

APPENDIX A

RESULTS OF UNIAXIAL COMPRESSIVE

STRENGTH TEST

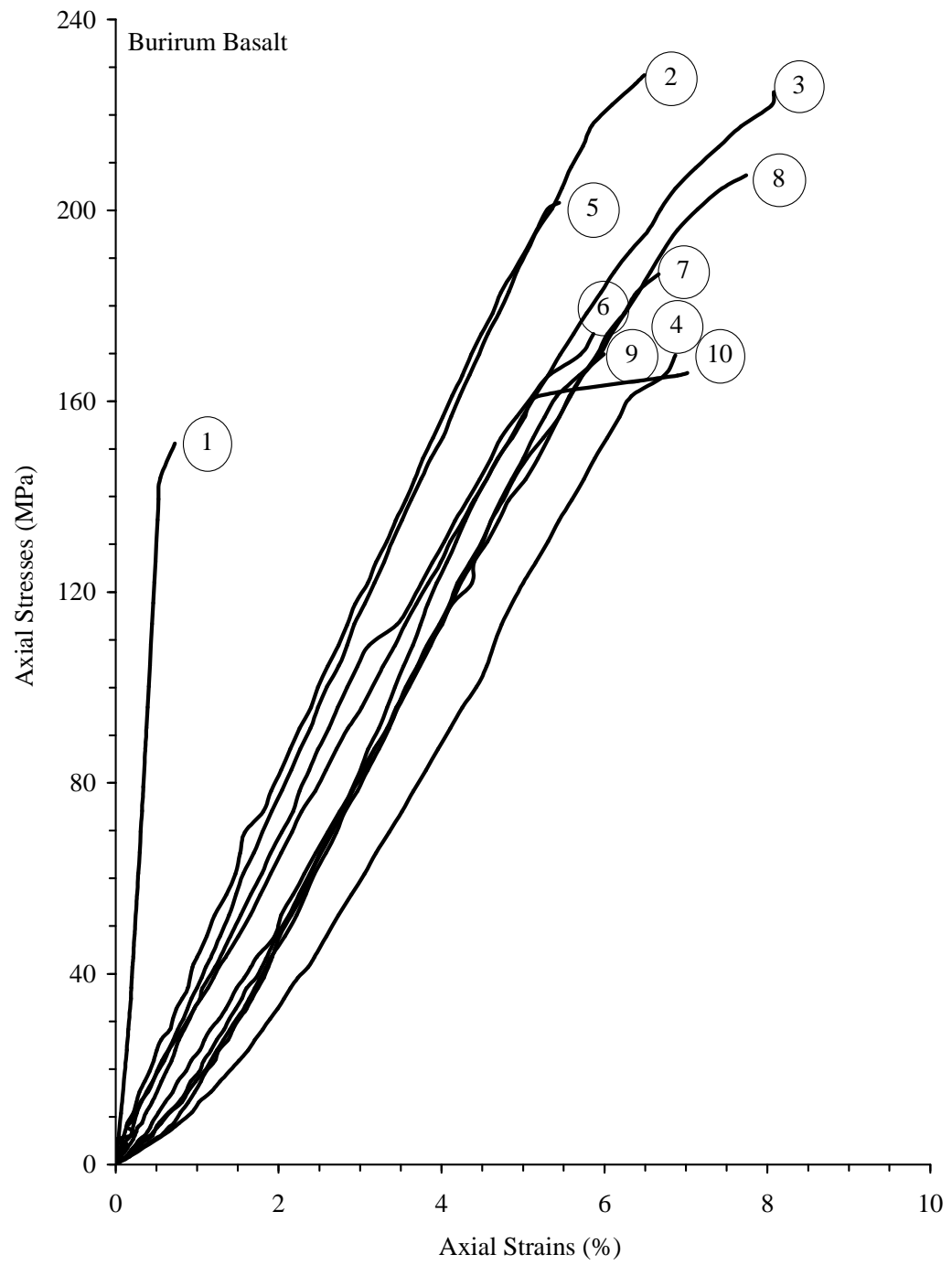


Figure A.1 The axial stress-strain curves for uniaxial compressive strength tests of Burirum basalt.

