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Technological transformations at Boatstrand Harbour



Figure 1: Boatstrand Harbour, Co. Waterford (Image courtesy of Malachy Walsh and Partners c. 2014)

The late nineteenth century was a revolutionary period for harbour construction in Ireland, principally due to the efforts of one man, Bindon Blood Stoney [1828-1909] the Chief Engineer to Dublin Port [1862-98]. Although portland cement, the primary ingredient of concrete, had been developed as early as 1820 it was not until Stoney's audacious use of large scale precast concrete blocks to build the North Wall extension and Alexandra Basin [1871-84]¹ at Dublin Port that the material gained sufficient credibility to engineers to wholly supplant the use of stone in maritime engineering works.

Stoney's bold experiment in concrete was a watershed moment in Irish maritime engineering, even for the smaller outlying ports along the coast. Before this moment the making or repairing of small harbours had, since the early eighteenth century, been executed almost exclusively in stone, leaving a legacy of hundreds of harbour structures built of local stone along the coast. As early as 1868 Stoney had extended his experimentation with concrete to a small harbour south of Dublin, Coliemore, where concrete footings were cast for the otherwise dressed and coursed stone piers.² More extravagant was the wholesale use of concrete at Dunbrattin harbour in County Waterford, known as Boatstrand to the local community, in 1884 [Figure 1]. This small cove had long been in use, first for smuggling tobacco³ and more lately for small fishing vessels, the latter activity sponsoring the construction of a small pier, possibly of rough stone or even rubble concrete⁴ in the 1870s by the fishermen themselves.⁵

¹ Cox, R. C. *Bindon Blood Stoney: Biography of a Port Engineer*. Dublin: Institution of Engineers of Ireland. 1990.

² William Spratt-Murphy, Elizabeth Shotton (Supervisor). *Coliemore Harbour: A Historical Study of the Minor Harbours of the South-East Coast of Ireland*. Dublin: UCD Unpublished Masters Dissertation. 2015.

³ Editor. 'Smuggling.' *Decies*. No. 3 (1976)

⁴ see notes on NAI OPW 5/HC/5/51/2

⁵ Underwater Archaeology Unit. *Piers, Ports and Harbours*. 2 Volume Draft Inventory. Dublin: National Monument Archive. 2002.

By 1884 the Board of Works [OPW] had drawn up substantive plans for a new pier overlaid on the existing work in addition to a quay, a landing slip and a groyne wall or breakwater, all of which was to be founded on a substructure of concrete block with cast concrete work above [Figure 2]. The harbour stood as built until 2015, a testament to the quality of the work, though it was by that time heavily eroded and in need of significant repair. Prior to its rebuilding, elements of its constructed logic were still visible in its fabric, as one can see in the apparent layering in the cast work [Figure 1] caused by sequential lifts of concrete during casting as well as the rudimentary concrete block work at the sluice gate in the groyne wall [Figure 3].

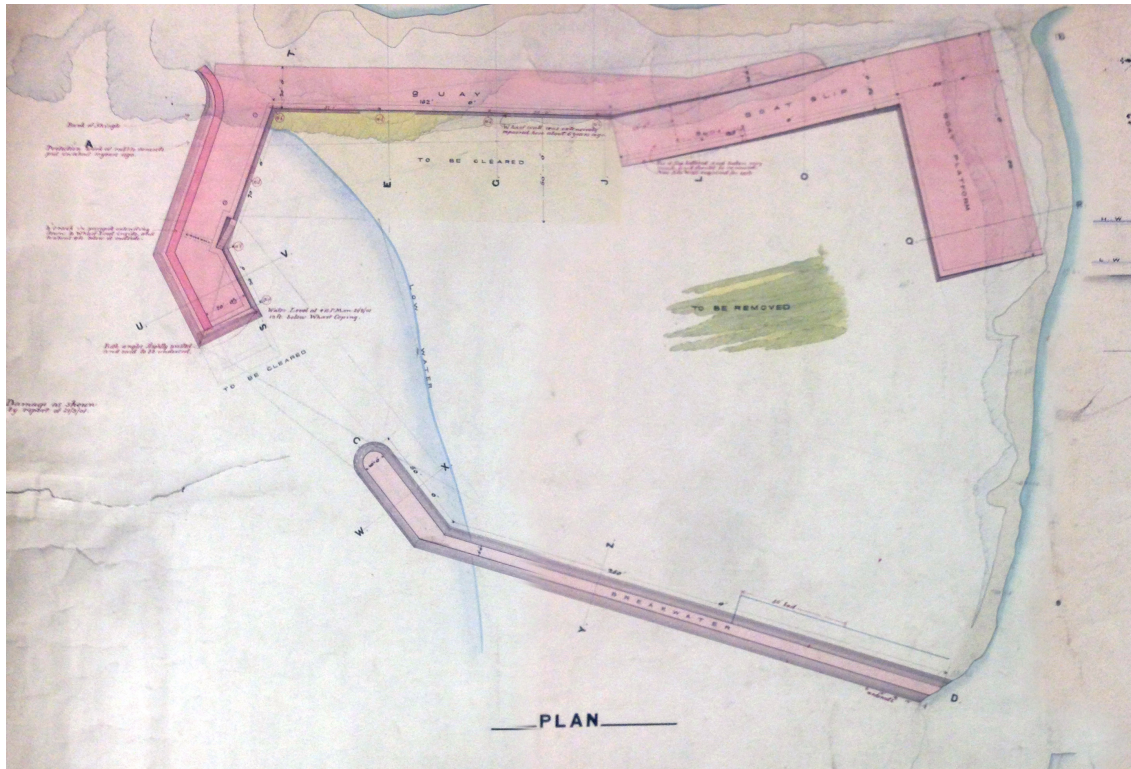


Figure 2: Boatstrand Harbour, Co. Waterford [National Archives of Ireland, OPW 5/HC/5/51/2 detail]



