CHAPTER III
SAMPLE PREPARATION

3.1 Introduction

This chapter describes rock samples used in this study collected from diverse areas of Thailand (Figure 3.1) to evaluate the single and multi-stage testing conditions. Types and names of the rocks are provided. Specimen dimensions follow the ASTM D7012-14 (2014) standard practice.

3.2 Rock Types and Names

Rock specimens come from various locations in Thailand. Table 3.1 shows the rock data, including period, rock unit, rock code, and rock types. The rock codes provided in the table correspond to those published by DMR (2007, 2010, and 2011). Rock specimens are prepared from ten different rock types, ranging from soft to hard rocks, including Tak Fa gypsum, Maha Sarakham salt, Khao Khad bedded limestone, Phu Kradung sandstone, Khao Khad marble, Pha Wihan sandstone, Phu Phan bedded sandstone, Phu Phan sandstone, Rayoung-Bang Lamung granite, and Buriram basalt.

3.3 Rock sample preparation

Prismatic specimens are prepared with nominal dimensions of 54 × 54 × 108 mm^3. The bedding planes for sedimentary rocks are oriented perpendicular to the primary axis (Figure 3.2). Tables 3.2 and 3.3 show single and multi-stage triaxial test specimen dimensions and density

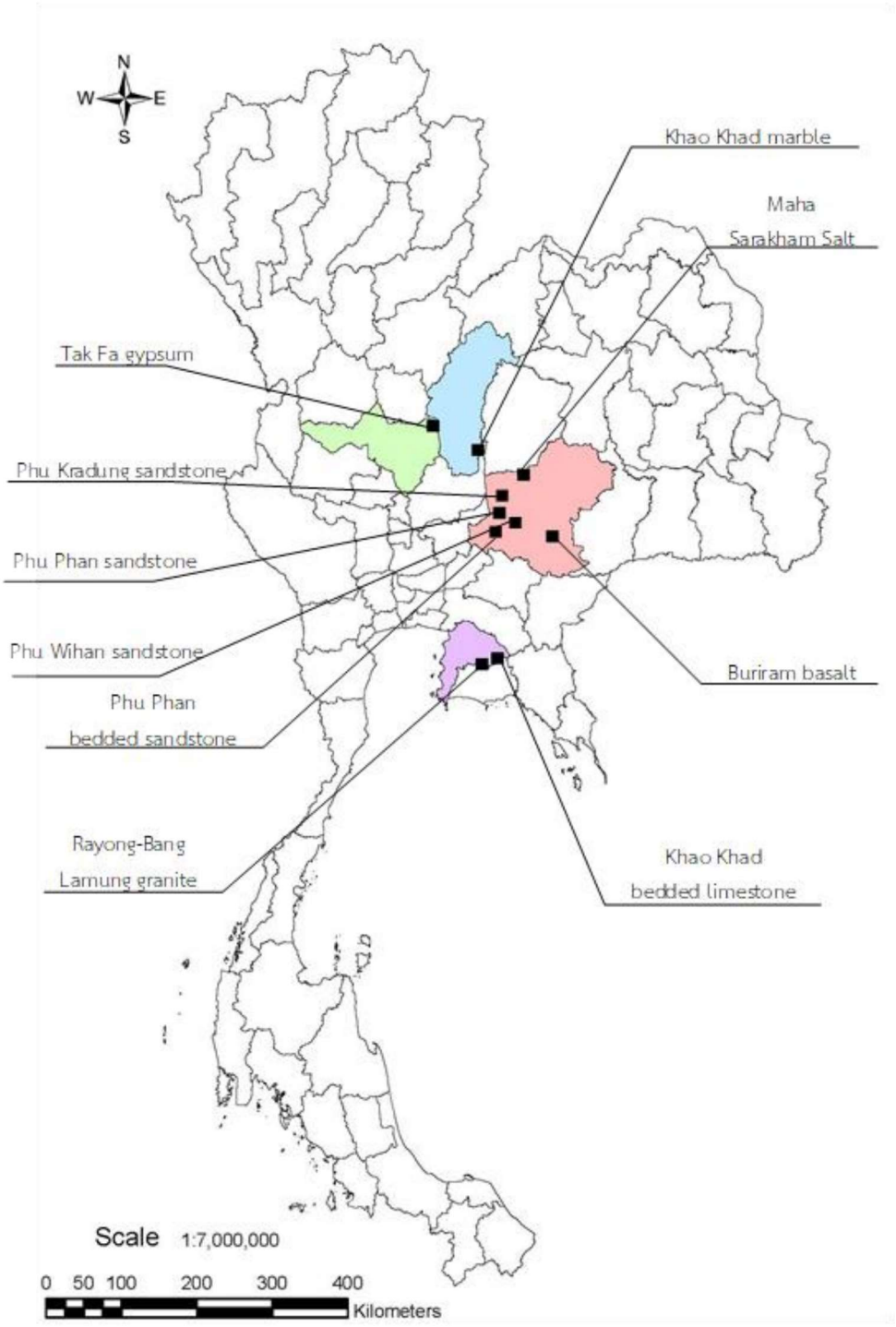

Figure 3.1 Locations at which rock specimens are collected for this study

Figure 3.2 Some specimens prepared for single and multi-stage triaxial compression tests

Table 3.1 Rock units and locations from which they are obtained.

Type of rocks	Period*	Code	Locations	Sources
Tak Fa Gypsum	P - C	Tkb	Nakhon Sawan	DMR (2007)
Maha Sarakham Salt	K	KTms	Nakhon Ratchasima	DMR (2010)
Khao Khad bedded limestone	TR - P	PR	Chonburi	DMR (2011)
