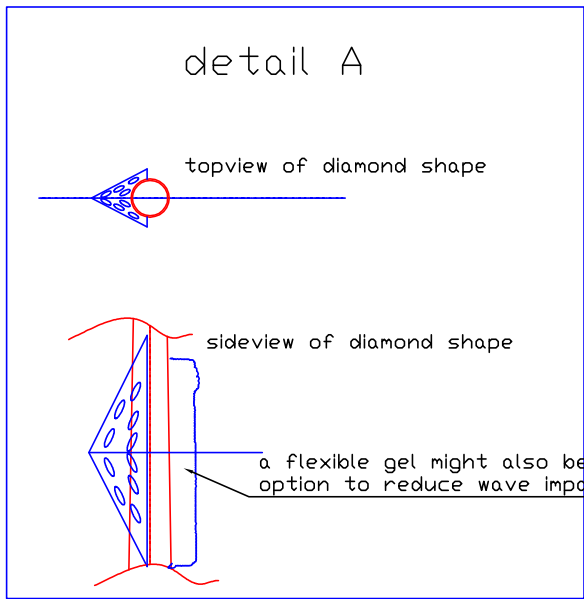


Reducing horizontal movement of gondola due to wave impact when windmill is placed in the sea to overcome problems on bearings due to slamming of waves and reducing sounds when hammering a pilone into the seabed



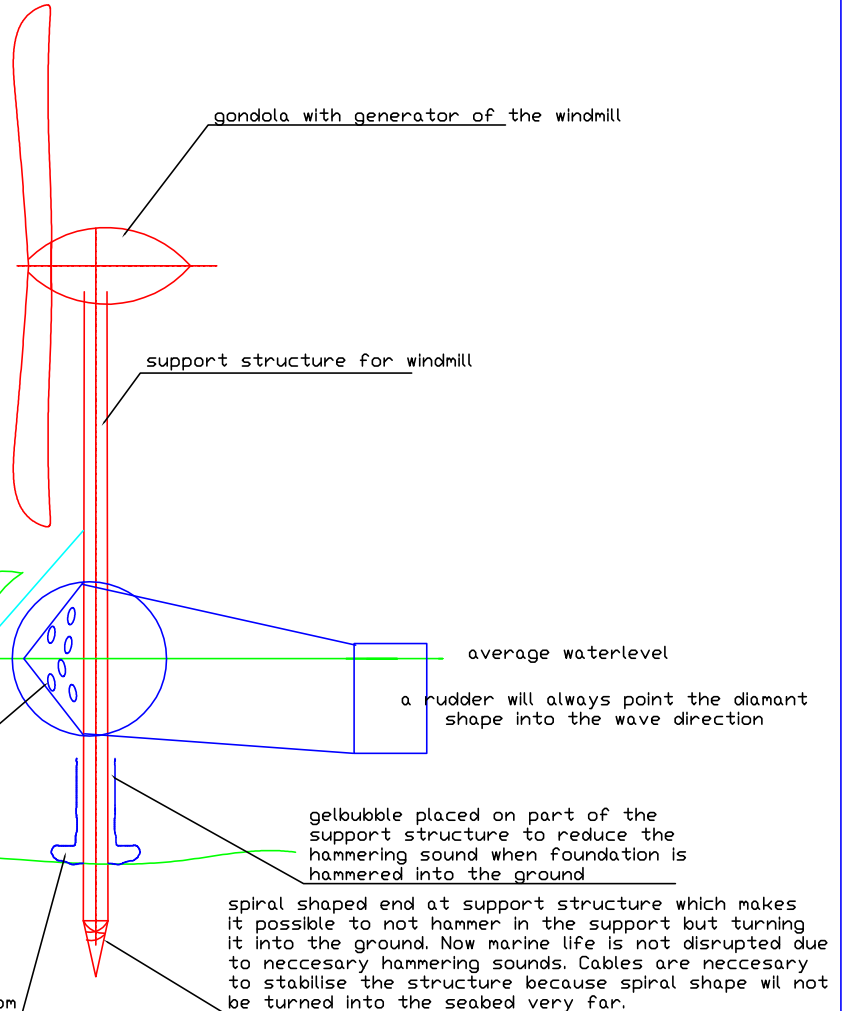
A wave hitting the support structure will give a horizontal acceleration to this structure. Due to that the gondola (part of generator) and blades of the windmill feel horizontal accelerations. Due to also Coriolis effects this will give high loads and excessive wear in parts of the gondola. So wave impact should be minimised.

Detail A: diamond shaped steel construction with big holes will spread the wave force on the support structure over a longer period of time. This will reduce the horizontal acceleration and translation the gondola feels

Steelcable

Groundanchor

gelbubble arises by gel coming lose from the supportstructure when this structure is hammered into the seabed



Steel cables with selfdigging ground anchors reduce the horizontal movement of the support structure. By connecting the other end of these cables to the structure at wave impactpoint will reduce horizontal movements at the water level. This also reduces movements of the gondola and blades. This reduces wear in for example the bearings of generator placed in the gondola.

Another possibility to reduce sounds during hammering is to use a sound absorbing non toxic gel which is attached to the outside of the support structure. This gel needs to have an open structure to effectively reduce sounds.