

## CHAPTER 1. INTRODUCTION

Nova Scotia has a rich history of Building Stone production which dates back to the earliest days of settlement. Local stone was used in the construction of the Halifax Citadel in the mid 18th Century. Scottish settlers in areas of Pictou, Colchester and Cumberland Counties used local sandstone for construction of buildings in the 18th and early 19th Centuries. In the mid 19th Century sandstone quarries in the Pictou area, Pictou County, and the famous Wallace Quarries, Cumberland County, exported large quantities of sandstone to Central Canada and New England for use in the construction of private residences, row houses and public buildings.

In recent years society has placed a greater emphasis on the preservation and restoration of historic buildings. Those constructed of stone require matching replacement stone or repairing stone. The only sandstone quarry operating intermittently in Nova Scotia at present is the Wallace Quarries Ltd. Quarry, Cumberland County. In response to an anticipated demand for stone colours other than the Wallace olive, the Building Stone Project was initiated to evaluate, map and inventory building stone quarries and prospects in Nova Scotia.

### METHODOLOGY

The H. Fletcher and E. R. Faribault, Geological Survey of Canada, series of geological maps of Nova Scotia documented building stone quarries at the turn of the Century. Over 250 old quarries were documented on these maps; approximately 150 of these were located for this study. Additional quarries and occurrences, as described by Parks (1914) and Carr (1955), were located and significant ones were included in this report. In total 51 quarries or quarry prospects were mapped, described in detail and are included in this report. They are organized alphabetically by rock type, colour, county and quarry name (e.g. granite, grey, Halifax County, Kinsac Lake Quarry comes before granite, red, Inverness County, First Fork Brook Occurrence). When the quarry name does not delineate a place then a geographic location is given after the name (e.g. Queen Quarry, Purcells Cove). A list and location map of quarries and prospects discussed in this report are presented in Figure 1. It is organized alphabetically by county and quarry/occurrence name.

The most historically significant quarries and those with the greatest development potential were diamond drilled. Drill core was logged in detail looking at features such as bed height, colour and texture, type and colour of the cement in sandstones, presence of deleterious minerals, the quantity of waste rock overlying the usable beds and the frequency and attitude of joints and fractures. The drill logs are presented in Appendix 1.

Samples were taken from many of the quarry sites. Large blocks were recovered from several quarries for further evaluation. Specimens were sawn and polished and some samples are included in Nova Scotia Department of Mines and Energy (NSDME), Sample Catalogue 89-01. These are available for viewing at the Nova Scotia Department of Natural Resources Library in Halifax. They are listed in this report under the individual quarry writeups as Samples 1-11, NSDME Sample Catalogue 89-01. Other samples, including drill core, listed under the individual quarry writeups and in Appendix 2, are available for viewing by appointment at the Nova Scotia Department of Natural Resources Core Library in Debert, Colchester County.

