

WEB SITE: www.simulate-events.com

Technical Note No.29

Subject: **BLOCK WALL COLLAPSE DUE TO A TRUCK IMPACT.**

The wall is 200 mm thick and has piers at both ends, as illustrated by the first figure. There is no reinforcement, but the blocks are solid. A truck-like body is approaching with the velocity of 72 km/hr. The process of impact and the contact that follows is simulated using an explicit finite-element program.

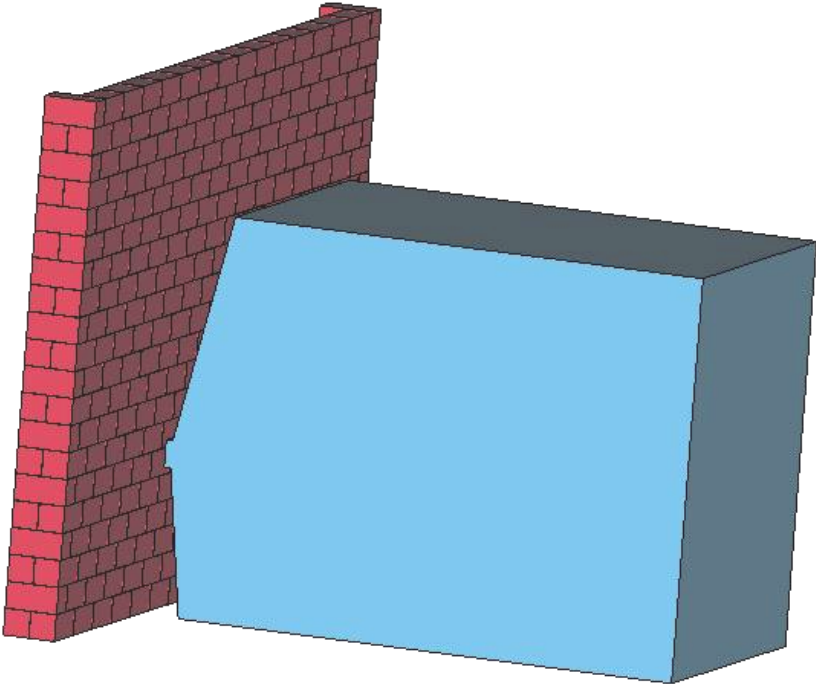
The second picture shows the early stage of the damage, when the blocks are squeezed out of their initial positions. In the third the damage is pronounced; not only the blocks are flying out, but also the piers are disrupted and the top course of blocks bows up. In the last picture the stream of flying bricks has a cloud of bricks behind it.

Details: The ground is treated as rigid. The bottom course of blocks is firmly attached to the ground. The blocks are held together by gravity and friction, there is no allowance for mortar strength. (Had this been included, the fragmentation would not be so complete.) The truck strongly tilts forward because its center of gravity is above the impact level and because the bottom course of blocks becomes an obstacle.

