

APPENDIX A – ORIGINAL GEOLOGICAL PROFILES

All original geological profiles will be presented in this Annex.

- Church of St. Jacob the Greater in Ruprechtice

Borehole 1

Distance from surface (m)	Description
0,00 - 0,04	cement dab above the ventilation channel
0,04 - 0,35	brick channel masonry
0,35 - 1,25	foundation masonry, ignimbrite (through borehole diameter, thickness ca 50 mm)
1,25 - 1,50	dtto, sharp-edged particles "subbase", without the mortar residues
1,50 - 1,70	rusty-brown (in some places greenish) dusty claystone, hard, with fragments, compact
1,70 - 3,00	dtto, the borehole core disintegrated, sporadic stones through borehole diamtere
3,00 - 5,20	dtto, compact rusty-brown core
5,20 - 12,50	dtto - hard consistency
6,20 - 6,50	disintegrated core, solid "small blocks" - hard consistency
6,50 - 7,20	thin lamination from significantly lighter material, in some places gray fill
7,20 - 7,40	transitional plastic zone (solid to hard consistency)
7,40 - 8,60	compact borehole core, hard consistency
8,60 - 8,90	dtto, hard consistency
8,90 - 9,00	dtto, hard consistency, brittle core
9,00 - 11,00	dtto, the strength increases with the depth, hard core, lighter color, it is possible to break off by hand on the edges, compact fragments - very hard, lower consistency limited in some places
10,85 - 11,00	rusty-brown dusty claystone with sharp-edged fragments (probably siltstones)
11,00 - 12,00	dtto, lightcoloured striped dusty claystone, compact, hard consistency

Borehole 2

Distance from surface (m)	Description
0,00 - 1,50	masonry of ventilation channel (fired bricks) and foundation masonry, masonry partially made from sandstone
1,50 - 1,55	foundation masonry - compact sample almost through the whole borehole diameter, light coloured ignimbrite (paleoryolite?)
1,55 - 1,80	foundation masonry, ignimbrite and light rusty-brown sandstone without the presence of mortar
1,80 - 3,00	silty claystone with numerous sharp-edged siltstone fragments (max. size 80 mm, ca 40 to 50 %), fragmented core, from rusty-brown to light ochroid color
3,00 - 3,30	smudged core, similar to building stone in the frontage masonry of the stone, silty claystone with ochroid color with rusty-brown linings, hard consistency
3,30 - 4,50	Dtto
4,50 - 6,30	Dtto, light gray to ochroid color, in some places rusty-brown color
7,40 - 7,55	transition of rusty-brown color to light gray (thanks to the presence of clay minerals and absence of Fe pigments), hard consistency
7,55 - 7,70	rusty-brown silty claystone, varied layered, layers thickness 2 - 5 mm, hard consistency
7,70 - 12,00	compact core, silty claystone, hard consistency, consolidated, brittle breakage when dividing, rusty-brown color, in some places gray

