**The Dartmouth Geological Building Trail.**

This walk follows a route through the central part of Dartmouth looking at the geology of building materials and some of the old aspect of the town. The walk starts and finishes at the Information Centre and takes about an hour.

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There are 3 main criteria for choice of building material;

1. Availability
2. Fitness for purpose; strength, appearance , workability, resistance to weather.
3. Cost

**Start**. *From the Information Centre cross the road towards the Flavel Church and The Flavel.*

**Stop 1** On the back wall of the church at the car park end facing The Flavel look carefully at the pointing between the limestone blocks. This is made up from gravel probably dredged up locally from the river Dart. Water rounded quartz stones are visible and also small shells from marine/estuarine shellfish. The building blocks, like many used in the town in the late 19th century, are a pinky-grey limestone probably from quarries at Galmpton Creek, nearby up river. This facilitated transportation. This sedimentary rock was laid down in shallow seas around 340million years ago.

*Continue across the adjacent car park passing in front of the Police station heading towards the George & Dragon Inn and then into Zion Place. Turn sharp right at the end in front of the G&D into Undercliffe, one of the old alleys of Dartmouth. After about 100m you will find yourself at the back of old warehouses. These were on the waterfront until 1876 when the land in front was reclaimed.*

**Stop 2** Look at the stone making up the wall of these warehouses. You can see a mixture, much of it local Dartmouth Group early Devonian rock of various sorts around 360 million years old. To the left of the large boarded up window there is a limestone block encrusted with calcite crystals. There are occasional pieces of red sandstone and granite. People used what was at hand.

*Continue along the alley and turn right at the first opportunity through a gateway just after Little Silver. Pass by old warehouses converted to business units and back to the main road. This road was the old water frontage. Turn left for about 50m to the Gas works unit next to the major road sign.*

**Stop 3.** This Gas works building is made from limestone blocks probably also from Galmpton Creek Quarry. In the blocks below the 2nd and 4th windows coral fossils are visible. These look like squashed feathers or big thumbprints. Crystals of calcite can also be seen on some block faces.

*Cross the road from here, head away from the river and turn left into the car park and head diagonally towards the flagpole in the gardens passing behind the information centre.*

**Stop 4 .** Just before the flag pole there is a marble statue “ Piscatorie”. This is probably imported Italian marble, uniformly fine grained, fairly easy to work, moderately hard and weather resistant, - an expensive stone for a special use. If the sun is shining you will be able to see that the rim of the boy’s hat is translucent so fine is the marble. Marble is a *metamorphic* rock – one that has been subjected to heat and great pressure in this case changing limestone into marble.

2

*Head for the shop “Fat Face “, next door to The Royal Castle Hotel.*

**Stop 5**. Below the shop windows you will see slabs of polished basalt, a hard *igneous* rock ( solidified from molten rock deep in the Earth). This particular type has iridescent purple crystals of Ladbradorite , popular in Victorian times for decorating buildings. It is found in Canada and Scandanavia and is costly to use.

 The shop’s threshold is made from marble, polished by years of passing feet.

 *Proceed round the boat float to Lloyds Bank*.

**Stop 6.**  This building is faced with fine granite. This stone is very strong, hard and difficult to work, attractive but expensive. Granite is also an igneous rock containing several different crystalised minerals . In sunlight you may see small silvery specs of the mineral mica in the newly replaced sections near the right window. The slower the molten rock cools the larger are the crystals.

*Continue towards the river and from the Station Restaurant and look back towards the Royal Castle Hotel.*

**Stop 7.** The majority of the buildings facing the Boatfloat are actually timber framed and rendered; often the end walls between buildings were made from poor local stone. Good quality stone is expensive and the area is far from the brick fields of the East Midlands. Some of the early buildings (pre 1800) have fireplaces built with brick from Holland. The local stone is poor quality but much used for general walling.

*Head along the front past the old Post Office (currently an estate agent) and Hospital, the builders of these two later structures could afford brick. Another 100m brings you to the Dartmouth Yacht Club .*

**Stop 8.** Facing you below the Yacht Club windows are slabs of semi polished limestone (probably from the Torquay area) showing fossilised corals and shells.

