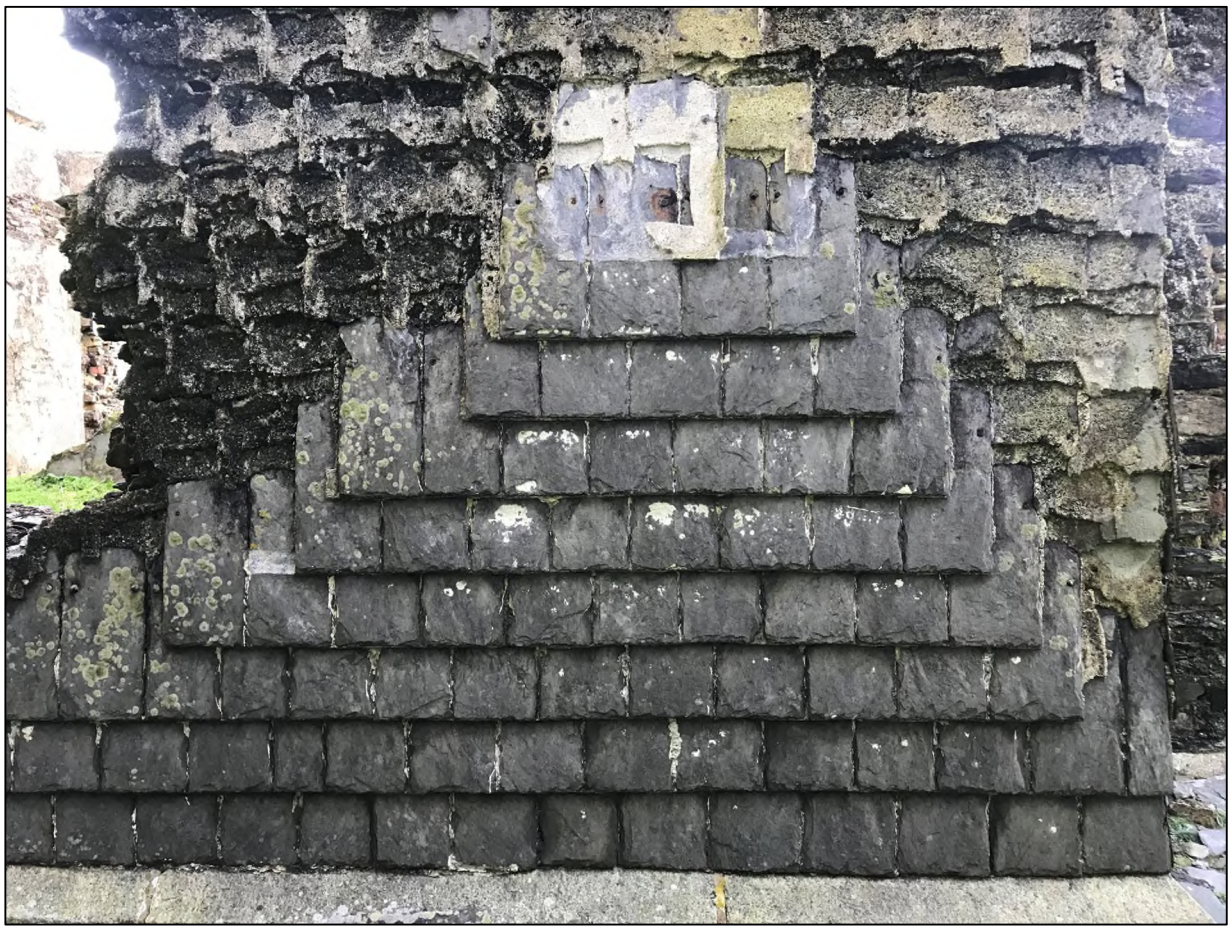
Preliminary Visual Assessment of Building Stone at the Upper and Lower Lighthouses Skellig Michael



on behalf of
the Office of Public Works

September 2021

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1.0 Introduction

A preliminary visual assessment of the building stone used at the upper and lower lighthouses on Skellig Michael, Co. Kerry, was undertaken between 12 noon and 3pm on 9th September 2021. Field notes are summarised in this report. A series of photographs taken on the day are part of this report. Sampling of building stone was not conducted. Neither were opening up works effected. The report briefly considers (1) geological context, (2) local setting, and (3) building stone encountered (viz. indigenous Skellig stone, Valentia slate, Wicklow granite and Yorkshire sandstone).

2.0 Geological Context

Skellig Michael represents one of the most westerly exposures of Devonian (Old Red Sandstone) rocks in Western Europe. These rocks are sedimentary in origin and were deposited during the upper part of the Devonian period, between 360 and 374 million years ago. During this time, Ireland, as part of a larger continental land mass, was situated south of the Equator. A crustal depression or trough, known as the Munster Basin, existed in Southern Ireland at this time allowing the accumulation of a great thickness of sediment. The basin was bordered by mountainous or upland areas to the north and south. The 200m of sediments exposed on Skellig Michael were deposited in alluvial and fluvial environments in this basin.