- **St. Ann Church in Vižňov**

Borehole 1

Distance from surface (m)	Description
0,00 - 0,50	sandy soil with sandstone fragments above foundation masonry
0,50 - 1,80	ignimbrite fragments, 10 % of plate through the borehole diameter, sandstone fragments (size 40 mm to 80/100 mm)
1,80 - 2,00	sharply disintegrating core, sediment
1,80 - 2,20	grey-green sediment (siltstone to claystone), weathered, compact core
2,20 - 2,35	red-brown sharply disintegrated soil
2,35 - 2,55	greyreddish brownish layered claystone, plate-disintegrated, hard consistency
2,55 - 3,00	sharply disintegrated rusty-brown silty claystone - disintegrated core, layered
3,00 - 4,00	horizontal layers, sharply disintegrated, rusty-brown
4,00 - 4,15	dtto, smudged, thin layered, variable coloring, significantly lighter
4,15 - 4,80	dtto, hard consistency, sharply disintegrated core
4,80 - 5,00	lighter rusty-brown color, soft consistency
5,00 - 5,50	lighter rusty-brown color, harder consistency
5,50 - 5,75	aquiferous layer, significantly softer
5,75 - 6,15	lighter rusty-brown color, hard consistency
6,15 - 6,28	sandstone of greenish color (absence of Fe pigmentation), hard, non-compact
6,28 - 6,70	lighter rusty-brown silty claystone, hard consistency
6,70 - 7,00	aquiferous layer, disintegrated to small plates and small scraps
7,00 - 7,10	rusty-brown silty claystone of lighter color
7,10 - 7,15	light rusty-brown silty claystone
7,15 - 7,50	mushy layer, sharply disintegrated silty claystone, soft consistency (probably due to drilling)
7,50 - 7,70	consistency solid to hard, - harder plates with softer filling (probably due to drilling)
7,70 - 7,95	mushy layer, soft consistency with harder fragments (probably due to drilling)
7,95 - 8,00	rusty-brown silty claystone, solid to hard consistency
8,00 - 8,14	soft consistency, very wet, harder cores, softer filling matter
8,14 - 8,70	green color (thanks to the clay minerals), solid to hard consistency
8,70 - 8,80	soft consistency
8,80 - 9,00	light grey-green color, solid to hard consistency
9,00 - 9,55	sharply disintegrated core, 10mm fragments max.
9,55 - 10,00	light rusty-brown core, disintegrated to stone fragments of maximum size 80*25 mm
10,00 - 10,23	dtto, compact core, hard consistency
10,23 - 10,36	light grey-brown silty claystone, easy to disintegrate by hand, hard consistency, probably dominantly silty particles
10,36 - 10,57	dtto - compact core, hard consistency
10,57 - 10,83	significantly softer consistency, horizontal layers of 2 - 3 cm thickness, soft filling matter (silty clay)
10,83 - 10,95	grey-rusty-brown silty claystone, thin layers of green color, hard, lighter color than surrounding
10,95 - 11,36	lighter rusty-brown color, silty claystone, hard consistency
11,36 - 11,45	rusty-gray-brown silty claystone + greenish layers, few sandy fraction, very fine to silty character
11,45 - 11,50	dtto, lighter rusty-brown color, hard consistency
11,50 - 11,65	disintegrated core - light colored, layered, grey-rusty-brown, disintegrated to silt, easy to disintegrate by hand
11,65 - 12,00	dark grey silty claystone, compact, hard consistency

Borehole 2

Distance from surface (m)	Description
0,00 - 0,20	red-brown, slightly sandy calcareous soil with small stone fragments
0,20 - 0,40	compact core of red-brown calcareous soil with fragments of paleoryolite and ignimbrite with fragments of claystone to siltstone, easy to break down by hand (not the stone fragments), green-grey concretions without Fe pigmentation
0,40 - 0,60	compact core of red-brown calcareous soil with fragments of paleoryolite and ignimbrite with fragments of claystone to siltstone, easy to break down by hand (not the stone fragments)
0,60 - 1,00	red-brown fragments of ignimbrite, hard
1,00 - 1,60	red-brown fragments of ignimbrite, hard
1,60 - 2,00	compact pieces of grey-red mortar with stone fragments of different petrographical character (fragments size to 5 mm)
2,00 - 2,50	compact fragments of hard grey calcareous siltstone to clay-silty limestone
2,50 - 3,00	compact pieces of grey-red mortar with stone fragments of different petrographical character (fragments size to 5 mm), piece of straw detected inside the sample
3,00 - 3,60	compact pieces of grey-red mortar with stone fragments of different petrographical character (fragments size to 5 mm)
3,60 - 4,30	fragments of red-brown clay siltstone ca 8 cm x 3 cm, hard
4,30 - 4,70	layer of grey-green siltstone (lightly red colored), relatively hard, easy to break down to small plates of 1 cm thickness
4,70 - 5,30	red-brown siltstone, fragments
5,30 - 5,50	red-brown siltstone, bigger fragments
5,50 - 5,80	red-brown siltstone, spilled
5,80 - 6,30	red-brown clay siltstone, hard fragments ca 5 cm
6,30 - 6,40	red-brown claystone with grey streaks, compact, solid, it is possible to break down by hand
6,40 - 6,45	red-brown claystone with grey streaks, compact, solid, it is possible to break down by hand
6,45 - 6,90	incoherent red-brown claystone with fragments of siltstone, grey smudged
6,90 - 7,40	compact core of red-brown claystone, grey smudged, easy to break down by hand to smaller pieces
7,40 - 8,00	red-brown calcareous claystone to siltstone, hard
8,00 - 8,20	compact core of red-brown claystone, grey smudged, easy to break down by hand to smaller pieces
8,20 - 8,40	red-brown calcareous claystone to siltstone, hard
8,40 - 9,40	red-brown claystone with portion of silt fraction, grey to green-grey smudged (thanks to clay minerals, without Fe pigmentation)
9,40 - 10,60	layer of grey-brown claystone with siltstone fragments (size ca 2 - 3 cm), easy to break down by hand
10,60 - 12,00	compact core of red-brown claystone with siltstone fragments, easy to break down by hand to smaller pieces

