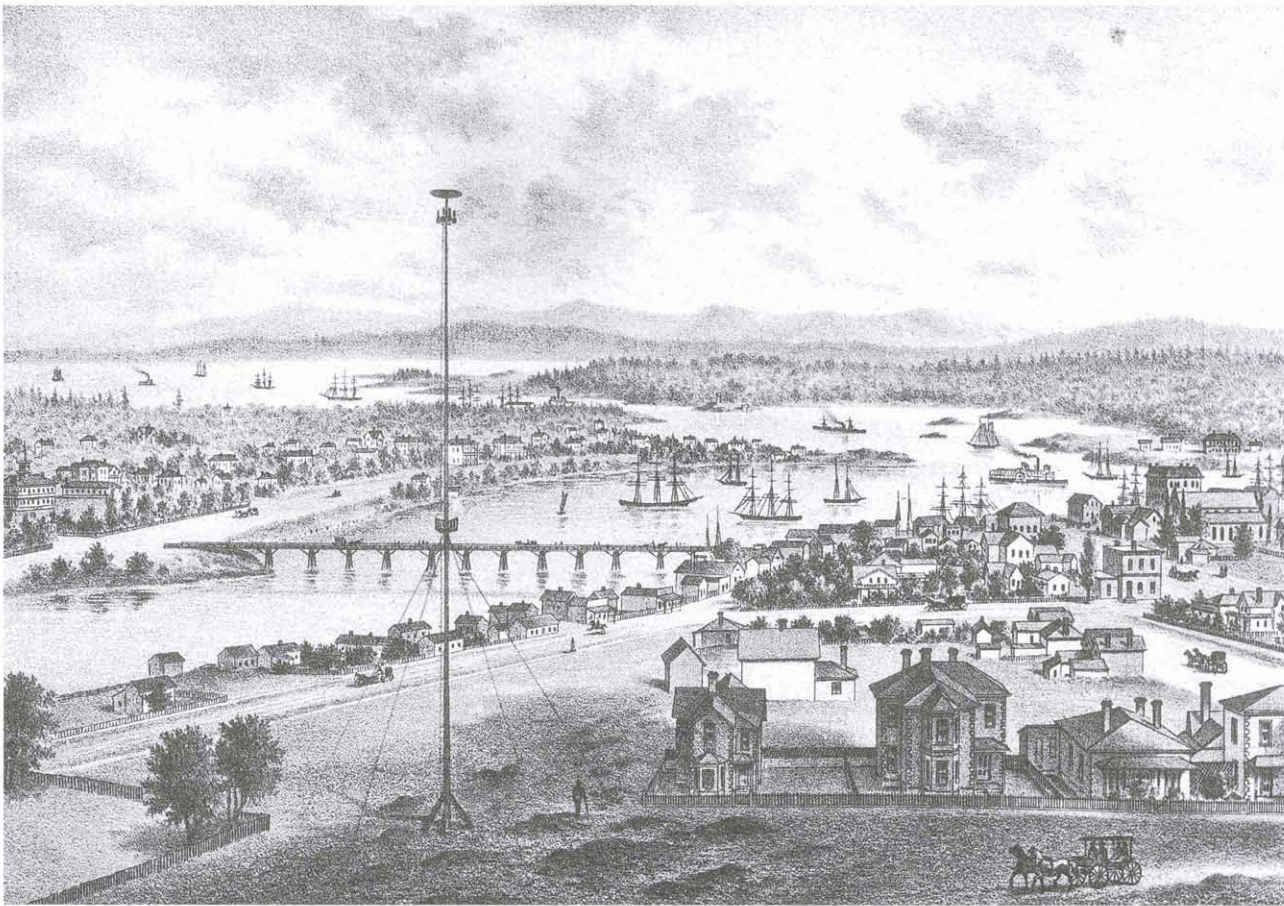




Dimension Stone in Victoria, B.C.

A City Guide & Walking Tour

By: Z.D. Hora and L.B. Miller

MINISTER'S MESSAGE



It is with a great deal of pleasure and pride that our Ministry is able to provide "Dimension Stone in Victoria, B.C.: A City Guide & Walking Tour".

If you are new to historic Victoria, I welcome you and congratulate you on your choice of destination. No other city in Canada offers this type of wonderful scenery and architectural diversity in such a lovely garden-like setting. If you are a resident the charm of your home is evident, and reading this book will only reinforce your perceptions.

There is a fascinating history to this place which is reflected in the rocks used to construct the historic monuments and buildings that are our landmarks. The city is built with pieces of British Columbia's natural heritage – granite from Hardy Island, red marble from Texada Island, Haddington Island andesite, and Cobble Hill sandstone are just a few of the types of B.C. stone that literally, are the building blocks of Victoria.

Lately there has been a resurgence of interest in quality stonework as people turn to the enduring turn-of-the century constructions that dot the Victoria landscape, and marvel at their beauty and durability. The Legislative Buildings, the old Royal Bank Building (now Munro's Bookstore), the Board of Trade building in Bastion Square ... all these buildings have stood the test of time and are still functional and attractive.

As you walk through this wonderful city, remember, permanence is part of Victoria's charm. Just as we have perennial blooms in the spring, we have aspects of this city that will not change, as they have been carved out of solid rock and erected for the enduring pleasure and use of all generations.

This is the beauty of stone; this is the beauty of Victoria.

Sincerely,

A handwritten signature in cursive script that reads "Anne Edwards".

Hon. Anne Edwards, Minister
Ministry of Energy, Mines and Petroleum Resources
Province of British Columbia

Cover photo: General view, from the westshore, of Victoria inner harbour in 1884. Shows 'birdcages' at extreme left at the site of the present Legislature buildings, and the inner harbour James Bay Bridge at the site of the present seawall and landfill. The Empress Hotel is located on what was once the James Bay mud flats which are under water, at high tide, in this photo. Photo from B.C. Archives and Records Service, Catalogue No. 44367.



The British Columbia Geological Survey Branch is part of the Ministry of Energy, Mines and Petroleum Resources. Its primary function is to carry out the geological survey of the province and to inventory the metallic, coal and industrial mineral resources of the province. It also undertakes public information projects on geology and geological hazards.

For information on the geology and mineral resources of the province of British Columbia contact the Geological Survey Branch, Victoria, 604-952-0382.

Canadian Cataloguing in Publication Data

Hora, Z.D.

Dimension stone in Victoria, B.C. : a city guide & walking tour

(Information circular, ISSN 0825-5431 ; 1994-15)

Issued by Geological Survey Branch.

Includes bibliographical references: p.

ISBN 0-7726-2189-6

1. Building stones - British Columbia - Victoria. 2. Stone buildings - British Columbia - Victoria. I. Miller, L.B. II. British Columbia. Ministry of Energy, Mines and Petroleum Resources. III. British Columbia. Geological Survey Branch. IV. Title. V. Series: Information circular (British Columbia. Ministry of Energy, Mines and Petroleum Resources); 1994-15.

TN 952.C3H67 1994

553.5'09711

C94-960241-8



VICTORIA
BRITISH COLUMBIA
CANADA

August 1994

TABLE OF CONTENTS

FOREWORD	1
----------	---

Quarries Of British Columbia	2
Geological Descriptions of a Selection of Victoria's Principal Building Stones	2

SITE DESCRIPTIONS	9
-------------------	---

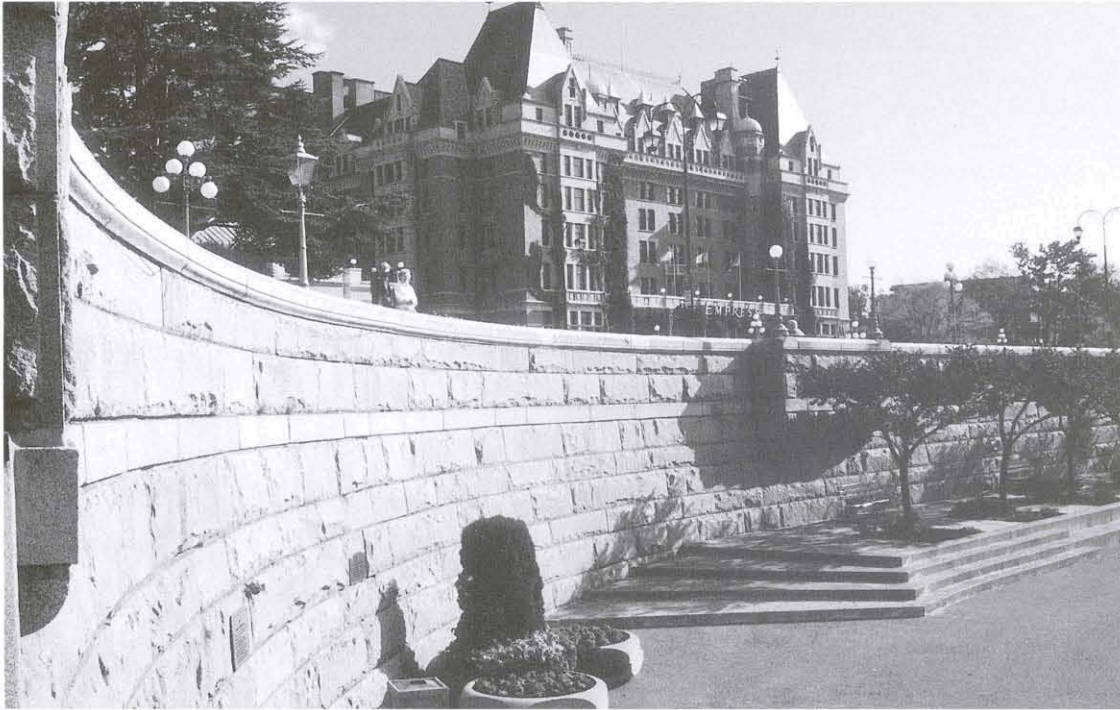
Victoria Breakwater	9
British Columbia Legislative Buildings	10
War Memorial	12
Statue of Queen Victoria	12
Statue of Captain Cook	13
Seawall	13
Empress Hotel and Conference Centre	14
Customs and Immigration Building (Old Post Office)	15
Weiler Building	16
Pither and Leiser Warehouse	17
Temple Building	18
Yarrow Building	19
Eaton Centre	19
Old Royal Bank – now Munro's Bookstore	20
Old Bank of Montreal	21
Board of Trade Building	21
Fieldstone Wall	22
Bastion Arcade	22
Federal Building (former Post Office)	23
Bank of Nova Scotia	23
Bank of Montreal	24
Carnegie Library	25
Metropolitan United Church	26
Christ Church Cathedral	27
Yorkshire Trust	28
Royal Bank	28
Royal British Columbia Museum	29
Craigdarroch Castle	31
Government House (Cary Castle)	33
Dr. O.M. Jones Residence	33
Normal School – now Camosun College	34
Royal Roads	36
Race Rocks Lighthouse	37
Jack Davis Building	38

GLOSSARY OF TERMS	39
-------------------	----

SELECTED BIBLIOGRAPHY	43
-----------------------	----



Photo of the Inner Harbour, Victoria, B.C., 1906 Shows the Legislature building with the newly completed seawall in front of the James Bay Bridge. The seawall (page 13) is part of a cofferdam which cut off the western reach of the harbour. This was done so that the Empress Hotel could be constructed on what was then the James Bay mud flats. Photo from B.C. Archives and Records Service, Catalogue No. 56023.



View from the Inner Harbour – Empress Hotel with the seawall in the foreground.

This publication highlights the past and potential uses of stone as a structural material and also as a culturally valuable and lasting resource. Most of Victoria's buildings and monuments that have used natural stone in their construction can be found within four to six city blocks of Victoria's Inner Harbour. While a few buildings outside of this area deserve mention, much of the diversity of Victoria's architecture and the character of the distinctive building materials can be appreciated without walking any great distance.

A tour of the city's many stone buildings and monuments is an excellent way to gain an appreciation not only of the geology and history of building stone but also of the architectural and aesthetic qualities associated with these structures.

Historically, people who chose stone as their building material did so, in part, because of its qualities of resistance against the wearing effects of time and the elements. As proof of this, old structures built of stone still stand in nearly every place they have been constructed.

Some of the earliest geological surveys of the Canadian Cordillera were closely tied to the construction of the Canadian Pacific Railroad. Geologists joined the surveying expeditions of the CPR in the 1860s and made the first stratigraphic studies, as well as locating potential dimension stone sites. The CPR used stone quarried along its right of way for bridges, abutments and markers and, inevitably, the use of stone in buildings followed the construction of the railroad. Stone buildings were erected in towns that had sprung to life along the railway. Nearly all of the stone used in these buildings was quarried and finished in British Columbia.

Over the years, the role of stone as a building material has changed considerably. With the increasing cost of producing building stone and the greater use of structural steel, reinforced concrete and new composite materials, there has been a considerable

decrease in the quantity of stone used in most buildings. Formerly, buildings were constructed with solid stone walls, many of which were load bearing; today this function has been replaced by steel frames combined with concrete. Although initially used as a convenient, close at hand construction material as well as for its natural qualities of fire resistance and strength, in time stone came to be appreciated for its aesthetic value. At the turn of the century, building with stone helped to convey a sense of permanence, stability and confidence, all of which were helpful attributes for public buildings constructed in a newly founded and widely dispersed nation. Many such buildings in Victoria are still in use, and most have been designated as heritage sites.

In the last two decades a new emphasis on the inherent heat and sound insulating properties of stone, combined with the quality of providing a lasting finish to modern office towers, has resulted in stone being used extensively for the exterior cladding of some buildings in larger Canadian cities. Stone quarried for this purpose is most often used as sheets of facing stone. Victoria has numerous landmarks and buildings that were built with stone in the first part of the 20th Century, for reasons of utility and simple aesthetics. However, only a few new buildings have made use of modern techniques of exterior stone cladding.

