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HARAMA MARBLE DEPOSIT

John Brady
Sudbury, Ontario, Canada

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Norwin Geological Ltd.
September, 1991

RECEIVED

MAY 6 - 1992

MINING LANDS BRANCH



HARAMA MARBLE DEPOSIT

J. BRADY, Sudbury
NORWIN Geological, Sept. 1991
Ed. SAWITZKY.

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INTRODUCTION

The following appraisal of the dimension stone potential of the Harama marble deposit is based on a brief one-day property visit by the undersigned.

The property which consists of seven mining claims comprising 113.4 hectares is located in Concession IV, Lots 10 and 11 in Parkin Township, approximately 40 kilometres north of Sudbury. Access is by a public gravel road leading from Hwy. 545, north of the town of Capreol (Figure 1).

GEOLOGY

The property is underlain by a portion of the Huronian Supergroup of the Southern Province, a Middle Precambrian (Aphebian-age) assemblage of sedimentary and volcanic rocks. The rocks of interest are limestones (marble) of the Espanola Formation¹. The Espanola Formation in Parkin Township consists of two members (Meyn, 1970). The lower member is a limestone interbedded with siltstone and the upper member is a fine-grained siltstone to sandstone. "The total thickness of the Espanola Formation is difficult to determine.....Total thickness is probably between 100 (30.5 m) to 200 (61.0 m) feet for the limestone..." Meyn, (1970).

To date stripping and trenching carried out on the property has revealed two areas (hereafter, referred to as Zones A and B) underlain by limestone deposits (Figure 2). Zone A encompasses an exposed area 50 meters by 150 meters and Zone B encompasses an exposed area 40 meters by 60 meters. Zone A trends north-south and Zone B trends east-west. This data suggests that limestone beds underlying Zone B may have been folded into a northerly orientation in the area underlain by Zone A. If this interpretation is correct it would significantly increase the

¹ Espanola Formation is a subunit of the Bruce Group.

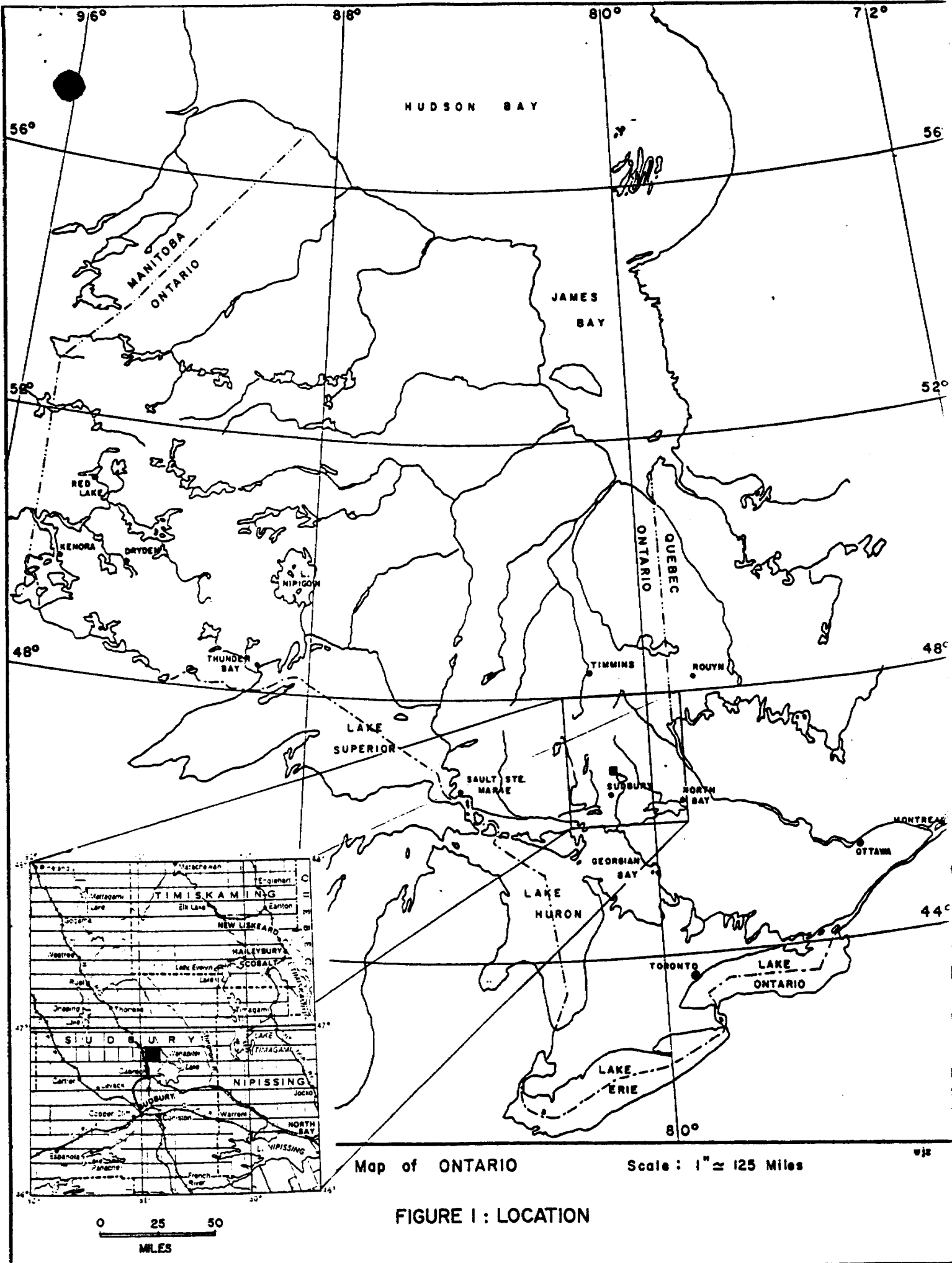


FIGURE 1: LOCATION

Hutton and Parkin Townships

Township. The mine has been producing pelletized iron-ore since 1963. Production in 1965 amounted to 625,000 tons of pellets.

A number of sulphide showings occur in the metavolcanics and associated intrusions. Some of these have been tested by trenching and drilling. Exploratory drilling and trenching were also carried out on the Huronian metasediments to test limestone for cement, quartzite for silica, and a basal conglomerate for uranium occurrences.

GENERAL GEOLOGY

Mineral exploration in the map-area in the past few years has shown a need for detailed mapping of the area to supplement the earlier reconnaissance-type work. More recent interest in uranium mineralization located at or near the base of the Huronian metasedimentary sequence made a remapping of that sequence desirable. The present mapping was the start of an extensive program to map in detail the Huronian rocks northeast of Sudbury. It was hoped that a lithologic and stratigraphic classification of the Huronian metasediments would be possible. Although the present map-area has a rather complex structural pattern (history), mapping based on a mixture of lithologic and stratigraphic criteria allowed the Huronian rocks to be subdivided into six mappable units (see Table 1). Their correlation with Huronian rocks of other areas is discussed in the text.

In the following paragraphs the individual rock units are described in detail, in order of their decreasing age.

Table 1

TABLE OF LITHOLOGIC UNITS

CENOZOIC	
Recent	Fluvial clays and silts, and swamp deposits
Pleistocene	Clay, sand, gravel, and till
<i>Unconformity</i>	
PRECAMBRIAN	
PROTEROZOIC	
Younger Diabase Intrusions	Olivine diabase
<i>Intrusive Contact</i>	
Nickel Irruptive	Quartz diorite breccia (Parkin offset)
<i>Intrusive Contact</i>	
Older Diabase Intrusions	Quartz diabase and diorite

HURONIAN

Cobalt G

Lor

Go

Bruce G

Se

Es

Br

M

ARCHEAN

Mafic I

Granit

Felsic

Mafic

The volcanic
considered to be
belts" in the Ca
upper greenschis

GR 80.