- **All Saints Church in Heřmánkovice**

Borehole 1

Depth from surface (m)	Description
0,00 - 0,30	soil, loess-sandy soil
0,30 - 0,59	faine-grained to coarse-grained brownish-red sandstones, slightly weathred (faine-grained are harder). Smaller pieces strongly weathered (easy to break up, coarse-grained easy to crumble by hand)
0,59 - 0,77	smaller pieces of sandstones with soil (with the presence of calcitic component)
0,77 - 1,00	bigger pieces of stones with soil, mostly faine-grained ferruginous sandstone (relatively hard); light gray fine-grained sandstone (very soft, easy to break up by hand, but does not crumble)' brown faine- to medium-grained sandstone (partly weathered, possible to break up, very soft)
1,00 - 1,65	bigger compact pieces of stone material of a round shape (as a consequence of drilling) with the height 1,5 to 10 cm; very softly weathered sandstones (medium-coarse, gray-wine-coloured); conglomerate; ignibrite; conglomerate with ferruginous cement; coarse-grained ferruginous sandstones to conglomerates (very soft, easy to break up by hammer)
1,65 - 2,00	brown-redish sandy soil
2,00 - 2,44	dark brown-redish sandstone, smaller pieces extremely weathered (extremely soft, are crumbling in hand, big pieces compact)
2,44 - 2,76	extremely weathered ferruginous sandstone to sand (coherent), wet
2,76 - 3,30	very weathered ferruginous sandstone with the admixture of calcite, easy to be falling into pieces, wet, extremely soft
3,30 - 3,90	compact sandstone, brown-redish with parts of lighter coloured sandstones, close to 4 m sandstone changes colour to gray-black; medium- to coarse-grained
3,90 - 4,05	silty-clay sediment, thin insertion, ochre colour
4,05 - 4,50	brown-redish disintegrated sandstones, non-compact pieces, weathered, coarse-grained
4,50 - 4,70	brown-black coarse-grained sandstone to conglomerate, strongly weathered (very soft, easy to crumble by fingers, but compact pieces)
4,70 - 4,90	fine-grained light gray sandstone with greenish positions (Cu compound), extremely soft
4,90 - 5,00	gray-beige medium-coarsed sandstone, not crumbling in hand, but easy to break up by hammer, very soft
5,00 - 5,62	gray-beige medium-coarsed sandstone, not crumbling in hand, but easy to break up by hammer, in some places coarse-grained, very soft
5,62 - 5,77	strongly disintegrated sandstone to coarse-grained sand with sandstone pieces, brown-redish col., in some places grey-beige, extremely to very soft
5,77 - 5,90	coarse-grained sandstone to conglomerate, brown-redish, compact pieces, strongly weathered

