BLEVE resistant tunnels – a feasibility study

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For crowded cities like most urban areas, there is an increasing urge for multi functional use of the available space. High rise buildings, tunnels, roads through or underneath buildings and buildings over road infrastructure become more popular. As a result the risks when accidents occur increase, resulting in a need for measures to reduce these risks and to control the consequences of accidents.

The results of a feasibility study are presented, in which the structural safety of a tunnel in a densely populated area is studied. It is studied whether it is feasible to design the tunnel in such a way that a possible BLEVE (Boiling Liquid Expanding Vapor Explosion) does not lead to failure of the structures in the near surrounding of the tunnel.

The future situation at the Leidsche Rijn near the A2 between Utrecht and Amsterdam has been used as a case study (see figure 1). In the area a concrete tunnel is foreseen, crossing directly beneath high rise office buildings and houses. Basically the buildings are supported by the walls of the tunnel. The buildings above the tunnel should be able to withstand a possible BLEVE in the tunnel. This means that the walls of the tunnel should not fail due to the BLEVE.

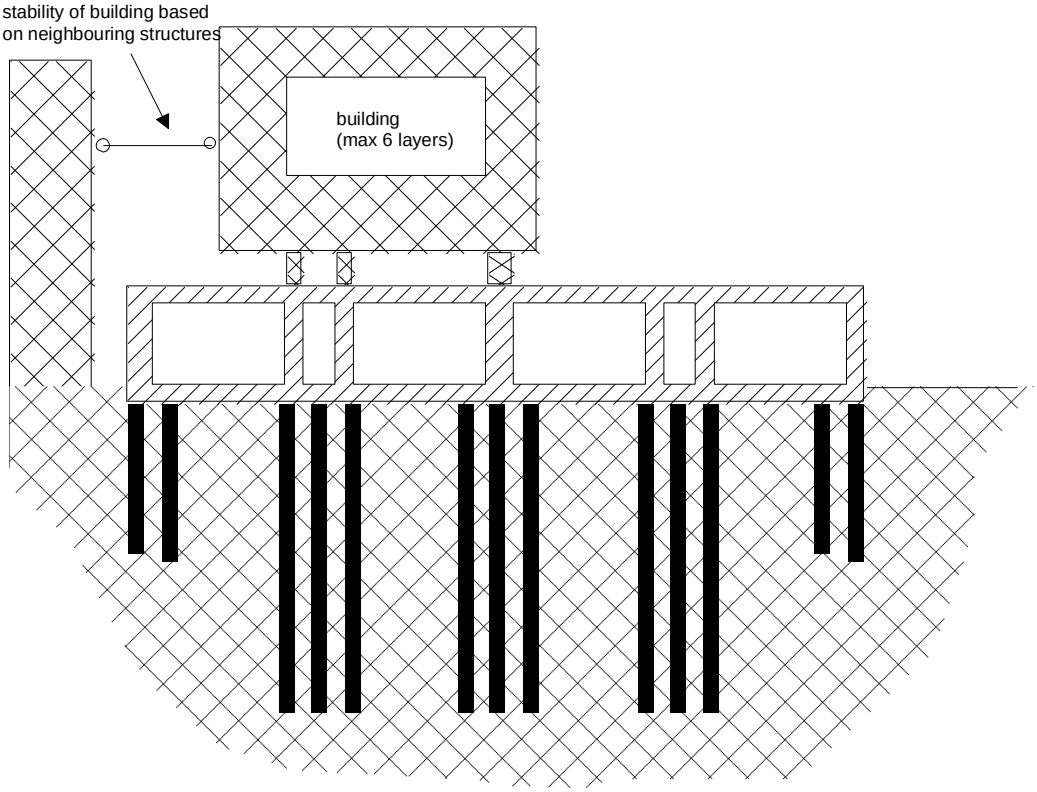

Figure 1 – Case study Leidsche Rijn