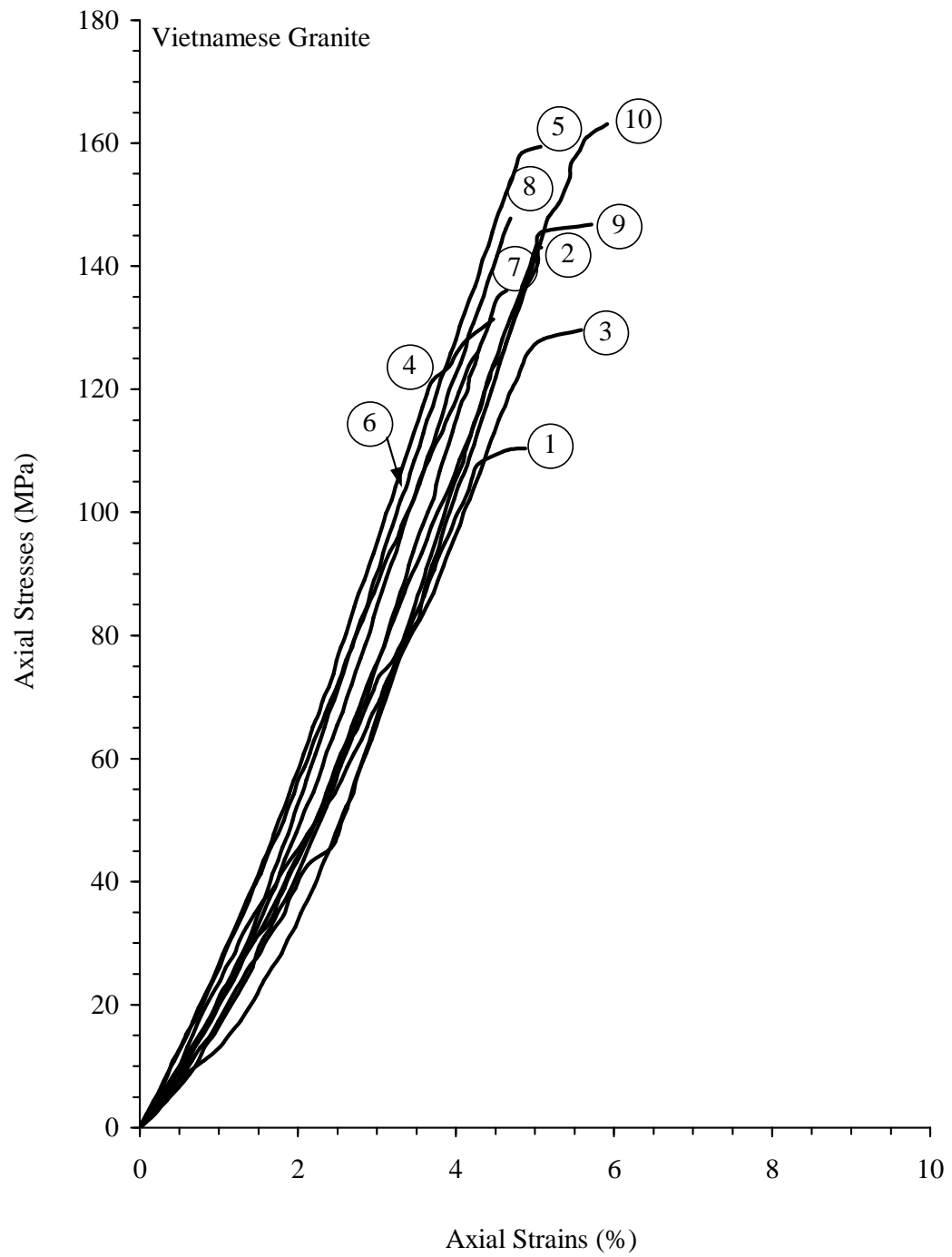


Figure A.2 The axial stress-strain curves for uniaxial compressive strength tests of Vietnamese granite.

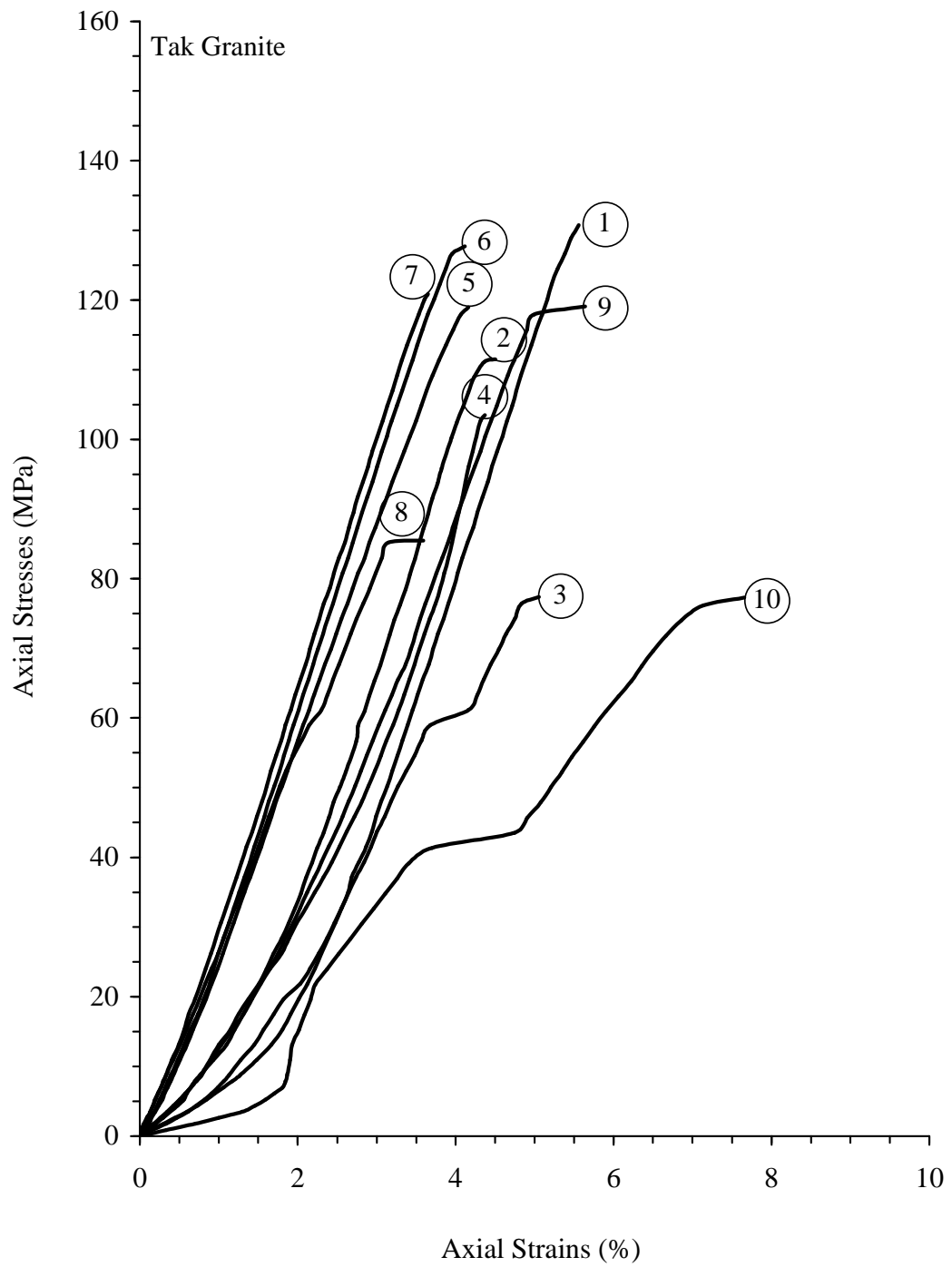


Figure A.3 The axial stress-strain curves for uniaxial compressive strength tests of Tak granite.