Quarries of British Columbia

In British Columbia, small amounts of commercially usable stone are being produced today from quarries in the vicinity of the Lower Mainland, in addition to limited quantities of ornamental stones such as rhodonite and jade from other parts of the province. The dimension stone industry was thriving at the turn of the century when construction of institutional and public buildings in new towns was a growth industry. However, the quarrying of stone gradually declined and ceased in the depression of the 1930s. Currently, various abandoned quarries and a number of new sites are being examined for their potential in today's markets. Some of the old sites are no longer viable, whether due to poor performance of the stone, changes in building technology, land-use or zoning regulations, or lack of necessary reserves, and will likely never be re-opened. A few, however, still show great potential for pleasing and structurally sound building stone. It is hoped that these can again be productive, along with sites that have been identified and developed in the past few years.

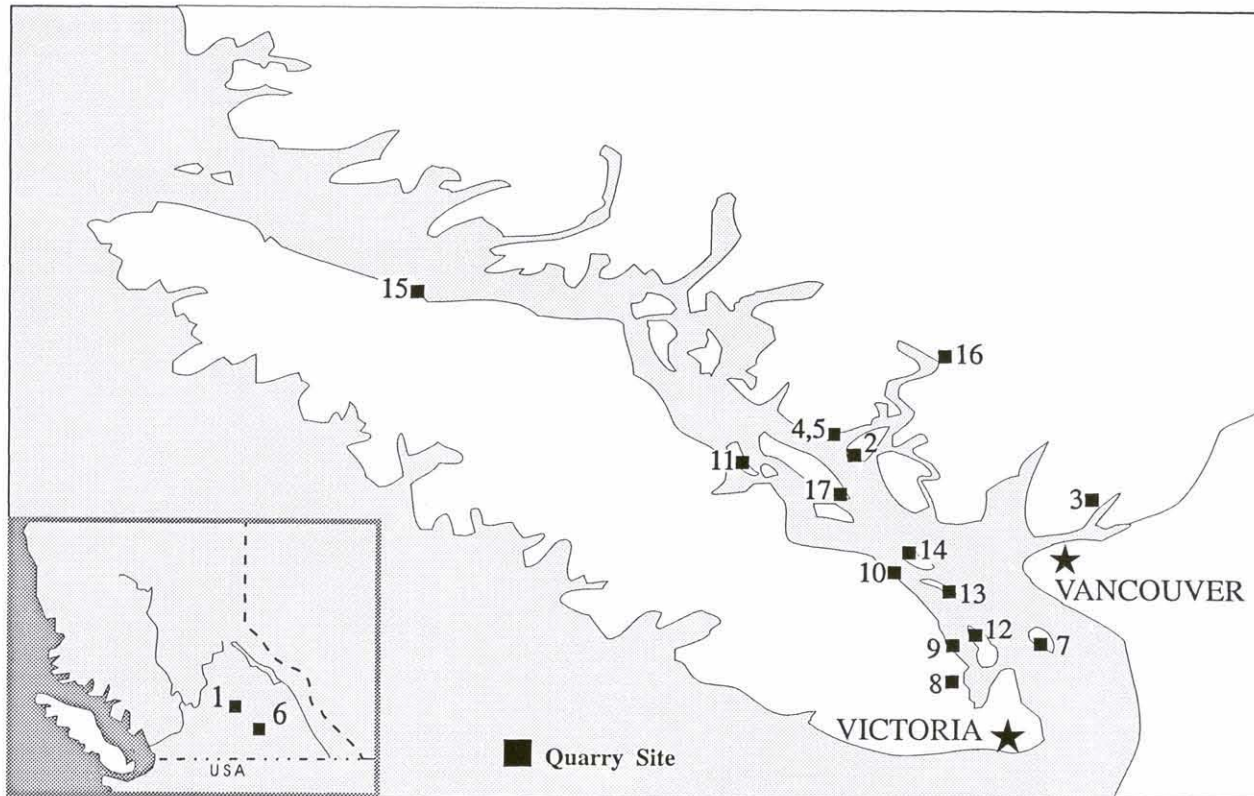
Geological Descriptions of a Selection of Victoria's Principal Building Stones

Dimension Stone

Rock that has been cut and finished to predetermined requirements is called dimension stone. The quarried stone may be finished in a number of ways. It may be bossaged, bushhammered, crenelated, honed, flamed, denteled and polished, or it may be used as ashlar with a naturally broken surface. Dimension stone is one of the most widely available of building materials. It is durable and can be worked with simple or complex tools towards a variety of ends, it is an effective conductor for heat and, perhaps more importantly, it is visually pleasing.

Almost every type of rock can and has been used as dimension stone. The suitability of a particular stone is governed primarily by physical properties and aesthetic appeal. The most common types used include granitic rock, marble, limestone, sandstone and slate as well as purely ornamental stones such as jade and rhodonite. Today stone is most commonly used as an exterior veneer or as tiles, but it is also used for sills, steps, lintels, curbstones or paving. Granite is often used for the base of build-

BRITISH COLUMBIA QUARRY LOCATION MAP



Granite Quarries

1. Okanagan Sunset
2. Nelson Island
3. Burrard Inlet
4. Hardy Island
5. Fox Island
6. Beaverdell

Sandstone Quarries

7. Saturna Island
8. Cobble Hill
9. Koksilah Island
10. Newcastle Island
11. Denman Island
12. Saltspring Island
13. Valde's Island
14. Gabriola Island

Other Sites

15. Haddington Island
Andesite
16. Jervis Inlet
Slate
17. Texada Island
Marble

ings which may subsequently be finished with dimension stone or with another material. For stone to be considered as dimension stone it should be relatively free of stains, knots, or irregularities in texture and should have an attractive, uniform colour. Knots are irregularly distributed particles of black coloured minerals, mostly hornblende or pyroxene. Their presence results in a lack of homogeneity, which decreases both the economic value and visual appeal of stone. Knots are common in granites along the coast, but they are less frequent in granites from other areas of British Columbia. With time and exposure to the weather, high quality dimension stone should not deteriorate physically.

Sandstones

Sandstones are usually composed of cemented sand that has been formed by the action of wind or deposited by water. Sandstones used for structural purposes in

Victoria, Vancouver and Nanaimo are 80 million-year-old (Late Cretaceous age) rocks which are exposed on the islands of the Strait of Georgia, and to a lesser extent on the southern part of Vancouver Island. These sandstones vary in grain size and colour, but are usually tinted between bluish grey and yellow. The buff or yellow colour results from oxidation. The first building stone from British Columbia to be used in construction was probably sandstone from a quarry on Gabriola Island. It was shipped to San Francisco for use in the Treasury Building in 1837. Stone from quarries on Gabriola, Saturna and Koksilah islands have been used extensively throughout B.C., as have sandstones from Denman, Newcastle and Saltspring islands.

Granites

Granite is a granular rock of igneous origin consisting predominantly of the minerals quartz, feldspar and commonly biotite or muscovite mica. Granites, by definition, are plutonic rocks which intrude other rocks in the earth's crust. Large masses of granite are called batholiths.

The term "granite" as used by builders and monument makers is of much wider application, and may be employed for almost any igneous rock including syenites and gabbros, and in the case of the very dark stones it is customary to prefix the adjective "black." Most of the granites mentioned in this guide are more accurately described as granodiorites as they have less quartz and plagioclase feldspar than granite.

Stone from the Okanagan Sunset and Okanagan Landing quarries as well as Burrard Inlet, Nelson Island, Fox Island and Hardy Island quarries has been used throughout British Columbia and the United States.

Volcanic Rocks

Rocks of volcanic origin are common along the coast, on Vancouver Island, and throughout the province. However, the only stone of this class actually quarried for building purposes is a light greyish *andesite* from Haddington Island; which is more accurately called *dacite*. The volcanic rocks of British Columbia are usually too severely fractured to be of any value as building stone. On the other hand, they have been quarried for use as construction aggregate and some volcanic rocks from the southern end of Vancouver Island have been used as fill for the breakwater in Victoria.

Andesite from Haddington Island is both unique and highly desirable as a building stone and has been used in some of the finest buildings in British Columbia. The stone is of a very uniform grain with only a slight variation in colour. Some of the more important buildings constructed with Haddington Island stone include the Legislative Buildings (Victoria), Royal British Columbia Museum (Victoria), Courthouse (Vancouver), Merchants Bank (Vancouver), Government House (Victoria) and parts of the Empress Hotel (Victoria). An examination of these buildings shows a remarkable uniformity in appearance and a similarity in the effects of weathering.

Marbles

Marble refers to limestone that has become crystalline and has a fine enough grain to allow it to take a good polish. In some cases, even though crystalline structure is lacking or only slightly developed, unrecrystallized limestones will be classed as marble if the stone is of sufficient appeal for use as ornamental material.

The purely commercial term "marble" is difficult to apply. British Columbia does not rank high as a producer of stone of this type. Red marble from Anderson Bay on Texada Island has been used for the interior finishing of various buildings, including the Old Post Office (Victoria), the Nanaimo Post Office and the Merchants Bank (Vancouver). Recently, several sites with potential for development have been identified on Vancouver Island.

Fieldstones

The term *fieldstone* is arbitrarily applied to any loose stone, whether natural, shaped, worked or unworked. Fieldstones were being used for construction long before architecture became a formal discipline. In developing countries around the world it is a common material for building houses, but in countries such as Canada, fieldstones are more commonly used for retaining or free-standing walls. An important property of stone is its high relative density, which together with its rigidity creates strong, stable walls.

Imported Stone

This statue on the grounds of Royal Roads Military College was carved in marble from Carrara, Italy.



Numerous varieties of imported stone have been used for facing the bases of commercial buildings on nearly every street in the downtown core. This stone is usually a granite, although marble and travertine have also been used. As well, the interior of many buildings use or have used both imported and local stone for decorative facing.

Carrara marble from Italy is an internationally renowned dimension stone that has been used for fine carving, monuments and statues throughout the province. The interior of the Legislative Buildings contain large amounts of imported marble, including Carrara varieties. Blue Pearl granite from Norway, used for the base of the statue of Queen Victoria, has also been used as a facing stone on several other buildings throughout the city. Black granite from Quebec and South Africa, and brown “mahogany” granite from South Dakota, face buildings in the area of Douglas Street. In addition, marble and travertine from locations in Italy, and even a grey marble from as far away as China, have been used on various buildings, both as a decorative base and for interior facing stone.

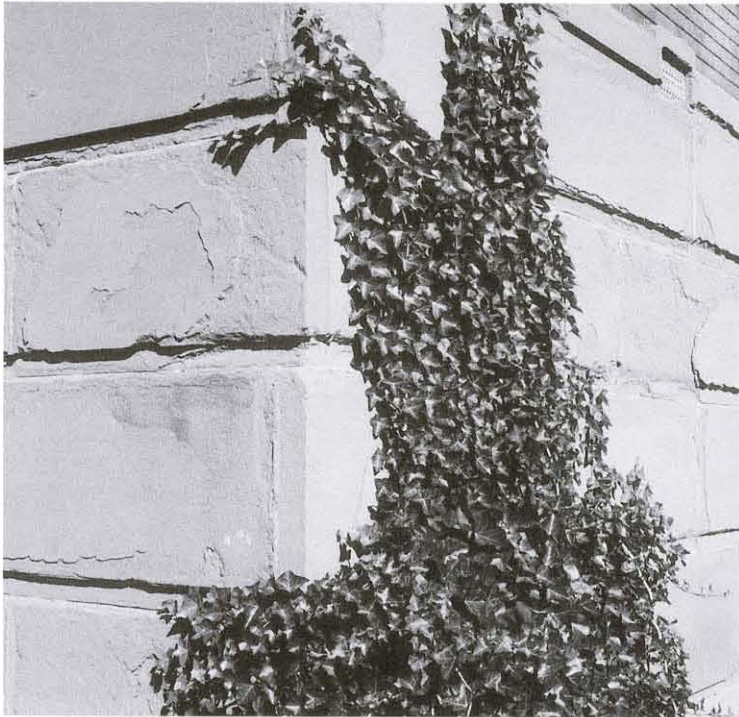
General Weathering Properties of Stone

The effects of time and weather on stone are not necessarily undesirable; weathering may even enhance certain qualities of the stone. Colour can mellow with time and soften the appearance of stone. For certain buildings and monuments a weathered and aged look may convey desirable impressions of antiquity and permanence.

Decay, which describes the ugly effects of time and elements, is caused by a variety of factors. Acid in air and rainwater can cause incipient decay of the mineral composition of some stones; salt in humid coastal air may have similar effects. Repetitive freezing and thawing can eventually cause stripping, exfoliation and cracking of stone, particularly where water retention occurs, on horizontal surfaces or in naturally porous stone.

Two detrimental effects of humidity on building stone are efflorescence and subflorescence. Efflorescence is the appearance of salts on a stone due to the evaporation of surface moisture. This evaporation draws internal salts, or the salts contained in the mortar, to the surface of the stone resulting in a condition commonly known as wall white, stack wall or wall cancer. Subflorescence is the term used to denote the internal crystallization of salts that occurs when evaporation takes place below the surface of the stone. This can result in accelerated decay and is therefore more harmful than efflorescence. Other effects include the darkening of stone due to the absorption of dirt or water; as well, pyrite and other iron-bearing minerals can oxidize when exposed to air and result in unpleasant iron stains or rust.

Decay of the Denman Island sandstone used on the Camosun College Lansdowne Campus occurred because the bedding planes in the sandstone were laid vertically rather than horizontally as they would occur in nature.