The present outcrop pattern of the Devonian (Old Red Sandstone) is due to subsequent structural deformation. This compression or folding of the rocks occurred during the Hereynian Mountain building period, approximately 300 million years ago. The structure of Skellig Michael is characterised by a single open trough-shaped fold (syncline) developed about an axis which plunges 100° to 070° east-northeast. Conjugate joint sets are generated symmetrically about this axis while an intensive cleavage fabric parallels the axis orientation.

3.0 Local Setting

The synclinal core which defines the geological setting of the island runs approximately through Seal Cove. The lower lighthouse is located on the southern limb of the syncline, whilst the upper lighthouse is found on the northern limb. Bedding dips are shallow (between 8° and 18°) toward the synclinal core. A pervasive and close cleavage is orientated 80° northeast. Conjugate joint planes (steep to near vertical) orientate to 70° northeast and 65° northwest. The synclinal core is characterised by an overburden of soliflucted glacial material occupying a valley feature to the south of South Peak. Rock exposure displays a range of lichen and vegetative cover from sea level upwards. Rock surfaces exposed during blasting in the 19th century present fresher and more massive smooth surface (largely joint and cleavage planes).

4.0 Building Stone

The building stone identified during the preliminary visual inspection includes sandstones indigenous to the island and introduced stone which included slate from Valentia Island, Co. Kerry, granite from Co. Wicklow, and Yorkshire sandstone (generally referred to as Yorkshire flagstones) from the United Kingdom.

4.1 Skellig Stone

There is pervasive use of local sandstone for building works in this part of the island. It is most conspicuously used as a rubble stone in the retaining wall to the lighthouse road and in any paving elements (e.g. drainage) on the lighthouse road surface. Local sandstone is also used in the construction of the upper lighthouse light keepers' cottages and lighthouse. No preliminary comment can be made as to construction material used in the lower lighthouse buildings as these are largely rendered. Local sandstone caps appear to have been the original cap stones to the lighthouse road wall between lighthouses.

4.2 Valentia Slate

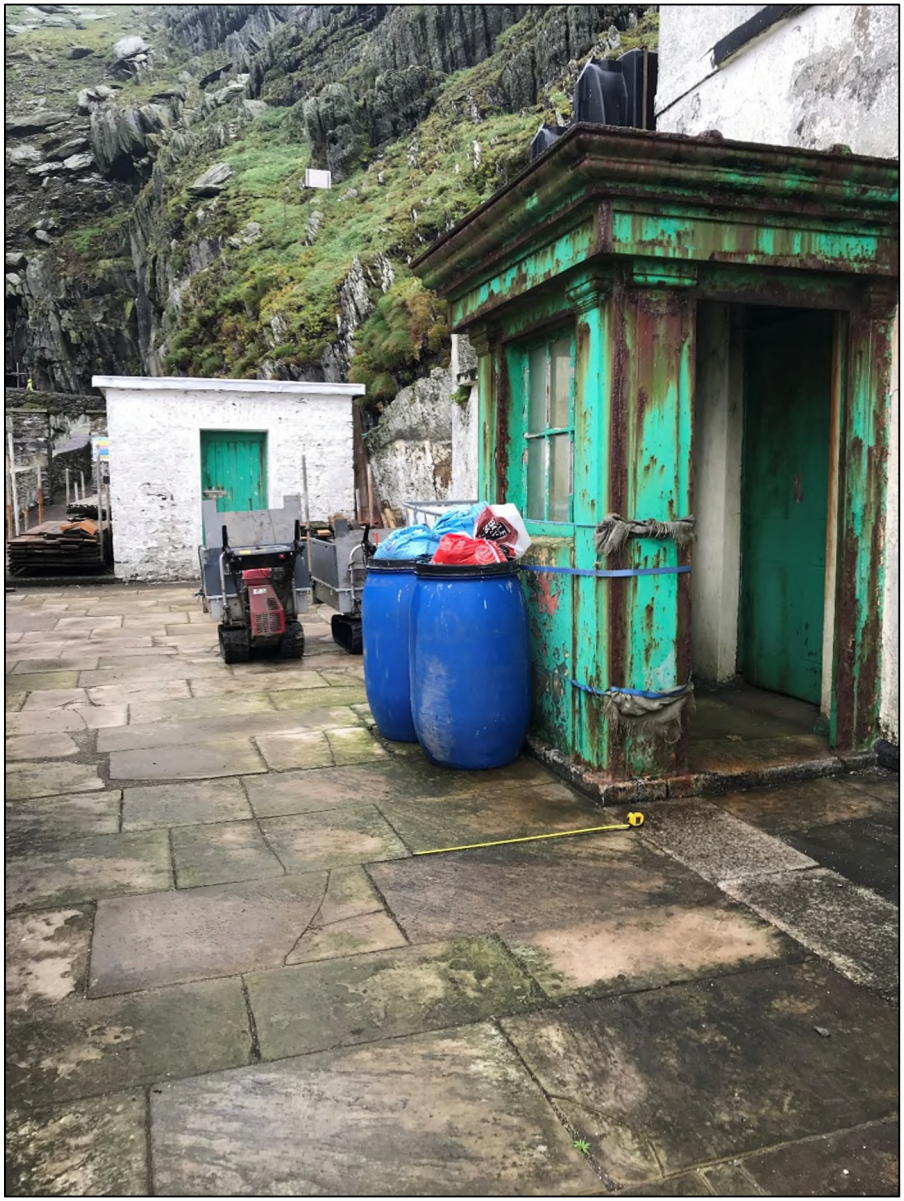
Valentia slate is most conspicuous as an external cladding to the upper lighthouse and associated lighthouse keepers' cottages. This slate is sometimes found replacing Wicklow granite as a basal plinth in the lighthouse keepers' buildings. Valentia slate plugs for this purpose also appear to be used as stone steps adjacent to the upper lighthouse. Recent restoration work utilised Valentia slate caps on the lighthouse road wall. A polished Valentia slate water cistern stands outside the lower lighthouse proper. Note in passing that silty sandstone "slates" local to the island and displaying a reasonably good fissility (approximating to Valentia slate) are also found as a cladding on the upper lighthouse keepers' cottages.