Phu Kradung sandstone	K	Jpk	Nakhon Ratchasima	DMR (2010)
Khao Khad marble	P	Pkd	Lopburi	DMR (2007)
Pha Wihan sandstone	J	JKpw	Nakhon Ratchasima	DMR (2010)
Phu Phan bedded Sandstone	K-J	Kpp	Nakhon Ratchasima	DMR (2010)
Phu Phan Sandstone	K-J	Kpp	Nakhon Ratchasima	DMR (2010)
Rayong-Bang Lamung granite	T	Rgr	Chonburi	DMR (2011)
Buriram basalt	T	bs	Nakhon Ratchasima	DMR (2010)

* Carboniferous (C), Permain (P), Tertiary (T), Triassic (TR), Jurassic (J), and Cretaceous (K)

Table 3.2 Dimensions and densities of specimens prepared for uniaxial and triaxial compression testing.

Type of rocks	Specimen No.	Width (mm.)		Length (mm)	Weight (g)	Density (g/cc)
		Parallel to Strike	Normal to Strike			
Tak Fa Gypsum	GS-UCS-01	54.2	54.0	107.32	685.43	2.18
	GS-TRI-02	54.1	54.0	107.38	695.32	2.22
	GS-TRI-03	53.7	54.5	106.74	687.36	2.20
	GS-TRI-04	54.1	53.9	106.36	689.31	2.22
	GS-TRI-05	54.5	54.6	106.98	702.31	2.21
Maha Sarakham Salt	S-UCS-01	54.0	54.0	107.70	661.32	2.11
	S-TRI-02	54.1	54.1	108.52	678.32	2.13
	S-TRI-03	53.9	54.4	108.84	675.31	2.12
	S-TRI-04	54.7	53.7	108.92	679.65	2.12
	S-TRI-05	53.6	53.8	106.32	661.31	2.15
Khao Khad bedded limestone	LS-UCS-01	54.0	54.0	108.98	832.15	2.62
	LS-TRI-02	54.7	53.9	109.02	846.52	2.63
	LS-TRI-03	54.7	53.6	107.36	843.16	2.68
	LS-TRI-04	53.8	54.4	106.52	825.47	2.65
	LS-TRI-05	54.7	54.1	107.84	851.24	2.67
	LS-TRI-06	54.1	53.7	107.32	821.74	2.64
Phu Kradung sandstone	PK-UCS-01	54.4	53.0	106.52	708.25	2.30
	PK-TRI-02	54.8	54.4	107.62	742.11	2.31
	PK-TRI-03	54.3	54.8	107.88	738.65	2.30
	PK-TRI-04	53.7	55.0	108.38	754.32	2.36
	PK-TRI-05	53.1	53.9	106.26	719.84	2.37

Table 3.2 Dimensions and densities of specimens prepared for uniaxial and triaxial compression testing. (cont.)