1963. Production

cs and associated
illing. Exploratory
asediments to test
erate for uranium

shown a need for
issance-type work.
ar the base of the
equence desirable.
map in detail the
ologic and strati-
possible. Although
(history), mapping
ved the Huronian
Their correlation

cribed in detail, in

Intrusive Contact

HURONIAN

Cobalt Group
Lorrain Formation
Quartzite

Faulted Contact

Gowganda Formation
Argillite, quartzite, and conglomerate

Unconformity

Bruce Group
Serpent Formation
Quartzite and conglomerate
Espanola Formation
Limestone, marble, and greywacke *
Bruce Formation
Conglomerate and quartzite
Mississagi Formation
Quartzite, argillite, and conglomerate

Great Unconformity

Faulting

ARCHEAN

Mafic Intrusive Rocks
Amphibolite, metagabbro, and metadiabase

Intrusive Contact

Granitic Rocks (Algomian)
Pink and grey granodiorite and quartz monzonite, granitic gneisses and
migmatites, and porphyritic granite

Intrusive Contact

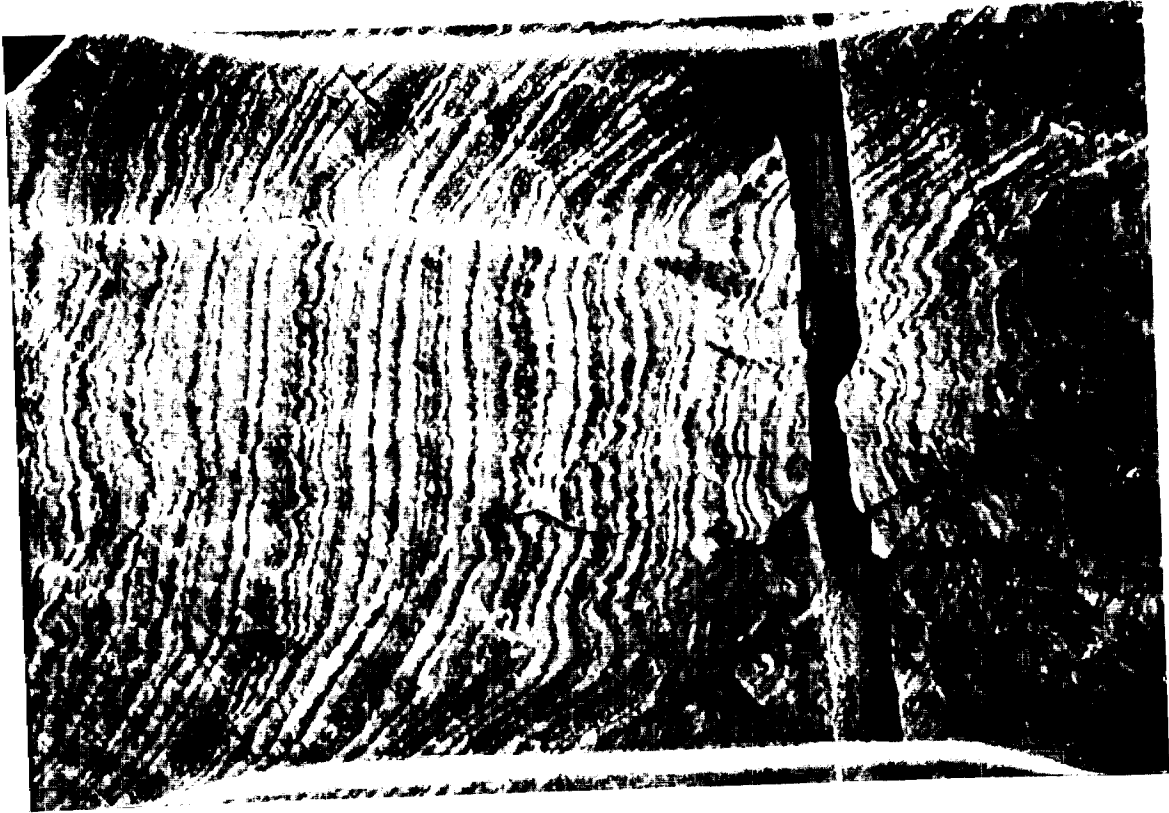
Felsic Metavolcanics
Rhyolite, rhyolite breccia, porphyritic rhyolite, felsic tuffs, and pyro-
clastics

Mafic Metavolcanics
Massive basalt, pillow lavas, and poorly to well banded mafic to inter-
mediate flows, and iron formation

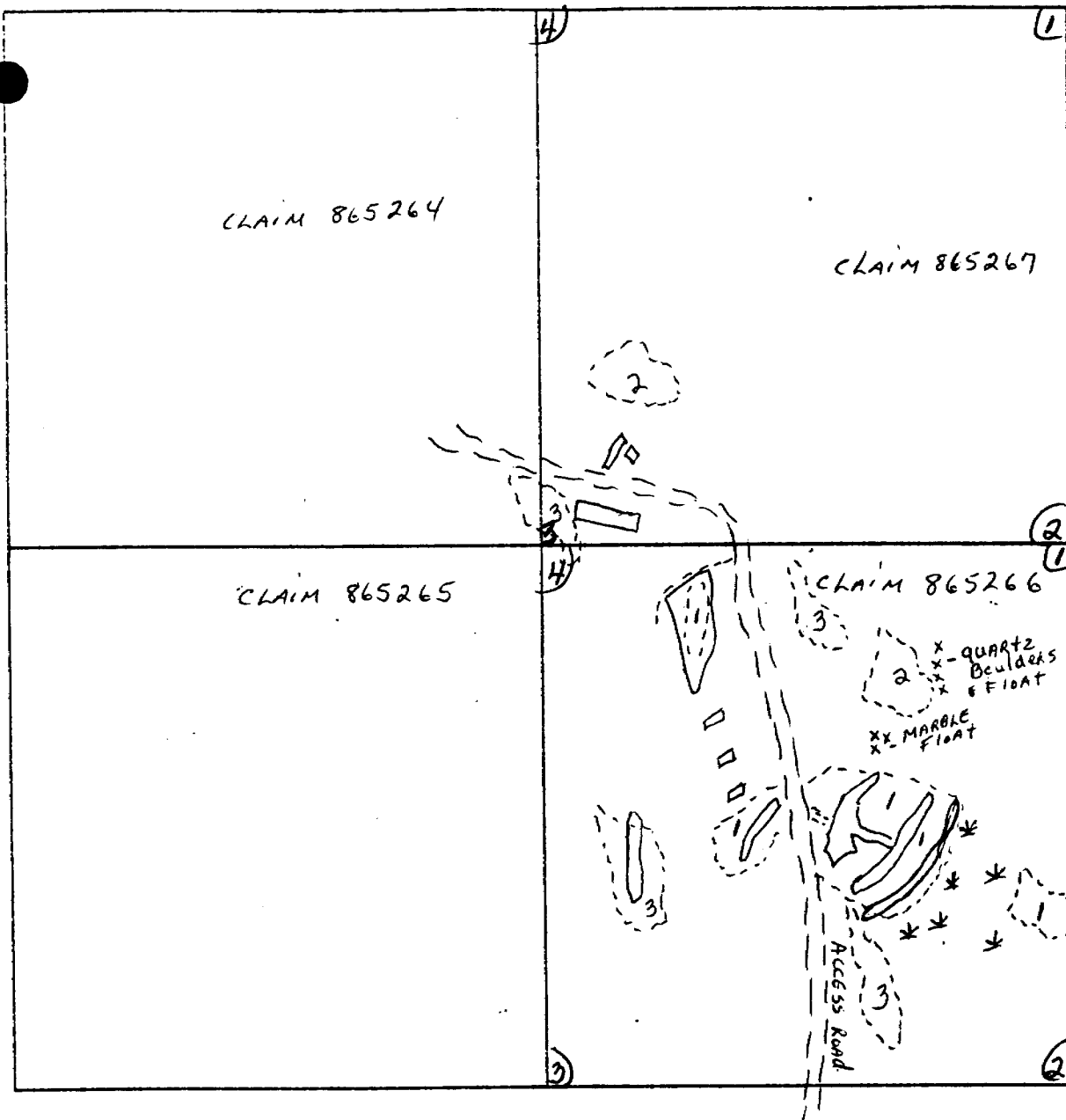
ARCHEAN

Mafic Metavolcanics

The volcanic rocks of this map-area, in the absence of age determinations, are considered to be Keewatin-type metavolcanics. They are typical of "greenstone belts" in the Canadian Shield. The volcanic rocks have been metamorphosed to the upper greenschist to lower almandine-amphibolite facies of regional metamorphism.