4.3 Wicklow Granite

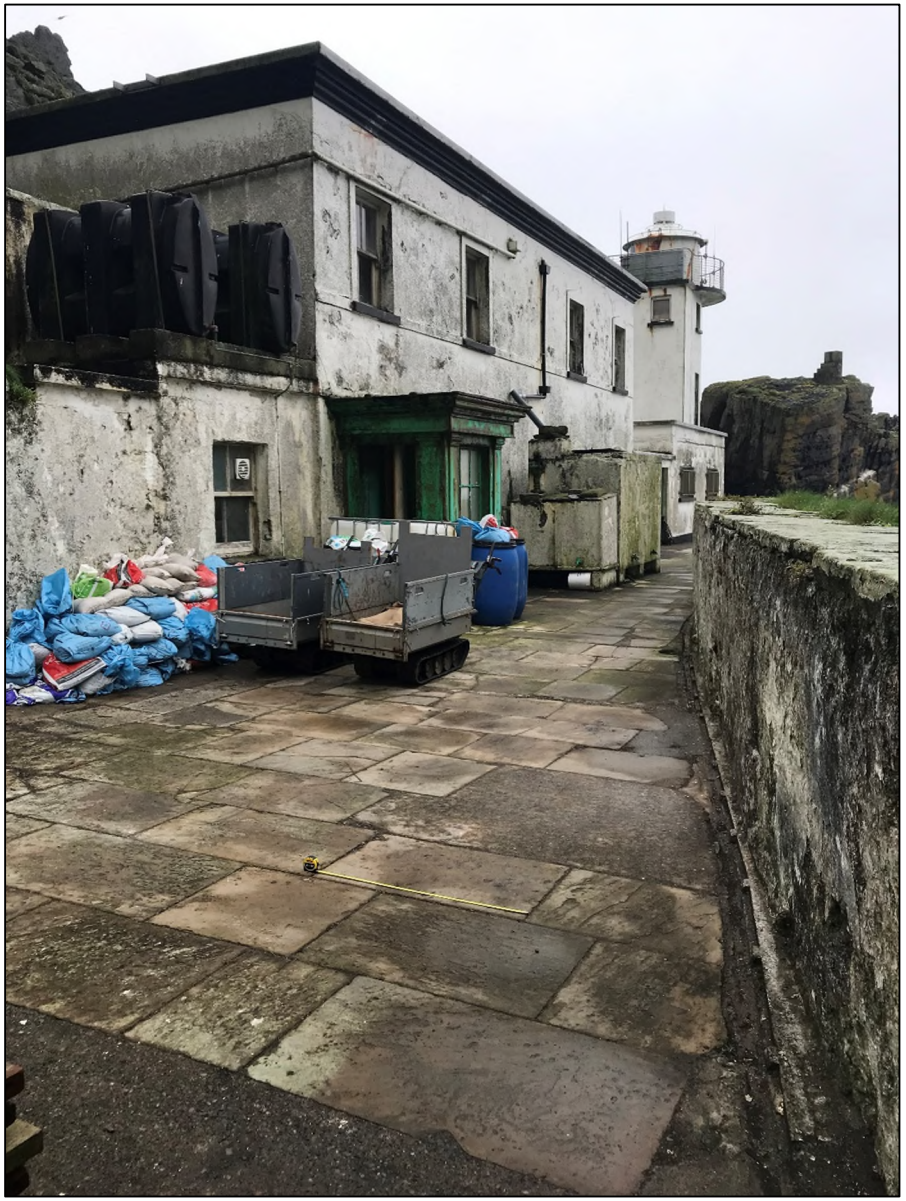
Wicklow granite is notably used in the detailing of the upper lighthouse. This includes an upper corbel plinth, cantilevered interior steps, and windowsills. The granite is also found in the adjacent lighthouse keepers' cottages as basal plinths, chimney plinths, and roof barges. At the lower lighthouse Wicklow granite is found as paving setts adjacent to Yorkshire flagstones in front of the lighthouse keeper's building. The granite is also identified in exposed sills to this building.