Figure 3: Sluice in groyne wall, Boatstrand Harbour, Co. Waterford (Image courtesy of Malachy Walsh and Partners c. 2014)

In the spring of 2014 Waterford County Council engaged the engineering firm of Malachy Walsh and Partners draw up plans for the refurbishment of the harbour, involving an encasing of the original elements with 400mm reinforced concrete as well as the addition of further quay walls. Work began in 2015 and is scheduled for completion in autumn 2016.

As part of the Irish Research Council funded *Minor Harbours* pilot project, Boatstrand was surveyed in July 2016 using a P20 Leica scanner to acquire full 3D pointcloud images of the harbour [Figure 4]. The intention of the project is to document the current state of the harbour in three dimensions and, with the aid of historic

images, archival documents, previous research and, in this case aided by engineering drawings, construct an historic timeline for the harbour using three dimensional models. Scanning mid-renewal was fortunate as it caught the harbour in a transitional phase in its development, with the earliest construction of rubble concrete work still exposed on the seaward side of the main pier. This evidence, in the form of scan data, in tandem with excavation drawings from 1884, will allow the team to produce conjectural models of the original cove, the first pier, and the original cast concrete harbour to form part of the historic timeline, which will include the most recent work by Malachy Walsh and Partners.

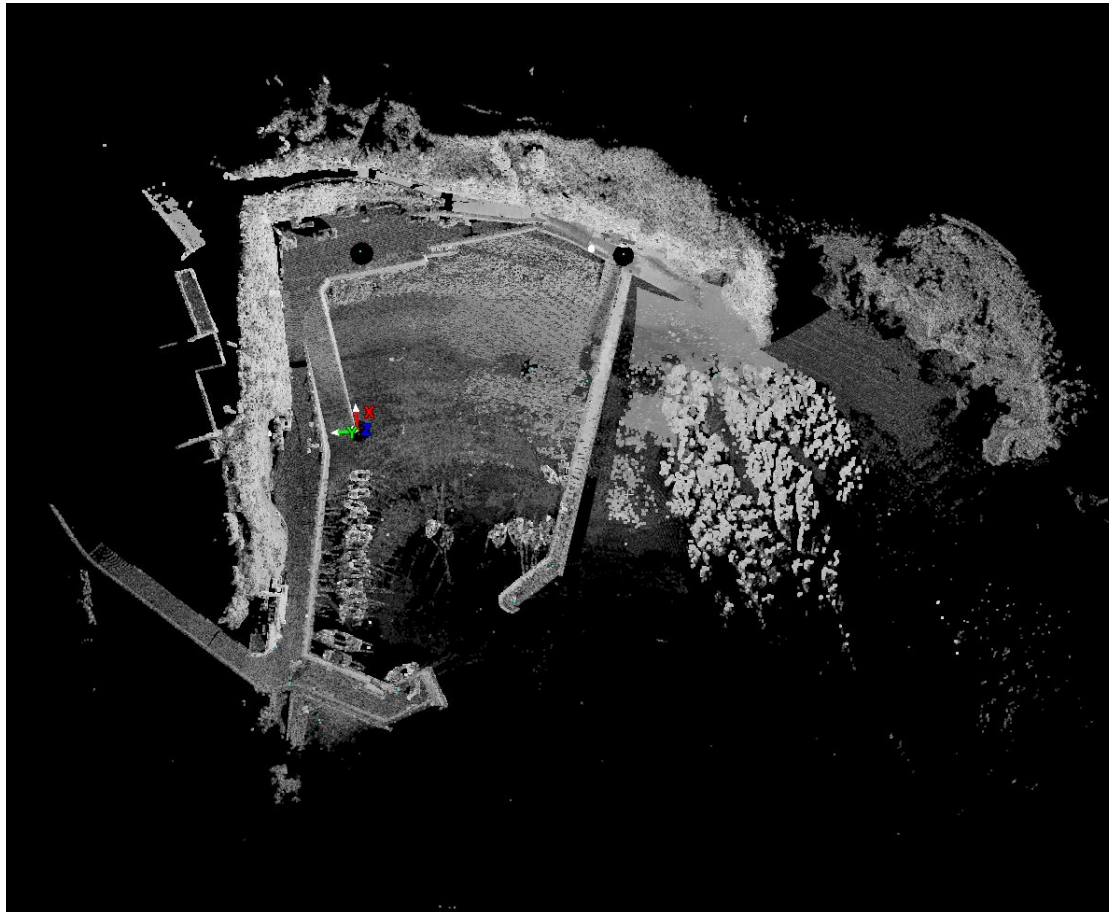


Figure 4: Pointcloud image of Boatstrand Harbour, Co. Waterford [Shotton, Semar, Lennon 2016]