5,90 - 6,00	black-brown crushed sandstone with the portion of fine-grained gray-greenish siltstone (to marlite), soft
6,00 - 6,12	gray-green fine-grained clastic sediment (siltstone to fine-grained sandstone) - gradually changes to coarse-grained parts
6,12 - 6,20	strongly weathered sandstone to conglomerate, is crumbling in hand, wet, brown, extremely soft
6,20 - 6,36	light coloured gray-green, fine-grained clastic sediment to marlite, soft, but compact
6,36 - 6,60	light gray rhyolite (quartz porphyre) with predominant fine-grained matrix, compact pieces, easy to break up by hammer, moderately hard
6,60 - 6,70	compact drill core made by the same light coloured stone, clay-soily waste around
6,70 - 7,00	fragments of light coloured stones, mixed clay-soily waste with clods
7,00 - 7,30	extremely soft, crumbling in hands, fragments of light coloured stone
7,30 - 7,67	big compact pieces, cores to 10 cm height, hard, quartz porphyre (paleoryolite), very hard
7,67 - 8,00	smaller fragments of the same stone, very hard
8,00 - 8,60	fragments of the same stone (max 10 cm)
8,60 - 8,70	fragments of the same stone, in some places strongly disintegrating to white fine dust
8,70 - 8,80	the same stone, at the beginning hard - changes to strongly disintegrating, wet, crumbling in hand, preserved compact cores, very soft
8,80 - 8,90	completely disintegrated stone to soily matter
8,90 - 9,00	hard stone (see upper line)
9,00 - 9,30	weathered light coloured stone with brown-beige parts; cores seems to be compact, but pieces stay in hand
9,30 - 9,70	the same stone (see upper line), but hard
9,70 - 9,90	compact piece of gray stone, in the middle rusty-coloured clay-soily dolls, which is slimy in hands
9,90 - 10,00	light coloured crushed stone, breaking up in fingers to smaller pieces
10,00 - 10,30	smaller pieces of the same stone with rusty-brown positions
10,30 - 10,40	completely weathered, clay-silty sedimentary, strongly disintegrating
10,40 - 10,45	light gray to light brown strongly disintegrating stone
10,45 - 10,60	same, in some places strongly partially weathered
10,60 - 11,00	strongly partially weathered, see upper line, in some places compact cores
11,00 - 12,00	weathered magmatic stone (quartz porphyre, paleoryolite), in some places harder positions