4.4 Yorkshire Sandstone

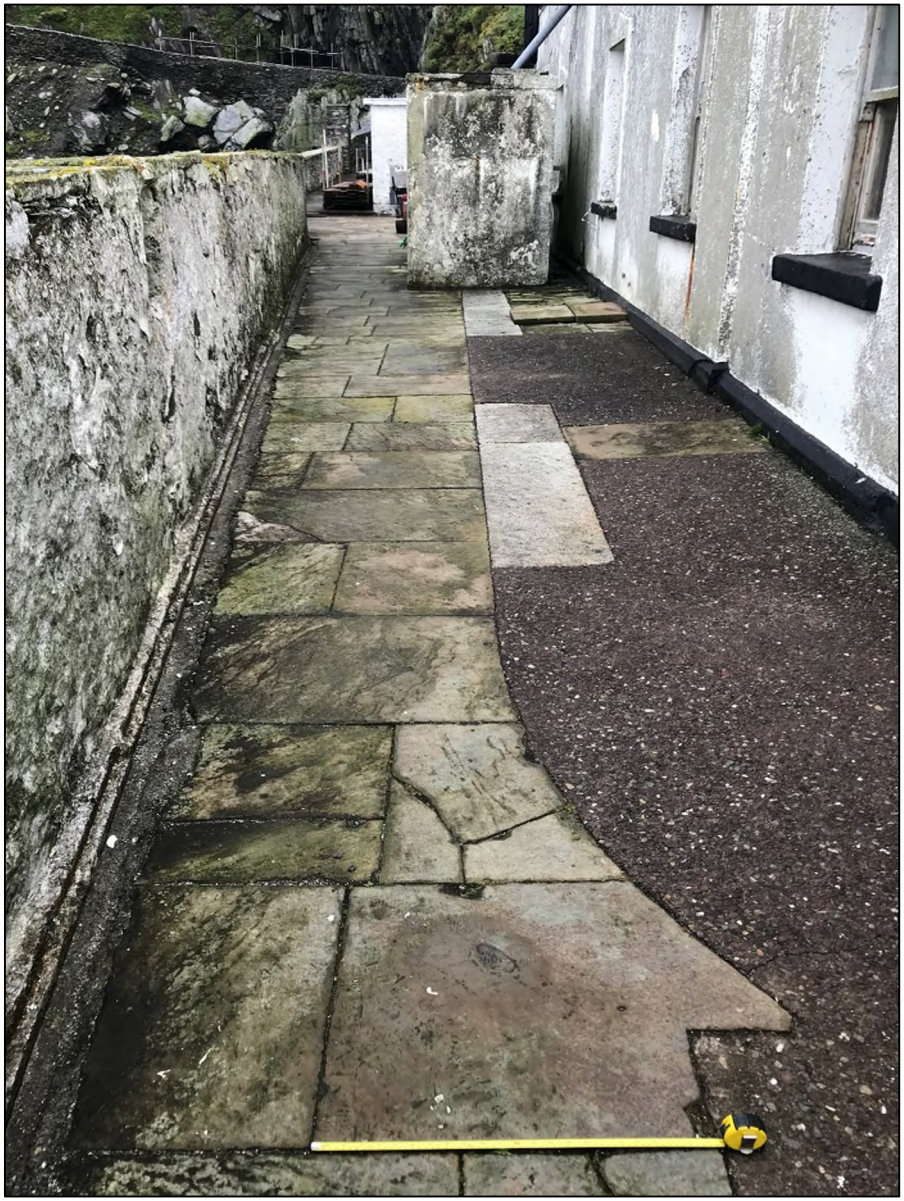
Yorkshire sandstone, a generic term given to grey/buff sandstone of good laminar fissility (also known as Yorkshire flagstone given its ubiquitous use for paving purposes), is found at both the upper and lower lighthouse locations. At the upper lighthouse it is used principally as a paving stone in front and around the lighthouse keepers' cottages, as skirting boards in the cottages, and as steps to the lighthouse complex. It is also used as window ope surrounds in the upper lighthouse. Likewise at the lower lighthouse this flagstone is used for paving in front of the lighthouse and as skirting boards inside the keepers' building. Yorkshire sandstone is also found a cap stone at intermediate locations on the lighthouse road wall.