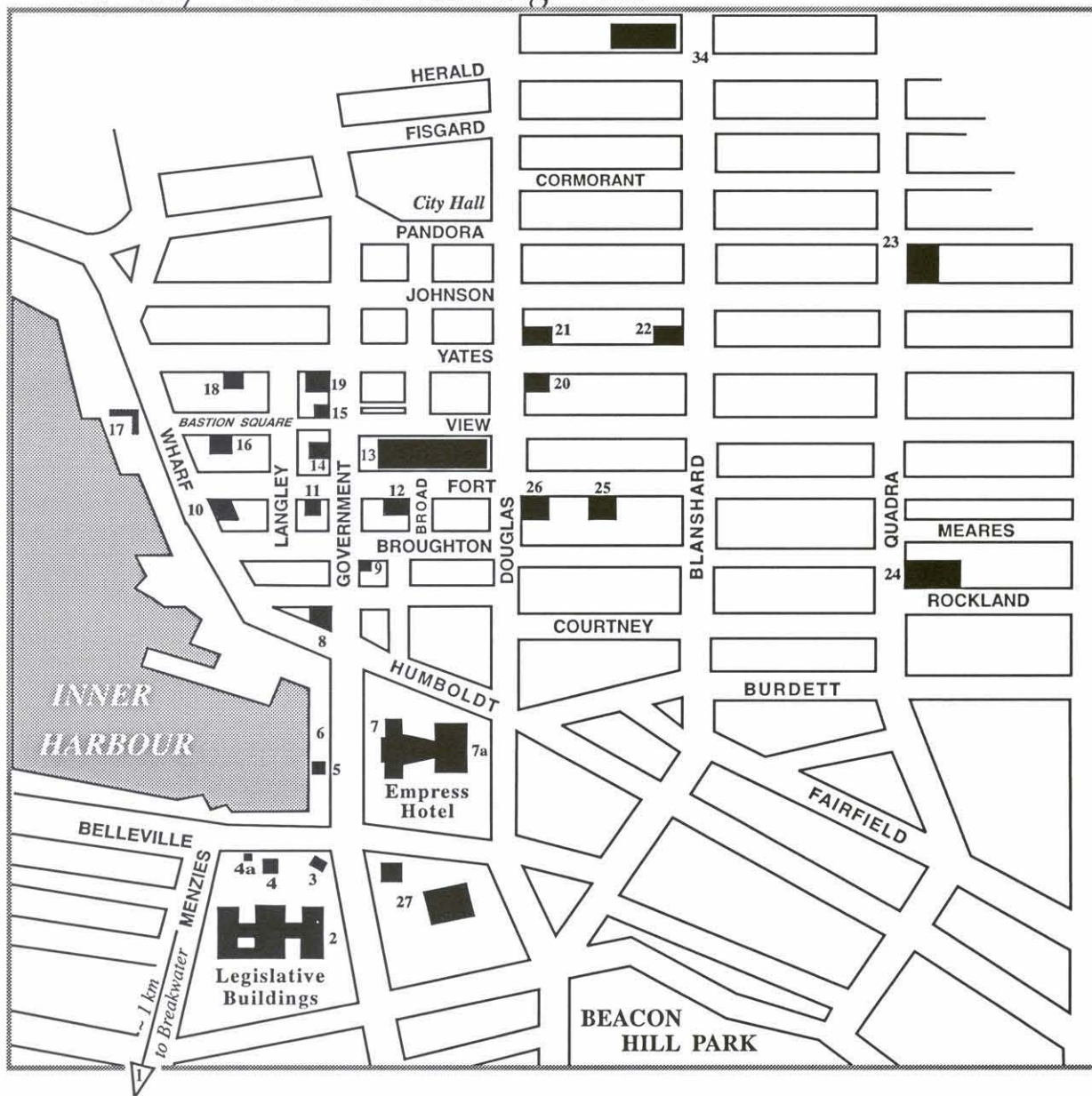
Continuing decay of the Denman Island sandstone in these pillars on the Camosun College campus in the form of cracking and stripping is due to the effects of rain and frost on the vertically exposed bedding planes.



NOTES

DIMENSION STONE IN VICTORIA

A City Guide & Walking Tour



- | | | |
|-----------------------------------|-------------------------------|--------------------------------|
| 1. Victoria Breakwater | 9. Weiler Building | 19. Federal Building |
| 2. Legislative Buildings | 10. Pither & Leiser Warehouse | 20. Bank of Montreal |
| 3. War Memorial | 11. Temple Building | 21. Bank of Nova Scotia |
| 4. Statue of Queen Victoria | 12. Yarrow Building | 22. Carnegie Library |
| 4a. Sir James Douglas Monument | 13. Eaton Centre | 23. Metropolitan United Church |
| 5. Statue of Captain Cook | 14. Old Royal Bank | 24. Christ Church Cathedral |
| 6. Seawall | 15. Old Bank of Montreal | 25. Yorkshire Trust |
| 7. Empress Hotel | 16. Board of Trade | 26. Royal Bank |
| 7a. Victoria Conference Centre | 17. Fieldstone Wall | 27. Provincial Museum |
| 8. Customs & Immigration Building | 18. Bastion Arcade | 34. Jack Davis Building |

Victoria Breakwater (1916)

Ogden Point off Dallas Road



Victoria Breakwater (Ogden Point) – Hardy Island granite.

History

The contract for the building of the Victoria breakwater called for 1.25 million cubic feet of dimension stone, consisting of large, roughly squared blocks of up to 20 tons in weight. This estimate actually fell short of the amount of stone needed, for by the end of May 1916, 1.5 million cubic feet had been delivered and the wall was not completed until the end of that year.

Building Stone

The breakwaters constructed in both Victoria and Vancouver contain granite from quarries on the southwest shore of Hardy Island. This stone contains a fair number of black knots which range up to 30 centimetres in diameter. This precluded its use as a decorative facing stone or as monumental stone but it has proven suitable for less ornamental uses as it is easily quarried in large blocks. The Victoria breakwater also incorporates basalt, quarried as rough rock and crushed stone, from Albert Head on lower Vancouver Island.

Weathering

Despite permanent contact with the sea water, this granite does not show any deterioration. Its excellent durability makes it an ideal choice for construction in locations with harsh or unusual weathering conditions.

British Columbia
Legislative Buildings
(1897; additions 1916)

501 Belleville at Government

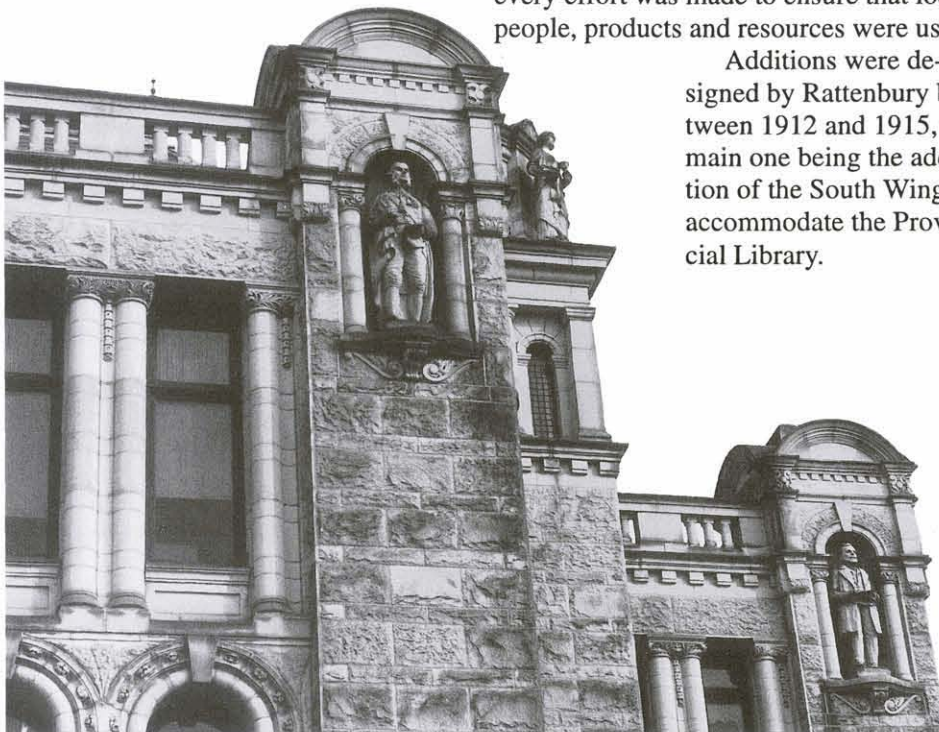


Legislative Buildings, Victoria, constructed with Haddington Island andesite with a base of Nelson Island granite.

History

In 1892 the government chose a plan for new parliament buildings designed by a young architect named Francis Mawson Rattenbury (then only 25 years old). They were the first of many buildings Rattenbury would design in Victoria, and certainly his most prestigious. It was hoped that the massive construction project would provide a boost for the flagging economy and every effort was made to ensure that local people, products and resources were used.

Additions were designed by Rattenbury between 1912 and 1915, the main one being the addition of the South Wing to accommodate the Provincial Library.



Statues surrounding the upper courses of the Legislative Buildings commemorate some of British Columbia's most renowned citizens.

Despite cost overruns (the total cost of \$924 000 was nearly twice the original estimate of \$500 000), delays and controversy, the Parliament Buildings serve as a focal point for Victoria's Inner Harbour.

Building Stone

Exterior: The foundations are made of Nelson Island granite. The exterior is made from Haddington Island andesite that was bossaged to give a natural rock-face appearance. The andesite varies in colour from bluish grey to greyish yellow with small, evenly distributed feldspar crystals up to 2 millimetres in diameter that appear as dark specks. The roofing slate, "a black carbonaceous, finely laminated rock free from objectionable impurities" (Parks, 1917), was quarried and split in Jervis Inlet. The steps and landings are granite from Burrard Inlet.

Interior: Marble was used extensively to finish the interior walls, stairways and floors of the Legislature. Tennessee marble is featured on the walls of the legislative chamber while dark green marble from Carrara, Italy and red marble from Texada Island, B.C. was used in the many columns and panelling throughout the Rotunda. One feature of note is the marble mosaic on the floor of the Rotunda, which was nearly replaced in the 1970s by more "practical" linoleum. The library addition is panelled and paved entirely with Italian marble. The columns surrounding the dome are not actually solid marble. They are a type of fabricated stone known as *scagliola*, which is made using a process that originated in 17th Century Italy. Marble chips, gypsum and glue are mixed and placed on a plaster base and then hand rubbed. These columns were assembled on site, resulting in a considerable cost saving.



The dome of the Legislative Buildings, which rises above the Rotunda, holds a (gold) gilded statue of Captain Vancouver 50 metres (165 feet) above the ground.

Weathering

In a 1917 report entitled "Building and Ornamental Stones of Canada," William Parks wrote that the parliament buildings

"... have a light yellowish-grey appearance very pleasing to the eye.... A variation in colour is to be observed; some blocks are decidedly more brownish than others and in a few instances a pinkish cast is shown.... Where water has been allowed to run over the masonry, the stone is much darker, doubtless on account of the soaking in of dirt.... The surface of the stone is hard without any sign of deterioration."

Today the same can be as truthfully said as in 1917. Weathering has only served to enhance the impressive appearance of these buildings and they continue to demonstrate the beauty of stone.

War Memorial (1925)

Legislature Lawns

Building Stone

The base was constructed using a coastal granite from Nelson Island.

Weathering

The base contains many knots of darker minerals and has been left in a rough-cut finish. Because of the unpolished finish, differentiation between the mineral components of the stone is pronounced on the more exposed surfaces. The stone has a tendency to accumulate and absorb dirt, which darkens it unevenly.

Statue of Queen Victoria (1921)

Centre,
Legislature Lawns

Building Stone

The base is made of a Norwegian granite known as *larvikite* which, due to the feldspar crystals which are an iridescent blue when polished, is given the commercial name *blue pearl*. The steps are of the same material as the base but in a slightly darker shade due to the higher pyroxene content. A few metres to the west of the Queen Victoria Statue is a monument to Sir James Douglas. The stone used to construct this monument contains very dark inclusions and other imperfections and therefore is likely to be from a local source, possibly even from within the Victoria area.

Weathering

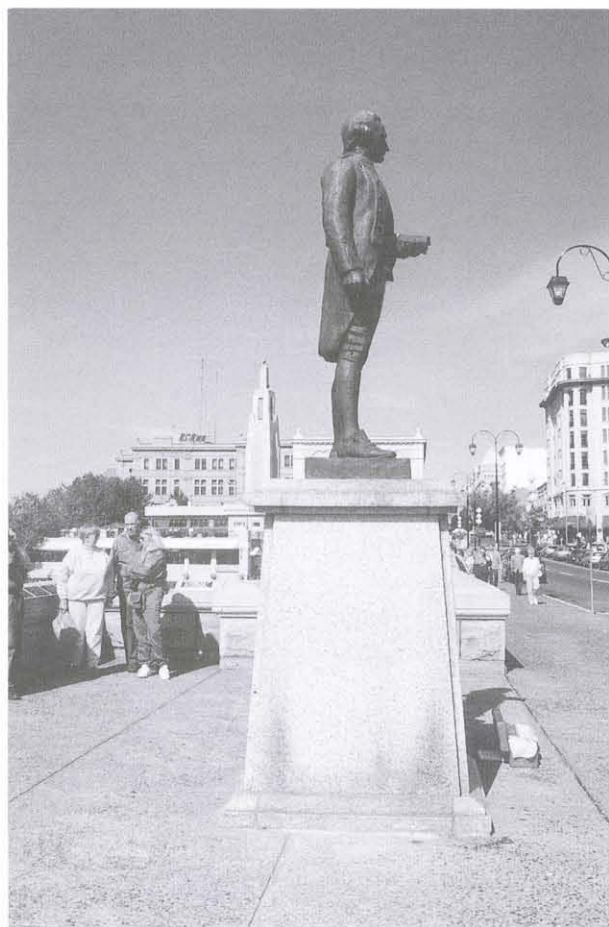
Little or no weathering is evident; there is no significant darkening or colour change due to the absorption of dirt or the accumulation of salts.