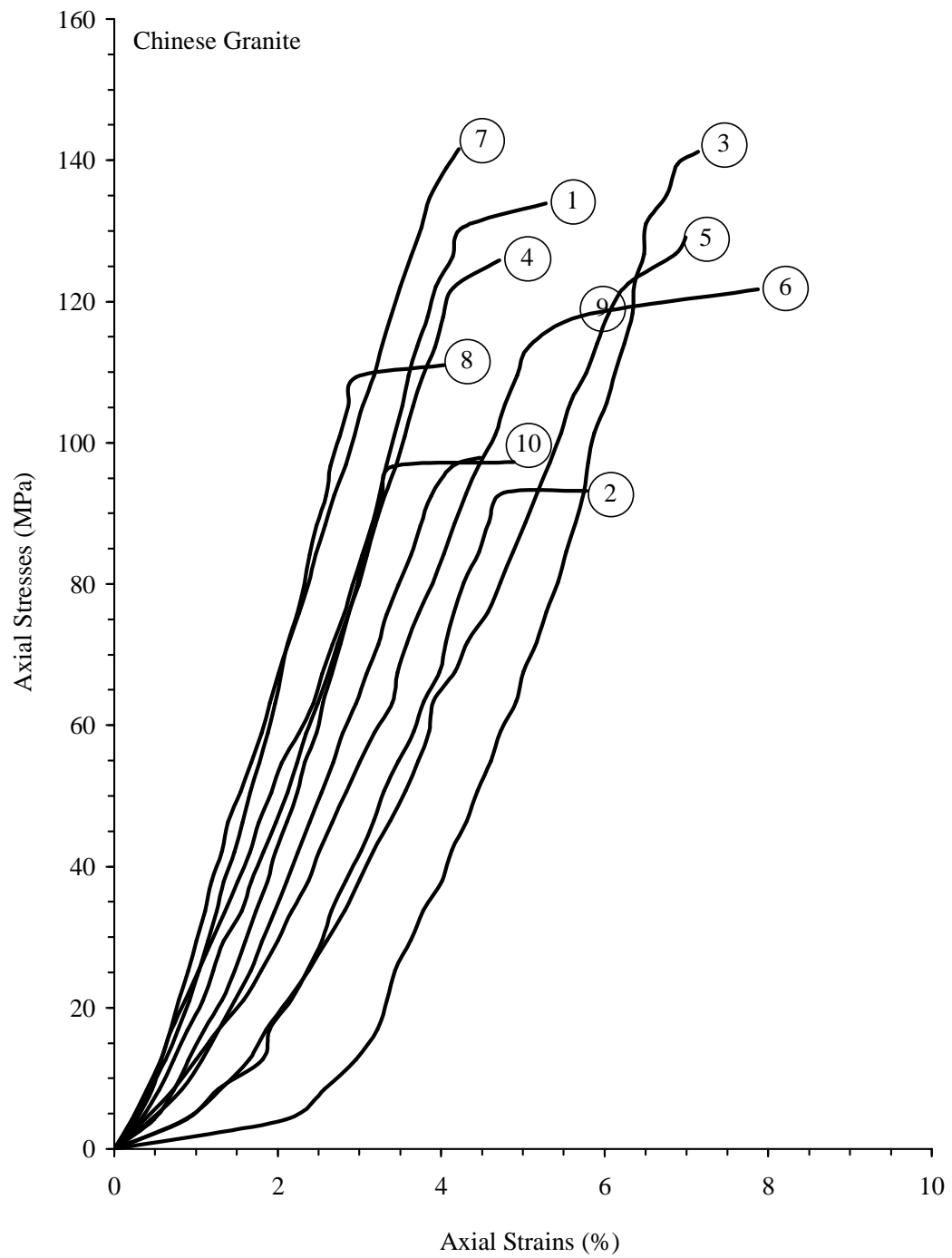


Figure A.4 The axial stress-strain curves for uniaxial compressive strength tests of Chinese granite.

