भारतीय मानक
Indian Standard

IS 7422 (Part 2) : 2024

भूवैज्ञानिक मानचित्र, खंड और उपसतही अन्वेषी लॉग में प्रयुक्त चिह्न और संक्षिप्त रूप

भाग 2 अग्निज शैल

(पहला पुनरीक्षण)

Symbols and Abbreviations Use in Geologlcal Maps, Sections and Subsurface Exploratory Logs

Part 2 Igneous Rocks

(First Revision)

ICS 07.060

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Geological Investigations and Subsurface Exploration Sectional Committee, WRD 05

FOREWORD

This Indian Standard (Part 2) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Geological Investigation and Subsurface Exploration Sectional Committee had been approved by the Water Resources Division Council.

In all spheres of engineering construction, data on the nature of the geological formations constituting the foundations are indispensable. Often, the data are given on maps or in geological sections using symbols and abbreviations. Geological maps and sections are also required for other activities, such as mining and mineral prospecting. Such maps and sections are, therefore, being prepared by various agencies in the country. In the absence of any standard for the guidance of the engineering geologist of engineer, different symbols and abbreviations are being used by different agencies, resulting in entirely different representations of the same geological data. The data collected and presented by one agency for a particular purpose is often useful to other agencies investigating for a different job. It, therefore, becomes essential for all agencies to follow the same practice. This standard has been prepared to fulfil this need.

This standard (Part 2) deals with igneous rocks while other parts are as follows:

Part 1	Abbreviations
Part 3	Sedimentary rocks
Part 4	Metamorphic rocks
Part 5	Line symbols for formation contacts and structural features

The symbolization of rock types is based on the principles laid down by the International Organization for Standardization. For the rock types to be covered for symbolization, classification of igneous rocks as adopted by United States Bureau of Reclamation for engineering purposes has been used.

The standard was published in 1974. This revision has been brought out to bring the standard in latest style and update with respect to the latest field practices. In revision of this standard, due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. In this first revision of standard, assistance have been derived from ISO 710-3 : 1974 ‘Graphical symbol for use on detailed maps, plans and geological cross section- Part 3 Representation of Magmatic Rocks’.

The composition of the Committee, responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 2022 ‘Rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SYMBOLS AND ABBREVIATIONS FOR USE IN GEOLOGICAL MAPS, SECTIONS AND SUBSURFACE EXPLORATORY LOGS

PART 2 IGNEOUS ROCKS

(First Revision)

1 SCOPE

This standard (Part 2) covers symbols for igneous rocks for use in geological maps, sections and logs of bore holes, test pits, exploratory drifts and shafts for river valley projects. Rock types covered in the standard are restricted to those commonly met with in engineering practice.

2 BASIC PRINCIPLES OF SYMBOLIZATION

2.1 In order to represent a type of rock on a map or on a plan, the corresponding surface should be covered by the symbols representing the rock in question. The surfaces occupied by rocks of different types should be separated by a continuous thin line if in nature there is a clear demarcation between the different types.

2.2 The graphic symbols should be used in black and white for the representation of rocks and minerals. Additional letter symbols may be used to designate other characteristics like age.

2.3 There is a great variety of rocks and it is impossible to have an individual symbol for each of the rock types that are found in nature. For this reason, the symbols are developed for the most important and frequently occurring rock types. For listing the rock types one of the simpler systems used for classification of rocks has been followed; however the tables of symbols for rock types are not meant to provide a standard system of classification. The symbolization is based on the following principles:

a) In order to characterize the properties of rocks, elementary symbols are chosen, which should:

   1) be a simple as possible and, therefore, easily traceable;
   2) express the nature of the rock; and
   3) be of such a dimension that several elementary symbols can be placed next to each other.

b) Principal rock types are represented by the juxtaposition of several identical elementary symbols; the variations of the above are shown by the addition of the elementary symbols which characterize the principal constituents.

c) In order to characterize the loose form of rock, symbols should be arranged with no determined order; a systematic staggered arrangement should represent the consolidated form of a rock.

d) The individual elements or the rows of symbols should be arranged either parallel to the stratification of foliation where applicable or parallel to the margin of the map or the geological formation under portrayal, as found convenient. The procedure adopted should be indicated on the plan.