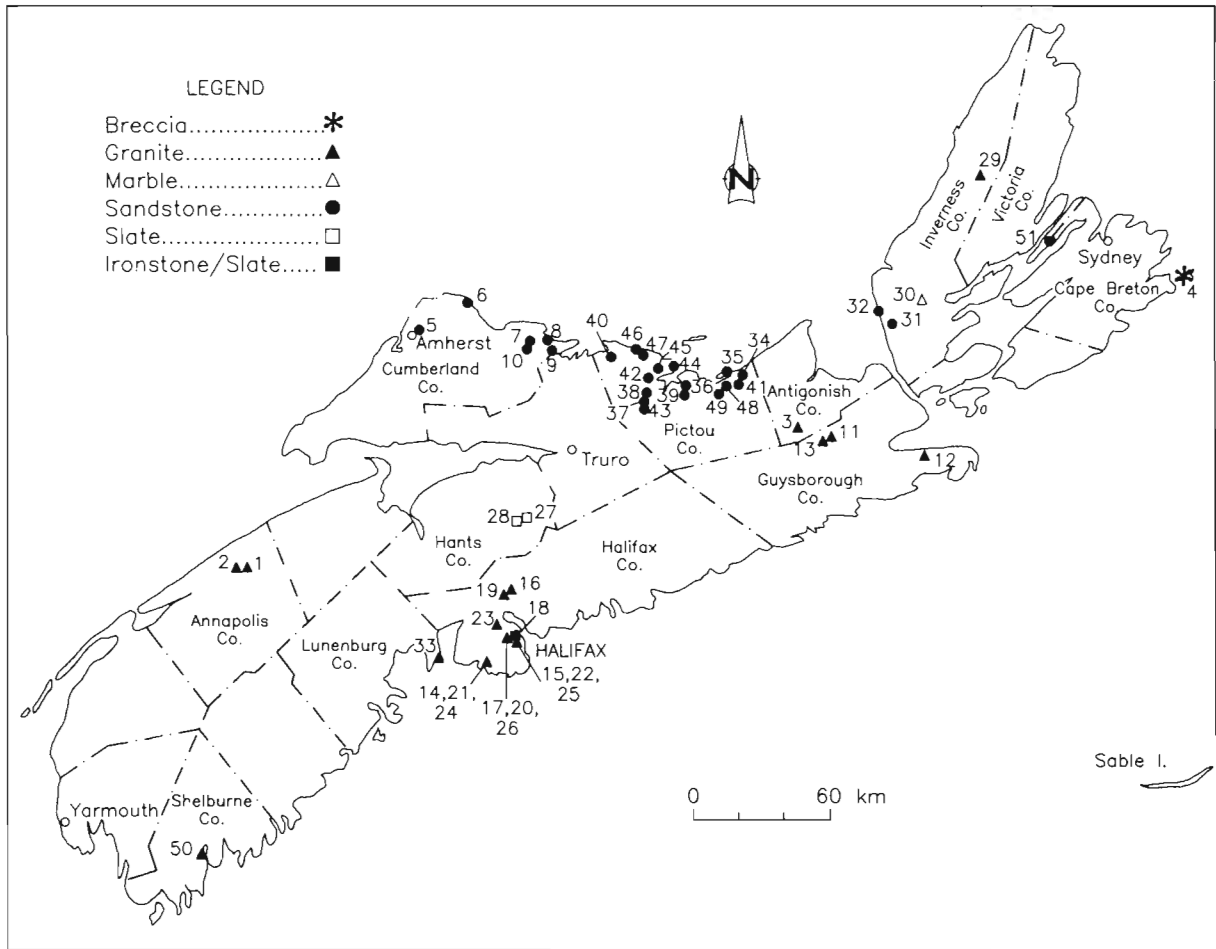
### PHYSICAL PROPERTIES

The physical properties, as reported in the detailed quarry descriptions, were taken from Parks (1914). Values such as specific weight, absorption, compressive strength and transverse strength are reported.

### FACTORS FOR BUILDING STONE

Factors which make a superior building stone today are not necessarily the same as those which made a suitable building stone in the past.

Today's building stone industry in North America and world wide is dominated by granitic rock types. Modern building construction methods use reinforced concrete, concrete blocks and bricks coupled with a curtain wall cladding system. The cladding panels typically measure 1 m x 1.5 m on each side and