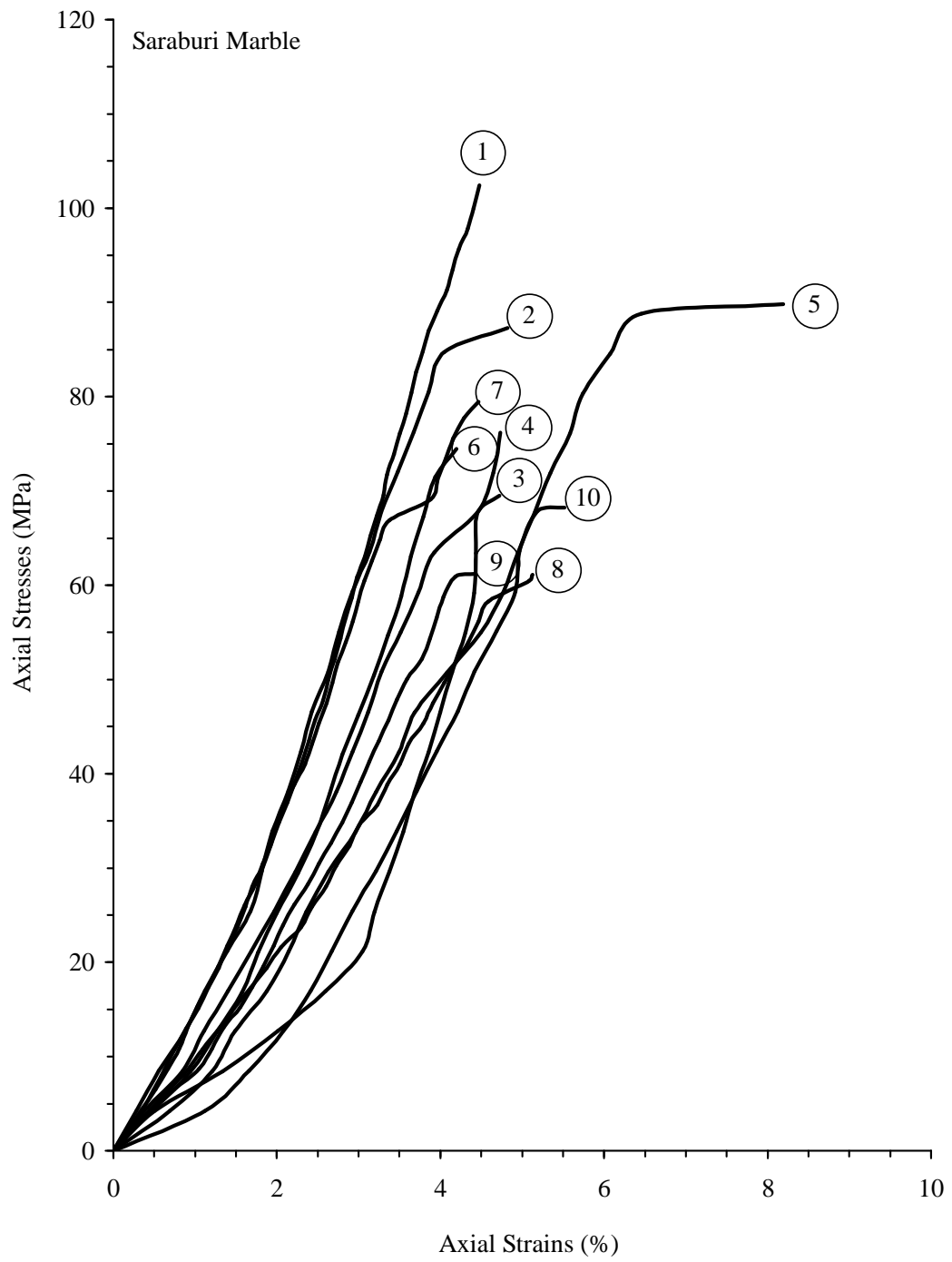


Figure A.5 The axial stress-strain curves for uniaxial compressive strength tests of Saraburi marble.

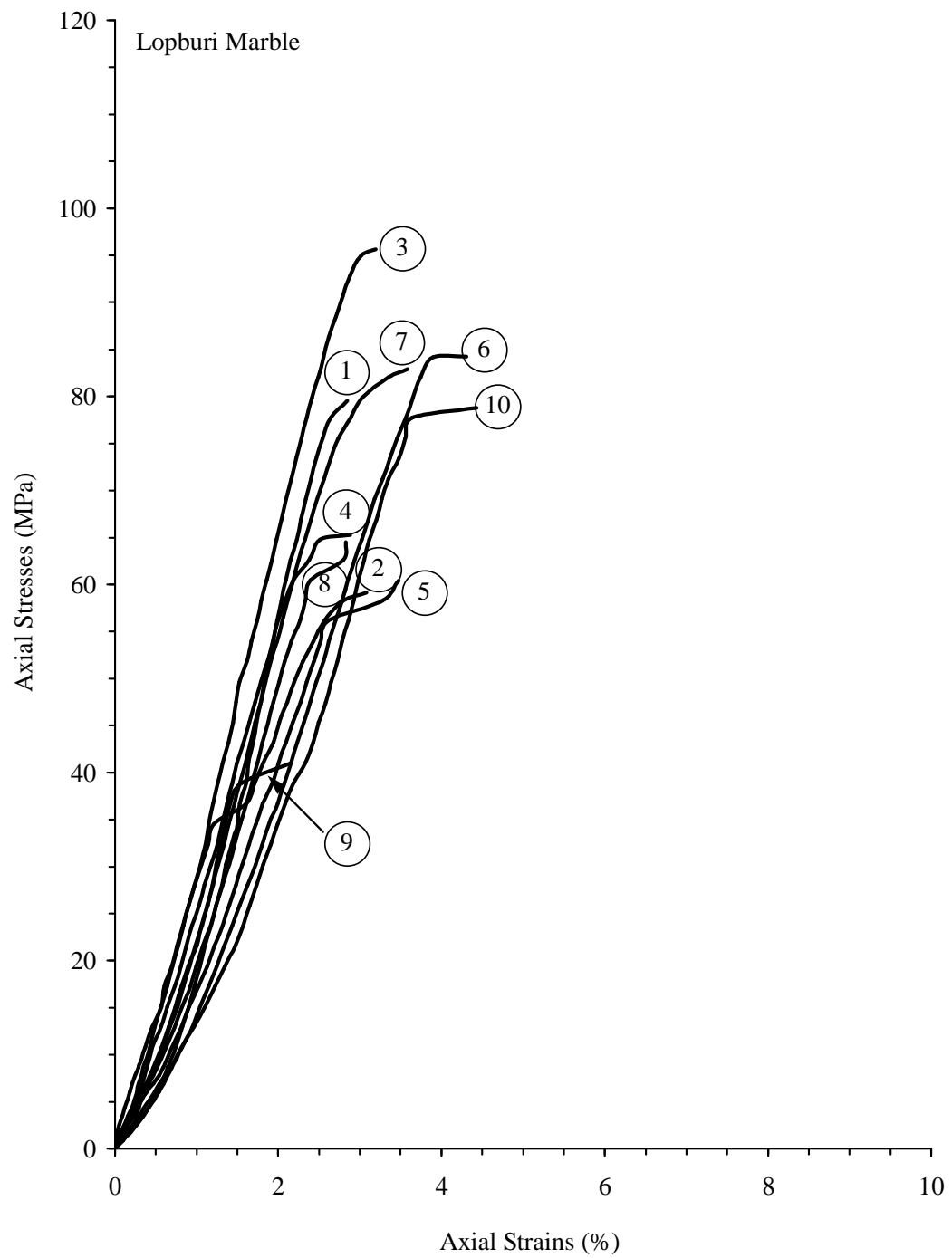


Figure A.6 The axial stress-strain curves for uniaxial compressive strength tests of Lopburi marble.