The basic symbols given in this standard should not be used for other representations. Within the framework of these principles, symbols for other rocks not covered in this standard may be developed and intimation may be made to the Indian Standards Institution. Similarly, for any characteristic not represented by a symbol, a new symbol may be chosen.

3 GRAPHIC SYMBOLS FOR IGNEOUS ROCKS

3.1 Basic Symbols

The basic symbols of the principal types of igneous rocks are given in Table 1.

3.2 Symbols for Rock Types

3.2.1 For developing symbols for different rock types from these basic symbols the following points should be kept in view:

a) A distinction in the grain size of rocks may be shown by the smaller or greater size of the basic symbols;

b) To indicate porphyritic texture, the basic symbol is replaced at intervals by a larger symbol of the same type;

c) The symbols representing plutonic rocks are derived from a cross;

 or the letter  ; for volcanic rocks, the basic symbol chosen is a right angle placed on its point  The symbols for feldspathoidal rocks are always asymmetrical  ;

d) In the symbols for alkaline rocks with the exception of feldspathoidal rocks, an open space in always left at the point of intersection of the lines for example  and  ;

e) To indicate the very acid character of a rock, a point is placed at the centre of the symbol, the lines being interrupted around the point of intersection  ;

f) With increasing basicity, the lines are thickened so that the darker appearance of the rock is reflected in the symbol; and

g) The various types of ultrabasic rocks may be represented by the greater or lesser length of lines in relation to the black square   .

3.2.2 The symbols for different rock types commonly met with in engineering practice are given in Table 2. Symbols for rock types not given in Table 2 may be developed using the basic symbols given in Table 1 on the basic of the principles laid down in **2** and **3.2.1**.

3.2.3 Where features are too small for graphical representation either an asterisk may be given against the feature and explained in the legend or the name of the rock written out.

Table 1 Basic Symbols of the Types of Igneous Rocks

(*Clauses* 3.1 *and* 3.2.2)

	PLUTONIC ROCKS				VOLCANIC ROCKS			
Sl No.	Rock Group	Group Symbol	More Differentiated Rock Types	Symbol	Rock Group	Group Symbol	More Differentiated Rock Types	Symbol
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	Alkali-granite				Alkali-rhyolite			
ii)	Very acid granite				Leucorhyolite			
iii)	Granite		Normal granite		Rhyolite		Rhyolite	
			Granodiorite				Rhyodacite	
			Quartz-diorite				Dacite	
	Syenite		Alkali-syenite		Trachyte		Alkali trachyte	
			Syenite				Trachyte	

Table 1 (*Continued*)