Nelson Island granite forms the base of the War Memorial in front of the Legislative Buildings.

Statue of Captain Cook (1976)

*Upper Causeway,
Inner Harbour*



The granite base of this statue has become quite discoloured due to the absorption of dirt and the staining caused by bronze plaques set into the base.

History

This statue was unveiled by British Columbia Premier William Bennett on July 12, 1976. Captain James Cook was reputedly the first European to set foot in what is now British Columbia, although the Spanish claimed that their landing at Nootka predated his arrival.

Building Stone

The base contains a coarse-grained granite from the Okanagan Landing quarry.

Weathering

The stone was originally polished but has not retained this finish well. There is a great deal of darkening due to the absorption of dirt. Staining from the statue above as well as the bronze plaques set into the base have detracted greatly from the stone's appearance.

Seawall (1906)

*Inner Harbour,
Government Street*

History

The seawall was built at a cost of \$150 000 to enable the construction of the Empress Hotel on the James Bay mud flats. A coffer dam was built beside the James Bay bridge to permit construction of the causeway.

Building Stone

Kelly Island granite was used to construct the main course of the seawall. This stone has more black mica than granites from either Nelson or Hardy islands and is a significantly darker stone. It has been used in both Canada and the United States as a foundation stone and was specifically used to construct the Victoria Harbour seawall because of its attractive appearance and resistance to weathering. Both the capping stone and the ashlar course a third of the way up the wall are a lighter coloured, coarser granite from Fox Island.

Weathering

Despite constant exposure to sea salt over 80 years, this granite retains a fresh appearance.

Empress Hotel (1908) and Conference Centre (1989)

721 Government Street

History

Built on the mud flats of James Bay which were reclaimed by the building of the seawall in 1906, the Empress was one of the last hotels originating from Canadian Pacific Railway manager William van Horne's dream of a chain of grand hotels commanding the choicest views and scenery across Canada. The site chosen was close to the terminus of both the Nanaimo and Esquimalt railways as well as the CPR ferry dock. Today, commanding an excellent view of Victoria's inner harbour, this site is still ideal. Architect F.M. Rattenbury's plan was to provide an impressive "front door" approach to the city to complement the parliament buildings, which he also designed.

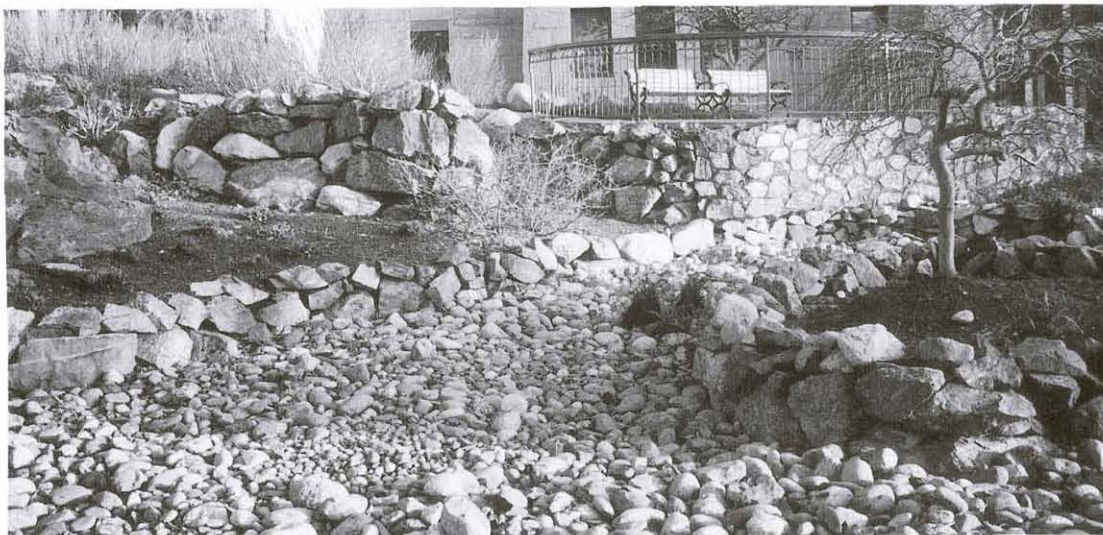
Additions were made between 1910 and 1929 by various architects who maintained the chateau style of the centre block. In all, 447 rooms were added to the original 160 to make a total of 607 guest rooms and suites as well as a ballroom, library and conservatory.

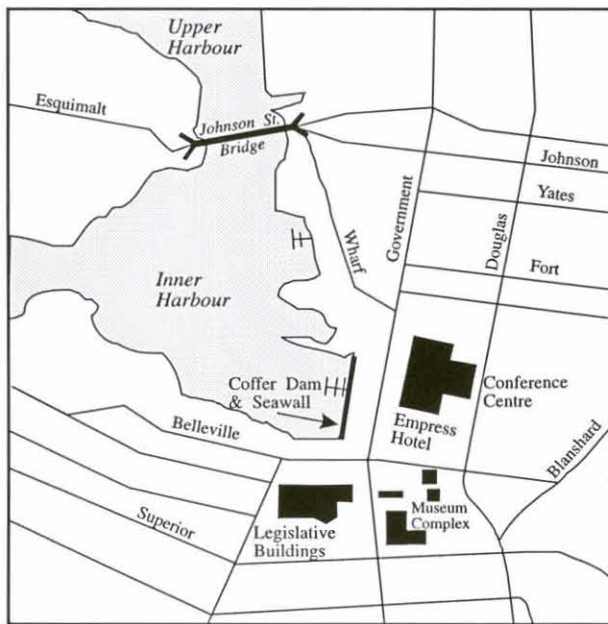
The interior of the recent (1992-93) lobby addition, as well as that of the adjoining Victoria Conference Centre, features dark green slate tiles imported from overseas. The Conference Centre contains marble tiling on the main walkways as well as bright green serpentinite (commercially known as "verde antique" green marble) in the tiling beside the walkways. This serpentinite is also used to floor the main area of the hotel lobby addition, where larger veins of white calcite are dramatically visible in the dark green stone. A Cararra marble statue in the lobby is an excellent example of this famous Italian stone.

*Both mortared and dry
fieldstone walls are used in
the rock gardens and grounds
of the Empress Hotel.*



*The Tyndall limestone
used to complete the
lobby addition to the
Empress Hotel contains
a variety of fossil
imprints from Late
Ordovician geological
time.*





Building Stone

A variety of stone has been used in the construction of the Empress Hotel and in the later completion of the Victoria Conference Centre. The exterior of the original block is clad with Haddington Island andesite with a local coastal granite base. The new main lobby addition makes use of Tyndall limestone from Garson, Manitoba which is a 440 million year old mottled limestone. The mottling is the result of burrowing by various marine organisms when the rock was still a limy mud, flooring an ancient continental shelf. Several varieties of fossils, including corals (both solitary and colonial), nautiloid cephalopods, sponges (stromatoporoids) and *Receptaculites* (colonial algae), can be seen in the stone.

The Tyndall limestone is interesting for its uniqueness in Victoria. Since the Haddington Island site had ceased to operate, Tyndall stone was chosen for its close colour match with the andesite.

Customs and Immigration Building (1914; Old Post Office)

816 Government Street

History

During the mid-1800s the Victoria Post Office was relocated six times. In 1898 at the time of the opening of the new Legislative Buildings, the post office began operations on this site. Alterations and additions completed in 1914 are still visible today. In 1952, the post office was once again relocated and by 1956 reconstruction of the Old Post Office building was completed for its current use as the Customs and Immigration Building. A recent reconstruction in 1991 produced the "granite" look of the facade on Government Street.

Building Stone

The front of the building (on Government Street) has a base of Island White granite from the Squamish quarry. The flat centres of the walls are sheets of Haddington Island andesite. The corners and pillars separating the wall segments are constructed of sand grains sprayed onto a fiberglass base, as can be seen by close examination of the exceedingly fine grained surface. At the back of the building on Wharf Street, the original Gabriola sandstone structure has not been replaced. The excessive amounts of staining and especially peeling that can be seen here illustrate one of the potential problems of sandstones. If they are laid incorrectly, that is with their bedding planes vertical, they tend to weather extremely quickly and in a very unattractive manner.

The original base is granite from Nelson Island. Red Malaspina marble from Texada Island was originally used for the interior finishing, but much of this had been removed by 1992.

Weathering

The weathering performance of the Gabriola sandstone, as seen on this building, is not good. Within a few years of its completion so much disintegration had occurred that re-facing was carried out in order to make the building presentable.

Island White granite from the Squamish quarry forms the base of the front of the building. Various sandstones and granite from Nelson Island compose the remnants of the original building, here visible behind the 1991 reconstruction.



" ... Both rock-face and bushed work have weathered well, but certain blocks show evidence of disintegration. It is said that this defect is due to the use of material which had been soaked in salt water.... On some of the smoothed work there is a strong tendency to brownish staining.... Individual blocks are already showing disintegration; but it appears a more careful selection of the stone would have obviated this defect...." (Parks, 1917)

Most of the decay in the sandstone has occurred along joints where water has soaked in, bringing salt to the surface of the stone. Water in these joints subsequently freezes and expands, causing the cracking, chipping and peeling that is evident on the remnants of original stone.

Weiler Building (1898)

921 Government Street

History

During the 1890s the Weiler Company was granted contracts for the interior finishing of some of the grandest buildings erected at that time, namely the Temple Building and the Bank of Montreal. In 1897 the firm was doing so well that new premises were deemed vital and necessary. At a basic cost of \$31 000, architect Thomas Sorby provided 109 162 square feet of well-lit display and storage space. The building itself was the largest in Victoria at that time. Sorby incorporated large display windows to allow for maximum lighting of merchandise. Theatrical lighting in the street level windows produced Victoria's first night time show-window displays.

Every possible space was utilized, including underneath the sidewalks, where the remains of the magnifying prisms designed to admit light into the underground stor-

age vaults can still be seen. When completed, it was believed to be one of the largest retail stores in Canada and was widely acclaimed to be a credit to the city.

Building Stone

The Weiler Block is the only building of any note that was constructed using sandstone from the west shore of Saturna Island. The quarry was abandoned at the beginning of this century, probably due to the presence of small round pellets of pyrite and irregular jointing which reduced the value of this stone.

Weathering

When quarried the unaltered stone was blue, but after exposure it oxidized to a buff colour that is highly attractive.

Pither and Leiser Warehouse (1905)

1019 Wharf Street

History

The Pither and Leiser warehouse is now a government office. It dates from the beginning of a period of expansion in Victoria's history, the late 1890s to World War I. At that time, Victoria still nurtured hopes of becoming the major Canadian seaport on the Pacific. Architect Thomas Sorby, who designed many buildings in the city, created a plain, unornamented building well suited to its purpose, a no-nonsense warehouse for the Pither and Leiser wholesale wines and liquor import firm.

Building Stone

The base is built of Coastal granite of an indeterminate source.

Weathering

Visible signs of weathering are few; the granite has an even grain with few knots or other impurities.

Temple Building (1893)

535 Fort Street

History

A new office for Robert Ward and Company was the first commercial building designed by Samuel Maclure in Victoria. It was also the first and only building in Victoria to follow the "organic" building style common in American commercial buildings of that period. This style is not based on historical architecture but rather takes its form from the nature of the materials and the structure of the building itself. The decoration is rather ornate, with many abstract floral motifs. When completed it was considered interesting for its originality and many modern conveniences. Among some of the unusual features for the day were the Gurney steam-heating system, the largest vault in the city at that time, and both gas and electric lighting. Although admired for its novelty in Victoria, the organic style of the Temple Building never took hold and today this building remains an architectural curiosity.

Building Stone

Bossaged Cobble Hill sandstone extends to the top of the first floor, where a single ashlar course of sandstone divides the storeys. The sandstone base changes from large blocks at the front of the structure, to smaller, rough-hewn blocks at the rear. The doorway is flanked by two imported "Scotch" granite pillars.

Weathering

The stone shows no sign of staining but is peeling slightly in places. The rock-face work on the base has withstood the weather well, with only slight signs of colour change.



The organic style of the Temple Building is relatively unique in Victoria. The "Scotch" granite pillars seen below have been used on several of Victoria's prominent structures.



Yarrow Building (1920)

645 Fort Street

History

The Yarrow Building, formerly the Pemberton Building, was once Victoria's largest office block, with 100 suites available for rent. It was constructed at the height of the economic boom before the First World War. The basement housed the Victoria Stock Exchange until its demise in 1916. Norman Yarrow purchased the building for use as a base of operations for his shipyard which employed over 3,000 people in 1946.

Building Stone

The coastal granite used in this building contains noticeable inclusions or knots of darker minerals which detract from the appearance of the building.

Eaton Centre

*One city block with entrances on
Government, Douglas, Fort and
Broad streets*

History

The recent construction of the Eaton Centre resulted in the demolition of many older buildings to make room for the new development. Fortunately, the facades of most of these were preserved, maintaining the impression that the block is still a series of buildings rather than a shopping mall. Quite a number of those older buildings used stone in their construction. Portions of this older stonework can still be identified, most often in the base of the new building.

Building Stone

Numerous examples of imported granite surround the exterior facades of the new Eaton Centre, which incorporates the exteriors of some of the buildings that previously stood on this site. On the interior, panels of various imported granites decorate the aisles and store fronts.