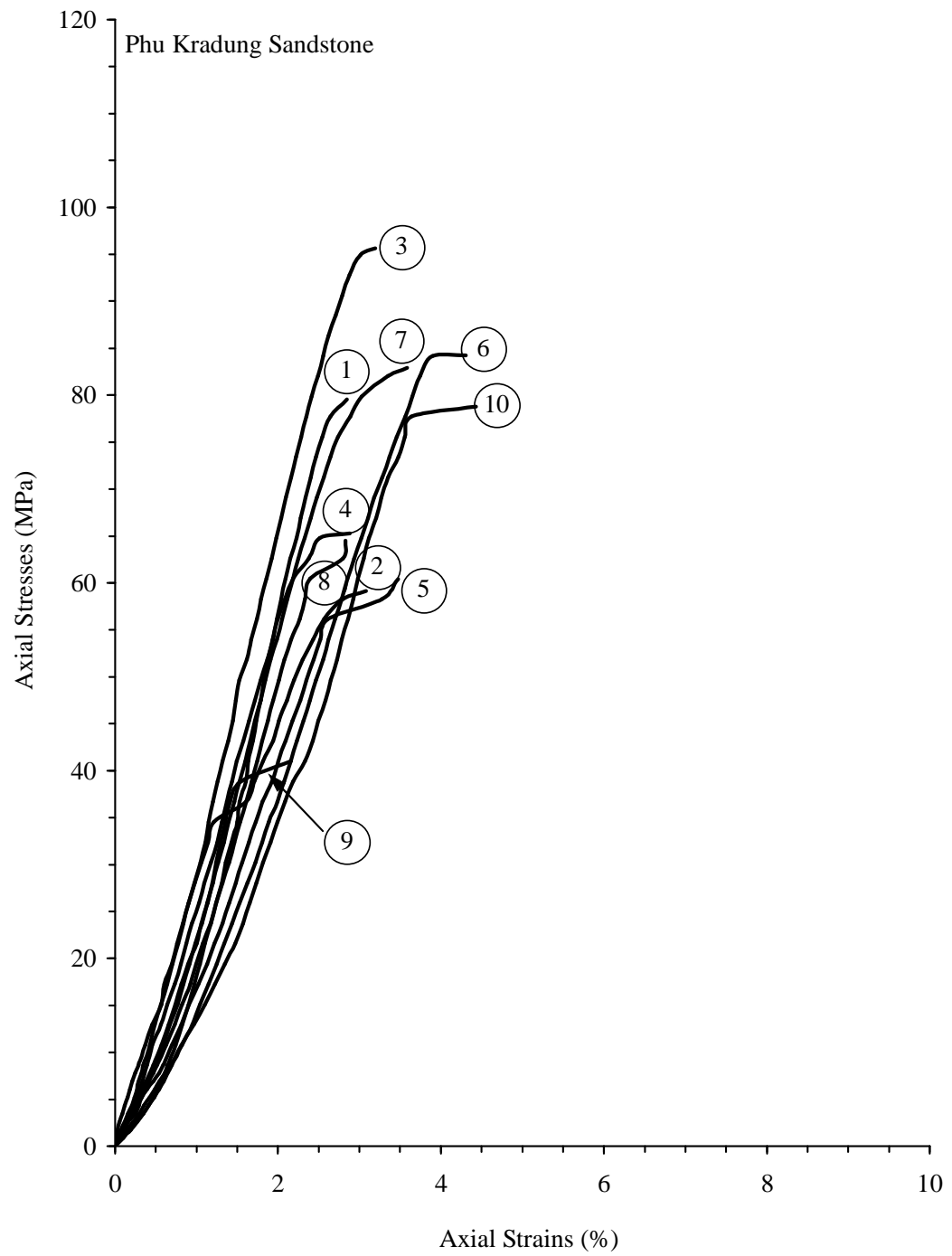


Figure A.7 The axial stress-strain curves for uniaxial compressive strength tests of Phu Kradung sandstone.

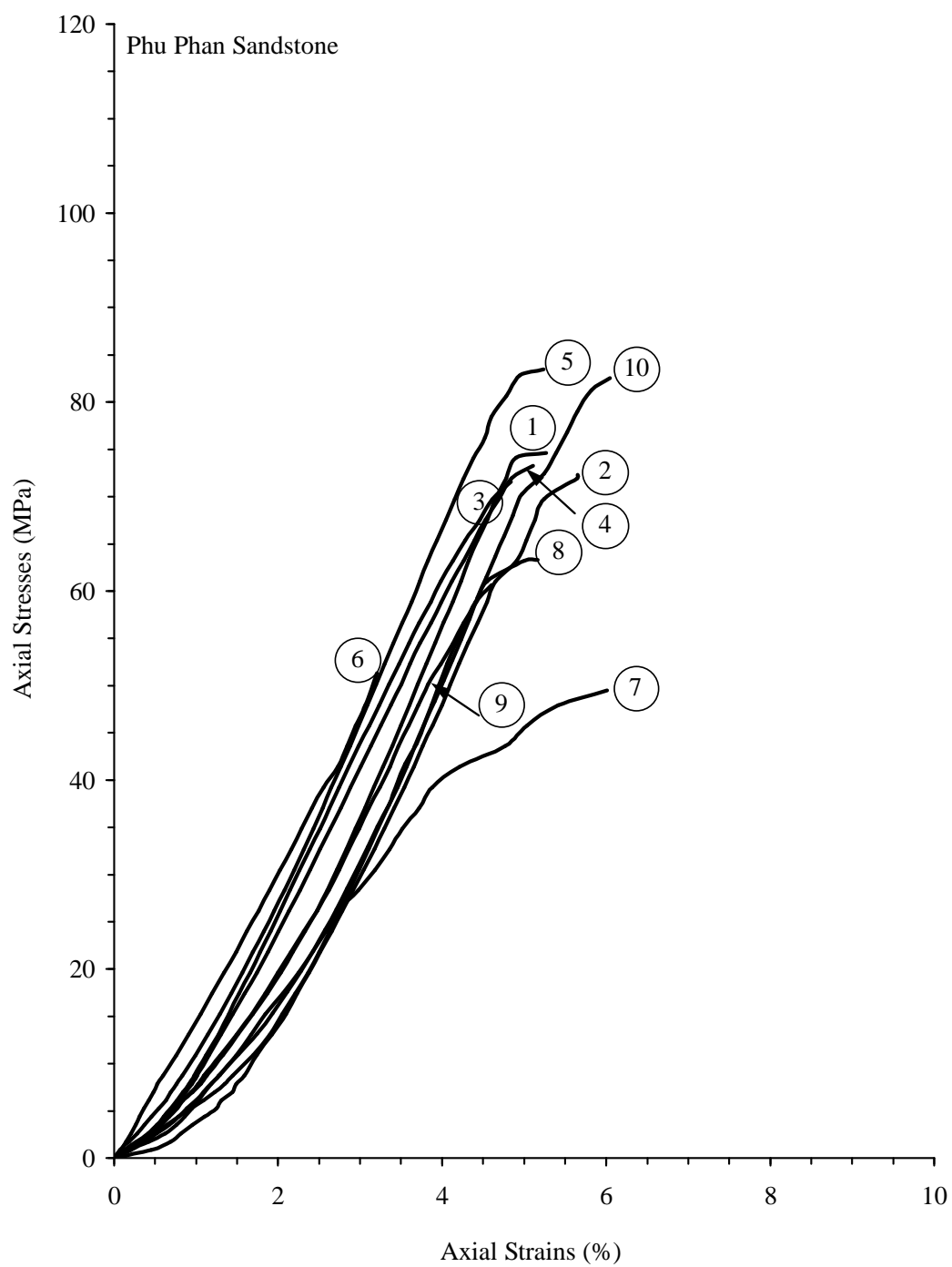


Figure A.8 The axial stress-strain curves for uniaxial compressive strength tests of Phu Phan sandstone.