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Scale - 1:5000 1cm = 50m

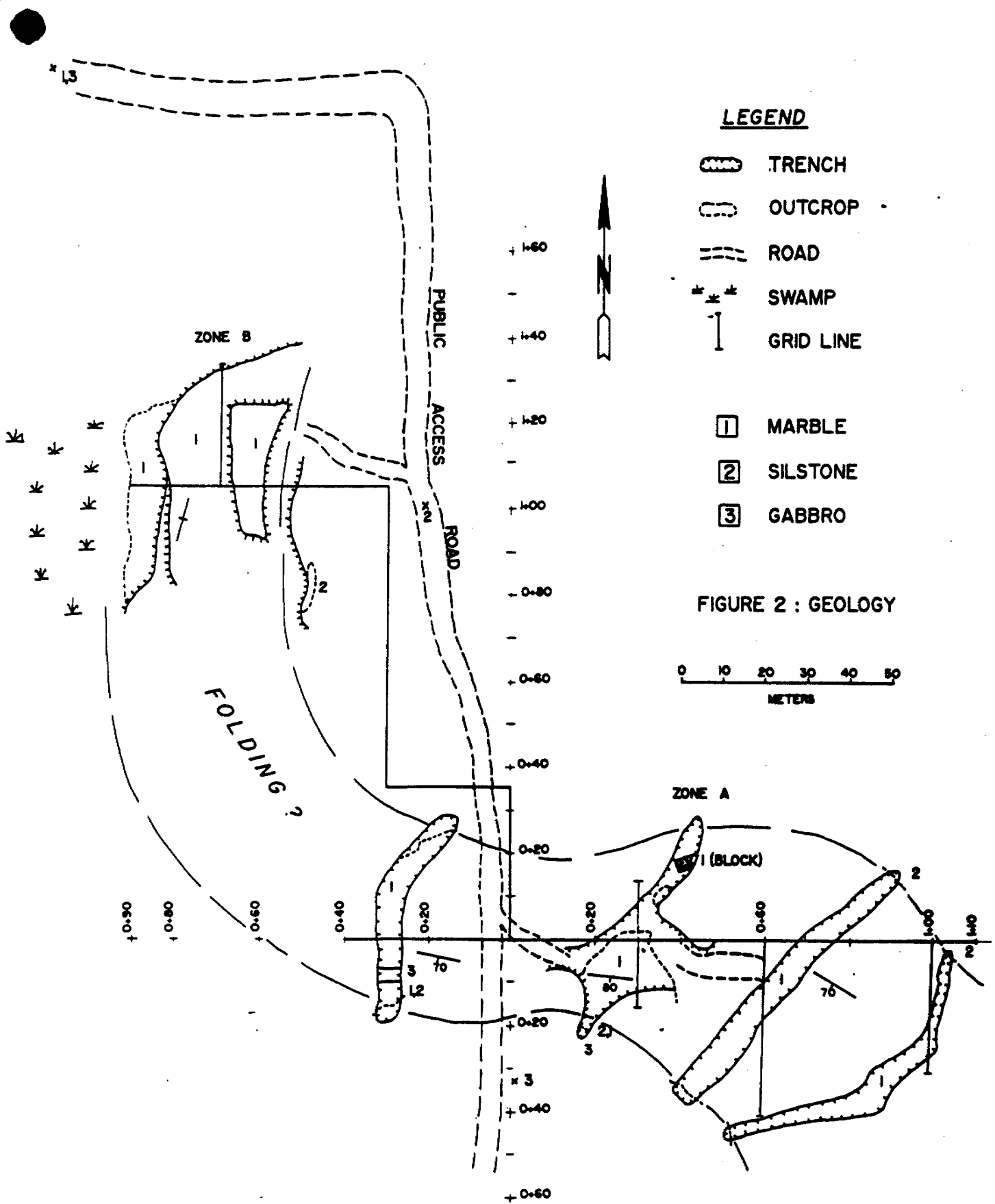
① Base Map Reference G2915 ② Refer to Detail Map No. II-B-HARAMA

③ Legends: ∇ - TRENCH AREA. * - SWAMP [] - MARBLE
(2) - siltstone (3) - Gabbro

Work Location	Type of Work	Dimensions	Assays & Ref. No's	Other
REFER TO DETAIL MAP II-B AND "Description of Trenching" sheet.				

NOTES:

- Prod. 101



LEGEND









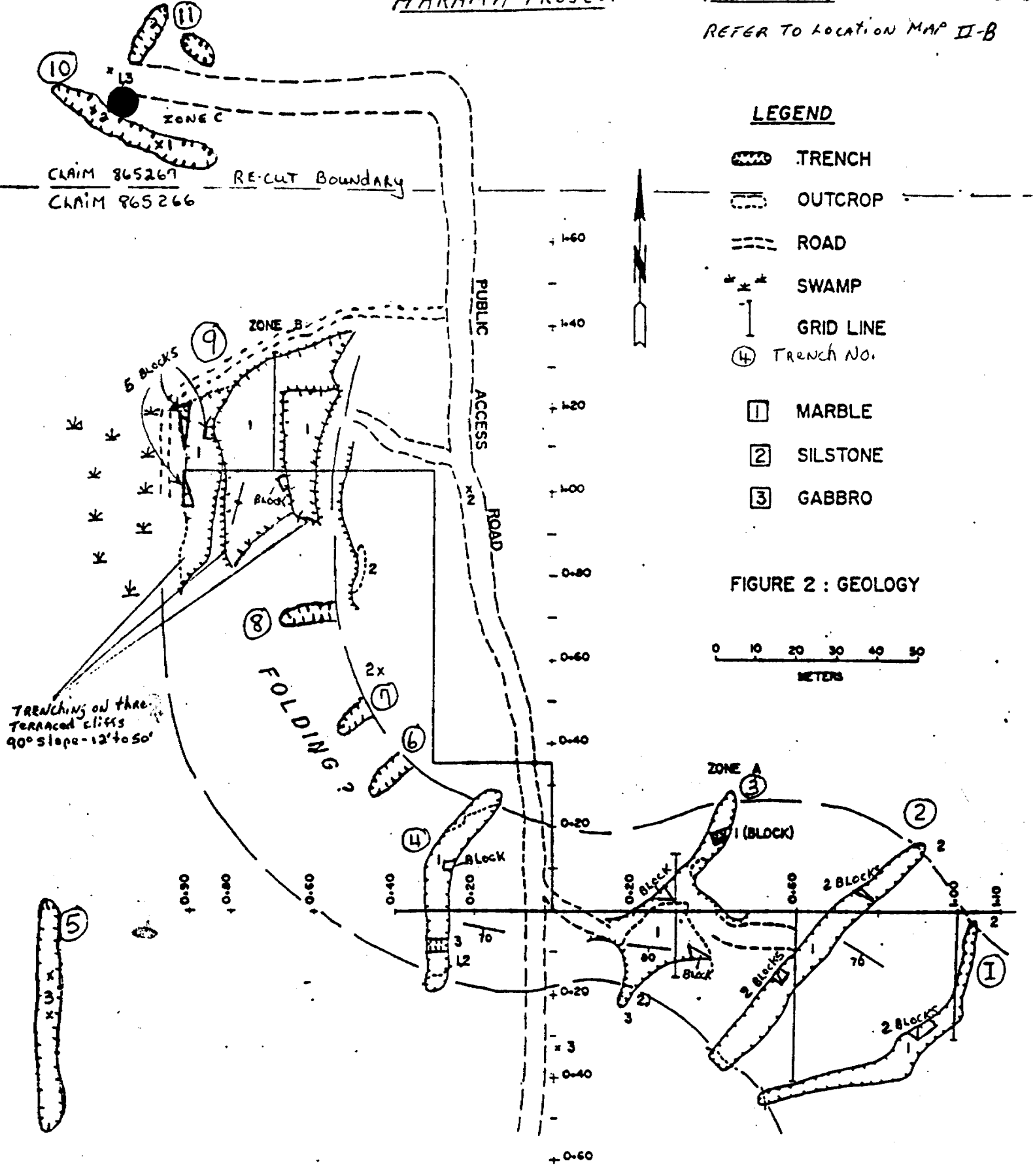
-  TRENCH
-  OUTCROP
-  ROAD
-  SWAMP
-  GRID LINE
-  MARBLE
-  SILSTONE
-  GABBRO