*Sandstone forms the base
of this portion of the
preserved heritage
facades – Eaton Centre.*

Old Royal Bank – now Munro's Bookstore (1909)

1108 Government Street

History

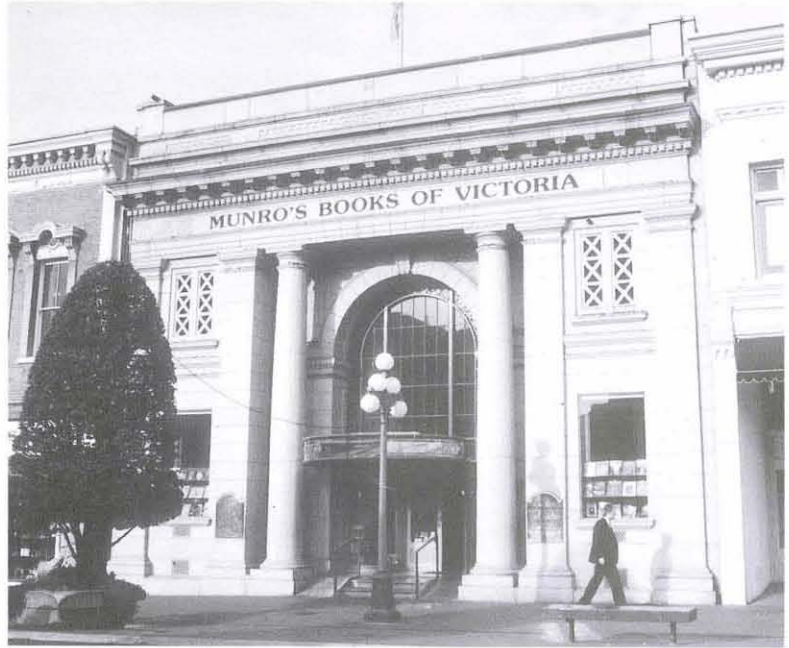
Architect Thomas Hooper created this former bank in the Edwardian Classical style characteristic of other bank buildings of this era. Stability has been portrayed through the use of dimension stone. Granite was used exclusively for the front of the building, and the central entrance is flanked by immense solid granite pillars twenty-four feet (more than seven metres) in height. Originally the basement had a shooting gallery where bank employees could prepare for the possibility of a hold-up. In 1982 the bank moved to a new location. The building received heritage designation soon afterward, and a local bookseller, James Munro, acquired it for his bookstore.

Building Stone

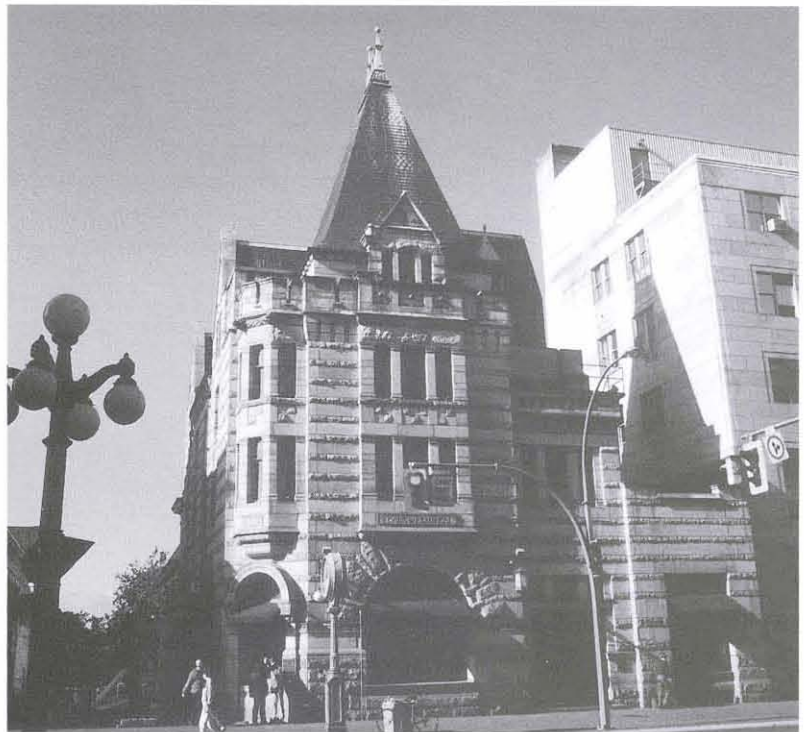
A coastal granite from Nelson Island was used to build the main facade which includes two immense columns quarried and laid in three courses.

Weathering

Portions of the stone have been stained due to the presence of copper pipes and plaques on the exterior of the building. In general the granite appears to be undamaged and shows few signs of decay.



The pillars flanking the old Royal Bank were constructed using three courses of stone.



Haddington Island andesite – used to construct the old Bank of Montreal.

Old Bank of Montreal (1896)

1200 Government Street

History

The use of stone to imply permanence and solidity is a common feature of banks built at this time. This building featured the most modern building techniques available in its day. A framework of steel girders and cement, combined with elimination of wood from its construction, ensured its continuing strength and resistance to fire. The floor above the banking room is supported by six immense columns, each capable of supporting up to 80 tons. The first of many banks built by Rattenbury, it foretold the style he would employ in the design of the Empress Hotel 12 years later.

Building Stone

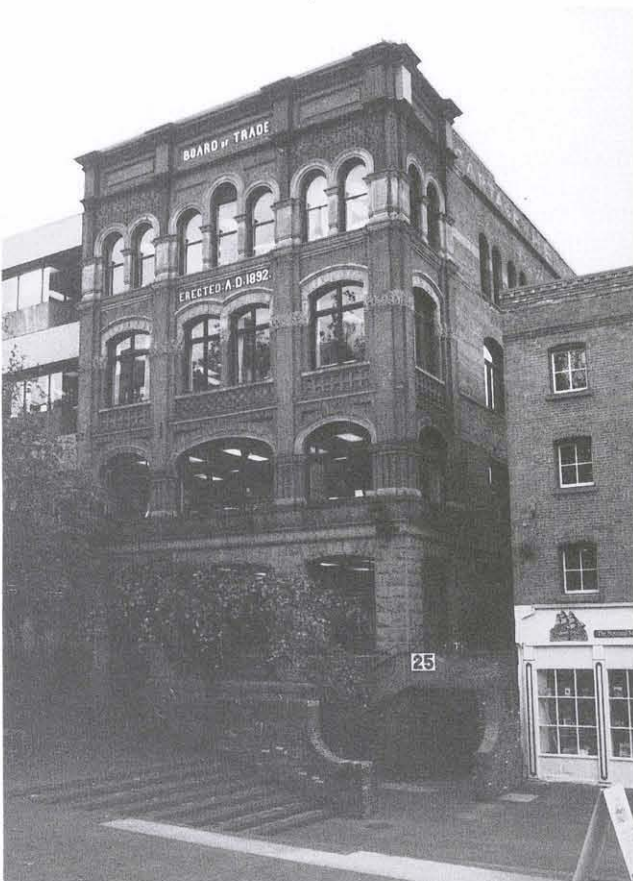
The exterior is Haddington Island andesite with a base of granite from Nelson Island. Above the main floor, the exterior is enhanced by alternating bands of split and cut Haddington Island stone which gives the building its distinctive appearance.

Board of Trade Building (1892)

31 Bastion Square

History

This building is interesting in its use of differing architectural styles for each floor. Window design, and the shape and form of the pilasters, change with each storey. Designed by A. Maxwell Muir for the Victoria Chamber of Commerce, it originally featured a lookout tower on the roof.



Building Stone

The base is built of bossaged Saturna Island sandstone combined with a single course of granite. A horizontal band of decorative sandstone runs midway across the third floor. Brick and galvanized iron complete the fourth floor.

*Board of Trade Building –
Saturna Island sandstone.*

Fieldstone Wall

*Outer wall of the Wharfside Eatery
and parking lot on Wharf Street,
opposite Bastion Square*

Building Stone

This mortared wall is a type of retaining wall that is fairly common in Victoria and can be seen around many houses as well as in the downtown area. There are also several excellent examples on the grounds of the Empress Hotel. This particular wall has been bricked over at some point and then later restored, although remnants of the secondary brick facing remain at street level. The lower-level parking area has been almost completely restored to its original condition.

Fieldstone walls tend to be put together with whatever stone is available on site and are frequently constructed using rubble from nearby building projects. They are relatively easy to build, requiring only time and a little advance planning. Their attractive rustic appearance, ease of building and low cost continue to ensure their popularity in residential and commercial areas.



Mortared fieldstone wall below Wharfside Eatery.

Bastion Arcade (1900)

535 Yates Street

History

Thomas Hooper designed this building as a warehouse for John Hepburn, a successful Klondiker and property developer in Victoria. It was then leased to Pither and Leiser, importers of alcohol and tobacco. The design reflects the interest within Victoria for the American commercial styles of this period.

Building Stone

The base and first floor are built of rusticated coastal granite with several granite lintels and sills on the upper levels.



Federal Building (1952; former Post Office)

1230 Government Street

History

This site had been used for a telegraph office and then a warehouse until it was demolished in 1950. Two years later a “new” post office building was built, then in 1993-94 the post office was relocated and the Federal Building was extensively renovated.

Building Stone

Polished granite from Nelson Island was used for the base; honed sheets of Haddington Island andesite complete this building.

A Nelson Island granite base supports the Haddington Island andesite used to face the Federal Building.

Bank of Nova Scotia (1923)

Corner of Douglas and Yates streets

Building Stone

A granite base supports the main facade, which is composed of Haddington Island andesite.

Weathering

Haddington Island stone has an excellent reputation for its weathering properties. The stone remains virtually undamaged, and shows few signs of cracking, staining or changes in colour. The large number of buildings that have been constructed with this stone, both in Victoria and throughout the province, provide excellent proof that Haddington Island andesite is one of British Columbia’s most popular building stones.



Haddington Island andesite – used in the Bank of Nova Scotia.

Bank of Montreal (1907)

*Corner of Douglas and
Yates streets*

History

One of the many banks in Victoria that was built with dimension stone, this bank is an excellent example of how to achieve an impression of solidity without appearing ponderous. It is yet another Victoria building designed by architect Francis Rattenbury. The distinctive Ionic columns and classic roofline contribute to the massive presence of the building. Originally the interior was finished entirely in marble with a 17-foot (5-metre) high ceiling. Although the marble finishing has been largely removed, the corner entrance, once filled in, has been recently restored.

Building Stone

The building is composed of blocks of Newcastle Island sandstone with a crenellated finish (alternating indentations and raised portions). An addition to the back of the building was completed with Haddington Island andesite.

Weathering

The sandstone shows few signs of decay and has retained an attractive appearance.

The Newcastle Island sandstone used to construct the Bank of Montreal on Douglas Street has been used in numerous other structures around the city.



Carnegie Library (1904)

794 Yates Street

History

The Victoria library, now a credit union, was built with a grant from the Andrew Carnegie Foundation. This indirectly caused much public debate. Some felt that an architect's fee should be avoided by using existing plans from other Carnegie libraries. Others, among them architect Francis Rattenbury, proposed a unique structure, one designed to enhance and fit the surrounding townscape. Eventually the matter was settled in favour of an original design. The result is this somewhat Romanesque building featuring a classical portico over the entrance and heavy stonework. Additions made to the back of the building are unfortunately not in a matching style.

Building Stone

The exterior is composed of alternating bands of rusticated and ashlar-finished Saturna Island sandstone resting on a granite base. Much of the ornamental carving has been preserved on the main entrance and around the sides of the building.

Weathering

The Library has a general grey-green-yellow colour that varies considerably in different blocks. The surface is quite hard and shows few signs of disintegration, but exposed parts have darkened with the accumulation of dirt. The building has a good general appearance and proves the adaptability of Saturna Island stone to fine carving. Eight-foot pillars cut from single blocks flank the portico.



After much controversy, a Romanesque design was chosen for the Carnegie Library.

Metropolitan United Church (1891)

1411 Quadra Street



The colour of the Koksilah sandstone used in the Metropolitan United Church has darkened unevenly over time.

History

In the 1880s the population of Victoria was expanding rapidly. The Presbyterian community soon found that existing facilities could not accommodate its rapidly increasing congregation. Thomas Hooper was given the task of designing a church that would emphasize the Nonconformist standing of the Methodist Church, one that would symbolize its distinct differences from the Church of England and the Church of Rome in both ritual and theology. The result was a unique and distinctive building that nonetheless fit parishioners' expectations and was therefore acceptable to those more accustomed to traditional forms.

Building Stone

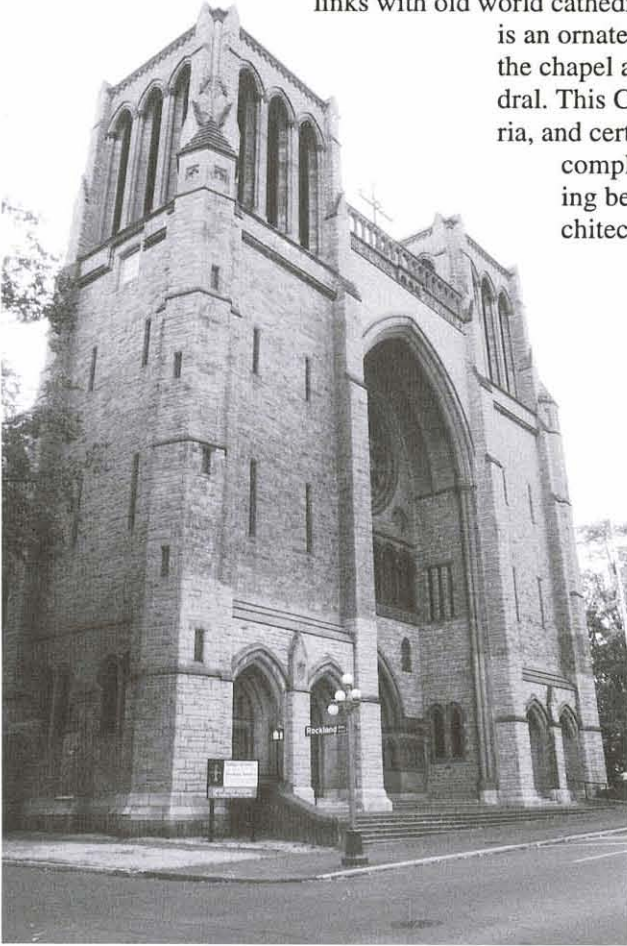
The original building made use of Koksilah sandstone. Imported granite pillars, similar to those seen on the Temple Building, flank the main entrance-ways.