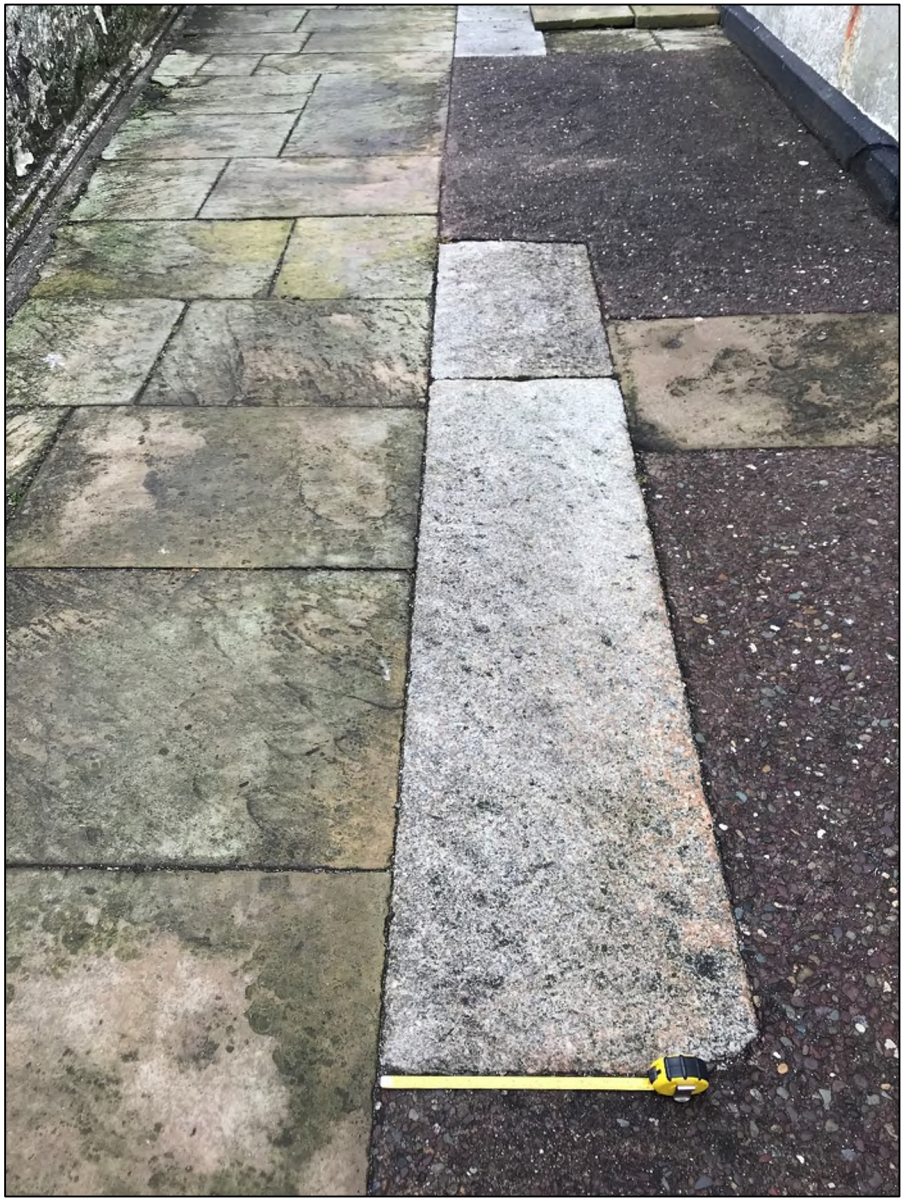
Photograph 1: Lower Lighthouse View to Northeast Showing Main Cast Iron Doorway. Note Yorkshire Flagstones (left) and Wicklow Granite Setts (right).



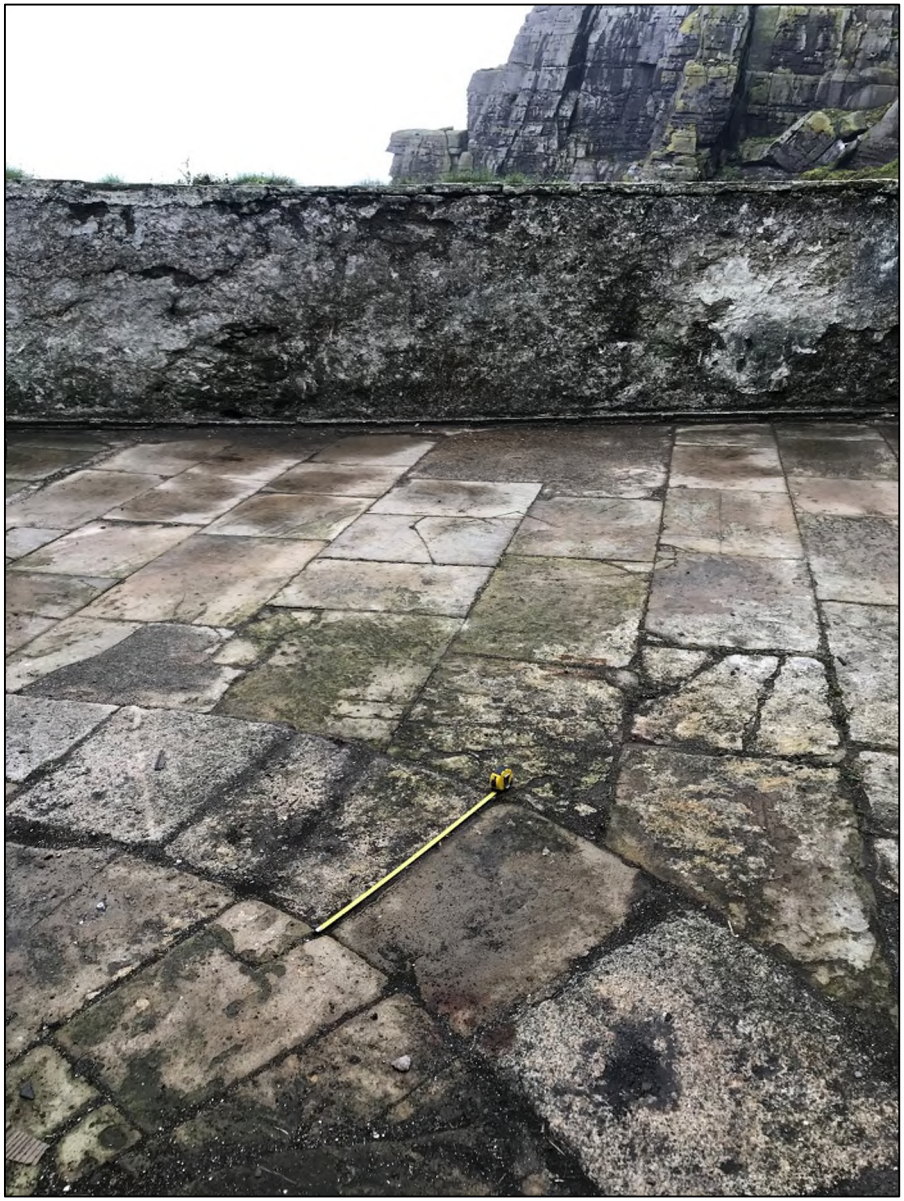
Photograph 2: Lower Lighthouse View to Southwest. Note Yorkshire Flagstones and Flagstone Caps to Safety Wall.