*Continue and turn right at the end of the road after 40m turn left passing the ferry ramp and past the* *Dartmouth Arms. After another few steps you will see what appears to be a monument just before the* *cobbled roadway.* This is one of the town conduits where people would draw water before water was piped to homes. It is made from Portland stone structure, this is a high quality limestone used in many London buildings.

At the far end of the pebbled wharf is Bayards Cove Fort (1537), a heavy walled gun emplacement to protect the town.

**Stop 9** Inside and at the back of the fort there is an exposed face of the local Dartmouth slates and shales, the beds can be seen dipping to the South. The local rock is very coarse and variable, unsuited to quality building but good and economic for heavy walling. The fort is probably built from stone dug in situ although the larger stones roofing the archways are a different form of Dartmouth slate which fractures into larger pieces and probably came from another local quarry.

*Retrace your route past the ferry ramp and climb the steps opposite the shop “Gifts for Gentlemen”. On the other side of the road is Holdsworth House, a sheltered housing complex converted from what was once the Dartmouth Board School built in 1873. Cross to the drive entrance on the left of the building.*

**Stop 10.** The building is probably made from Permian sandstone from the Torbay area laid down about 250 million years ago. This is a sedimentary rock laid down in water and subsequently compacted. The

3

characteristic red colour is due to oxidised iron typical of rock laid down in flash floods in normally dry areas. The blocks in the entrance pillars show coarser cross bedded sandstone- the deposited layers are not parallel, typical of wind swept sand dunes.

*Head back into town along Higher Street past the Cherub Inn (1380) , and past the renovated Elizabethan* *house*. This end of the block was burnt down in 2009 and it was only the massive stone separating walls made from local stone that prevented the fire spreading further. All the buildings were timber framed.

*Continue past The Seven Stars to St Saviours Church.*

**Stop 11**. Inside the church, let into the floor of the aisles, are several memorial stones made from nearly black marble with white streaks. This is Ashburton marble from the edge of Dartmoor, polished by centuries of feet. Near the pulpit marbles in the floor of differing colours, probably from quarries in Plymouth, Torquay or Ipplepen, have been used decoratively. The pulpit itself is unusual appearing to be painted wood but actually made from stone. Return through the main door and go right round to the other side of the church yard and enter the graveyard. Repairs to the windows can be seen where the stone has weather badly and has been replaced by new Portland limestone. This material is uniform and can be readily worked to the shape required and is still in plentiful supply. The surrounding walls are made from rougher more local slatey material. As you walk round to the east end of the church notice the weathering on the top of the buttresses. These points take the brunt of running water and different repairs can be seen, some in granite, lasting forever, some with slate, very economical probably with 50-100 year life. On the back east wall there is a small unrepaired window, the mullions showing the effects of physical and chemical weathering on the limestone. In this wall it is possible to find a wide variety of stone, igneous granite often used on corners as it weathers well, red sandstone and local shale rock.

*You are nearly at the end. Walk away from the church along Anzac St and stop on the corner in Duke St facing Ladbrokes with your back to Sakura.*

**Stop 12.** Look down at the kerbstones. Many of these are of Dartmoor granite, an ideal long lasting material even in this situation where the stone must take a huge amount of stress from people, vehicles and weather. Granite is a rock made from a mixture of crystalline minerals. If the molten rock cools quickly the crystals are small ( as Lloyds bank) at your feet and further along outside Lloyd Attree Jewellers, some blocks have crystals of feldspar mineral up to 50mm long.

*Now cross the road and head towards the gardens, walk under the Butterwalk supported since 1600s by granite pillars*. On the corner is the NatWest bank, the walls like many others that you may have noticed on the walk are hung with slate. Slate is a *metamorphi*c rock ( mudstone *changed* by heat and/ or pressure over millions of years) and is a relatively cheap and plentiful material that splits conveniently into thin sheets and has good weather resistance. A slate roof should last 50- 100 years.

*Round the corner and across the road you are now back at the Information Centre.*

  This geological walk was compiled by The Geology Group of Dart Valley U3A 2013