ROCK TYPE	#	QUARRY	PAGE	ROCK TYPE	#	QUARRY	PAGE
<b>ANNAPOLIS COUNTY</b>				<b>HANTS COUNTY</b>			
▲	1	Heritage Memorials Ltd. Quarry	15	□	27	East Gore Slate Quarry	89
▲	2	Robert Baltzer Quarry	18	□	28	Upper Rawdon Slate Occurrence	90
<b>ANTIGONISH COUNTY</b>				<b>INVERNESS COUNTY</b>			
▲	3	South River Lake Quarry	9	▲	29	First Fork Brook Occurrence	35
<b>CAPE BRETON COUNTY</b>				△	30	Glencoe Marble Occurrence	46
※	4	Scatarie Island Occurrence	7	●	31	Graham River Quarry	88
<b>CUMBERLAND COUNTY</b>				●	32	McKays Point Occurrence	66
●	5	Amherst Redstone Quarry	82	<b>LUNENBURG COUNTY</b>			
●	6	Coldspring Head Quarry	85	▲	33	Aspotogan Quarry	32
●	7	Fred Mead Quarry	68	<b>PICTOU COUNTY</b>			
●	8	Wallace Quarries Ltd. Quarry	77	●	34	Bameys River Quarry	53
●	9	Wallace Ridge Quarry	69	●	35	Big Merigomish Island Quarries	49
●	10	Wallace River Quarries	70	●	36	Eagle Quarry	71
<b>GUYSBOROUGH COUNTY</b>				●	37	Elliotts Quarry	72
▲	11	Arsenault Quarry	11	●	38	Four Mile Brook Quarry	54
▲	12	Queensport Quarry	20	●	39	Gammon and Weir Quarry	55
▲	13	West Erinville Quarry	14	●	40	Hines Quarry	86
<b>HALIFAX COUNTY</b>				●	41	Huggans Brook Quarry	73
▲	14	Brookfield Quarry	37	●	42	MacKenzie Quarry	56
▲	15	Couglan Quarry	22	●	43	MacPherson Quarry	74
▲	16	Fletchers Lake Quarry	23	●	44	McKeens Quarry	59
▲	17	Granite Quarry	24	●	45	Sawmill Brook Quarry	63
■	18	King Quarry	45	●	46	Seafoam Quarries	50
▲	19	Kinsac Lake Quarry	25	●	47	Toney River Quarry	51
▲	20	Kline Quarry	26	●	48	West Branch French River Quarry 1	87
▲	21	Little Lake Occurrence	39	●	49	West Branch French River Quarry 2	52
▲	22	Purcells Cove Quarry	27	<b>SHELburne COUNTY</b>			
▲	23	Quarry Lake Quarry	28	▲	50	Shelburne Island Park Quarry	33
▲	24	Quarry Lake Granite Quarry	42	<b>VICTORIA COUNTY</b>			
▲	25	Queen Quarry	30	●	51	Grant Quarry	67
▲	26	Yeadon Quarry	31				

Figure 1. Location map for building stone quarries and occurrences throughout the Province of Nova Scotia.

1.5 cm in thickness. The exterior surface of the panels may be polished, flamed or abraded to achieve the desired texture. Modern stone cutting and polishing techniques use raw stone blocks which weigh up to 20 t and measure 1.5 m x 2 m x 3 m in size. Blocks this size generate minimal waste in the manufacturing process. Panel size and thickness have limited stone choices to granite and marble.

Building construction in North America in the 18th, 19th and early 20th Centuries used building stone for the construction of load-bearing walls. Stone backed by brick formed the structures of the buildings. Individual block sizes were generally in the 1/8-1/4 m<sup>3</sup> range. Sandstone, limestone and marble were the materials of choice of the day because of the warm, earth tone colours and ease with which they could be worked. Granites were also used, but were generally unpolished.

Stone extracted for use in the restoration of buildings has a much different set of criteria than stone extracted for the construction of modern buildings. For restoration purposes, colour, texture, bed heights and the absence of deleterious materials are the most significant factors. Often, if stone is not available from the original quarry, a suitable matching replacement can be found.

### **HISTORICAL USE OF NOVA SCOTIA BUILDING STONE**

Sandstone was the predominant building stone quarried in Nova Scotia over the last 200 years. Buff, olive and tan coloured sandstone were quarried near Pictou and New Glasgow, Pictou County; Tatamagouche, Colchester County; and Wallace, Cumberland County. Striking grey sandstone was also quarried near New Glasgow and Wallace.