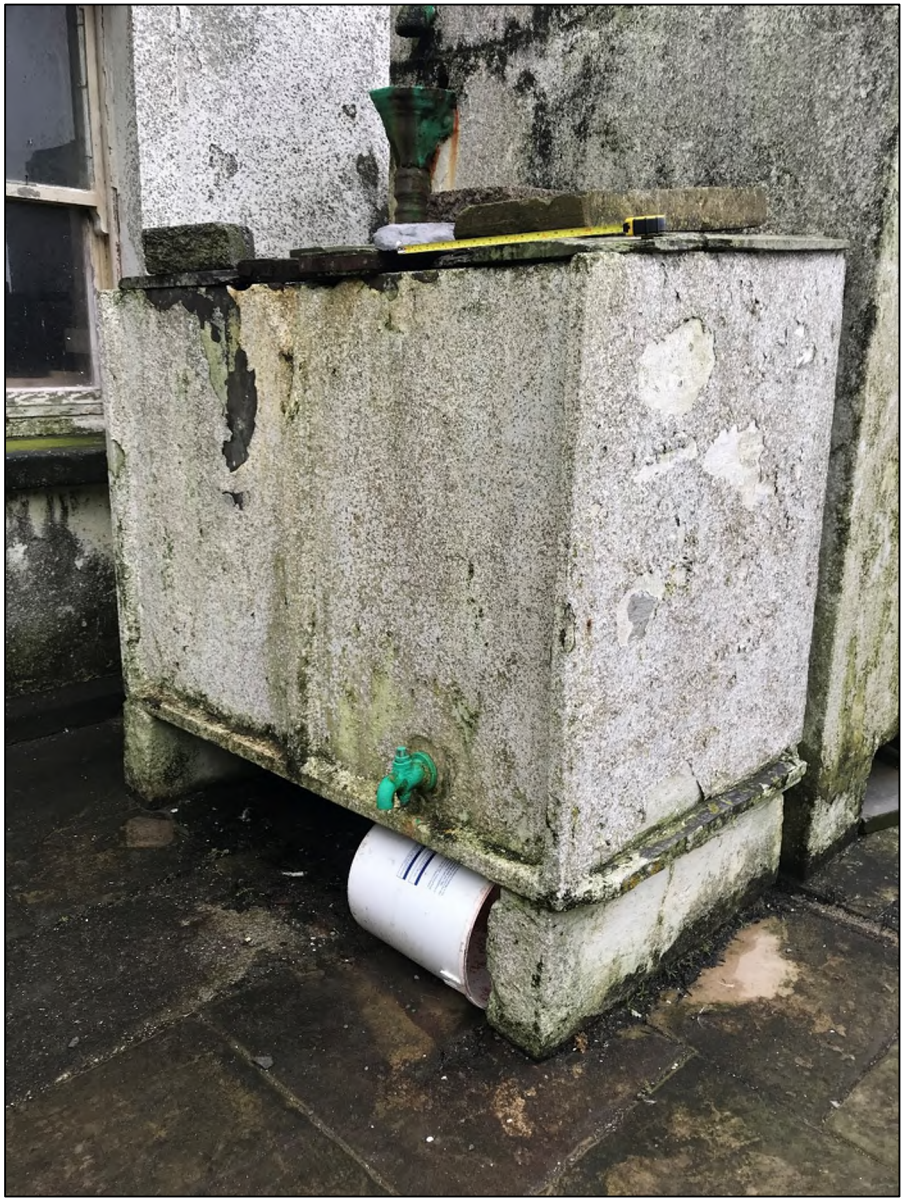
Photograph 3: Lower Lighthouse View to Northeast. Note Yorkshire Flagstones (left) and Wicklow Granite Setts (right).



