

WALK BACK ALONG HAY STREET TO CATHEDRAL AVENUE. TURN RIGHT AND WALK DOWN TO THE CATHEDRAL. NOTE THE IMPOSING BUILDINGS ON THE RIGHT. THESE ARE THE OLD CENTRAL GOVERNMENT OFFICES.

15. St Georges Cathedral.

The present cathedral was started in 1879 and contains many materials of geological interest. The footings are Tamala limestone.

Built of locally made brick, the clay used was from what is now Queens Gardens.

The roof is Welsh slate. This was replaced with new slates in 2007. The columns supporting the roof in the Cathedral are made from 'bluestone.'

This is a basalt quarried in Victoria and used extensively for buildings in Melbourne during the late 19th century.

The font made from Donnybrook sandstone in 1930, is another example of how well it can be carved.

The window and door framings are from rock quarried on Rottnest Island.

The pulpit was carved in England from Caen Stone.

This is a Jurassic limestone quarried in Northern France. It has been widely used in France and England in church buildings, such as Canterbury Cathedral and the Norman parts of the Tower of London.

The main Altar is white sandstone with marble panels. The Soldiers Chapel on the north side of the Altar is built from brick and Donnybrook Sandstone.

LEAVE THE CATHEDRAL BY THE MAIN ENTRANCE AND WALK TO ST GEORGES TERRACE, CROSS OVER TO: 16. Stirling Gardens.

These are bounded by walls of Toodyay Stone.



This is a quartzite, a metamorphic rock composed of silica. This variety is easily cleaved along a planar structure. The green colour on the exposed surfaces is not algae. It is a mineral called fuchsite.

17. 41- 43 St Georges Terrace (Suncorp Bank)

The exterior facing to the upper and lower floors is a Marble.

This is a medium grained Italian marble. Panels of a white marble are used for detailing and show evidence of sedimentary deposition.



18. 45 St Georges Terrace.

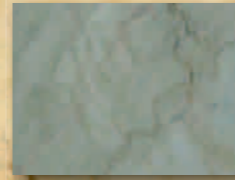
This building has two interesting stones, one interior and the other, exterior.



The interior floor and exterior steps are York Stone granite. But the walls are a coarse grained marble from Wombeyan in NSW, some 40km south west of Sydney.

19. Allendale Square.

Note the 'Black Granite' structures outside. Inside, the ground floor and wall facings are West Australian Marble from the Pilbara region 1200km north of Perth, approximately the same latitude as Exmouth.



This Pilbara stone is known as Nanutarra marble, which is dolomitic in nature, (a limestone rich in Magnesium) and shows many characteristics of limestone structures.

20. Trinity Church.

The use of granite footings under a brick structure is clearly visible. In this case, it is quite a grand scale.

This Church was designed by HS Trigg and built in 1893. The facade is a particularly decorative design referred to 'American Romanesque'. Another of his designs can be seen in Barrack Street adjacent to McNess Royal Arcade.

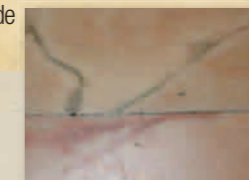
WALK UP THE SLOPE ALONGSIDE THE CHURCH, AND CHURCH HALL THROUGH THE TRINITY ARCADE BACK TO HAY STREET. TURN LEFT, CROSS OVER AND WALK THROUGH THE PICCADILLY ARCADE.



21. Piccadilly Arcade.

Originally built in 1938, Piccadilly Arcade was refurbished during 1984.

The floor and lower shop fronts are made from a pink and grey marble imported from Portugal.



A 'Walk-Through-Guided Tour' outlining the diversity rocks, stones and masonry materials used in many of our heritage locations.

This trail is not intended as a comprehensive review of the urban geology of the City of Perth in its widest sense. Whilst concentrating on the use of locally occurring rock used in the construction and decoration of the inner City, this guide also includes reference to the use of some geologically interesting stone.

Geologists refer to three families of rock.

1. Igneous rocks were formed through the cooling of molten rock that exists below the surface of the Earth. Rock which cooled slowly shows large crystals of minerals as seen in granite; quickly cooled rocks, such as lava flows on land, show limited crystal development - basalt, for example.



2. Sedimentary rocks are the product of erosion and weathering of all other kinds of rock, which are then transported to where they settle and undergo lithification to become rock once more. Common examples are sandstones and limestones.



3. Metamorphic rocks are formed when rocks deeply buried in the Earth's crust are subjected to high temperatures and / or pressures. They undergo a change in physical form. Often, new types of mineral are developed in the process. Common examples are slate and marble.



When considering the geology of buildings, there are two main uses of rock: construction and decoration. All rock used in a building, for whichever purpose, is referred to as dimension stone.

FORREST PLACE

1. Commonwealth Bank and General Post Office Buildings.

Built in the early 1920s, these two buildings are constructed of two different rock types. The ground floor is constructed from Mahogany Creek granite and the upper is Donnybrook sandstone.



Mahogany Creek quarry was situated just off the Great Eastern highway 30 km east of Perth 2km from the town. It was abandoned in the 1930s. The granite is very even grained. The overall impression is a white to grey colour with black spots. It shows no sign of weathering.