Type of rocks	Specimen No.	Width (mm.)		Length (mm)	Weight (g)	Density (g/cc)
		Parallel to Strike	Normal to Strike			
Khao Khad marble	MR-UCS-01	54.9	54.0	106.62	828.98	2.62
	MR-TRI-02	53.7	53.4	107.02	819.33	2.67
	MR-TRI-03	53.3	54.0	106.32	815.36	2.66
	MR-TRI-04	54.1	54.1	108.52	824.77	2.60
	MR-TRI-05	53.7	53.3	107.30	805.32	2.63
	MR-TRI-06	54.4	53.7	106.86	812.55	2.60
Pha Wihan sandstone	PW-UCS-01	54.0	53.9	106.74	732.15	2.36
	PW-TRI-02	54.2	54.1	106.36	741.11	2.38
	PW-TRI-03	53.4	53.6	106.98	719.19	2.35
	PW-TRI-04	53.9	54.0	106.52	716.55	2.31
	PW-TRI-05	54.2	54.4	107.62	729.32	2.30
	PW-TRI-06	54.4	53.6	107.88	731.31	2.33
	PW-TRI-07	53.4	53.7	108.38	738.95	2.38
Phu Phan bedded Sandstone	PPBSS-UCS-01	54.4	54.3	107.02	721.35	2.28
	PPBSS-TRI-02	53.4	54.1	106.32	732.15	2.39
	PPBSS-TRI-03	54.4	53.4	108.52	729.85	2.32
	PPBSS-TRI-04	53.7	53.0	107.88	721.54	2.35
	PPBSS-TRI-05	54.9	54.4	108.38	749.32	2.32
Phu Phan Sandstone	PPSS-UCS-01	54.3	54.0	106.26	721.36	2.31
	PPSS-TRI-02	54.0	54.2	106.62	731.54	2.34
	PPSS-TRI-03	53.1	53.0	107.36	718.36	2.38
	PPSS-TRI-04	54.3	53.9	106.52	732.55	2.35
	PPSS-TRI-05	54.1	54.4	107.84	729.87	2.30

Table 3.2 Dimensions and densities of specimens prepared for uniaxial and triaxial compression testing. (cont.)

Type of rocks	Specimen No.	Width (mm.)		Length (mm)	Weight (g)	Density (g/cc)
		Parallel to Strike	Normal to Strike			
Rayong-Bang Lamung granite	GR-UCS-01	53.7	54.7	108.52	812.36	2.55
	GR-TRI-02	54.8	53.3	107.88	817.77	2.59
	GR-TRI-03	55.0	54.0	108.38	805.36	2.50
	GR-TRI-04	53.3	55.0	106.32	799.25	2.57
Buriram basalt	BS-UCS-01	53.9	53.3	107.36	836.52	2.71
	BS-TRI-02	54.0	53.8	106.52	856.32	2.76
	BS-TRI-03	54.1	54.5	107.84	865.36	2.72
	BS-TRI-04	53.7	54.7	108.52	887.77	2.79
	BS-TRI-05	53.8	54.1	107.88	871.36	2.77

Table 3.3 Dimensions and densities of specimens prepared for multi-stage triaxial compression testing.

Type of rocks	Specimen No.	Width (mm.)		Length (mm)	Weight (g)	Density (g/cc)
		Parallel to Strike	Normal to Strike			
Tak Fa Gypsum	GS-MST-01	54.0	54.0	107.68	695.3	2.21
Maha Sarakham Salt	S-MST-01	54.3	53.5	108.32	672.3	2.13
Khao Khad bedded limestone	LS-MST-01	53.9	54.0	109.02	825.4	2.60
Phu Kradung sandstone	PK-MST-01	54.3	54.0	108.46	732.5	2.30
Khao Khad marble	MB-MST-01	53.9	54.4	107.32	819.3	2.61
Pha Wihan sandstone	PW-MST-01	54.0	54.3	108.34	732.7	2.31
Phu Phan bedded Sandstone	PPBSS-MST-01	54.3	53.0	109.22	742.3	2.36
Phu Phan Sandstone	PPSS-MST-01	54.1	54.9	110.02	765.3	2.34
Rayong-Bang Lamung granite	GR-MST-01	53.2	53.2	108.32	785.3	2.56
Buriram basalt	BS-MST-01	54.7	53.8	107.64	865.3	2.73