Weathering

The Koksilah sandstone has much to recommend it, including an attractive colour, fine grain and excellent wearing properties. Portions of the stone have darkened unevenly over the years, but this has served to enhance its warm appearance.

History

The first church of the Diocese of British Columbia was built on the site of the current Law Courts but was destroyed by fire near the end of the 19th Century. Although J.C.M. Keith's design for this 13th Century style structure was chosen in 1891, construction did not begin until 1926 due to a series of economic crises, debate over the original design and the sheer ambitiousness of the project. There are several links with old world cathedrals. The choir screen is from Westminster Abbey; there is an ornate chair from St. Paul's Cathedral; and the corner stone near the chapel altar rests on 12th Century stones from Canterbury Cathedral. This Cathedral is one of the most handsome churches in Victoria, and certainly the most impressive. Although Keith never saw its completion, the design brought him worldwide acclaim, including being elected a fellow of the Royal Institute of British Architects, "the highest honour in the gift of the society."



Christ Church Cathedral was constructed using Newcastle Island sandstone. It is currently one of the largest cathedrals in Canada.

Building Stone

The main structure is reinforced concrete faced with rusticated Newcastle Island sandstone resting on a coastal granite base. In the nave, five pairs of free-standing, steel-reinforced sandstone pillars rise towards the ceiling, the baptistery is floored with Texada Island marble and the main entrance-ways are paved with slate tiles. The addition at the back of the cathedral is not actually stone but a finish similar to that seen on the corners of the Old Post Office. Black and white sand particles appear to have been sprayed onto a fiberglass base, producing a very even and uniform surface.

Weathering

The Newcastle Island sandstone in this structure has weathered rather poorly, which is unexpected in a sandstone so thoroughly cemented, especially as the stone has an excellent performance record elsewhere in the city. Exfoliation and a large degree of darkening due to the accumulation of dirt are obvious on many of the blocks and disintegration of some blocks can be seen.

Yorkshire Trust (1912)

737 Fort Street

History

Architect A.A. Cox designed the Yorkshire Trust Building in an Edwardian Classical style similar to the Old Royal Bank on Government Street. This style is repeated in many of the banks and commercial buildings of the downtown core.

Building Stone

This building utilizes Haddington Island andesite for the main part of the structure with a base of coarse-cut coastal granite. The neighbouring building, the Money Exchange, is faced with imported marble.

Royal Bank (ca. 1960s)

Corner of Douglas and Fort streets



The facing of the Royal Bank is made of precast concrete blocks with a Beaverdell granite aggregate.

Building Stone

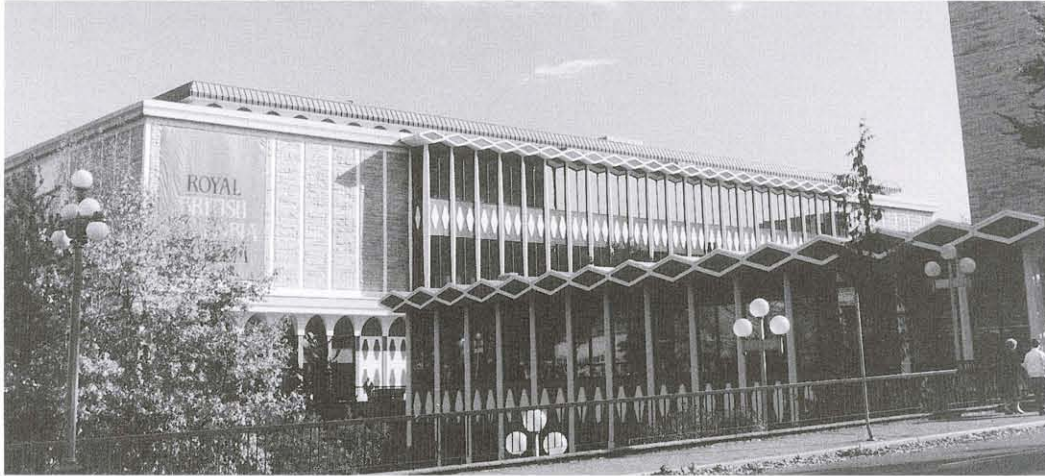
The exterior is of precast concrete blocks with a Beaverdell granite aggregate that has been given a flat, polished surface. The granite is coarse-grained with many phenocrysts of pink orthoclase feldspar.

Weathering

This building material survives the effects of the elements well. Its coarse surface is prone to damage by wind and water but the resulting increased differentiation between the granite and the cement has created a speckled appearance that is quite pleasing.

Royal British Columbia Museum (1968)

675 Belleville Street



The upper courses above the granite base of the Royal British Columbia Museum are finished in ashlar Haddington Island andesite, a finish that was popular at the time of its construction in the 1960s.

History

In 1886 a group of citizens, concerned about the removal of artifacts from British Columbia to museums and private collections in the east, petitioned the Lieutenant Governor to create a provincial museum. The British Columbia Museum of Natural History and Anthropology was subsequently approved and until 1968 it occupied what space was available in and around the Legislative Buildings. To celebrate the 1967 centennial of the Confederation of Canada, the provincial government decided to build a new museum complex. Original cost estimates were about \$5 million but the new complex, called Heritage Court, cost \$10 million and was not completed until 1968. The complex contains more than 100 000 square feet of exhibit space, a carillon tower, an archives building and a curatorial tower. The name of the museum was changed in 1968 to British Columbia Provincial Museum, and in 1987, when Queen Elizabeth bestowed "Royal" status upon the institution, it became the Royal British Columbia Museum.

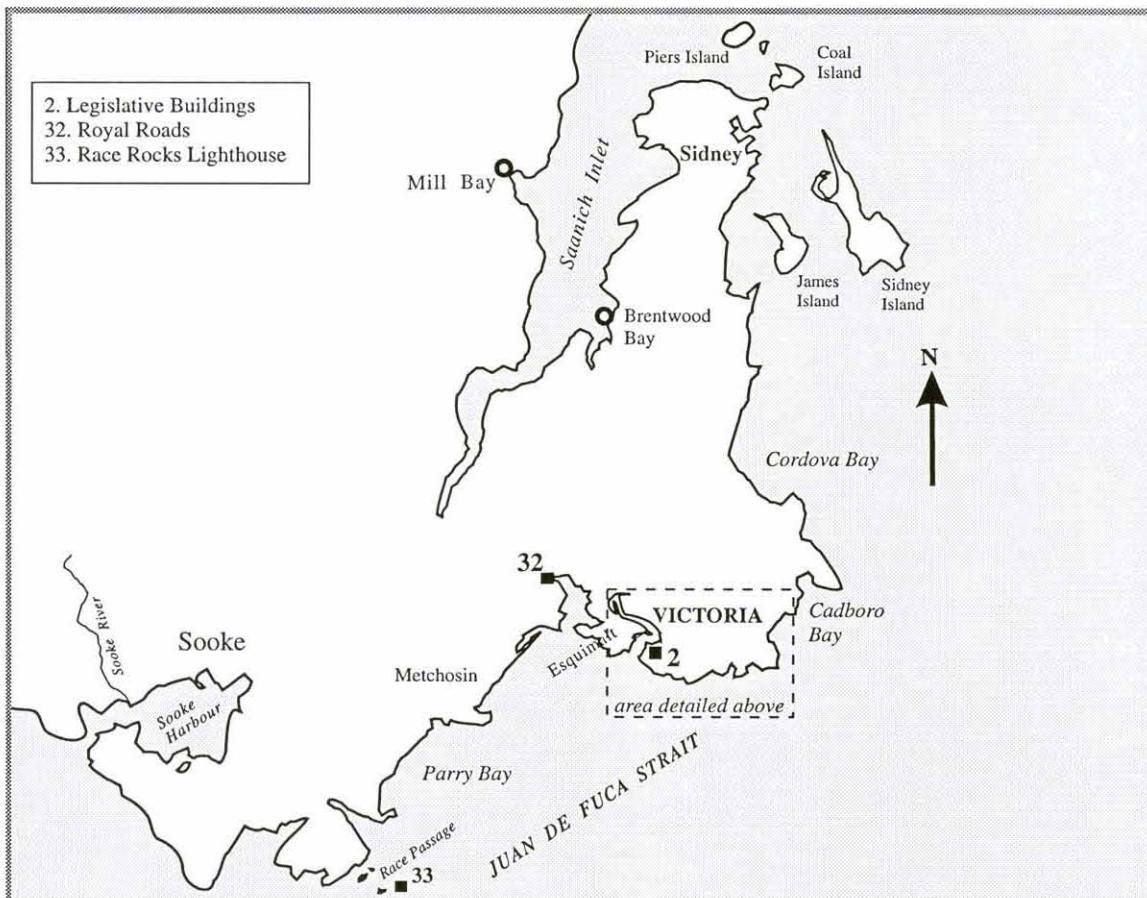
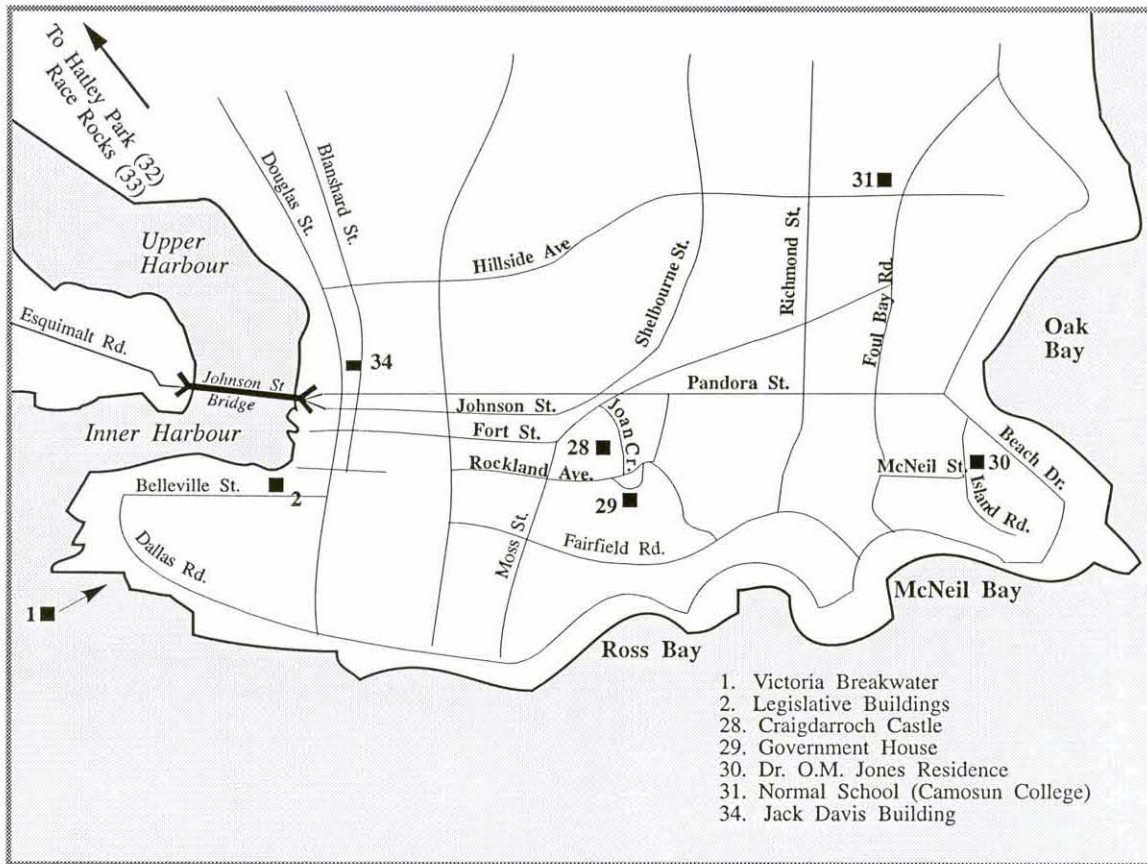
Building Stone

The buildings within Heritage Court are made predominantly of Haddington Island andesite with an ashlar finish. The base of the museum is granite from Nelson Island. Around the outside of the building are one-inch slabs of an imported green and black siliceous marble constructed in pillar form. The outer walls of the museum courtyard are a pale pink granite from the Okanagan Sunset quarry. The tall curatorial tower, or Fannin Collections building, is also constructed with Haddington Island andesite complemented by white marble pillars on the main floor.

Weathering

The pink granite around the outer walls shows rusty stains resulting from the weathering of black biotite mica flakes in the stone.

