Table S3. A synthetic case in Section 6.2.2.

Burial depth (m)	Vertical Stress (MPa)	Pore pressure (MPa)	[1]α determined by [2]DCSM	[3]σ_{eff} (MPa) [α=0.6]	[4]k (m^2) [α=0.6]	σ_{eff} (MPa) [α determined by DCSM]	k (m^2) [α determined by DCSM]
0	0	0		0.0	1.00E-15	0.00	1.00E-15
0.2	5	2	1.88	3.8	5.03E-16	1.25	7.98E-16
0.4	10	4	1.75	7.6	2.53E-16	2.99	5.82E-16
0.6	15	6	1.67	11.4	1.27E-16	4.95	4.08E-16
0.8	20	8	1.61	15.2	6.39E-17	7.09	2.77E-16
1	25	10	1.56	19.0	3.21E-17	9.35	1.84E-16
1.2	30	12	1.52	22.8	1.61E-17	11.72	1.20E-16
1.4	35	14	1.49	26.6	8.11E-18	14.15	7.72E-17
1.6	40	16	1.46	30.4	4.08E-18	16.63	4.93E-17
1.8	45	18	1.44	34.2	2.05E-18	19.16	3.12E-17
2	50	20	1.42	38.0	1.03E-18	21.68	1.97E-17

[1]Effective stress coefficient denoted as α.

[2]Discretized Clay Shell Model (DCSM) proposed by this research.

[3]Effective stress denoted as σ_{eff}.

[4]Permeability denoted as k.