

Tides and Flooding

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Dover is subject to a perennial flooding problem. Physically, the town is situated at the extreme south-eastern tip of the British Isles. It is also the closest seaport to the Continent with Calais, France 20.6 miles (33.1km) away. Situated on the English Channel (French: La Manche), it is an arm of the Atlantic Ocean that joins the North Sea off the Thames Estuary. The Channel is about 350 miles (560 km) long, varies in width from the Strait of Dover (French: Pas de Calais) to 150 miles (240 km), and covers an area of approximately 29,000 square miles (75,000 square kilometres).

The Channel is a shallow sea with an average depth of about 390 feet (120 metres) at its widest part and about 148 feet (45 metres) in the Strait of Dover. Because of this, it acts as a funnel to both winds and tides, making the Strait notoriously tempestuous.

It has been recognised since ancient times that the Moon has an important effect on tidal movements. Its gravitational force tends to bring the Earth and the Moon towards each other but as they both rotate about a common centre of gravity, this has a counter effect. The part of the Earth's surface nearest the Moon is subject to the greatest gravitational force, but only water on the Earth's surface is free to move and it is this gravitational pull that creates tides. The actual magnitude of the gravitational pull and the time lags involved vary according to terrestrial conditions so no two places respond in the same way.

Another force involved is the Sun but due

to the greater distance involved this effect is much less. Albeit, when the Sun and Moon are in conjunction – during the phase of a 'New Moon' or in opposition 'Full Moon' – the combination of the two forces act together and the rise and fall of tides are stronger – these are called Spring Tides. When the two celestial bodies are at right angles to each other, the force is not so strong and the result is what is called Neap Tides.

Because there is a time interval involved, in the waters around Britain spring tides occur 2 days after a New and Full Moon and the neap tides 2 days after the Moon's Quarters. Finally, because the Moon's orbit is elliptical, the distance between it and the Earth varies. When they are closest this is said to be Perigee and furthest away, Apogee.

The next factor to be taken into account is Tidal streams. These are the movements produced in response to the above but they are also affected by winds – the stronger the wind the greater the effect. Another factor is the barometric effect, when the atmospheric pressure is low, the sea level is increased and vice versa. The sea level will also be raised on the coast towards which it is blowing. Finally, if sea level is raised in one area, there will be a fall in another. This is a particular problem in the southern part of the North Sea as it causes Storm surges leading to flooding along the east coast of England and on the west coasts of the Continent.

For Dover the problem of flooding increases if there are strong winds blowing

from the south-west and the tidal stream is running in the same direction during a Perigee Spring tide that causes an exceptionally high tide. Further, if there is an atmospheric deep depression travelling eastwards past the northern entrance to the North Sea, this too, with the combination of tide and wind, will cause flooding.

Dover is famous for the White cliffs; indeed the town nestles between the eastern cliffs on which the Castle is built and the Western Heights. They rise to 350 feet (110 metres) and are comprised of chalk and black flint. The river Dour is about three miles long, narrow and not particularly deep. The river rises at Temple Ewell, with a tributary coming in from the Alkham valley.

From Kearsney Abbey the Dour flows through the village of River and then the town skirting the east side of Pencester Gardens, turns west behind Castle Street and at Stembrook turns south towards the sea before going west again and through a culvert under Townwall Street (A20). The final leg of its journey to Wellington Dock, is through culverts under New Bridge and Cambridge Terrace.

In the past, there were a series of flood plains along this fast flowing river's embankment but after Kearsney Abbey, with the exception of Pencester Gardens, these have been subject to building development. Furthermore, for much of this part of the Dour's course, the developments are only a few feet above the ordinary level of the river. Hence, when there is heavy rain the areas that were once flood plains are prone to flooding and with a combination of an exceptionally high tide and heavy rain there will be flooding.

There is much evidence in the historical



Western Docks and Former Lord Warden Hotel From Western Heights C1990s showing the concreting that has since been increased.

records of the town being flooded from the sea, which has led to flood defences being built. There is also much evidence of the Dour overflowing its banks, for instance in 1850, from Charlton to Dieu Stone Lane the land on either side of the river flooded and froze and the area became a skaters' paradise. To some extent, the industrialisation along the Dour exacerbated the fresh water flooding but it was the large-scale house building and road laying programmes, in the second half of the nineteenth century, that turned the problem into a regular crisis.

In 1863, while what became Maison Dieu Road was being laid it was recommended that the surface should be raised 3 feet (1metre) above the Dour's mean level. It was decided that this was too expensive so flooding became a regular problem thereafter. Some thirty years later, the council purchased the riparian rights to Stembrook Mill and lowered the base of the river from there to St James Lane by about 2 feet (0.6metres). This initially solved the problem but since then many properties have been built and roads using concrete or other impervious materials.

By 5th January 1873, following the classic combination of wind, weather and tide, the Pier District around the harbour, was severely flooded. The heavily populated area was not only under a combination of

sea and fresh water but raw sewage as the outfalls ended in the sea nearby.

Following a quarter of a century of regular flooding, in 1899 an especially nasty flood affected the Pier District. The council proposed to buy land from Dover Harbour Board (DHB) to create a secondary sea defence but this came to naught. Instead, much of the Pier District was condemned and demolished in order to build a viaduct and road access to the harbour. More recently, in 1994, the Victorian sewage works on Elizabeth Street, in what was the Pier District, was upgraded and a 1,500mm diameter concrete pipe replaced the original outfall. Since 1999 sewage has been taken from there to Broomfield bank, Farthingloe, for treatment. However, in that area there has been extensive laying of impervious material to create the A20 and other roads plus lorry, coach and car parks.