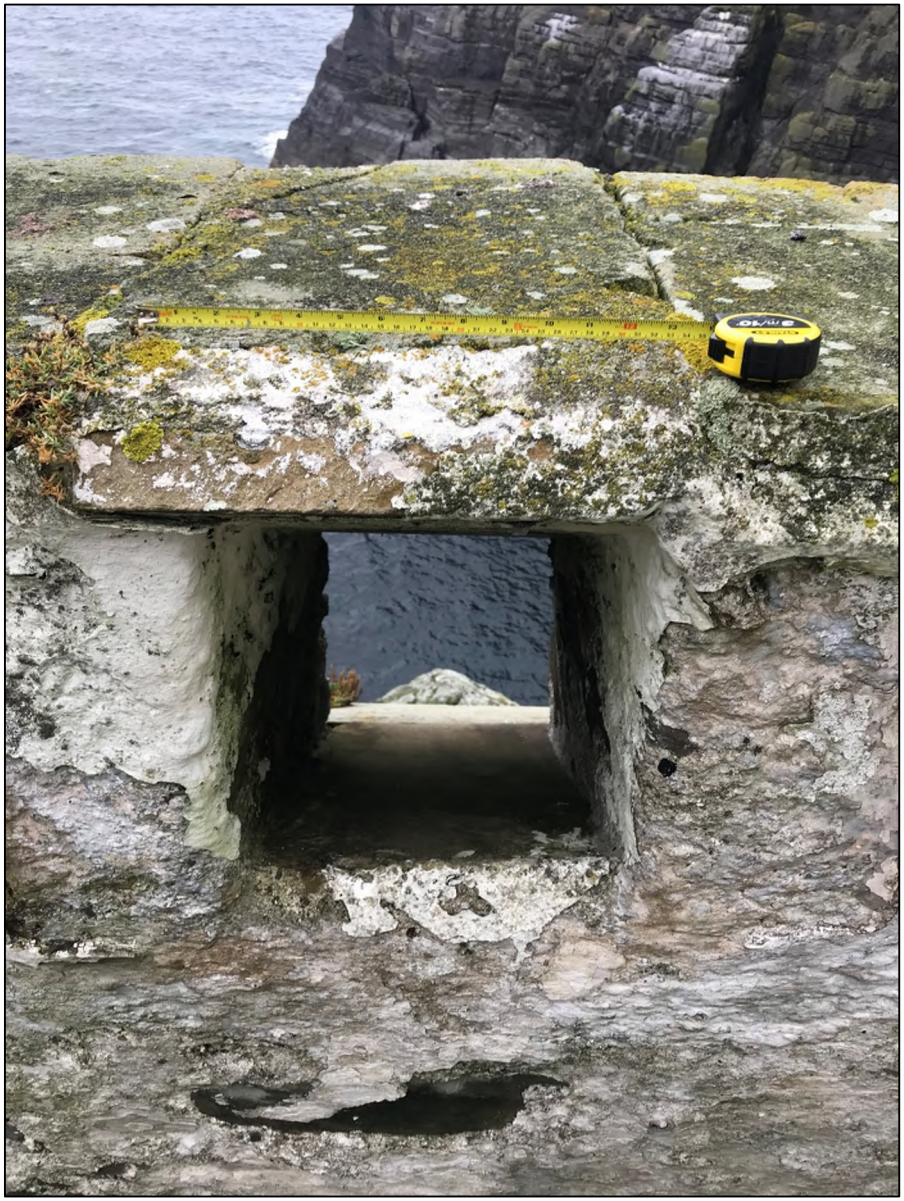
Photograph 4: Lower Lighthouse View to Northeast. Detail of Relationship Between Yorkshire Flagstone (left) and Wicklow Granite Setts (right).