A very popular red sandstone was quarried in Amherst, Cumberland County, for many years. Several historically important buildings in the region were constructed of these materials. Province House was built of Wallace sandstone. The Halifax Armouries was constructed of Amherst red sandstone. Pictou sandstones were used to construct the New Glasgow Post Office. Scores of other buildings throughout the Maritimes, Quebec, Ontario and New England remain as monuments to Nova Scotia sandstone.

Past granite production was centred in the Halifax area with supplementary activity in the Nictaux, Annapolis County, and Shelburne, Shelburne County, areas. Halifax granites are found as basement courses in many of the sandstone buildings in Halifax. One of the better granites, from the Brookfield Quarry, Terence Bay, Halifax County, can be seen on the Merrill Lynch building in downtown Halifax. The majority of granite quarried in Nova Scotia was used in the monument trade. The small blocks available in the old quarries combined with older manufacturing methods restricted the granites use to the higher value grave marker and monument business.

### **NOVA SCOTIA STONE FOR RESTORATION**

A number of building restoration projects have been carried out over the last decade in Nova Scotia and elsewhere. One of the most significant was the restoration of Province House in Halifax. Originally constructed of Wallace olive sandstone, the effects of 200 years of smoke and the elements required that the building be cleaned, repaired and restored. The details of this work are outlined in Appendix 3, written by Les Batten of Maritime Canstone Inc. The required replacement stone was quarried from the present Wallace Quarries Ltd. Quarry, Cumberland County, which is located approximately 4 km north of the old quarry which supplied the original stone.

The restoration of the Art Gallery of Nova Scotia, formerly the Dominion Building, was completed in 1989. Research revealed that the original Dominion Building was constructed of brown sandstone quarried at Marys Point, New Brunswick (Appendix 4). This particular stone was of a colour and texture unlike any of the Nova Scotia sandstone quarries. In this case, the old Marys Point Quarries were reopened for a short period of time and the stone necessary for the Art Gallery Restoration was removed.

The Peace Tower and Centre Block of the Parliament Buildings in Ottawa were constructed of Napean, Ontario sandstone and trimmed with Wallace sandstone. Ongoing restoration and maintenance of these buildings has provided a continuing market for Wallace sandstone.

## REGIONAL GEOLOGY

The geology of Nova Scotia is diverse and provides a wide variety of igneous, metamorphic and sedimentary terranes in which to explore for and develop building stone quarries. The central mainland core is composed of greywackes and slates of the Meguma Group. These rocks have been used in the Halifax area for construction for over 200 years. Due to the high pyrite content, these rocks are locally known as 'ironstones'. Various granitoids of the South Mountain Batholith intruded these rocks. Granodiorites and monzogranites have also been quarried and used in the Halifax area as building stones and for monument work. A fine grained, biotite granite quarried at Nictaux, Annapolis County, has been a very popular ornamental stone for over 100 years.

The Carboniferous sedimentary rocks of the Cumberland Basin have been quarried extensively over the last 175 years. In fact over 50 old quarries were active between Amherst, Cumberland County, in the west and Pomquet, Antigonish County, in the east. Sandstone quarries are also known in the Carboniferous sandstones of Cape Breton Island.

This paper reports in detail the results of the Building Stone Project (1984-1989) and is a compilation of information collected from quarry site visits, literature research and detailed diamond drilling of several old quarries and prospects. Possible uses for the stone at each of the sites are listed. These include monuments, tiles, rubble stone, decorative chips and ashlar. Appendix 5 is a glossary of building stone terms as well as some of the technical terms used in Appendix 3 which discusses restoration. The final section of each detailed description is Comments which gives the author's opinion of the potential for development of that particular site. This information, coupled with the Nova Scotia Sample Catalogue 89-01 (Nova Scotia Department of Mines and Energy, 1989) and the Building Stone in Nova Scotia pamphlet (Dickie, 1988, 1991, 1993), provides an accurate information base for the building stone industry of today. It will be of help to the restoration expert who is looking for a specific stone type and the entrepreneur who is looking for a suitable granite deposit for the manufacture of curbing stone, tile and cladding.