

CORK - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	Church Bay		
Other names used for site	Poulnacalla Bay, Poulnacallee Bay		
IGH THEME	IGH10 Devonian		
TOWNLAND(S)	Church Bay		
NEAREST TOWN/VILLAGE	Crosshaven		
SIX INCH MAP NUMBER	99		
ITM CO-ORDINATES	580870E 560410N		
1:50,000 O.S. SHEET NUMBER	81	GSi BEDROCK 1:100,000 SHEET NO.	25
GIS CODE	CK033		

Outline Site Description

Foreshore rock platform backed by low cliffs at popular swimming beach.

Geological System/Age and Primary Rock Type

Upper Devonian sandstone and siltstone of the Ballytrasna Formation and overlying Gyleen Formation.

Main Geological or Geomorphological Interest

Church Bay is formed along the strike of a major east–west-striking anticline, the Church Bay Anticline. The northern limb of the anticline is very well exposed on the rock platform that forms the north side of the bay. The core of the anticline comprises rocks of the Old Red Sandstone Ballytrasna Formation, which is overlain at the northern end of the site by the Gyleen Formation. The contact between the two formations is very well exposed.

The Ballytrasna Formation represents the Upper Devonian terrestrial succession in central and east Cork. It comprises red and green sandstone and siltstone that were deposited from a network of rivers that flowed southwards from the landmass to the north. Features exposed at Church Bay include the near-vertical axial plane cleavage that is a common feature of the Old Red Sandstone, and large desiccation cracks, subsequently infilled by coarse sand, that formed under sub-aerial conditions. Calcrete nodules visible in some siltstone beds are further evidence for terrestrial conditions.

Towards the end of the Devonian Period sea levels began to rise and the sea advanced northwards from the south. The uppermost Devonian rocks in Cork comprise grey, green and red sandstone and siltstone of the Gyleen Formation that were deposited on the coastal plain bordering the sea. At Church Bay a thick, massive grey-green marine sandstone bed marks the start of the Gyleen Formation. The contact between it and the underlying red beds of the Ballytrasna Formation is uneven, the structures suggesting erosion of the latter by the advancing sea. Above the sandstone layer is a thick bed of red siltstone, indicating renewed river deposition before marine conditions became fully established in the succeeding Carboniferous Period.

Site Importance – County Geological Site

This site contains an excellent exposure of the Church Bay Anticline, part of the regional fold structures that are characteristic of the geology of County Cork. The Ballytrasna Formation and its contact with the overlying Gyleen Formation, displaying the transition from terrestrial to marine conditions towards the end of the Devonian period, are extremely well exposed.

Management/promotion issues

The site is located at a public beach and is readily accessible via road. Caution is required when entering on to the rock platform that comprises most of the site as it is partly submerged at high tide and is otherwise exposed to rough seas. Church Bay is one of a series of sites on the west side of Cork Harbour that illustrate the Devonian–Carboniferous geology of the region. It merits promotion, preferably as part of a harbour geological heritage trail.



The Church Bay Anticline, view toward west from the central part of the site. Steeply-dipping beds on northern limb of anticline (right) are cut by near-vertical cleavage.



Tectonically deformed desiccation cracks in siltstone of the Ballytrasna Formation. In-filled with a coarse brown sand that stands proud from the weathered rock surface.



Detail of irregular contact between siltstone of the Ballytrasna Formation (right) and sandstone of the Gyleen Formation (left, under hammer).



Grey channel sandstone of Gyleen Formation overlies red siltstone of Ballytrasna Formation on northern side of site. Grey sandstone unit is in turn overlain by red siltstone. View towards north.