Borehole 2

Depth from surface (m)	Description
0,00 - 0,30	bigger pieces of strongly weathered sandstone, max. size 10 cm, from fine-grained to medium-grained, sometimes so weathered positions, that they look like soil; light coloured sandstone
0,30 - 0,60	fine masonry fragments from strongly weathered sandstones - both light coloured fine-grained, as well as red Permian sandstones, which are harder; light coloured sandstones are falling into pieces in hand; average size 4 cm; significant amount of brownish-red slimy soil
0,60 - 1,20	bigger pieces of weathered coarse-grained sandstone, both dark as well as light coloured, in some places smaller pieces of almost sandy siltstone (weathered), high amount of fine masonry fragments of almost soil character
1,20 - 1,55	strongly weathered ferruginous sandstone, mostly already incoherent creating "soil"
1,55 - 1,65	"harder" light coloured sandstone, lightly weathered
1,65 - 1,80	strongly disintegrating "sandstone" almost to sandy soil of brownish-red colour
1,80 - 2,00	compact piece of ferruginous sandstone
2,00 - 2,30	quartz porphyre, compact big pieces, beige-red colour
2,30 - 2,40	"hard" sandstone (almost of greywacke character)
2,40 - 2,50	weathered sandstone (fragments), see upper lines, together with "soil"
2,50 - 2,60	ignimbrite, hard
2,60 - 3,00	strongly weathered basement (probably originally brownish-red Permian sandstones) with bigger pieces of quartz porphyre and brown-black sandstone
3,00 - 3,10	brownish-red sandstone, weathered
3,10 - 3,80	sandstone to arcose sandstone, firstly with brownish-red colouring, at the end brown-black (greywacke character), in some places strongly silicified (cement, compacted grains), relatively hard
3,80 - 3,85	position of greenish siltstone to silty marlite
3,85 - 4,00	brown-black sandstone, fine- to medium-grained, high portion of feldspars
4,00 - 4,20	very fine-grained sandstone to silty sandstone, thinly laminated, soft, weathered
4,20 - 4,60	pinkish to brownish-red sandstone, very coarse-grained, hard
4,60 - 4,90	silty sandstone to siltstone, in some places brown laminae, at the end strongly weathered with the position of slimy soil
4,90 - 5,00	fine-grained brownish-red sandstone, relatively hard
5,00 - 5,25	silty sandstone to siltstone, in some places brown laminae, at the end strongly weathered with the position of slimy soil
5,25 - 6,10	brownish-red coarse-grained sandstone, at the end strongly weathered, completely crumbling, pieces without coherent core
6,10 - 6,50	smaller compact pieces of quartz porphyre (paleoryolite)
6,50 - 7,00	compact drill cores of quartz porphyre, feldspars kaolinized
7,00 - 7,40	bigger pieces of quartz porphyre of beige-brown colour, partly weathered, coherent (disintegrates after hammer hit)
7,40 - 7,60	light beige to grey quartz porphyre (paleoryolite), partly weathered, feldspars ochre (kaolin.)
7,60 - 8,00	strongly weathered sandstones to fine-grained conglomerates, dominance of powdery material, without compact core pieces
8,00 - 9,00	strongly weathered coarse-grained sandstone to conglomerate
9,00 - 9,50	quartz porphyre (paleoryolite), hard, with positions of clay soil
9,50 - 9,70	quartz porphyre (paleoryolite), hard, pieces
9,70 - 10,9	pyroclastic sediment (?), changing of silty clay positions with volcanic stones fragments (q. porphyre), completely falling into pieces after light hit
10,9 - 12,00	compact pieces of drill core made by quartz porphyre, in some places soil-clay insertion

- **St. Barbara Church in Otovice**

Borehole 1

Distance from surface (m)	Description
0,0 - 1,0	redbrown sandy soil with small stone particles
1,0 - 1,2	compact pieces of slightly weathered coarsegrained arcose sandstone
1.2	thin layer of redbrown soil with small fragments of fine grained clastic stones; easy to break down by hand
1.4	compact piece of brownreddish silty claystone
1,5 - 2,0	small pieces of brownreddish silty claystone
2,0 - 2,2	big pieces of brownreddish silty claystone
2.3	pebble of hard claystone
2.4	sandstone masonry with mortar
2,4 - 2,9	fragments of coarsegrained arcose sandstone, easy to break down by hand; fragments of thick bedded gray claystone
2,9 - 3,0	sandstone masonry with mortar
3,0 - 3,5	small fragments of silty claystone, easy to break down by hammer
3,5 - 3,7	compact pieces of hard silty claystone
3,7 - 3,9	layer of silty character (weathered claystone) with small stone fragments
3,9 - 4,5	small fragments of silty claystone, easy to break down by hammer
4.5	compact piece of silty claystone
4,6 - 5,0	small fragments of silty claystone
5,0 - 5,4	layer of strongly weathered claystone
5,4 - 5,5	layer of strongly disintegrated to soil character
5,5 - 5,6	compact piece of silty claystone
5,6 - 5,8	small fragments of silty claystone, easy to break down by hammer
5,8 - 6,0	compact piece of silty claystone
6,0 - 7,0	layers of weathered finegrained sedimentary stone (claystone?), easy to break down by hammer, easy to break down by hand, in some places harder positions
7,0 - 7,3	layer of thin bedded silty claystone, relatively hard, break down by hammer
7,3 - 7,4	layer of strongly weathered claystone
7,4 - 8	layers of weathered finegrained sedimentary stone (claystone?), easy to break down by hammer, easy to break down by hand, in some places harder positions
8,0 - 9,0	compact pieces of silty claystone, in some places weathered layer
9,0 - 10,0	mostly weathered position, very easy to break down by hammer
10,0 - 10,5	small fragments of silty claystone
10,5 - 12,0	gray claystone, thin bedded, easy to break down by hand to thin layers

