creation of new “super columns” based on the remaining parts of the silo walls. In addition, due to the proximity of the site to the sea, the existing foundations capacity, in contact with salt water, is unknown and the silo building will be underpinned with new foundations



Future Sørlandets Kunstmuseum (SKMU), in Odderøya, Kristiansand