SOLID WALL AND TRUCK

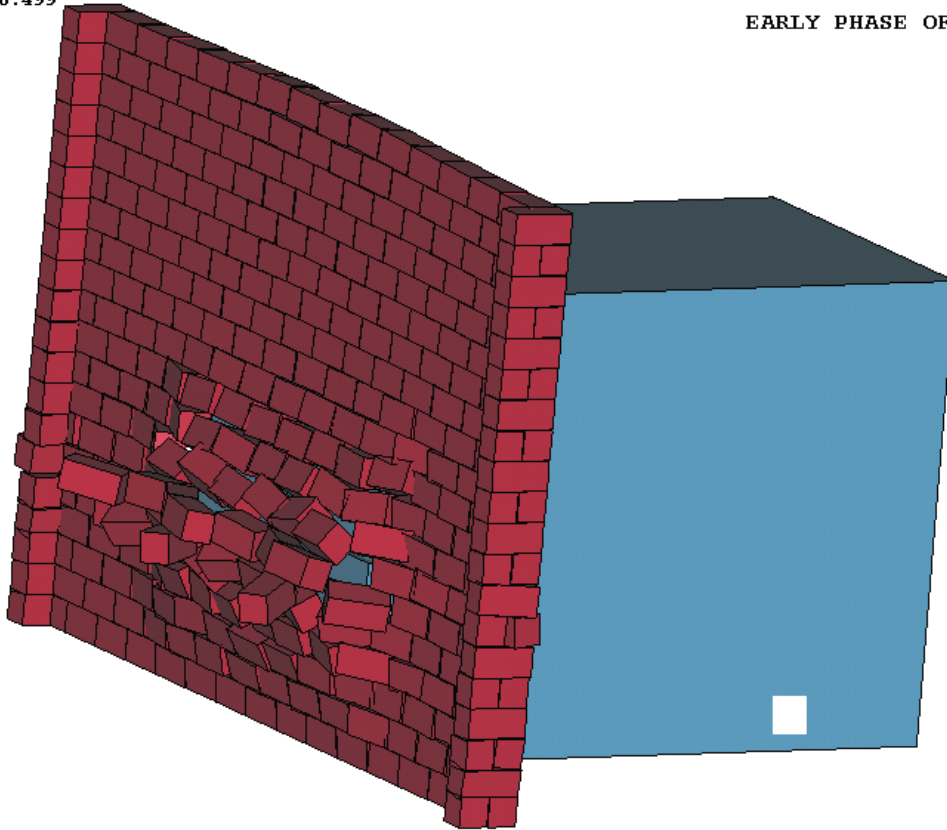
Time = 0

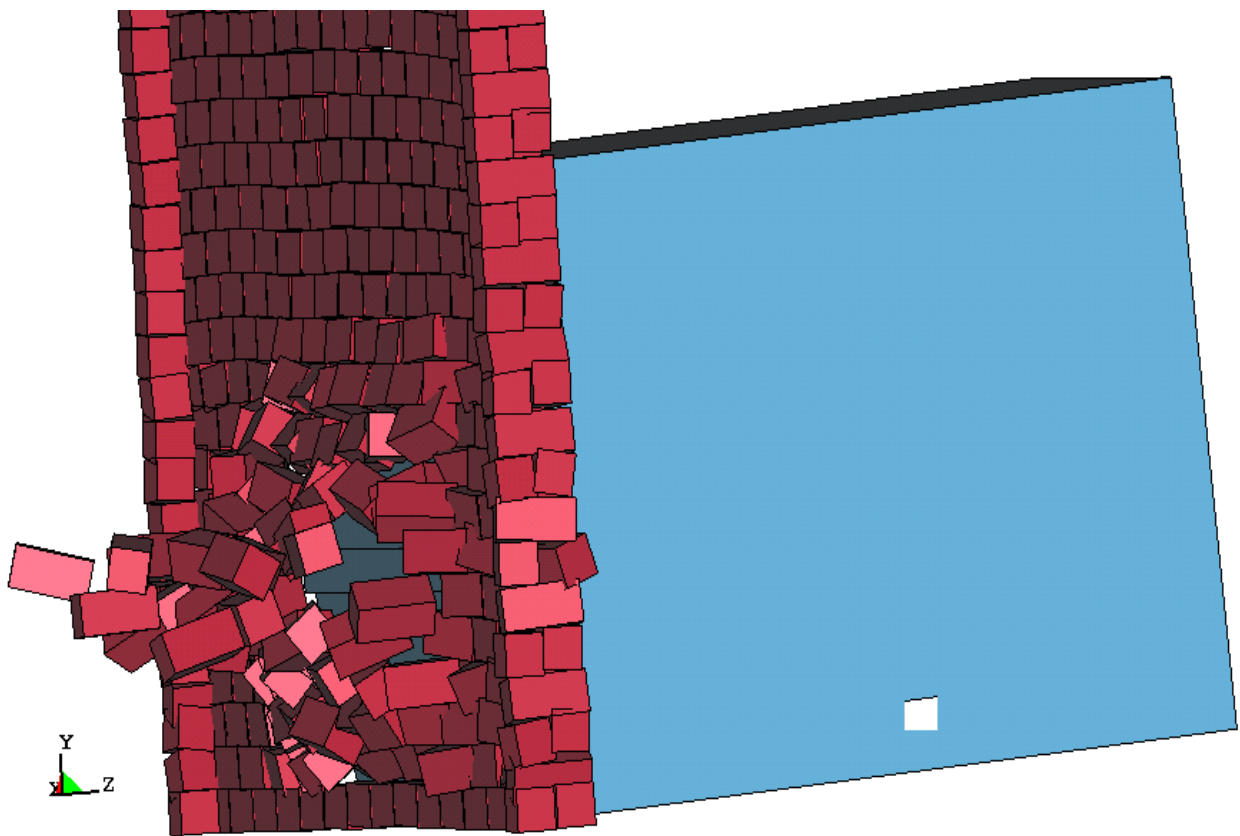
Wall standing on rigid plane.
Bottom course attached to the plane
Truck moving along the plane



SOLID WALL AND TRUCK
Time = 30.499

EARLY PHASE OF IMPACT





SOLID WALL AND TRUCK
Time = 400

TOTAL DESTRUCTION
(NOTE THE TRUCK ROTATING ABOUT HORIZ. AXIS)