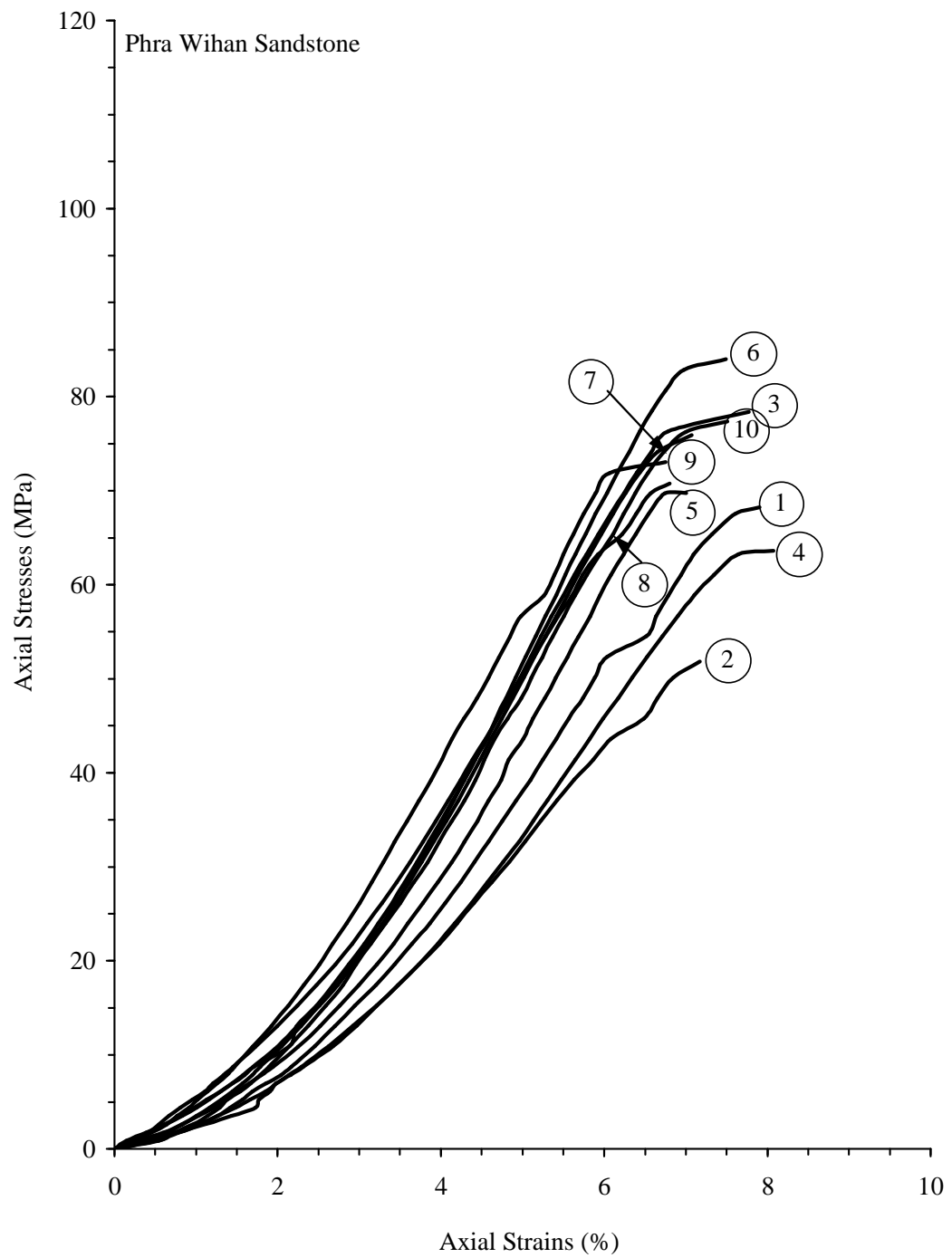


Figure A.9 The axial stress-strain curves for uniaxial compressive strength tests of Phra Wihan sandstone.