FIGURE 2 : GEOLOGY



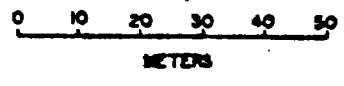
REFER TO LOCATION MAP II-B



LEGEND

- TRENCH
- OUTCROP
- ROAD
- SWAMP
- GRID LINE
- TRENCH No.
- MARBLE
- SILSTONE
- GABBRO

FIGURE 2 : GEOLOGY



J. BRADY · CMIP/91

potential reserves on the property.

The potential tonnes² of limestone available from the property is as follows:

Zone A....	641,250 tonnes	(assuming a depth of 30 metres)
	1,282,500	(assuming a depth of 60 metres)
Zone B...	205,200 tonnes	(assuming a depth of 30 metres)
	410,400	(assuming a depth of 60 metres)
Subtotal	846,450 tonnes	(30 metres)
	1,692,900	(60 metres)
Zone A-B fold structure....	1,120,000 tonnes	(30 metres)
	2,140,000 tonnes	(60 metres)

Northwest of Zone B, stripping and trenching revealed an outcrop of limestone (Figure 2). If the intervening area between this latter exposure and Zone B is underlain by limestone this would again increase the number of tonnes of limestone available from the property by a significant factor.

In Zone A limestone predominates and is intercalated with minor thin beds of siltstone. This zone is characterized by uniform, thin to thickly bedded limestone of alternating grey-green, grey-buff and pink colours. The very attractive and decorative colour banding of this marble is shown in Photograph 1. The buff to pink tones are consistently developed in varying proportions in all trenches exposed. Convolute bedding and brecciated textures which characterize Zone B are minor components of this area.

In Zone B limestone predominates with rare siltstone intercalations. This area is characterized by a buff, buff-green and pink coloured limestone displaying a brecciated texture and

² Assumptions: Specific gravity of marble = 2.85, "Height" = 30 metres and 60 metres; these depths have been intersected by Jarvis Res., 1 km to the southeast of the Harama site.

convoluted bedding.


Zone B consists of a series of ridges readily amenable to the extraction of large blocks of dimension stone. Two large blocks measuring 3.0 metres by 2.0 metres by 1.5 metres were removed from Zone B for cutting and polishing in Sudbury. The polished material produced an aesthetically beautiful marble with a dazzling array of pink-green colours and intriguing bedding plane patterns.

Initial ASTM testing on a single specimen was carried out by Trow Engineering of Sudbury with test results presented in Appendix A. Results of various strength tests have been very positive.

The Harama marble project is 1 kilometre northwest of the Jarvis Resources' quarry operation which is currently producing marble dimension stone from a 6 million-ton marble deposit (Northern Miner, May 6, 1991; Sept. 2, 1991).

SUMMARY

An attractive multicoloured marble with predominate pink-green hues suitable for the extraction of large blocks of dimension stone has been discovered in Parkin Township, north of Sudbury, Ontario. The marble deposit with potential tonnage estimates of at least 1.2 million tonnes is readily accessible by road. It is on strike with a currently operating marble quarry with proven and probable reserves of 6 million tons.

Qual 2.6412

E. SAWITZKY



Rock Mechanics

Trow Consulting Engineers Ltd.
1074 Webbwood Drive, Sudbury
Ontario, Canada, P3C 3B7
Telephone: (705) 674-9681
Facsimile: (705) 674-8271

SO0381R

September 18, 1991

Mr. John Brady
1227 Holland Road
Sudbury, Ontario
P3A 3R1

B. 14555

Dear Sirs:

**MARBLE DIMENSION STONE TESTING
PRELIMINARY TEST REPORT**

Further to your authorization, Trow Consulting Engineers Ltd. performed the required preliminary tests in connection with the above noted project.

The stone sample delivered to our laboratory was collected at the surface. It has been tentatively identified as marble. The sample as delivered was determined by macroscopic means to be a calcitic dolomite variety of marble. The marble is buff-pink in colour with green to pink, 4-mm wide parallel bands. It is fine grained, with a granoblastic saccharoidal texture. Local fractures (2-mm wide), which are filled with a possible chloritic material, cross-cut the above mentioned banding at an angle of approximately 45°. The marble has a quasi conchoidal fracture. During testing procedures minor subhedral pyrite (< 1mm) was noted closely associated with the banding.


All the tests were performed according to relevant ASTM standards, however, because of the preliminary nature of this project, only one specimen was used in each of the tests. Modulus of rupture, uniaxial compressive strength and flexural strength were determined for dry condition. Test results are provided in Table 1. The reported values are compared with the requirements for Marble Dimension Stone (Exterior), as specified in ASTM C 503 - 89. Generally, the strength requirements were met. Absorption test results were slightly high in case of one specimen; the other specimen met the criterion.

The test results provided in Table 1 are based on single specimens only. The ASTM standards cited in Table 1 require a series of tests performed on certain number of

specimens tested in directions parallel and perpendicular to the bedding (rifts) in dry and wet conditions in order to obtain enough data for statistical evaluation of stone properties. In this regard the reported test results cannot be considered as meeting relevant ASTM standards and further testing is recommended in order to comply with the standards.

We trust that the above is satisfactory to you at this time. Should you have any questions, please do not hesitate to contact our office.

Yours very truly,
TROW CONSULTING ENGINEERS LTD.