Donnybrook stone quarry is situated 180 km south of Perth about 4 km south of the town. There are still five quarries operating in the Donnybrook area. The stone ranges from very fine grained white to a coarser grained mid-brown coloured rock.

2. The Plinths in Forrest Place.

These are mostly composed of a range of granites, predominantly York Granite (see 8 below).



3. The Water Feature, Forrest Place.

The sphere of rock rotating on its plinth is made of an orbicular granite from Boogardie near Mount Magnet on the Meekathara Road. The Boogardie

orbicular granite is nearly 2700 million years old and has spherical structures crystallized from magma.

4. The lift shafts on the east side.

These have a thin facing of Donnybrook sandstone.

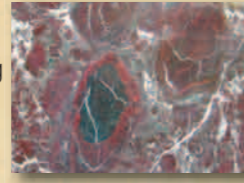


The grain and bands of darker material are clearly visible. The principal cements are from clay minerals. The bands were produced when the rock was saturated with water and the darker minerals leached in.

WALK ALONG MURRAY STREET PAST MYERS

5. City Central.

Whilst not strictly heritage, this building has interesting facing stones. The dominant stone is maroon coloured.

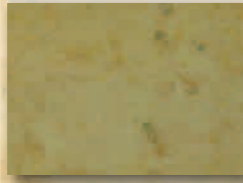


This is probably a pillow lava breccia (a rock composed of broken fragments). This is an obducted (raised up) section of sea floor where the pillow lavas have been broken up in the process. Other stones are pale granite and migmatite.

6. David Jones Store.

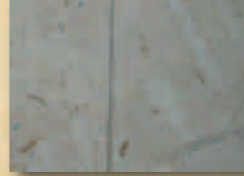
The store is faced with a limestone showing stylolites.

These are structures where a contact is marked by an irregular line resembling a suture. They are believed to have been made by movement under pressure at the time the rock was forming. They are nearly always associated with carbonate rocks.



7. Chilliz (Donegal Building).

This shop has a limestone facing. A number of fossils, mainly shell fragments, can be seen.



8. HBF Building.

The building is faced with 'York Granite.' The interior is also lined and paved with York Granite.



This was quarried at the **Gwambygine quarry** which is 9km south-east of York on the Great Southern highway. Operations ceased in 1996. It is a grey background interspersed with pale pink potassium feldspar crystals. Look for the black xenoliths (rock fragments enveloped in the mother rock) scattered throughout.

9. Government Printing Office.

This is the first of several buildings built of brick. Many of the 19th and 20th century buildings that remain, were built similarly. The bricks used in the older buildings were made within the City. Built between 1894 and 1922, the original building was completed in 1894, with a third floor added in 1907 and a fourth during 1922.

The four storey corner building was constructed of load bearing brick and features projecting corner towers. The ground floor bricks have a roughened surface known as a 'rusticated' finish. The walls are solid brick with no cavity. Curtin University restored and refurbished the building in 2002.



10. Government Stores.

The former Perth Government Stores was built in 1911 from Donnybrook sandstone to the ground floor and brick above

An interesting feature of the sandstone is that the lower courses show the hammer marks where a mason has hand-finished the blocks.



CROSS OVER MURRAY STREET.

11. Number One Fire Station.

This is the first building on the trail that is built from Tamala limestone, the most common stone used in the Perth region.



In geological terms, Tamala limestone is very young. It occurs from Albany in the South to Shark Bay in the North along the coast. Hence its name - the 'coastal limestone.' It is an aeolianalarenite and is made of beach sand rich in carbonate, carried by winds and deposited as dunes which have been lithified (cemented into a rock) by percolating rainwater. It was formed in the interglacial periods 400,000 years ago when the Earth was warm and sea level high. These periods, (the earth is currently in such a period), generally last about 20,000 years. The stone varies in quality, tends to be an open texture and prone to weathering.



12. Young Australia League Entrance.

This entrance is framed by Donnybrook sandstone with two large columns.

The YAL was founded by J.J. Simons in 1905, initially to promote AFL football. Simons was a passionate Australian and devoted his life promoting all things Australian and youth in particular. The foundation stone was laid in 1922 and the building opened in 1924. He founded the field centre at Araluen that later became the Botanical Gardens.

13. Public Health Building, 57 Murray Street.

Built in 1912, this is another example of the use of Donnybrook sandstone facing to produce a beautiful building. The carved swan in the apex of the roof above the main door is an example of how good the stone is for such work.



WALK SOUTH DOWN PIER STREET AND TURN RIGHT INTO HAY STREET TO THE TOWN HALL.

14. Town Hall.

This was one of the major building projects undertaken by the first convicts who arrived in 1850. It is essentially a brick built structure made from locally sourced materials. The materials used for the ground floor are of geological interest.



This is a metamorphosed granite from the east of Western Australia in the Fraser Range called Verde Austral. It has also been used extensively for paving in Martins Place, and the Olympic Games venues in Sydney. It can also be seen on the concourse of Perth Concert Hall. The centre panels are a garnet gneiss called 'Garnet Ice,' which clearly shows the banding



Heritage Perth would like to thank Norman Harrison for devising this trail and writing the text. © Heritage Perth 2011.

