Pull-out of headed stud anchor from a concrete block

embedment depth = 600 mm
Pull-out of headed stud anchor from a concrete block
3D FE analysis of anchor channels under shear load close to the edge
Anchor channels close to the edge loaded by a shear load perpendicular & parallel to the edge

anchor channel 28/15, $c_1 = 40$ mm

anchor channel 50/30, $c_1 = 100$ mm
Anchor channel close to the edge loaded by a shear load parallel to the edge

Post peak crack pattern, anchor channel 50/30, $c_1 = 100$ mm (edge distance), $s = 150$ mm (spacing), tests by Roik, company HALFEN (2009)

Numerically obtained post peak crack pattern, anchor channel 50/30, $c_1 = 100$ mm (edge distance), $s = 250$ mm (spacing)
3D FE analysis of headed anchors close to the edge under shear load perpendicular to the edge.
3D FE analysis of headed anchors close to the edge under shear load parallel to the edge
3D FE analysis of anchor groups close to the edge under torsion loading
Push-in pull-out simulation
Penetration of anchor into a concrete block
Penetration of anchor into a concrete block
Anchorage of steel hydraulic turbine into a concrete block

Turbine

Concrete block
(cca. 30x30x8 m)
Anchorage of steel hydraulic turbine into a concrete block
Anchorage of steel hydraulic turbine into a concrete block
Anchorage of steel hydraulic turbine into a concrete block - detail
Anchorage of steel hydraulic turbine into a concrete block - detail