Borehole 2

Distance from surface (m)	Description
0,00 - 0,30	brown sandy soil
0,3 - 0,9	fragments of coarsegrained arcose sandstone (slightly weathered), the surface is easy to crumble by hand
0,9 - 1,0	thin bedded silty claystone
1,0 - 1,2	bigger fragments of coarsegrained arcose sandstone (slightly weathered), the surface is easy to crumble by hand
1,2 - 1,3	layer of strongly weathered sandstone, disintegrated to sand
1,3 - 1,5	thin bedded silty claystone to siltstone
1,5 - 2	dark redbrown sandstone, small fragments strongly weathered (extremely soft, disintegrated by hand), bigger fragments compact
1.8	claystone
2,0 - 2,5	stone fragments with mortar
2.5	big pebble of strange stone material, not weathered, hard, probably andesite (?)
2,5 - 3,5	weathered redbrown silty claystone, smalle fragments
3,5 - 4,4	strongly weathered layer of soli character with claystone fragments
4,4 - 4,6	redbrown claystone, easy to break down by hammer
4,6 - 5,0	compact pieces of claystones, redbrown
5,5 - 5,5	slightly weathered layer of redbrown claystone, easy to break down by hammer
5,5 - 5,6	layer of easy disintegrating clastic sediment of caly -silty character
5,6 - 6,0	bigger fragments of redbrown claystone, some of them easy to break down by hammer
6,0 - 7,0	sizely different fragments of easy break down redbrown claystone
7,0 - 7,4	compact and harder fragments of claystone
7,4 - 7,6	layer of brown "soil" with small fragments of fine grained sedimentary stones
7,6 - 8,0	compact fragmenents of claystone, redbrown, easy to break down by hammer
8,0 - 8,15	weathered greybrown clasic fain grained sediment (silty claystone), easy to break down by hand to soli character
8,15 - 9,0	layer of graybrown claystone, easy to break down by hammer
9,0 - 9,5	strongly weathered claystone, disintegrated to small fragments, easy to break down by hand
9,5 - 10,0	gray claystone, easy to break down by hammer
10,0 - 10,5	browngray layer of clastic sediment, breaking down by hand to soil character
10.5	leyer of harder claystone
10,5 - 11,0	light gray sediment of claystone character, easy to break down by hand, some harder positions
11,0 - 11,6	layer of soft gray claystone, in some places easy to break down by hand to soli character
11,6 - 12,0	harder fragments of gray claystone

APENDIX B – CALCULATION RESULTS

- St. Ann Church in Vižňov

Pictures below present the results for the model with foundations where the same load is applied for both of them.