Jacek Nodzynski

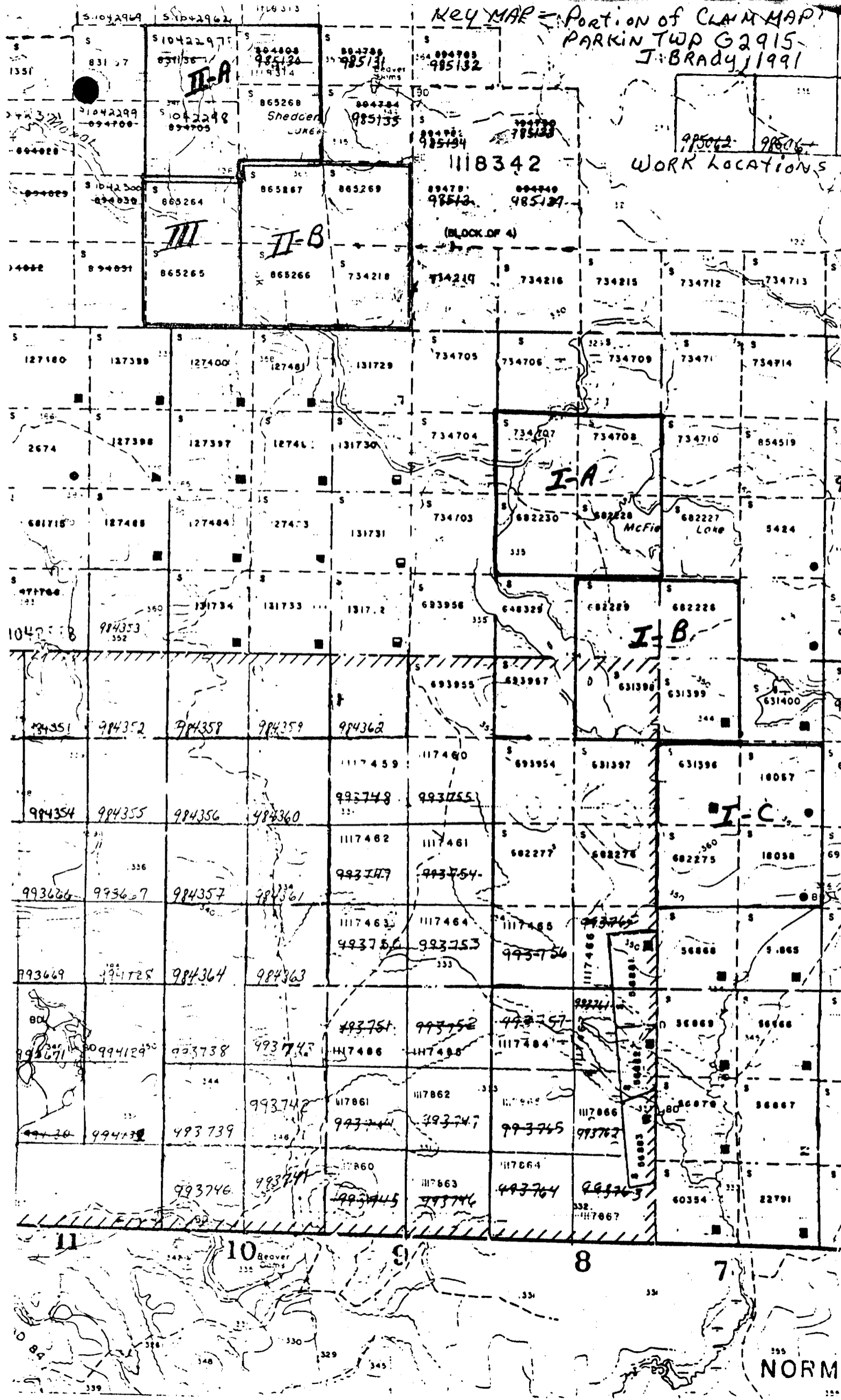
TABLE 1

TEST	TEST RESULTS	ASTM REQUIREMENTS (C 503-89)
C97 Absorption	0.18%, 0.22%	max. 0.20%
C97 Density (kg/m ³)	2730, 2708	- ¹
C99 Modulus of Rupture (MPa)	7.26	min. 7.00
C170 Uniaxial Compressive Strength ² (MPa)	96	min. 52
C880 Flexural Strength (MPa)	7.10	min. 7.00

¹ Based on visual examination only, the rock can be classified as calcitic dolomite marble, therefore the density requirement is 2595 - 2800 kg/m³.

² Core specimen was tested and the strength result was converted to that of corresponding cube (according to the standard requirements).

KEY MAP - Portion of CLAIM MAP
PARKIN TWP G2915
J. BRADY, 1991



ASTM STANDARD TESTS FOR BUILDING STONE
and
CANMET COST GUIDELINES

CONTENTS

Introduction.....	1
Sample requirements.....	2
Schedule for ASTM building stone tests.....	3

SAMPLE REQUIREMENTS FOR ASTM TESTS

- C 97-83 Absorption and Bulk Specific Gravity of Natural Building Stone
- C 99-52 Modulus of Rupture of Natural Building Stone
- C 170-50 Compressive Strength of Natural Building Stone
- C 241-51 Abrasion Resistance of Stone Subjected to Foot Traffic
- C 666-80 Resistance of Concrete (Building Stone) to Rapid Freezing and Thawing
- C 880-78 Flexural Strength of Natural Building Stone
- D 2845-83 Determination of Pulse Velocities and Ultrasonic Elastic Constants of Rock

Introduction

This report has been assembled in order to familiarize the prospective client with sample requirements, testing procedures and costs involved for the ASTM Standards related to building stone.

CANMET currently has the capability of conducting all the ASTM tests presented in this report and is also capable of offering limited technical advice with respect to sampling techniques and general inquiries on the subject of building stone.

The cost estimates in this report are those for each test condition. However, some engineering practices and/or ASTM tests require that both or several conditions be performed in order to satisfy the respective standards. Where the standard requires multiple test conditions, this is so indicated.

For more detailed information on stone specifications and the physical testing of building stone or slate refer to the 1985 Annual Book of ASTM Standards, Volume 04.08 Soil and Rock; Building Stone.

Should you have any questions relating to this report, testing procedures, combinations of related tests and conditions or building stone in general please do not hesitate to contact Mr. R.K. Collins at (613) 992-8794.

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SAMPLE REQUIREMENTS

The following sample requirements and specifications have been taken from the corresponding ASTM Standard test requirements. These requirements shall be adhered to when submitting samples of building stone for testing.

In addition to the attached specific sample requirements for each ASTM test the following information shall also be submitted:

- 1- samples shall be clearly numbered and identified as to precise location;
- 2- the rift (bedding), grain and head grain, if necessary, shall be clearly marked on each individual prepared and/or unprepared sample;
- 3- sample orientation pertaining to the direction of load which is to be applied to each sample shall be clearly stated and be included in the accompanying sample documentation;
- 4- accompanying documentation with all the above information for each sample and specifying the ASTM test required.

Also, the sample shall be selected to represent a true average of the type or grade of stone under consideration and shall be of the quality supplied to the market under the type designation to be tested. The sample may be selected by the purchaser or his authorized representative from the quarried stone or taken from the natural ledge and shall be of adequate size to permit the preparation of the required number of samples or specimens for each test required.¹

¹ 1985 Annual Book of ASTM Standards, Volume 04.08 Soil and Rock; Building Stone page 4.

SCHEDULE FOR ASTM BUILDING STONE TESTS

ASTM TEST	ASTM TEST NAME	estimated time (hours)		
		for sample preparation	to perform test	total
* C 97 - 83	absorption and bulk specific gravity of natural building stone	1.5	0.50	2.00
* C 99 - 52	modulus of rupture of natural building stone	1.5	0.50	2.00
* C 170 - 50	compressive strength of natural building stone	1.5	0.50	2.00
* C 241 - 51	abrasion resistance of stone subjected to foot traffic	1.5	0.50	2.00
* C 666 - 80	resistance of concrete (building stone) to rapid freezing and thawing	1.5	0.50	2.00
* C 800 - 78	flexural strength of natural building stone	1.5	0.50	2.00
92845 - 83	laboratory determination of pulse velocities and ultrasonic elastic constants of rock	1.0	0.50	1.50

* TESTS MAY BE DONE IN COMBINATION THEREBY ELIMINATING SOME SAMPLE PREPARATION COSTS

ASTM Designation: C 97-83

Standard Test Requirements for

**ABSORPTION AND BULK SPECIFIC GRAVITY
OF NATURAL BUILDING STONE**

Sample specifications:

Minimum number of samples:.....1
Minimum sample size:.....greater than 150 mm x 230 mm (6x9 in.)
Minimum number of specimens per sample:...3
Minimum specimen size:.....cubes, prisms, cylinders, or any regular
form with least dimension not under 50 mm
(2 in.) and greatest dimension not over
75 mm (3 in.)
Specimen preparation:.....sawed or drilled surface

Test conditions:

DRY - specimens oven dried for 24 hours; then 48 hours immersed in distilled water
Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per test:

A: unprepared specimens - 100.00
B: prepared specimens - 25.00

ASTM Designation: C 99-52

Standard Test Requirements for

MODULUS OF RUPTURE OF NATURAL BUILDING STONE

Sample specifications:

Minimum number of samples:.....1 (per condition of loading)
Minimum sample size:.....greater than 100 x 200 x 200 mm (4x8x8 in.)
Minimum number of specimens per sample:...3
Minimum specimen size:.....slab 100 x 200 x 60 mm (4x8x2 1/4 in.)
Specimen preparation:.....sawed and ground

Test conditions:

CONDITION 1:

DRY (perpendicular to rift or bedding)
Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

CONDITION 2:

DRY (parallel to rift or bedding)
Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

CONDITION 3:

WET (perpendicular to rift or bedding)
Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

CONDITION 4:

WET (parallel to rift or bedding)
Minimum number of specimens: 3

ASTM Designation: C 99-52 con't.