Building Stone - Greater Victoria Area



Craigdarroch Castle (1885)

1050 Joan Crescent

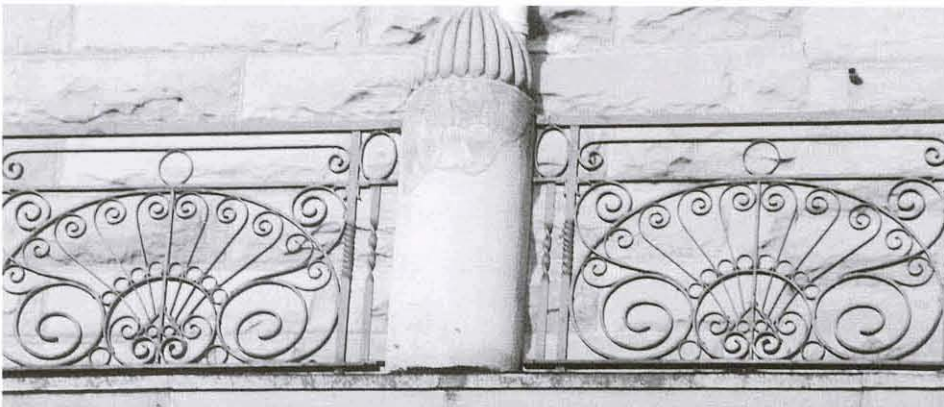


The effects of weathering on the Koksilah stone used for Craigdarroch Castle are similar to those seen on the Metropolitan United Church, which was also built with this sandstone.

History

Craigdarroch Castle was the fairy tale creation of Robert Dunsmuir, a coal baron thought to have been the richest man in British Columbia at the end of the 19th Century. Dunsmuir had an architectural team from Portland design the castle along Scottish baronial lines. The project seems to have been dogged by misfortune; Robert Dunsmuir died before the castle was completed and his family seems to have subsequently lost their enthusiasm for the project. As well, the architect assigned to the project, Warren Heywood Williams, died less than four months after construction began. The running of the practice was left to Arthur Smith, who had only recently been promoted from draftsman to architect. These events doubtless contributed to the somewhat haphazard manner in which the castle was finished. Interior decoration and landscaping were hastily completed and structural oddities, such as a dining room door that opens onto a four foot drop, still remain. The castle was finally ready after four years of construction. Following the death of Dunsmuir's widow, Joan, in 1908, the castle's 27 acres were subdivided into 144 building lots and sold.

Wrought iron railing with Koksilah sandstone from the front wall of Craigdarroch Castle.



Over the years Craigdarroch has served as a convalescent home for soldiers in the First World War and as offices and classrooms for the Victoria College, the Greater Victoria School Board and the Victoria School of Music. With the threat of demolition in 1959, a society for the maintenance and preservation of Craigdarroch Castle was formed. The castle is now a museum and designated heritage site open to the public.

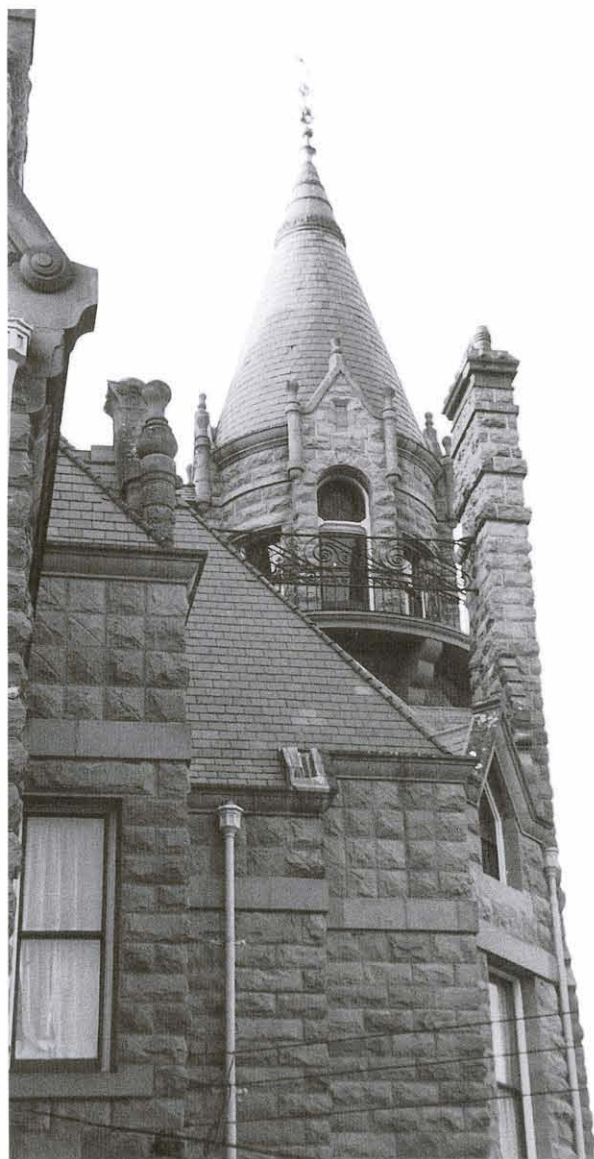
Building Stone

Koksilah sandstone is the major component of the castle materials. It also uses granite from Robert Dunsmuir's own quarries and marble tiles imported from San Francisco; the columns are imported "Scotch" granite similar to that seen on other buildings around Victoria.

Weathering

The weathering properties of the Koksilah stone, as seen in this building, show little variation from the effects seen on the Metropolitan United Church where it was also used. In general the stone has retained its fresh look and appears to be wearing well.

Craigdarroch Castle details – turret, and front porch with columns.



Government House (Cary Castle)

1401 Rockland Avenue

History

Government House is the third building to claim both the name and this site. In 1860 George Cary, the first Attorney General for British Columbia, had F.W. Green design his castellated dream house on 25 acres. When Cary returned to England in 1864, Elizabeth Miles bought and subsequently sold Cary Castle to the colonial government. After several alterations it was designated as the official residence of the Governor of British Columbia. During the Queen's birthday ball in 1870, a chandelier fell and started a fire. Two years later the coach house burned. Finally, on May 18, 1899, fire razed the building, and all that survived were the ballroom and the conservatory.

Architects Maclure and Rattenbury designed a new Government House, which was completed in 1903. As time progressed, fire hazards multiplied until on April 15, 1957, fire destroyed Government House once again. The present building, which the Ministry of Public Works designed and furnished at a cost of \$1.6 million, incorporates just one part of the former structure – the porte cochere that Lt. Governor James

Dunsmuir added in 1907.



The porte cochere, built in 1907, is the only portion of the original structure remaining.

Building Stone

The original porte cochere is made of a beige sandstone of unknown origin with a coastal granite base. The building uses several types of local stone, namely Haddington Island andesite for the main body of the house and slate from Jervis Inlet for the terraces and balconies.

Dr. O.M. Jones Residence (1909)

599 Island Road

History

Dr. Jones was a respected doctor who arrived in Victoria in 1891. He hired the famous architect Francis Rattenbury to build a solid stone-walled house on 38 acres of choice land in Oak Bay. Due to subsequent subdivision it now stands on only 4.5 acres beside Anderson Park. Many residences in Victoria contain some element of stone construction, usually stone that has been quarried on site. A brief walk around the older residential areas of Oak Bay and Fairfield will provide numerous examples of stone used in lintels, steps and foundations.

Building Stone

This house uses granite obtained on the site and is roofed with slate from Jervis Inlet.

Normal School – now Camosun College (1911)

1950 Lansdowne at Richmond



Denman Island sandstone was used to construct the Victoria Normal School, which is now part of the Lansdowne Campus of Camosun College.

History

This building was constructed in the late Renaissance Italianate Revival style at a cost of about 300,000 dollars and is the product of Victoria's efforts to obtain an institution for teacher training away from Vancouver. It was originally used as the Victoria Normal School with a layout of nine lecture rooms, two laboratories and a music room. During World War II the building was used as a military hospital. In 1956 the school became part of Victoria College, and in 1961 granted its first degrees in conjunction with The University of British Columbia.

Building Stone

The main block was constructed with Denman Island sandstone with a roof of imported Welsh slate.

Weathering

The Denman Island sandstone in this building provides several examples of weathering that has resulted in decay. The edges and corners of some blocks have been rounded and broken, and considerable deterioration has also occurred on the large blocks of sandstone that are the main components of the structure. Many of the blocks were used with their bedding planes vertical, which exposed them to the weather and caused exfoliation to occur.

"The Normal School in Victoria ... may be regarded as indicative of the appearance of the stone shortly after being laid in the wall.... The grain of the stone is fine, but occasional streaks of coarser grain are to be seen.... Pyritic staining is not common, but much efflorescence was observed; it is impossible to state whether this is due to the stone itself or the mortar. Much of the stone is in heavy coursing two feet thick, and some rather intricate carvings indicate that the stone is capable of fine chiseling." (Parks, 1917)

Weathering of the Denman Island sandstone can be easily seen on the coping of this window.



This detail shows the British Columbia coat of arms as well as the weathering of the stone used to carve it.



History

Former Premier and Lieutenant Governor James Dunsmuir, son of Robert Dunsmuir, commissioned architect Samuel Maclure to create a fabulous home above Esquimalt Lagoon. The resulting Hatley Park was modeled after Compton Wynyates, one of the great country estates of Tudor England.

Master mason William Heatherbelle hired sixty craftsmen to build the massive forty-room structure at a cost of \$4 million; the original estimate was for \$350 000. These rooms consisted of a billiard room, ballroom, 22 bedrooms and 9 bathrooms. Outside there were facilities for shooting, golfing and yachting. Approximately one hundred gardeners formed a small Chinese community on the estate.

James died in 1920, and his wife in 1927; three years later the estate was sold to the Canadian government for \$75 000, which is just about equal to the original cost of the perimeter stone wall. It became Tri Services College from 1948 until 1968, when its name was changed to Royal Roads Military College. Today the gardens and grounds are open to the public.

Building Stone

Royal Roads was built with Koksilah, Saturna Island and Valdes Island sandstones as well as a locally quarried grey and pink granite that contains large and numerous flakes of black and white mica.



Royal Roads was built with various sandstones and with granite that was most likely quarried on site.

Race Rocks Lighthouse (1860)

*On Race Rocks off William Head
(accessible only by boat)*

History

Race Rocks lighthouse was built before British Columbia entered Confederation. A grant was received from the Imperial Government for \$35 000 to build both the Fisgard and Race Rocks lighthouses. Race Rocks began service on December 26, 1860, and is named after the tides that race around the treacherous reef at the base of the rocks. Race Rocks is home to several varieties of marine mammals, especially sea lions and seals, and today is a marine ecological reserve and a lighthouse museum.

Building Stone

The majority of the tower was built with Scottish granite shipped as a ballast rock around Cape Horn; upper levels were finished with less durable local sandstone.



Race Rocks Lighthouse was built with stone shipped around Cape Horn as ballast in sailing ships of the mid-1800s.

Jack Davis Building (1993)

1810 Blanshard Street
corner of Herald Street

History

The Jack Davis Building was built to house the B.C. Ministry of Energy, Mines and Petroleum Resources. When the Ministry took possession of the building, in July of 1993, it was the first time the entire organization had been housed under one roof since the 1800s.

It was designed by the architectural firm of Kasian Kennedy of Vancouver and built by Sandbar Construction Ltd. of Saanichton. The original building plans proposed a single type of B.C. granite, specifically *Pacific Rose* granite from a quarry site near Summerland. The granite acquired from that site was cut from large boulders, which had broken away from the main granite outcrop, and permanent quarry facilities were not established. However, the stone proved so attractive that the final truckload of finished panels was stolen and replacement material had to be found quickly in order to finish construction. It was decided to finish the remaining wall sections with a darker, *Grenville* pink granite from Quebec.



The Jack Davis Building displays two types of granite: one for the wall facings, and a second as floor tiles.

Building Stone

The ground floor exterior walls and the entrance hall are clad with two varieties of pink granite: a lighter variety of stone, pink and white, coarse-grained was used as a floor tile, and on the upper walls above the building entrance is the beautiful B.C. granite from the Okanagan area called *Pacific Rose*. The darker type of granite used on the ground level walls and columns is the variety of Quebec granite called *Grenville*.

The Jack Davis Building is the home of the British Columbia Ministry of Energy, Mines and Petroleum Resources. The ground floor contains a library and information centre which has mineral and information displays related to Ministry activities and the province's natural resources.



Pacific Rose granite from the Okanagan area has been installed as floor tile in the foyer of the building.

GLOSSARY OF TERMS

<i>Andesite</i>	A dark-coloured, fine-grained volcanic rock that often contains visible crystals of plagioclase feldspar.
<i>Ashlar</i>	1. Stone with a rectangular or square face. 2. Masonry, consisting of blocks of stone, finely squared and laid in courses exceeding a height of 30 centimetres.
<i>Batholith</i>	Any large intrusive mass of igneous rock (almost always granite, in its broadest sense) that has no observable base.
<i>Bleeding</i>	Staining action on stone caused by oxidized (rusting) rock components, metals, oil-based putties, caulking or sealing compounds.
<i>Bedding</i>	The arrangement of sedimentary rock into layers of varying thickness and character.
<i>Bossaged</i>	The description of a dimension stone block that has been roughly split so that the central part of the block is higher than the edges.
<i>Bushhammered</i>	A dimension stone block in which the surface has been broken into a regular series of contiguous hollows 1-3 millimetres deep. The ridges between the hollows have a rough split texture.
<i>Calcite</i> (CaCO_3)	A common mineral in sediments and altered basic igneous rocks; occurs frequently in veins. It is also the primary mineral in limestone and marble.
<i>Cementation</i>	The process by which the individual particles of a sedimentary rock are held together by a secondary material. This may be a substance introduced by groundwater percolating through the pores of the rock, or it may be derived from dissolving part of the mineral matter of the rock followed by redeposition as a cement or matrix.
<i>Coarse-grained</i>	Describes rock in which the individual grains or crystals are greater than 5 millimetres in size.
<i>Compaction</i>	The diagenetic process which involves the close-packing of the individual grains of a sediment mainly by the elimination of pore spaces and the expulsion of entrapped water; this is normally brought about by the weight of the overlying sediments.
<i>Coping</i>	A flat stone used as a cap on freestanding walls.
<i>Cornice</i>	A projection that crowns a wall, a horizontal division of a wall, or an architectural feature.
<i>Course</i>	Horizontal range of stone units along the length of a wall.
<i>Crenelated</i>	A sawn facing in which there are regular grooves 1-1.5 millimetres deep, spaced about 5 millimetres apart.
<i>Crystalline</i>	The texture of a rock exhibited as closely fitting or interlocking crystals that grew in igneous rock as it cooled. Example: granite.
<i>Denteled</i>	Describes a surface made up of grooves 1-4 millimetres deep between which the rough split texture remains.
<i>Dimension Stone</i>	A natural rock that has been quarried and shaped to meet specific requirements for use in the construction and monument industries.

