



KNIGHT INLET GRANITE QUARRY (92K/12W)

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KEYWORDS: Dimension stone, Knight Inlet, granite quarry, Catherine Blue Granite, hornblende diorite.

INTRODUCTION

A dimension-stone quarry (MINFILE 92K-140), located approximately 250 kilometres northwest of Vancouver on the north shore of Knight Inlet, was opened in 1985 after several years of sampling and evaluation. The quarry has operated intermittently since, producing monumental and ornamental stone known locally as "Catherine Blue Granite". Examples of the stone can be viewed at the British Columbia Pavillion (dedication panels) in Vancouver and at the cenotaph on Crescent Beach near White Rock.

This article is a continuation of a program to evaluate dimension-stone quarries in British Columbia begun in 1985 (White, 1986).

SAMPLE DESCRIPTION

The quarry was opened in hornblende diorite of the Coast plutonic complex (Roddick *et al.*, 1979). The diorite is medium grained (1 to 5 millimetres) and has an attractive blue-grey tone which is darkened by euhedral phenocrysts of hornblende and blades of biotite. The groundmass consists of light blue-grey plagioclase which constitutes approximately 50 per cent of the rock, and minor epidote (less than 1 per cent) which is present as tiny pale green grains. The contrast between felsic and mafic minerals is sharp and attractive, particularly when surfaces are polished, although occasional pitting and blind spots may develop when slabs are polished (Hora, 1982).

Pyrite (less than 1 per cent) is observed in outcrop and polished slabs; the rock is weakly magnetic, has few knots of mafic minerals greater than 5 millimetres across and is generally free of stains. There is a gradual but significant darkening

of the stone over a 40-metre interval south of the worked face.

Samples collected and tested meet American Society for Testing and Material (ASTM) standards for granite building stone (Table 3-6-1).

The working face (Plate 3-6-1), approximately 24 metres long by 2.4 metres high, has been developed along a prominent set of joints which strike north-northeast and dip vertically (Figure 3-6-1). A second set of northeasterly striking joints dips moderately to steeply southwest and occasionally north.

Measurement of joint and fracture density in outcrop indicates 35 per cent of joints are spaced more than 1 metre apart. Quarry manager, Kelly Robertson, indicated blocks up to 1.5 by 2.1 by 2.6 metres have been quarried, although average blocks measure 1.2 by 1.5 by 2.4 metres. Up to 50 per cent of waste is produced during quarrying, due to irregular and closely spaced joints (Kelly Robertson, personal communication, 1987).

RESERVES

Seven diamond-drill holes (145.4 metres) have delineated 62 500 cubic metres of unaltered hornblende diorite (Cavers, 1983). There is good potential for additional reserves of stone east of the worked face, however, much of the area is covered by thin overburden and the area could not be examined in detail.

ACKNOWLEDGMENTS

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TABLE 3-6-1
KNIGHT INLET DIMENSION STONE; PHYSICAL PROPERTIES

Commodity	Quarry Name	NTS	Specific Gravity	Absorption by weight %	Traverse Strength ¹ psi	Traverse Strength ¹ MPa	Compressive Strength ¹ psi	Compressive Strength ¹ MPa
Granite	Knight Inlet	92K/12W	3.05	0.113	3510	24.2	23 946	165.1
Physical requirements — American Society for Testing and Materials (ASTM)								
Granite*			n/a	40 (max.)	1500 (min.)	10.34	19,000 (min.)	131

* Granite (commercial definition) — a visibly granular, igneous rock generally ranging in colour from pink to light or dark grey and consisting mostly of quartz and feldspar, accompanied by one or more dark minerals. The texture is typically homogeneous but may be gneissic or porphyritic.

Source: 1984 Annual Book of American Society of Testing Material (ASTM).

Physical tests: B.C. Ministry of Transportation and Highways (Geotechnical and Materials Branch). Results obtained from samples collected by Hora, 1982 and White, 1987.

¹ Results of 3 samples — tested dry.

Conversion Factor: psi→MPa = # × 6.894757 × 10⁻³.