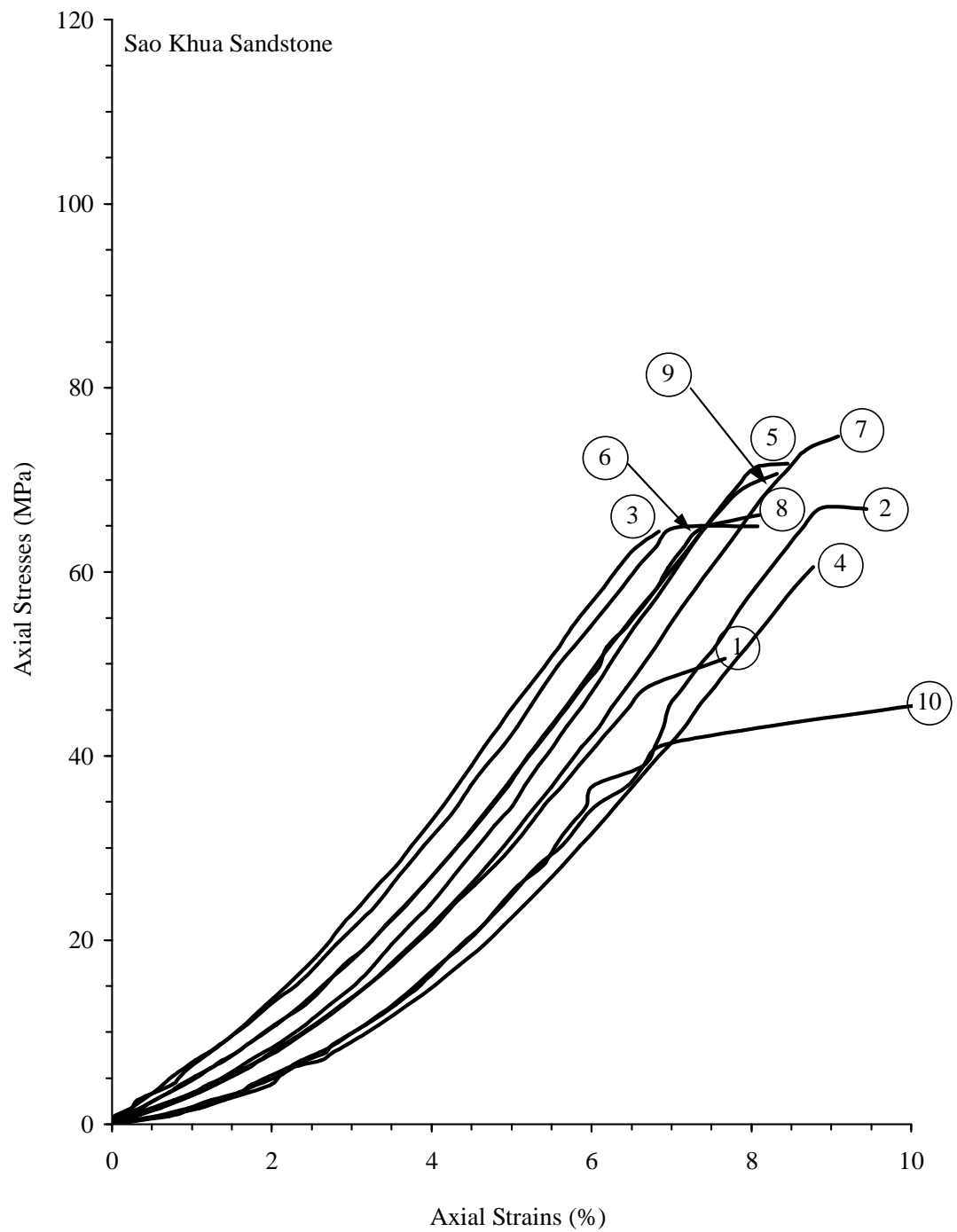


Figure A.10 The axial stress-strain curves for uniaxial compressive strength tests of Sao Khua sandstone.

Table A.1 Results of uniaxial compressive strength tests of Burirum basalt.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
BA-22-UCS-01	53.51	137.70	2.81	151.13	32.00
BA-22-UCS-02	53.53	137.18	2.82	228.38	38.00
BA-22-UCS-03	53.55	136.78	2.77	224.77	32.00
BA-22-UCS-04	53.51	137.69	2.81	169.90	30.00
BA-22-UCS-05	53.55	137.32	2.81	201.61	38.00
BA-22-UCS-06	53.52	137.26	2.81	174.58	38.00
BA-22-UCS-07	53.53	137.21	2.81	186.76	31.00
BA-23-UCS-08	53.54	137.40	2.82	207.48	31.00
BA-23-UCS-09	53.54	137.07	2.81	169.90	31.00
BA-23-UCS-10	53.53	137.26	2.81	166.03	31.00
Average Uniaxial Compressive Strength			188.06 \pm 26.30 MPa		
Average Elastic Modulus			33.20 \pm 3.36 GPa		

Table A.2 Results of uniaxial compressive strength tests of Vietnamese granite.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
RGR-01-01-UCS-01	53.75	141.47	2.60	97.42	28.00
RGR-01-02-UCS-02	53.72	141.03	2.63	143.05	38.00
RGR-01-03-UCS-03	53.60	139.41	2.62	129.68	28.50
RGR-01-04-UCS-04	53.60	140.48	2.62	125.90	31.00
RGR-01-05-UCS-05	53.62	141.01	2.61	159.48	37.50
RGR-01-06-UCS-06	53.63	138.35	2.62	131.39	37.50
RGR-01-07-UCS-07	53.55	137.90	2.62	136.06	38.00
RGR-01-08-UCS-08	53.50	138.64	2.63	147.83	37.50
RGR-01-09-UCS-09	53.60	139.47	2.62	146.80	31.00
RGR-01-10-UCS-10	53.55	139.32	2.62	163.09	37.50
Average Uniaxial Compressive Strength				138.07 \pm 18.86 MPa	
Average Elastic Modulus				34.45 \pm 4.26 GPa	

Table A.3 Results of uniaxial compressive strength tests of Tak granite.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
GG-SR-UN-01	53.55	135.06	2.62	124.47	-
GG-SR-UN-02	53.52	135.26	2.62	111.43	35.90
GG-SR-UN-03	53.46	134.53	2.62	77.33	23.93
GG-SR-UN-04	53.51	135.36	2.62	103.21	39.18
GG-SR-UN-05	53.53	133.83	2.62	118.57	31.25
GG-SR-UN-06	53.52	135.73	2.61	127.34	34.68
GG-SR-UN-07	53.49	135.58	2.62	120.68	35.53
GG-SR-UN-08	53.53	135.15	2.62	85.18*	28.12
GG-SR-UN-09	53.48	136.02	2.62	118.92	30.54
GG-SR-UN-10	53.53	135.66	2.62	130.31	32.08
Average Uniaxial Compressive Strength				119.37 ± 8.75 MPa	
Average Elastic Modulus				32.36 ± 4.58 GPa	

Table A.4 Results of uniaxial compressive strength tests of Chinese granite.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
WGR-01-01-UCS-01	38.53	77.52	2.63	97.26	32
WGR-01-02-UCS-02	38.43	79.40	2.65	93.20	27
WGR-01-03-UCS-03	38.43	78.53	2.65	141.20	38
WGR-01-04-UCS-04	38.52	78.28	2.64	125.87	36
WGR-01-05-UCS-05	38.43	79.37	2.63	129.12	18
WGR-01-06-UCS-06	38.48	77.87	2.64	121.70	28
WGR-01-07-UCS-07	38.50	78.27	2.63	141.55	39
WGR-01-08-UCS-08	38.52	78.28	2.64	111.11	44
WGR-01-09-UCS-09	38.53	77.40	2.63	97.85	33
WGR-01-10-UCS-10	38.50	78.02	2.64	133.89	43
Average Uniaxial Compressive Strength				119.27 \pm 18.34 MPa	
Average Elastic Modulus				34.00 \pm 7.97 GPa	