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per test conditions:

A: unprepared specimens - 100.00
B: prepared specimens - 25.00

ASTM Designation: C 170-50

Standard Test Requirements for

**COMPRESSIVE STRENGTH OF
NATURAL BUILDING STONE**

Sample specifications:

Minimum number of samples:.....1 (per condition of loading)
Minimum sample size:.....greater than 50 x 50 x 225 mm (2 x 2 x 9 in.)
Minimum number of specimens per sample:...3
Minimum specimen size:.....cubes, square prisms, or cylinders - the diameter or lateral dimensions being greater than 50 mm (2 in.) and the ratio of height to diameter or lateral dimension should be not less than 1:1
Specimen preparation:.....sawed and ground

Test conditions:

CONDITION 1:
DRY STRENGTH (perpendicular to rift or bedding)
Minimum number of specimens: 3

Estimated number of person hours:
A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

CONDITION 2:
DRY STRENGTH (parallel to rift or bedding)
Minimum number of specimens: 3

Estimated number of person hours:
A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

CONDITION 3:
WET STRENGTH (perpendicular to rift or bedding)
Minimum number of specimens: 3

Estimated number of person hours:
A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

ASTM Designation: 170 - 50 con't.

CONDITION 4:

WET STRENGTH (parallel to rift or bedding)

Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per condition:

A: unprepared specimen - 100.00
B: prepared specimen - 25.00

ASTM Designation: C 241-51

Standard Test Requirements for

**ABRASION RESISTANCE OF
STONE SUBJECTED TO FOOT TRAFFIC**

Sample specifications:

Minimum number of samples:.....1
Minimum sample size:.....25 mm (1 in.) thick x 200 mm (8 in.) square
Minimum number of specimens per sample:...3
Minimum specimen size:.....cubes, 25 mm (1 in.) x 50 mm (2 in.) square
Specimen preparation:.....sawed with sharp edges rounded by grinding

Test conditions:

DRY - specimens oven dried for 24 hours; then abrasion tested for 30 minutes
Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per test:

A: unprepared specimen - 100.00
B: prepared specimen - 25.00

ASTM Designation: C 666 - 80

Standard Test Requirements for

**RESISTANCE OF CONCRETE (BUILDING STONE) TO
RAPID FREEZING AND THAWING**

Sample specifications:

Minimum number of samples:.....1

Minimum sample size:.....variable

Minimum number of specimens per sample:...3

Minimum specimen size:.....a) 100 x 200 x 50 mm (4 x 8 x 2 1/4 in.)

b) cube, square, prism or cylinder -
the diameter or lateral dimension is not less
than 50 mm (2 in.) and the ratio of the height
to diameter or lateral dimension is not less
than 1:1

Specimen preparation:.....sawed or core drilled

Test conditions:

NET - to determine the resistance of building stone specimens to rapid repeated
cycles of freezing and thawing by:

PROCEDURE A: rapid freezing and thawing in water

Minimum number of samples: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.

B: test - 0.5 hrs.

PROCEDURE B: rapid freezing in air and thawing in water

Minimum number of samples: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.

B: test - 0.5 hrs.

All specimens are tested for fundamental traverse frequency, pulse velocity
and weight at beginning of test and after 300 cycles.

ASTM Designation: C 666 - 90 con't

Approximate estimate of cost per test procedure:

A: unprepared sample - 100.00

B: prepared sample - 25.00

ASTM Designation: C 890 - 78

Standard Test Requirements for

FLEXURAL STRENGTH OF NATURAL BUILDING STONE

Sample specifications:

Minimum number of samples:.....1

Minimum sample size:.....127 mm (5 in.) wide x 25 mm
(1 in.) thick x 300 mm (12 in.)
long

Minimum number of specimens per sample:...3

Minimum specimen sizes:.....slab 38 mm (1 1/2 in.) wide x
25 mm (1 in.) thick x 300 mm
(12 in.) long

Specimen preparation:.....split and sawed

Test conditions:

CONDITION 1:

DRY - A: heat specimens at 50°C for 24 hours and cool at room temperature
in a desiccator for 48 hrs.

Minimum number of samples: 3

Estimated number of person hours:

A: sample preparation - 1.5 hrs.
B: test - 0.5 hrs.

CONDITION 2:

WET - B: immerse specimens in water at 20°C for 48 hrs.

Minimum number of samples: 3

Estimated number of person hours:

A: sample preparation - 1.5 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per test condition:

A: unprepared sample - 100.00
B: prepared sample - 25.00

ASTM Designation: D 2845-83

Standard Test Requirements for

**LABORATORY DETERMINATION OF PULSE VELOCITIES
AND ULTRASONIC ELASTIC CONSTANTS OF ROCK**

Sample specifications:

Minimum number of samples:.....1 (or as many samples as necessary to
to reflect the true nature of the deposit)

Minimum sample size:.....ratio of pulse travel distance (length) to
minimum lateral dimension not to exceed 5

Sample preparation:.....sawed, drilled, cored with contact surfaces
finished by lapping or grinding

Test conditions:

CONDITION 1:

oven dried state (0% saturation)

Estimated number of person hours:

A: specimen preparation - 1.0 hrs.
B: test - 0.5 hrs.

CONDITION 2:

saturated condition (100% saturation)

Estimated number of person hours:

A: specimen preparation - 1.0 hrs.
B: test - 0.5 hrs.

CONDITION 3:

any intermediate state

Estimated number of person hours:

A: specimen preparation - 1.0 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per test conditions:

A: unprepared specimens - 75.00
B: prepared specimens - 25.00

ASTM STANDARD TESTS FOR SLATE
and
CANMET COST GUIDELINES

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SAMPLE REQUIREMENTS FOR ASTM TESTS

- C 120-52 Flexure Testing of Structural or Electrical Slate (Modulus of Rupture)
- C 120-52 Flexure Testing of Roofing Slate (Modulus of Rupture)
- C 120-52 Flexure Testing of Roofing Slate (modulus of Elasticity)
- C 121-48 Water Absorption of Slate
- C 217-58 Weather Resistance of Natural Slate

ASTM Designation: C 120-52 (Reapproved 1981)

Standard Test Requirements for

**FLEXURE TESTING OF STRUCTURAL OR
ELECTRICAL SLATE (MODULUS OF RUPTURE)**

Sample specifications:

Minimum number of samples:.....6
Minimum sample size:.....300 mm x 38 mm x 25 mm (12 x 1 1/2 x 1 in.)
Sample preparation:.....split and sawed

Test conditions:

DRY (perpendicular to rift or bedding)
Minimum number of samples: 3

DRY (parallel to rift or bedding)
Minimum number of samples: 3

Estimated number of person hours:

A: sample preparation - 1.50 hrs.
B: test - 0.75 hrs.

Approximate estimate of cost per test:

A: unprepared sample - 112.50
B: prepared sample - 37.50

Introduction

This report has been assembled in order to familiarize the prospective client with sample requirements, testing procedures and costs involved for the ASTM Standards related to slate.