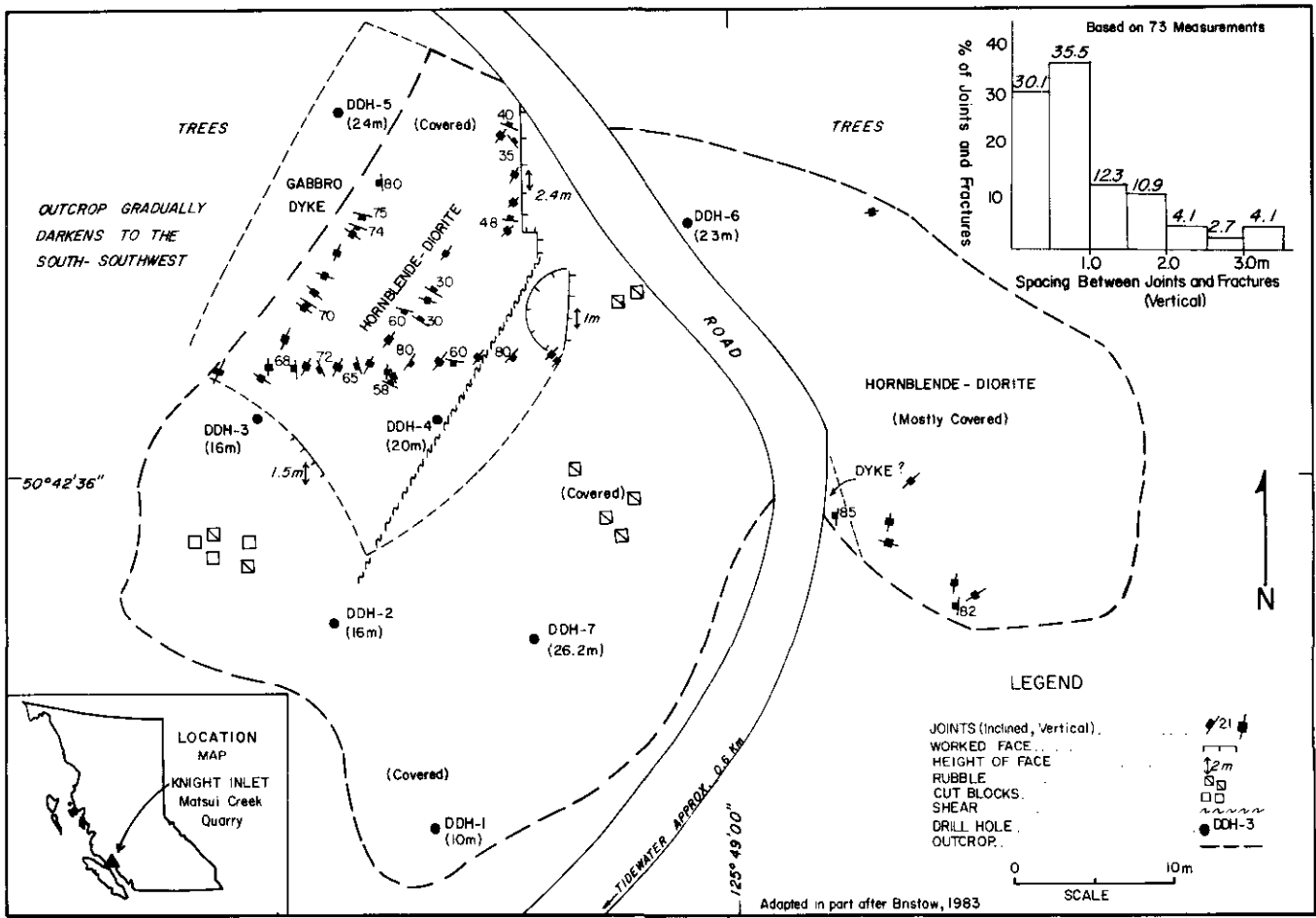


Figure 3-6-1. Knight Inlet Granite Quarry (92K/12W).