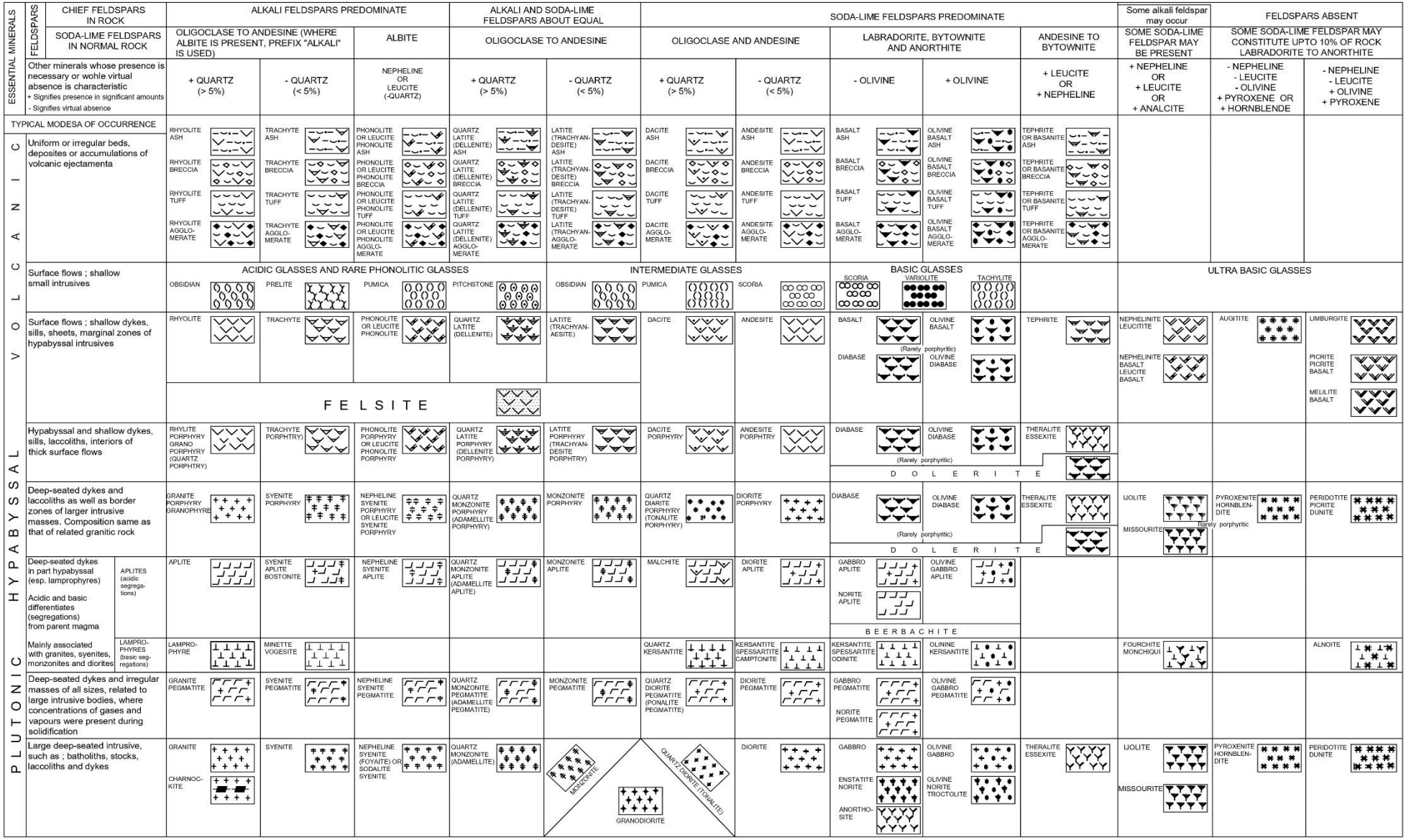
	PLUTONIC ROCKS				VOLCANIC ROCKS			
Sl No.	Rock Group	Group Symbol	More Differentiated Rock Types	Symbol	Rock Group	Group Symbol	More Differentiated Rock Types	Symbol
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Monzonite				Latite	
iv)	Diorite				Andesite			
			Gabbro					
v)	Gabbro		Norite		Basalt			
			Anorthosite					
vi)	Feldspathoidal plutonic rocks		Nepheline-syenite		Feldspathoidal volcanic rocks		Phonolite	
			Essexite/Theralite					
			Ijolite				Feldspathoidal basalt	

Table 1 (*Concluded*)

	PLUTONIC ROCKS				VOLCANIC ROCKS			
Sl No.	Rock Group	Group Symbol	More Differentiated Rock Types	Symbol	Rock Group	Group Symbol	More Differentiated Rock Types	Symbol
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
vii)	Ultra basic rock				Picrite, Picrite - basalt			

Table 2 Symbols for Igneous Rock

(*Clause* 3.2.2)



ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Geological Investigations and Subsurface Exploration Sectional Committee, WRD 05