<i>Efflorescence</i>	Whitish powder, sometimes found on the surface of stones and masonry, caused by the deposition of soluble salts.
<i>Face</i>	Refers to the exposed surface of stone on a building or structure, or may refer to the active working area in a quarry.
<i>Feldspars</i>	The most important group of rock forming silicate minerals with the general formula $MAI(Al,Si)_3O_8$. Four chemically distinct groups exist: potassium feldspars; sodium feldspars; calcium feldspars; barium feldspars. Barium feldspars are exceedingly rare.
<i>Fine-grained</i>	Describes rock in which the individual grains or crystals are less than 1 millimetre in size.
<i>Flagstone</i>	A dimension stone that can be split into thin slabs.
<i>Flamed</i>	A high-temperature jet of flame is passed over the cut surface of coarse-grained dimension stone blocks or sheets to split off the surface grains and give the stone a rough appearance.
<i>Formation</i>	A body of metamorphic or sedimentary rock having an easily recognizable upper and lower boundary that can be traced in the field. It must be regionally extensive and geologically significant.
<i>Gabbro</i>	A dark plutonic rock, commercially called a "black granite."
<i>Grain</i>	The orientation of particles or crystals that make up a rock or sediment. Also a direction of splitting in rock.
<i>Granite</i>	A visibly granular, igneous rock generally ranging in colour from pink to light or dark grey and consisting mainly of quartz and feldspar, accompanied by one or more dark minerals. The texture is typically homogeneous.
<i>Honed</i>	Describes the texture that results in dimension stone when a randomly oriented cut is made.
<i>Igneous rock</i>	A rock that has solidified from molten magma. Igneous rocks constitute one of the three main classes into which all rocks are divided (<i>i.e.</i> , igneous, metamorphic, sedimentary).
<i>Iridescence</i>	The exhibition of prismatic colours (producing rainbow effects) in the interior or on the surface of a mineral, caused by interference of light with thin films or layers of different refractive index.
<i>Jade</i>	A hard, extremely tough, compact semiprecious stone consisting of either the pyroxene mineral jadeite or the amphibole mineral nephrite and having an unevenly distributed colour ranging from dark or deep green to dull or greenish white. It takes a high polish and is used for jewelry, carved articles, ornaments and as tiles.
<i>Joint</i>	A fracture surface in a rock. A joint surface is usually planar. Typically, the density of parallel joints controls size of the dimension stone blocks that are recoverable in a quarry.
<i>Knot</i>	Small cluster of darker minerals in granite or other intrusive rock.
<i>Limestone</i>	A sedimentary rock consisting of more than 50% calcium carbonate.
<i>Lintel</i>	A horizontal piece across the top of an opening (as of a door) that carries the weight of the structure above it.
<i>Marble</i>	A metamorphic rock consisting predominantly of fine to coarse-grained recrystallized calcite and/or dolomite and capable of taking a polish.

<i>Medium-grained</i>	A rock in which the individual grains or crystals are between 1 and 5 millimetres in size.
<i>Metamorphic rock</i>	Rocks derived from pre-existing rocks by mineralogical or chemical changes in response to changes in temperature, pressure, stress or chemical environment.
<i>Mica</i>	A prominent rock-forming constituent of many igneous and metamorphic rocks. Mica normally occurs as flakes and varies from colourless to silvery white, pale brown, or yellow to green or black.
<i>Mullion</i>	Vertical masonry detail subdividing a window.
<i>Plutonic</i>	An igneous rock which has cooled and solidified below the earth's surface.
<i>Polished</i>	Describes a dimension stone in which a single polished surface is prepared so that it reflects light.
<i>Pyrite staining</i>	Occurs when the sulphide mineral pyrite (FeS ₂) rusts due to exposure to humidity and oxygen. This results in unpleasant reddish brown stains on the surface of the stone.
<i>Quarry</i>	A surface mine or open-air workings; usually for dimension stone or aggregate material.
<i>Quartzite</i>	A very hard metamorphic rock consisting chiefly of quartz grains that have been completely cemented together.
<i>Rhodonite</i>	A pale rose-red to red-brown silicate of manganese. It is often marked by black streaks and veins of manganese oxide. Used as an ornamental stone.
<i>Rock faced</i>	Describes dimension stone that is finished so as to resemble a natural rock face.
<i>Siliceous</i>	Used to describe rocks containing a large proportion of extremely fine-grained silica.
<i>Sandstone</i>	A sedimentary rock composed of rounded to angular sand-sized particles that are more or less united by a cementing material such as calcium carbonate. The particles usually consist of quartz or feldspar.
<i>Scabbed texture</i>	A flat facing made of parallel streaks 3 to 7 millimetres deep, 5 to 20 millimetres apart, generally straight, separated by small fractures where rock has split off.
<i>Sedimentary rock</i>	A rock resulting from the consolidation of mineral or rock materials that accumulated in layers, or by precipitation from solution, or by organic means such as accumulation of plant and animal debris.
<i>Sill</i>	In construction this is a horizontal unit of stone used at the base of an exterior opening in a structure.
<i>Slate</i>	A compact, fine-grained metamorphic rock that possesses <i>slaty cleavage</i> and hence can be split into slabs and thin plates. Most slate is formed from shale.
<i>Subflorescence</i>	Precipitation of soluble salts when evaporation takes place below the surface of the stone. This results in a net volume increase which can cause the stone to fracture or peel.
<i>Syenite</i>	An igneous rock composed principally of feldspar and which, with an increase in quartz content, grades into granite.

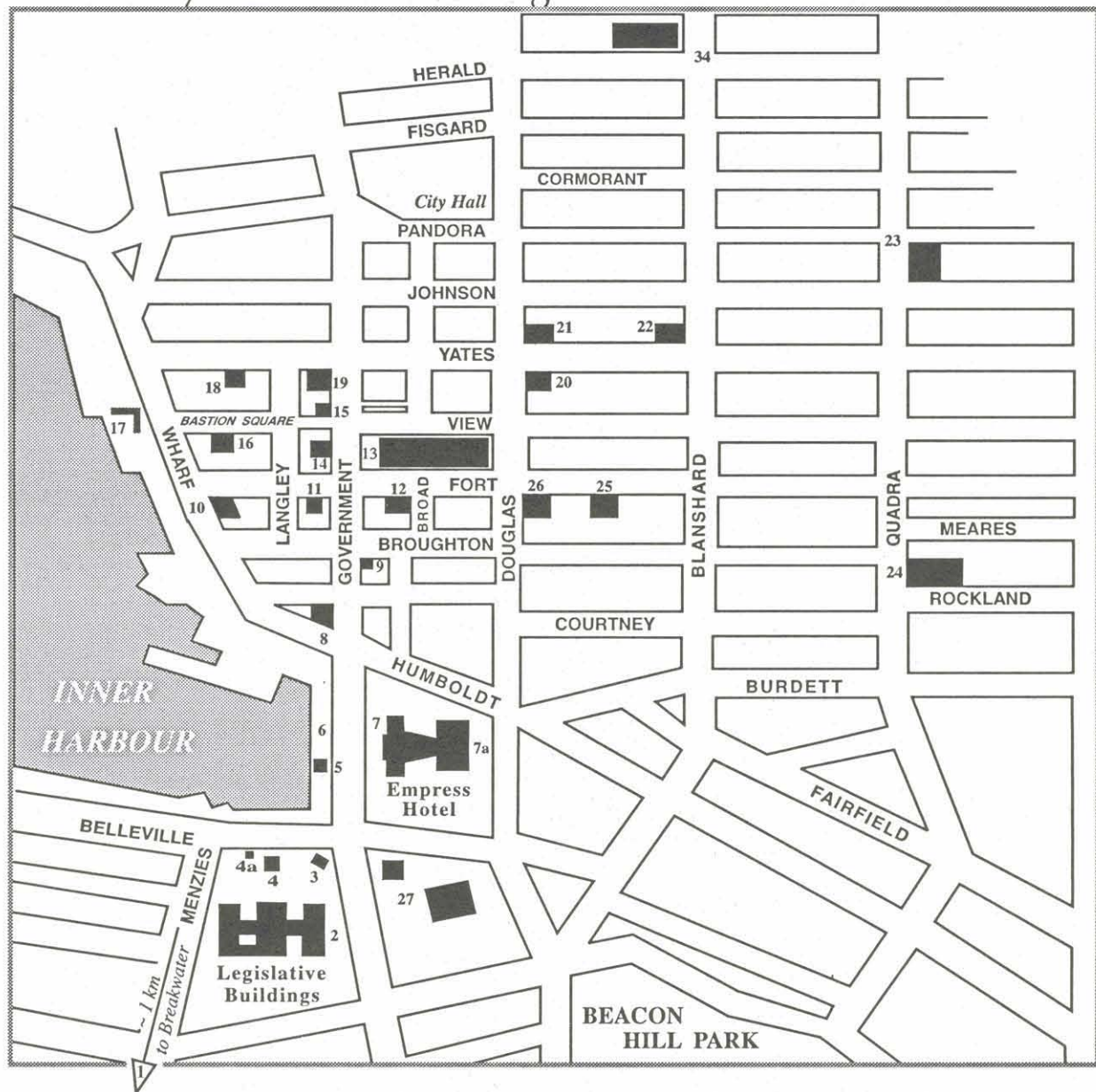
<i>Tooled</i>	Describes dimension stone in which the surface has been worked to incorporate fine parallel streaks 12 millimetres deep, between which the ridges have a rough split texture.
<i>Verde Antique marble</i>	A commercial term for rock composed chiefly of serpentine that is capable of taking a high polish. Commercially it is considered a marble.

SELECTED BIBLIOGRAPHY

- British Columbia Heritage Conservation Branch (1979): Heritage-BCBC.
- Carr, G.F. (1955): The Granite Industry of Canada; Department of Mines and Technical Surveys, Industrial Minerals Division, No. 846.
- Castle, G. and King, B. (1985): Victoria Landmarks; published by the authors.
- Castle, G. and King, B. (1988): More Victoria Landmarks; Sono Nis Press.
- City of Victoria Heritage Advisory Committee (1975): City of Victoria Heritage Conservation Report.
- Corley-Smith, P. (1992): The Ring of Time, the Story of the British Columbia Provincial Museum; British Columbia Provincial Museum, Special Publication No. 8.
- Heritage Advisory Committee (1974): Wharf Street City of Victoria Heritage Designation Report; Department of Community Development.
- Kemp, K.M. (1992): Walking Tours of Building Stones for Introductory Geology Courses; Journal of Geological Education, Volume 40, pages 188-193.
- Manitoba Energy and Mines (n.d.): Manitoba Stone; Agricola Mineralia.
- Mills, G.E. (1976): Architectural Trends in Victoria, British Columbia 1800-1914; Parks Canada, Volumes 1 and 2.
- Parks, W.A. (1917): Report on the Building and Ornamental Stones of Canada; Canadian Department of Mines, Volume 5, Report No. 452.
- Power, W.R. (1983): Construction Materials. Dimension and Cut Stone; in Industrial Minerals and Rocks; Lefond, S.J., Editor; American Institute of Mining and Metallurgical and Petroleum Engineers, 5th edition.
- Reksten, T. (1987): Craigdarroch, The Story of Dunsmuir Castle; Orca Book Publishers.
- Segger, M. and Franklin, D. (1979): The British Columbia Parliament Buildings; Arcon Publishers.
- Segger, M. and Franklin, D. (1979): Victoria, A History in Architecture 1843-1929; American Life Foundation.
- Shadmon, A. (1989): Stone, An Introduction; Bootstrap Press.
- Stark, S. (1986): Oak Bay's Heritage Buildings, More Than Just Bricks and Boards; B.C. Heritage Trust.
- White, G.V. (1985): Dimension Stone Quarries in British Columbia; B.C. Ministry of Energy, Mines and Petroleum Resources.
- White, G.V. and Hora, Z.D. (1988): British Columbia Dimension Stone; British Columbia Ministry of Energy, Mines and Petroleum Resources.

DIMENSION STONE IN VICTORIA

A City Guide & Walking Tour



- | | | |
|-----------------------------------|------------------------------|--------------------------------|
| 1. Victoria Breakwater | 9. Weiler Building | 19. Federal Building |
| 2. Legislative Buildings | 10. Piher & Leiser Warehouse | 20. Bank of Montreal |
| 3. War Memorial | 11. Temple Building | 21. Bank of Nova Scotia |
| 4. Statue of Queen Victoria | 12. Yarrow Building | 22. Carnegie Library |
| 4a. Sir James Douglas Monument | 13. Eaton Centre | 23. Metropolitan United Church |
| 5. Statue of Captain Cook | 14. Old Royal Bank | 24. Christ Church Cathedral |
| 6. Seawall | 15. Old Bank of Montreal | 25. Yorkshire Trust |
| 7. Empress Hotel | 16. Board of Trade | 26. Royal Bank |
| 7a. Victoria Conference Centre | 17. Fieldstone Wall | 27. Provincial Museum |
| 8. Customs & Immigration Building | 18. Bastion Arcade | 34. Jack Davis Building |



**British
Columbia**



Canada