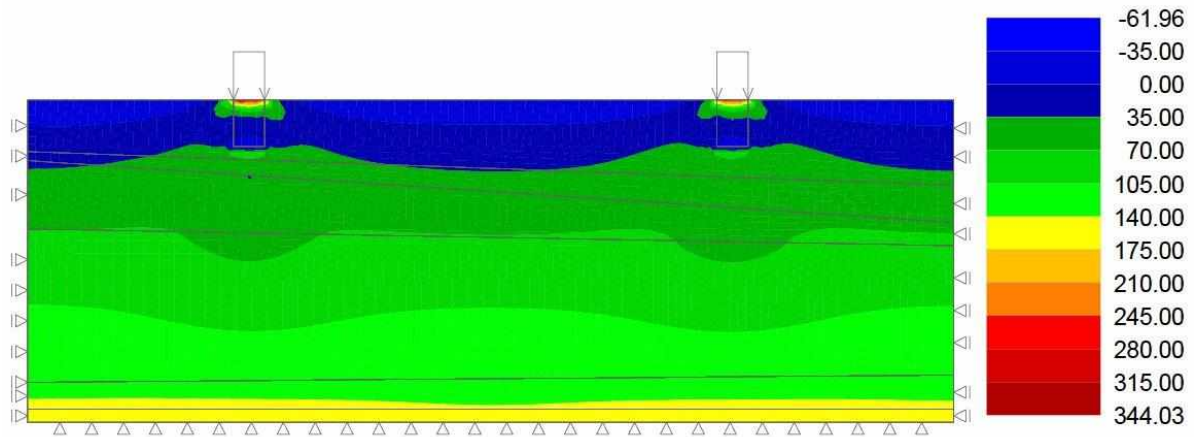


Figure 62 - Total stress σ_x , kPa

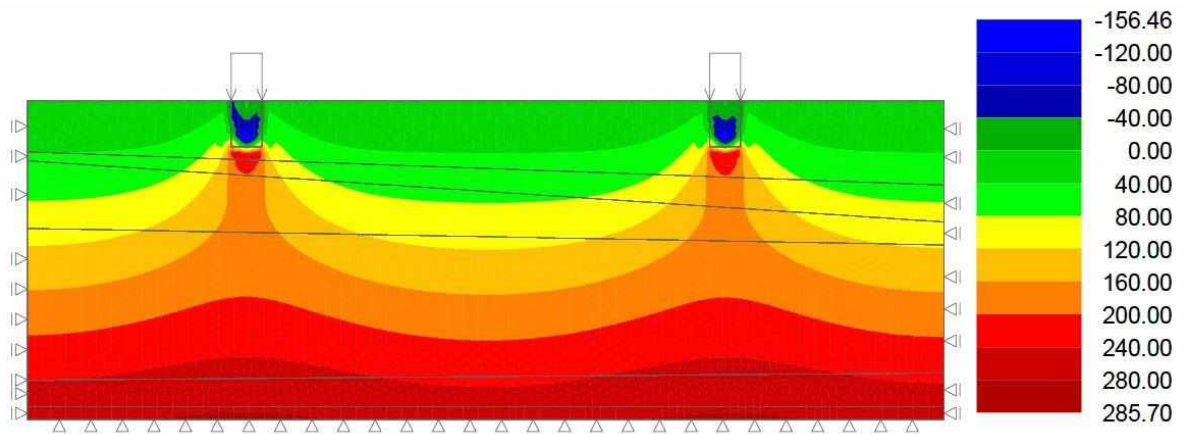


Figure 63 - Total stress σ_z , kPa

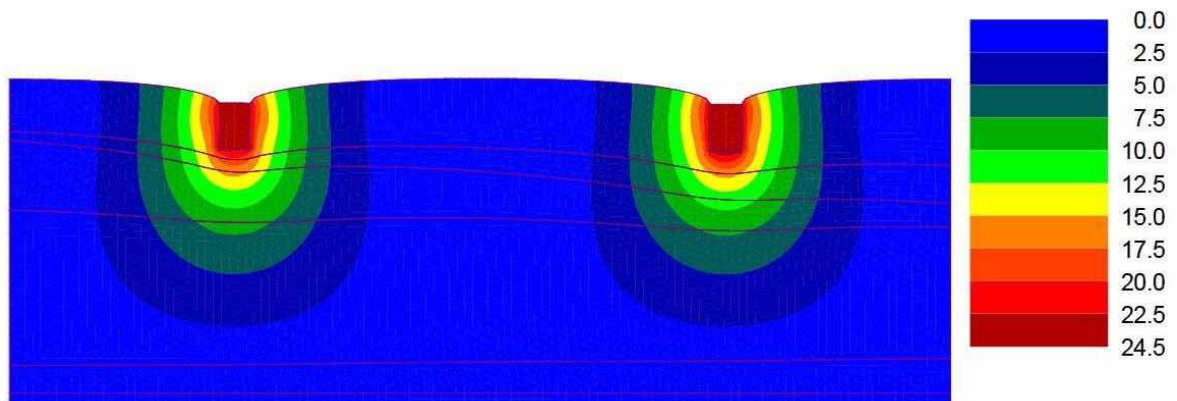


Figure 64 – Vertical displacement, mm

- All Saints Church in Heřmánkovice

