Over the last few decades construction of retaining walls in urban areas has grown significantly, as a result of territorial and economical development of the cities. In most cases, retaining walls are deep structures with the existence of groundwater level because urban areas are often at a few meters above sea level. Furthermore, construction of retaining walls in cities introduce special problems as a result of being directly in touch with urbans elements and citizens.

In these conditions, for deep borings and with the existence of groundwater level, diaphragm walls and secant pile walls are the only feasible retaining walls in urban areas. The main difference between both structures is type of ground to bore. Nowadays, diaphragm walls have a large field of application from not very hard ground up to loose ground which can be bored with use of support fluids. On the other hand, secant pile walls are usually used in hard ground, where it is not possible install diaphragm walls, and in rocks, even though it is technically possible install secant pile walls in a more extensive range of grounds. In the particular case of Spain, technology of secant pile walls has not been introduced yet in the same way as in others european countries.

This minor thesis describes, firstly, diaphragm walls and secant pile walls as the feasible retaining walls in urban areas, working under water. Especially it examines secant pile walls, as for their calculation and constructive method, because these represent a singular type of retaining wall. Although field of application of secant pile walls is actually limited, a general approach has been carried out for different types of ground describing main constructive methods for this type of retaining wall.

Secondly, a comparative study between diaphragm walls and secant pile walls has been carried out in a fairly hard and quite permeable ground, where diaphragm walls are usually installed with use of bentonite fluids as support fluids. Under particular requirements of urban areas, secant pile wall has been suggested as an alternative to diaphragm wall. Performance and effects on urban areas of both types of retaining walls have been studied and a multicriteria analysis has been carried out. In this analysis factors of different nature have been considered with the aim to determine the ideal alternative between both types of retaining walls. The analysis is based on experimental information obtained in Palma de Mallorca.