CANMET currently has the capability of conducting all the ASTM tests presented in this report and is also capable of offering limited technical advice with respect to sampling techniques and general inquiries on the subject of building stone.

The cost estimates in this report are those for each test condition. However, some engineering practices and/or ASTM tests require that both or several conditions be performed in order to satisfy the respective standards. Where the standard requires multiple test conditions, this is so indicated.

For more detailed information on stone specifications and the physical testing of building stone or slate refer to the 1985 Annual Book of ASTM Standards, Volume 04.08 Soil and Rock; Building Stone.

Should you have any questions relating to this report, testing procedures, combinations of related tests and conditions or building stone in general please do not hesitate to contact Mr. R.K. Collings at (613) 992-8794.

SAMPLE REQUIREMENTS

The following sample requirements and specifications have been taken from the corresponding ASTM Standard test requirements. These requirements shall be adhered to when submitting samples of building stone for testing.

In addition to the attached specific sample requirements for each ASTM test the following information shall also be submitted:

- 1- samples shall be clearly numbered and identified as to precise location;
- 2- the rift (bedding), grain and head grain, if necessary, shall be clearly marked on each individual prepared and/or unprepared sample;
- 3- sample orientation pertaining to the direction of load which is to be applied to each sample shall be clearly stated and be included in the accompanying sample documentation;
- 4- accompanying documentation with all the above information for each sample and specifying the ASTM test required.

Also, the sample shall be selected to represent a true average of the type or grade of stone under consideration and shall be of the quality supplied to the market under the type designation to be tested. The sample may be selected by the purchaser or his authorized representative from the quarried stone or taken from the natural ledge and shall be of adequate size to permit the preparation of the required number of samples or specimens for each test required.¹

¹ 1985 Annual Book of ASTM Standards, Volume 04.08 Soil and Rock; Building Stone page 4.

SCHEDULE FOR ASTM SLATE TESTS

ASTM TEST	ASTM TEST NAME	estimated time (hours)		
		for sample preparation	to perform test	total
C 120 - 52	flexure testing of structural or electrical slate (modulus of rupture)	1.5	0.75	2.25
*	flexure testing of roofing slate (modulus of rupture)	1.5	0.75	2.25
*	flexure testing of roofing slate (modulus of elasticity)	1.5	1.50	3.00
C 121 - 48	water absorption of slate	1.0	0.50	1.50
C 217 - 58	weather resistance of natural slate	1.5	0.50	2.00

* TESTS MAY BE DONE IN COMBINATION THEREBY ELIMINATING SOME SAMPLE PREPARATION COSTS

ASTM Designation: C 120-52 (Reapproved 1981)

Standard Test Requirements for

FLEXURE TESTING OF ROOFING SLATE
(MODULUS OF RUPTURE)

Sample specifications:

Minimum number of samples:.....6
Minimum sample size:.....100 mm x 100 mm (4 x 4 in.)
Sample preparation:.....sawed

Test conditions:

DRY (perpendicular to rift or bedding)
Minimum number of samples: 6

Estimated number of person hours:

A: sample preparation - 1.5 hrs.
B: test - 0.75 hrs.

Approximate estimate of cost per test:

A: unprepared samples - 112.50
B: prepared samples - 37.50

ASTM Designation: C 217-58

Standard Test Requirements for

WEATHER RESISTANCE OF NATURAL SLATE

Sample specifications:

Minimum number of samples:.....1
Minimum sample sizes.....greater than 150 x 100 x 250 mm (6 x 4 x 10 in.)
Minimum number of specimens per sample:..3
Minimum specimen size:.....50 x 100 mm (2 x 4 in.) x 25 mm (10 in.) in length
Specimen preparation:.....cut and ground

Test conditions:

NET - 7 days in 1% sulfuric acid solution + 24 hours drying
Minimum number of specimens: 3

Estimated number of person hours:

A: specimen preparation - 1.5 hrs.
B: test - 0.5 hrs.

Approximate estimate of cost per test:

A: unprepared specimens - 100.00
B: prepared specimens - 25.00

ASTM Designation: C 121-48 (reapproved 1981)

Standard Test Requirements for

WATER ABSORPTION OF SLATE

Sample specifications:

Minimum number of samples:.....6

Minimum sample size:.....square or rectangular slab;
5 - 8 mm (3/16 - 5/16 in.) in thickness and
greater than 100 mm (4 in.) square

Sample preparation:.....split and sawed

Test conditions:

CONDITION 1:

NET - 48 hr. immersed in water (preferred method)

Minimum number of samples: 6

Estimated number of person hours:

A: sample preparation - 1.0 hrs.

B: test - 0.50 hrs.

CONDITION 2:

NET - 8 hr. immersed in water and boiled (alternate method)

Minimum number of samples: 6

Estimated number of person hours:

A: sample preparation - 1.0 hrs.

B: test - 0.50 hrs.

Approximate estimate of cost per test condition:

A: unprepared sample - 75.00

B: prepared sample - 25.00

ASTM Designation: C 120-52 (Reapproved 1981)

Standard Test Requirements for

**FLEXURE TESTING OF ROOFING SLATE
(MODULUS OF ELASTICITY)**

Sample specifications:

Minimum number of samples:.....6
Minimum sample size:.....200 mm (8 in.) long
Sample preparation:.....sawed

Test conditions:

DRY (perpendicular to rift or bedding)
Minimum number of samples: 3

DRY (parallel to rift or bedding)
Minimum number of samples: 3

Estimated number of person hours:

A: sample preparation - 1.50 hrs.
B: test - 1.50 hrs.

Approximate estimate of cost per test:

A: unprepared sample - 150.00
B: prepared sample - 75.00

* test may be done in conjunction with modulus of rupture of slate

Approximate estimate of cost per test when done in conjunction with
the modulus of rupture of slate:

A: total cost for combined test - 87.50



411155W9246 2.14555 PARKIN

900

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

Mining Lands Branch
Geoscience Approvals Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

ONTARIO GEOLOGICAL SURVEY
GIS - ASSESSMENT FILES
JUL 28 1992
RECEIVED

Telephone: (705) 670-7264
Fax: (705) 670-7262
Our File: 2.14555
Transaction #W9270.0017
9270.0018

July 6, 1992

Mining Recorder
Ministry of Northern Development and Mines
159 Cedar Street, 2nd Floor
Sudbury, Ontario
P3E 6A5

Dear Sir/Madam:

Subject: APPROVAL OF ASSESSMENT WORK SUBMITTED ON MINING CLAIM
S865266 IN PARKIN TOWNSHIP

The deficiencies in the work reports have been rectified within the 45 day period specified in the Notice of Deficiency. The two reports of work are approved as of June 30, 1992.

Report of Work #9270.0017 is approved as originally filed.

Report of Work #9270.0018 is approved as outlined on the attached Assessment Work Credit Form. Because the sample sent for ASTM testing was removed from only one claim, the work was only performed on one claim. The Credit Form reflects this work.

Please indicate both approvals on your claim record sheets.