Plate 3-6-1. Working face — Knight Inlet Quarry (92K/12W).

ical tests. David Hannay provided capable and cheerful assistance in the field. Figures were drafted by Janet Fontaine.

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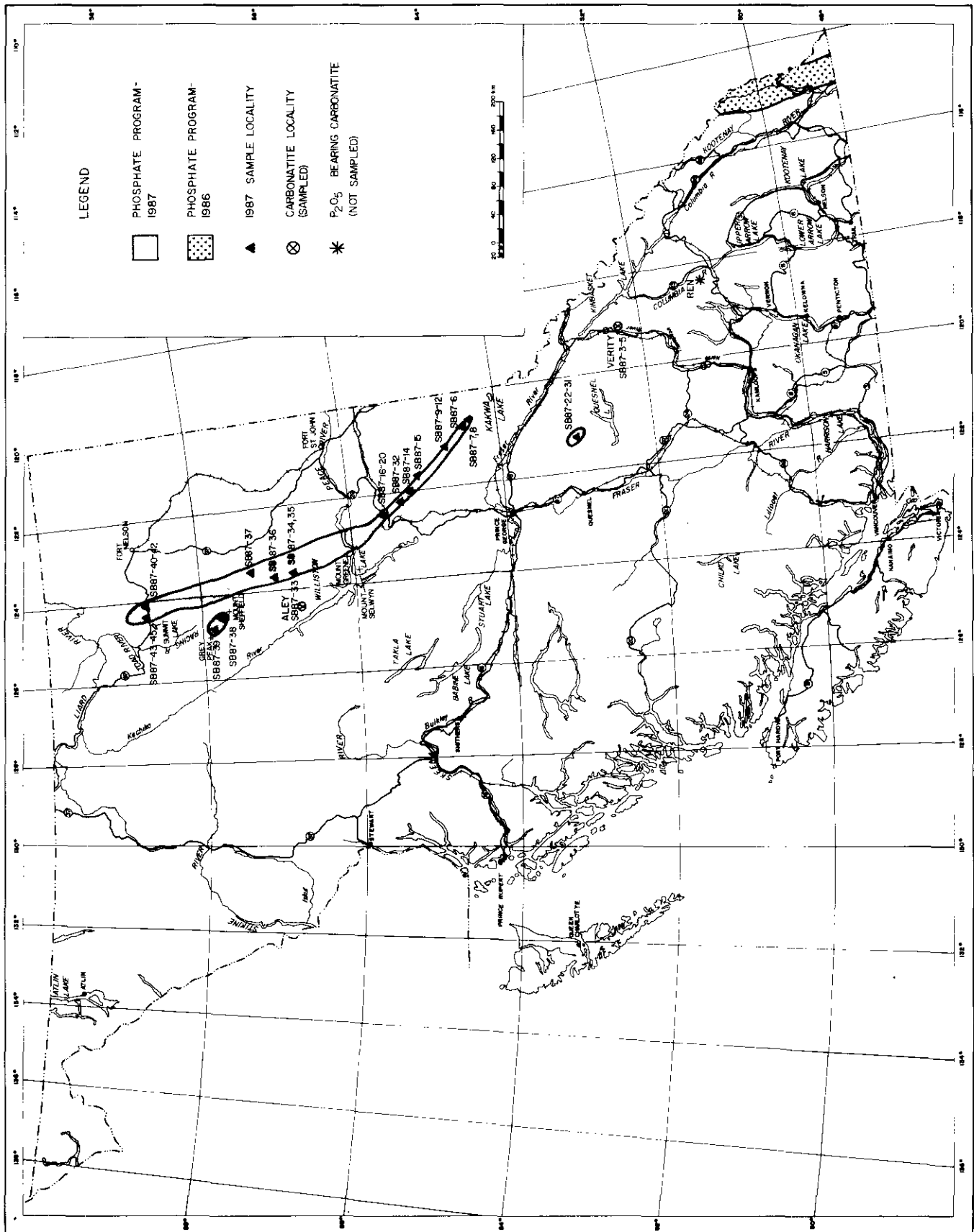


Figure 3-7-1. Sample location map.