Table A.5 Results of uniaxial compressive strength tests of Saraburi marble.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
YMB-01-01-UCS-01	38.37	77.92	2.58	68.26	16
YMB-01-02-UCS-02	38.38	77.58	2.60	87.26	25
YMB-01-03-UCS-03	38.42	77.07	2.61	69.52	26
YMB-01-04-UCS-04	38.40	77.70	2.61	76.18	21
YMB-01-05-UCS-05	38.42	77.88	2.58	89.82	17
YMB-01-06-UCS-06	38.53	77.52	2.56	74.48	24
YMB-01-07-UCS-07	53.77	139.98	2.54	79.49	26
YMB-01-08-UCS-08	53.77	136.63	2.58	61.14	15
YMB-01-09-UCS-09	53.57	140.31	2.57	61.25	18
YMB-01-10-UCS-10	53.58	139.59	2.60	102.42	25
Average Uniaxial Compressive Strength				78.69 \pm 14.57 MPa	
Average Elastic Modulus				21.30 \pm 4.42 GPa	

Table A.6 Results of uniaxial compressive strength tests of Lopburi marble.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
MB-SR-UN-01	53.77	133.38	2.71	79.51	29.38
MB-SR-UN-02	53.78	133.72	2.72	59.09	28.78
MB-SR-UN-03	53.78	133.38	2.72	95.57	32.36
MB-SR-UN-04	53.73	135.04	2.72	65.32	29.70
MB-SR-UN-05	53.78	132.95	2.72	60.32	25.02
MB-SR-UN-06	53.76	133.93	2.73	84.21	25.46
MB-SR-UN-07	53.79	133.32	2.72	82.80	30.25
MB-SR-UN-08	53.78	134.25	2.72	64.43	27.81
MB-SR-UN-09	53.77	133.61	2.71	39.86	31.14
MB-SR-UN-10	53.78	133.68	2.72	78.71	27.40
Average Uniaxial Compressive Strength				74.44 \pm 12.62 MPa	
Average Elastic Modulus				28.73 \pm 2.35 GPa	

Table A.7 Results of uniaxial compressive strength tests of Phu Kradung sandstone.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
GST-01-UCS-01	53.50	138.83	2.53	82.67	13.39
GST-01-UCS-02	53.52	138.92	2.53	75.18	11.57
GST-01-UCS-03	53.50	138.92	2.54	65.49	11.94
GST-01-UCS-04	53.49	138.95	2.54	76.03	12.56
GST-01-UCS-05	53.49	138.71	2.53	66.00	11.61
GST-01-UCS-06	53.46	138.85	2.51	72.24	11.39
GST-01-UCS-07	53.51	138.08	2.54	71.10	11.63
GST-01-UCS-08	53.50	137.55	2.56	79.51	13.02
GST-01-UCS-09	53.50	137.54	2.56	72.38	12.19
GST-01-UCS-10	53.49	138.24	2.53	67.71	12.21
Average Uniaxial Compressive Strength				72.83 \pm 5.65 MPa	
Average Elastic Modulus				12.15 \pm 0.67 GPa	

Table A.8 Results of uniaxial compressive strength tests of Phu Phan sandstone.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
YST-01-UCS-01	53.52	137.93	2.25	81.92	18.81
YST-01-UCS-02	53.51	137.95	2.29	72.33	18.29
YST-01-UCS-03	53.52	137.03	2.29	71.59	17.91
YST-01-UCS-04	53.51	138.17	2.25	73.29	17.77
YST-01-UCS-05	53.52	137.40	2.25	83.50	19.61
YST-01-UCS-06	53.52	137.85	2.27	51.29	17.05
YST-01-UCS-07	53.52	137.08	2.25	49.51	10.78
YST-01-UCS-08	53.52	137.48	2.25	63.31	17.17
YST-01-UCS-09	53.51	136.61	2.25	60.64	19.02
YST-01-UCS-10	53.50	136.88	2.25	74.60	20.24
Average Uniaxial Compressive Strength				72.37 ± 8.53 MPa	
Average Elastic Modulus				18.43 ± 1.08 GPa	

Table A.9 Results of uniaxial compressive strength tests of Phra Wihan sandstone.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
WST-01-UCS-01	53.52	137.68	2.32	77.40	14.79
WST-02-UCS-02	53.50	137.65	2.32	51.81	10.22
WST-03-UCS-03	53.51	136.96	2.33	78.38	15.08
WST-04-UCS-04	53.50	136.56	2.32	63.62	11.12
WST-05-UCS-05	53.52	136.60	2.33	69.77	14.63
WST-06-UCS-06	53.50	137.59	2.34	83.98	16.62
WST-07-UCS-07	53.51	137.03	2.33	75.89	15.17
WST-08-UCS-08	53.52	136.47	2.33	70.77	13.86
WST-09-UCS-09	53.52	138.01	2.33	73.08	15.18
WST-10-UCS-10	53.51	137.42	2.32	68.21	12.65
Average Uniaxial Compressive Strength				71.29 \pm 8.96 MPa	
Average Elastic Modulus				13.93 \pm 2.00 GPa	

Table A.10 Results of uniaxial compressive strength tests of Sao Khua sandstone.

Specimen No.	Average Diameter D (mm)	Average Length L (mm)	Density ρ (g/cc)	Failure Stress σ_c (MPa)	Elastic Modulus E (GPa)
RST-01-UCS-01	53.69	137.23	2.33	45.43	8.45
RST-01-UCS-02	53.75	137.68	2.33	66.78	11.31
RST-01-UCS-03	53.76	136.92	2.32	64.34	11.77
RST-01-UCS-04	53.77	137.04	2.32	60.47	10.39
RST-01-UCS-05	53.73	136.84	2.33	71.71	11.97
RST-01-UCS-06	53.75	138.64	2.33	64.88	11.57
RST-01-UCS-07	53.80	137.58	2.32	74.69	11.87
RST-01-UCS-08	53.76	138.10	2.32	66.12	11.33
RST-01-UCS-09	53.76	138.28	2.32	70.61	11.46
RST-01-UCS-10	53.73	137.03	2.33	50.54	9.87
Average Uniaxial Compressive Strength				67.45 \pm 4.59 MPa	
Average Elastic Modulus				11.46 \pm 0.50 GPa	