Yours sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Branch
Mines and Minerals Division

LJ/jl
Enclosures:

cc: Resident Geologist
Sudbury, Ontario

Assessment Files Office
Toronto, Ontario

ASSESSMENT WORK CREDIT FORM

FILE NUMBER: 2.14555
DATE: July 6, 1992
RECORDER'S REPORT NUMBER: W9270.0018

RECORDED HOLDER: John Brady

CLIENT NUMBER: 111562

TOWNSHIP OR AREA: Parkin Township

CLAIM NUMBER	VALUE OF WORK DONE ON THIS CLAIM	RESERVE
S865266	\$2,980	\$2,980



Ontario

Ministry of Northern Development and Mines

Report of Work Conducted After Recording Claim

Mining Act

Transaction Number

W9270.00017

Mining Lands

Personal Information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

2.1

- Instructions:**
- Please type or print and submit in duplicate.
 - Refer to the Mining Act and Regulations for requirements of filing assessment work or consult the Mining Recorder.
 - A separate copy of this form must be completed for each Work Group.
 - Technical reports and maps must accompany this form in duplicate.
 - A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s) <i>John Brady</i>	Client No. <i>111562</i>
Address <i>1227 Holland Rd. Sudbury, ONT. P3A3R1</i>	Telephone No. <i>5660613</i>
Mining Division <i>Sudbury</i>	Township/Area <i>PARKIN</i>
M or G Plan No. <i>62915</i>	
Dates Work Performed From: <i>April 1/91</i>	To: <i>Nov 30/91</i>

Work Performed (Check One Work Group Only)

Work Group	Type
<input checked="" type="checkbox"/> Geotechnical Survey	<i>Geology report.</i>
<input type="checkbox"/> Physical Work, Including Drilling	
<input type="checkbox"/> Rehabilitation	
<input type="checkbox"/> Other Authorized Work	
<input type="checkbox"/> Assays	
<input type="checkbox"/> Assignment from Reserve	

RECEIVED

MAY 6 - 1992

MINING LANDS BRANCH

Total Assessment Work Claimed on the Attached Statement of Costs \$ *600.00*

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

Name	Address
<i>Nowin Geological</i>	<i>560 Notre Dame Notre Dame Ave, Sudbury, ONT. P3C 5L2</i>

(attach a schedule if necessary)

Certification of Beneficial Interest * See Note No. 1 on reverse side

I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Date <i>mar 30/92</i>	Recorded Holder or Agent (Signature) <i>J Brady</i>
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Certification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.		
Name and Address of Person Certifying <i>J. BRADY 1227 Holland Rd. Sudbury, ONT. P3A3R1</i>		
Telephone No. <i>5660613</i>	Date <i>mar 30/92</i>	Certified By (Signature) <i>J Brady</i>

For Office Use Only

Total Value Cr. Recorded <i>Reserve 8600.00</i>	Date Recorded <i>April 20 1992</i>	Mining Recorder <i>[Signature]</i>	Received Stamp <i>RECEIVED</i>
	Deemed Approval Date <i>July 1 1992</i>	Date Approved	
	Date Notice for Amendments Sent		



**Statement of Costs
for Assessment Credit**

**État des coûts aux fins
du crédit d'évaluation**

Mining Act/Loi sur les mines

WORK REPORT "C" - Geological

Transaction No./N° de transaction
W9270.00017

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un registre des concessions minières. Adresser toute question sur la collecte de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4^e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert- conseil	Type		
	Geological Report	600	600
Supplies Used Fournitures utilisées	Type		
Equipment Rental Location de matériel	Type		
Total Direct Costs Total des coûts directs			600

2. Indirect Costs/Coûts indirects

** Note: When claiming Rehabilitation work indirect costs are not allowable as assessment work.
Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type		
Food and Lodging Nourriture et hébergement			
Mobilization and Demobilization Mobilisation et démobilisation			
Sub Total of Indirect Costs Total partiel des coûts indirects			
Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)			
Total Value of Assessment Credit (Total of Direct and Allowable indirect costs)		Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)	

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note: Le titulaire enregistré sera tenu de vérifier les dépenses demandées dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

Filing Discounts

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.
2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
	× 0.50 =

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.
2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Évaluation totale demandée
	× 0,50 =

Certification Verifying Statement of Costs

I hereby certify:
that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as Recorded Holder I am authorized
(Recorded Holder, Agent, Position in Company)

to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

Et qu'à titre de _____ je suis autorisé
(titulaire enregistré, représentant, poste occupé dans la compagnie)

à faire cette attestation.

Signature Brady Date mar 30/92

Report of Work Conducted After Recording Claim

Mining Act

Transaction Number
W 9270.00018

Mining Land

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

- Instructions:
- Please type or print and submit in duplicate.
 - Refer to the Mining Act and Regulations for requirements of filing assessment work or consult the Mining Recorder.
 - A separate copy of this form must be completed for each Work Group.
 - Technical reports and maps must accompany this form in duplicate.
 - A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s) <i>John Brady</i>	Client No. <i>111562</i>
Address <i>1227 Holland Rd. Sudbury, ONT. P3A3R1</i>	Telephone No. <i>5660613</i>
Mining Division <i>Sudbury</i>	Township/Area <i>PARKIN</i>
	M or G Plan No. <i>62915</i>
Dates Work Performed From: <i>May 1/91</i> To: <i>Nov 30/91</i>	

Work Performed (Check One Work Group Only) **RECEIVED**

Work Group	Type
<input type="checkbox"/> Geotechnical Survey	<i>MAY 6 - 1992</i>
<input type="checkbox"/> Physical Work, Including Drilling	<i>MINING LANDS BRANCH</i>
<input type="checkbox"/> Rehabilitation	
<input checked="" type="checkbox"/> Other Authorized Work	<i>SECT 17 - Result of Beneficiation ^{STONE TESTING} cutting & polishing.</i>
<input type="checkbox"/> Assays	
<input type="checkbox"/> Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs \$ *2980.⁰⁰*

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

Name	Address
<i>Khouri Granite</i>	<i>Elisabella St. Sudbury</i>
<i>Hercules Stone</i>	<i>2216 Longlake Rd. Sudbury</i>
<i>Trow Consulting Engineers</i>	<i>1074 Webbwood Dr. Sudbury</i>

(attach a schedule if necessary)

Certification of Beneficial Interest * See Note No. 1 on reverse side

I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Date <i>Mar 30/92</i>	Recorded Holder or Agent (Signature) <i>J Brady</i>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------	--------------------------------------------------------

Certification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.

Name and Address of Person Certifying <i>J. BRADY 1227 Holland Rd. Sudbury, ONT. P3A3R1</i>		
Telephone No. <i>5660613</i>	Date <i>MAR 30/92</i>	Certified By (Signature) <i>J Brady</i>

For Office Use Only

Total Value Cr. Recorded <i>Reserved 831,980</i>	Date Recorded <i>April 2 1992</i>	Mining Recorder <i>[Signature]</i>	Received Stamp RECEIVED <i>[Signature]</i>
	Deemed Approval Date <i>July 13/92</i>	Date Approved <i>[Signature]</i>	
	Date Notice for Amendments Sent		



Ministry of Northern Development and Mines

Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

WORK Report C-55517 Result of Beneficiation
Transaction No./N° de transaction
W9270.00018

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un registre des concessions minières. Adresser toute question sur la collecte de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4^e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type STONE TESTING	444	
	cutting/polishing	2536	
			2980
Supplies Used Fournitures utilisées	Type		
Equipment Rental Location de matériel	Type		
Total Direct Costs Total des coûts directs			2980

2. Indirect Costs/Coûts indirects

** Note: When claiming Rehabilitation work Indirect costs are not allowable as assessment work. Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type		
Food and Lodging Nourriture et hébergement			
Mobilization and Demobilization Mobilisation et démoblisation			
Sub Total of Indirect Costs Total partiel des coûts indirects			
Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)			
Total Value of Assessment Credit (Total of Direct and Allowable Indirect costs)		Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)	

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

Filing Discounts

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.
2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.
2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Total Value of Assessment Credit	Total Assessment Credit
× 0.50 =	

Valeur totale du crédit d'évaluation	Evaluation totale demandée
× 0,50 =	

MAY 6 - 1992

Certification Verifying Statement of Costs

I hereby certify: that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as Recorded Holder I am authorized (Recorded Holder, Agent, Position in Company)

to make this certification

Attestation de l'état des coûts

J'atteste par la présente : que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

Et qu'à titre de _____ je suis autorisé (titulaire enregistré, représentant, poste occupé dans la compagnie)

à faire cette attestation.

Signature Brady Date mar 30/92