Organization	*Representative*(*s*)
In Personal Capacity, (*G-202, JMD Garden Sohna Road, Sector 33 Gurugram-122018*)	DR P. C. NAWANI **(*Chairperson*)**
AECS Engineering & Geotechnical Services Pvt Ltd, Noida	DR TANU RAGHUVANSHI (MANAGER LABORATORY) SHRI SANJEEV TREHAN DIRECTOR (*Alternate*)
Afcons Infrastructure Limited, Mumbai	DR SUNIL BASARKAR, GM (DESIGNS) DR LAKSHMANA RAO MANTRI, ASSISTANT GM (DESIGN) (*Alternate*)
Aimil Limited, New Delhi	SHRI LAXMIDHAR MOHAPATRA SHRI HEMAN MANCHANDA (*Alternate*)
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CSIR - Central Institute for Mining And Fuel Research, Dhanbad	DR J. K. MOHNOT, CHIEF SCIENTIST AND SCIENTIST-IN-CHARGE DR ANIL SWARUP (*Alternate*)
Central Soil & Material Research Station, New Delhi	SHRI N P HONKANDAVAR, SCIENTIST E SHRI HARI DEV, SCIENTIST E (*Alternate*)
Central Water Commission, New Delhi	SHRI SAMIR KUMAR SHUKLA DIRECTOR (FE AND SA) SHRI S. K. DAS, DIRECTOR CMDD (E AND NE) (*Alternate*)
Central Water & Power Research Station, Pune	DR G. DHANUNJAYA, SCIENTIST C SHRI V. CHANDRA SHEKAR, SCIENTIST C (*Alternate*) SHRI B. SURESH KUMAR SCIENTIST C (*Alternate*)
Ferro Concrete Construction Pvt Ltd, Indore	DR MAHAVIR BIDASARIA (*Alternate*)
Geological Survey of India, New Delhi	SHRI P. K. GAJBHIYE, DIRECTOR SHRI IMTIKUMZUK, DIRECTOR (*Alternate*)
Gujarat Engineering Research Institute, Vadodara	SHRI N. R. MAKWANA, JOINT DIRECTOR (IRRIGATION) SHRI R. K. CHAUHAN, SENIOR GEOLOGIST, ENGINEERING GEOLOGY DIVISION (*Alternate*)
Himachal Pradesh Power Corporation Limited, Shimla	SHRI ER. R. K. KAUNDAL, GENERAL MANAGER (DESIGNS) SHRI SANJAY RANA DY GM (*Alternate*)
Indian Institute of Remote Sensing, Dehradun	DR R. S. CHATTERJEE, SCIENTIST 'G' AND HEAD, GEOSCIENCES DEPARTMENT
J&K State Power Development Corporation Limited, Srinagar	SHRI RAVI PANDITA

Organization	*Representative*(*s*)
M/S Parsons Overseas Ltd, New Delhi	SHRI SANJAY RANA, MANAGING DIRECTOR SHRI ASHUTOSH KAUSHIK, CEO (*Alternate*)
Narmada Control Authority, Indore	SHRI M. K. CHAUHAN
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National Institute of Rock Mechanics, Karnataka	DR AJAY KUMAR NAITHANI DR SANDEEP NELLIAT (*Alternate*)
National Thermal Power Corporation Limited, Noida	SHRI NAVEEN KUMAR JAIN SHRI BHUVNESH KUMAR (*Alternate*)
North Eastern Electric Power Corporation Ltd, Shillong	SHRI GIRISH KALITA, MANAGER (GEOLOGY)
Satluj Jal Vidyut Nigam Ltd Limited, Shimla	SH AJAY KUMAR, MANAGER SHRI BRIJESH BADONI, MANAGER (*Alternate*)
Tehri Hydro Development Corporation India Limited, Rishikesh	SHRI AJAY KUMAR SHRI KAILASAH CHANDRA UNIYAL (*Alternate*)
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BIS Directorate General	SHRI R. BHANU PRAKASH SCIENTIST 'E'/ DIRECTOR AND HEAD (WATER RESOURCES) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI AJAY MEENA
SCIENTIST 'B'/ASSISTANT DIRECTOR
(WATER RESOURCES), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: WRD 05 (21365).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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