Albeit, the combined effects of wind, weather, tides, and lack of flood plains continued to hit the town. Indeed, Dovorian Budge Adams, writing of his childhood in the early part of the 20th century, spoke of Dolphin Lane by the Phoenix brewery. He wrote in an article in the Dover Society magazine (May 1991) that in heavy weather and springtides'



*Dour River Flood Level St James Lane 7th May 1935
Taken by D J Edward September 1953 © Library*

flooding was so regular that the sandbags stored in the yard of the brewery in readiness such that it made it difficult to enter the premises!

On 7th May 1937, five days before the Coronation of George VI (1936-1952), abnormal rainfall flooded Maison Dieu Road. On the night of 20th May, during high tide, there was a thunderstorm that lasted two hours and the Dolphin Lane/St James Lane area was under such deep water that a mark was affixed to the wall of the Phoenix brewery. This happened again on 10th June and finally on St Swithen's Day (15th July) that year, the floods extended from Maison Dieu Road to Townwall Street.

Shortly after, on 20th July, the town's



*Dour in Full Flood Dieu Stone Lane February 2014
© Lorraine Sencicle*



*Dour in Full Flood Looking Towards Park Street
February 2014 © Lorraine Sencicle*



*Flood Prevention Control Box Maison Dieu Road
Recently Installed by Southern Water Ltd.*



*Flood prevention pumps are under the manhole covers
and have recently been installed by Southern Water
Limited on Maison Dieu Road.*

surveyor, William Boulton Smith, presented a report to the Town Council in Committee. In this, he stated that flooding occurred when heavy rains coincided with spring tides and that extensive and immediate steps were necessary to improve the surface water drainage system of Dover. He emphasised that the increasing number of roads impervious to water exacerbated the problem. His recommendations amounted to a cost approaching £400,000 and although work was initiated, it ceased when other calls on the town's budget were made.

Following World War II (1939-1945), the frequency of floods increased due to housing and industrial development. In July 1957, severe flooding occurred following heavy rain and a high tide restricting the discharge of the River Dour. This resulted in, David Bevan, Dover Borough Engineer 1951-1972, in September that year producing a report. He made several recommendations that included: a new bridge over the Dour at Flying Horse Lane; a new surface water sewer to drain the area to the north of Market Square; the division of the main sewer that crossed the Dour in a culvert under New Bridge and modifications to the Wellington Dock gates. The report was adopted and between 1957 and 1961 improvements were made in Barton Road, Granville Street, Maison Dieu Road and London Road from what is now Coombe Valley Road to Buckland Bridge. After 75 years, Head Wrightson and Co. had replaced the Wellington Docks gates at a cost of £35,000 in 1945, so the Harbour Board did not intend to replace them at that time. Since the early 1960s, there has been an increase in the use of automatic washing machines and the emphasis on human hygiene has increased the pressure on the removal of used household water through Dover's archaic drainage system.

Half a century after the Bevan report in 2008, the Community Hospital, in line with government recommendations of the time and included 'step-up and step-down beds', that this author and her small team won for Dover, was scuppered. Dover District Council (DDC) decided that the Community Hospital should be on the former Brook House site, in Maison Dieu Road. Those against the proposal loudly protested emphasising the flood risk in the area. The project was dropped and DDC blamed the Environment Agency for doing nothing to alleviate the flooding problem. The result is that Dover is to have a lower

grade polyclinic on a site where the road access leaves much to be desired.

As for the Brook House site proposal, the representative of the Environmental Agency this author had dealings with at that time, did identify the causes of the flooding risk and, in great detail, the solutions available. The problem, he said, was caused by a combination of heavy rain and a high tide restricting the discharge of the River Dour and the impervious road and car parking surfaces!

These, he said, could be dealt with by builders/householders being more environmentally aware. The use of specialist building measures on known flood plains – similar to those used for the Riverside Centre for the Community Hospital proposal. Flood prevention kiosks and vents to alleviate potential crisis situations – such as those built recently by Southern Water Limited in Maison Dieu Road, Brookfield Place and at the Buckland Mill housing development on Crabble Hill. Finally, dealing with the restriction problem of the River Dour at Wellington Dock that occurs during the combination of storms and high tides.

For the last few years the Dover Harbour Board (DHB) has been considering the

redevelopment of Western Docks that my husband, Alan, is particularly interested in. Several years ago, Alan emphasised the importance of small vessels being able to continue to use the Wellington Dock. It has been suggested that a new navigation channel may be cut through the Esplanade from the dock to connect with a proposed new marina development to be situated to the east of the Prince of Wales pier. The cut would incorporate a sea lock of modest proportions when compared with the size of the existing Wellington dock's twin mitre gates. It is these mitre gates that can retain water within the dock when sea levels are low but cannot prevent water flowing in when sea levels are high.

During family discussions on the subject, I brought to Alan's attention the 1993 DHB development plan for the Western Docks. Former DHB employee, Bill Fawcus was responsible for delivering the project. Alan asked Bill why the plan had not gone ahead and was told that the Environment Agency had blocked it due to an unacceptable flood risk. On the highest spring tides of the year, water levels can overtop the walls of the Wellington Dock. With a combination of low atmospheric pressure, storm force North West winds in the North Sea and heavy rainfall swelling the River Dour, the risk of flooding is further increased.



Wellington Dock East End Bubbles Caused by the Dour Entering Through Culverts at this End
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Wellington Dock Gates From the Tidal Basin with Swing Bridge in Background
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