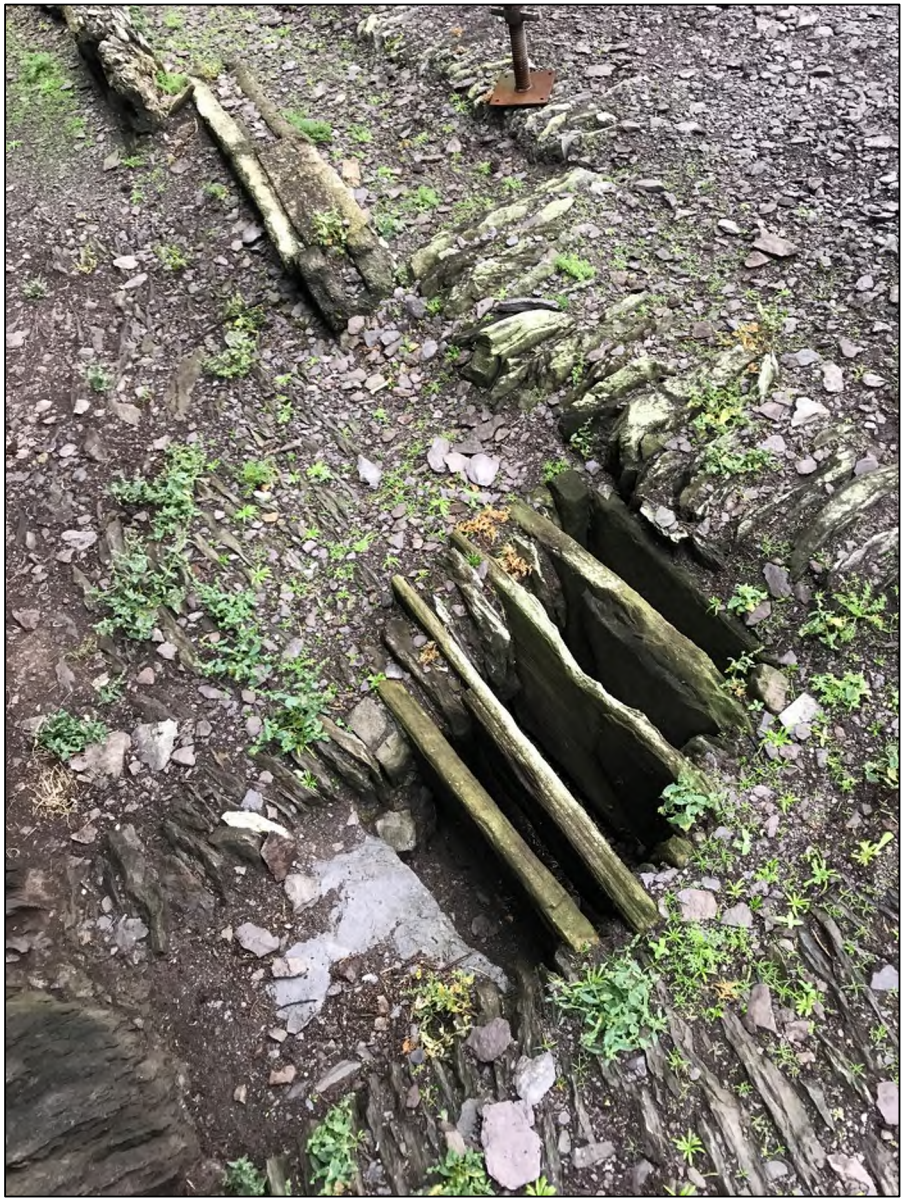
Photograph 5: Lower Lighthouse View to Northwest. Yorkshire Flagstones and Wicklow Granite Setts (curved with tape).



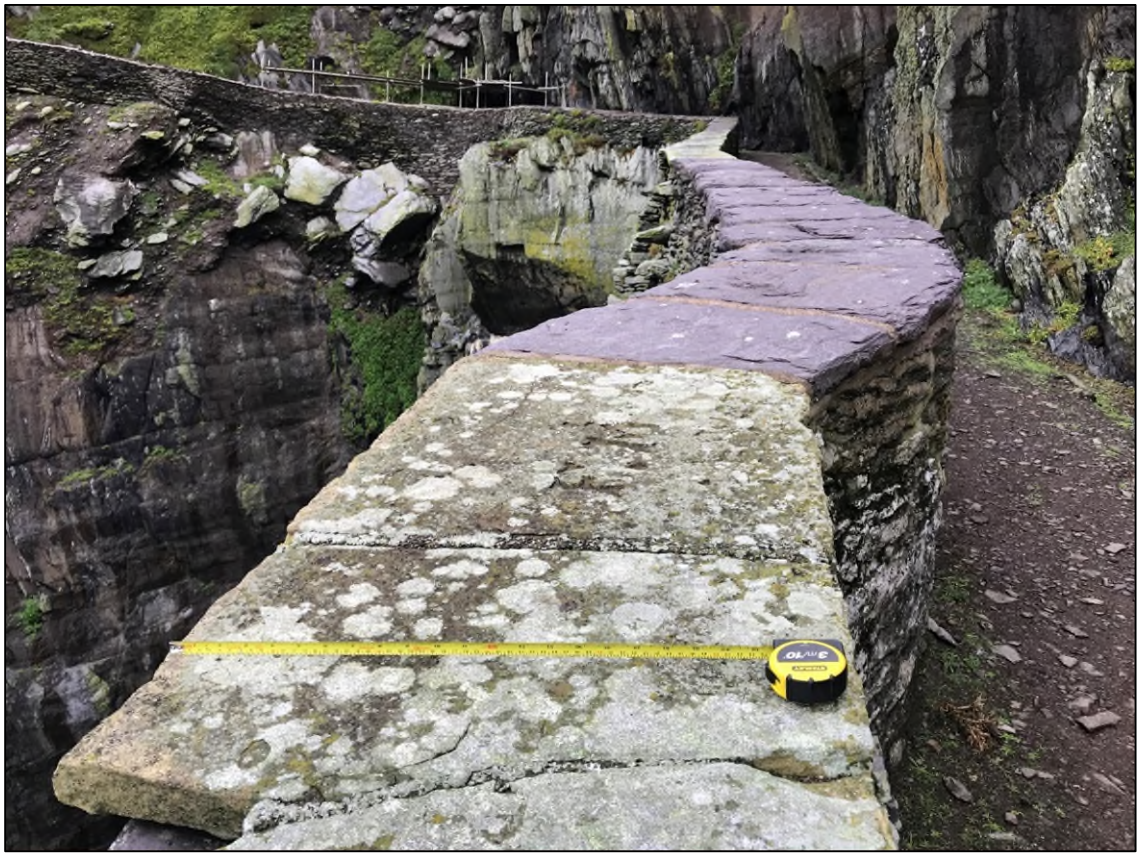
Photograph 6: Lower Lighthouse. Water Cistern Constructed From Valentia Slate.



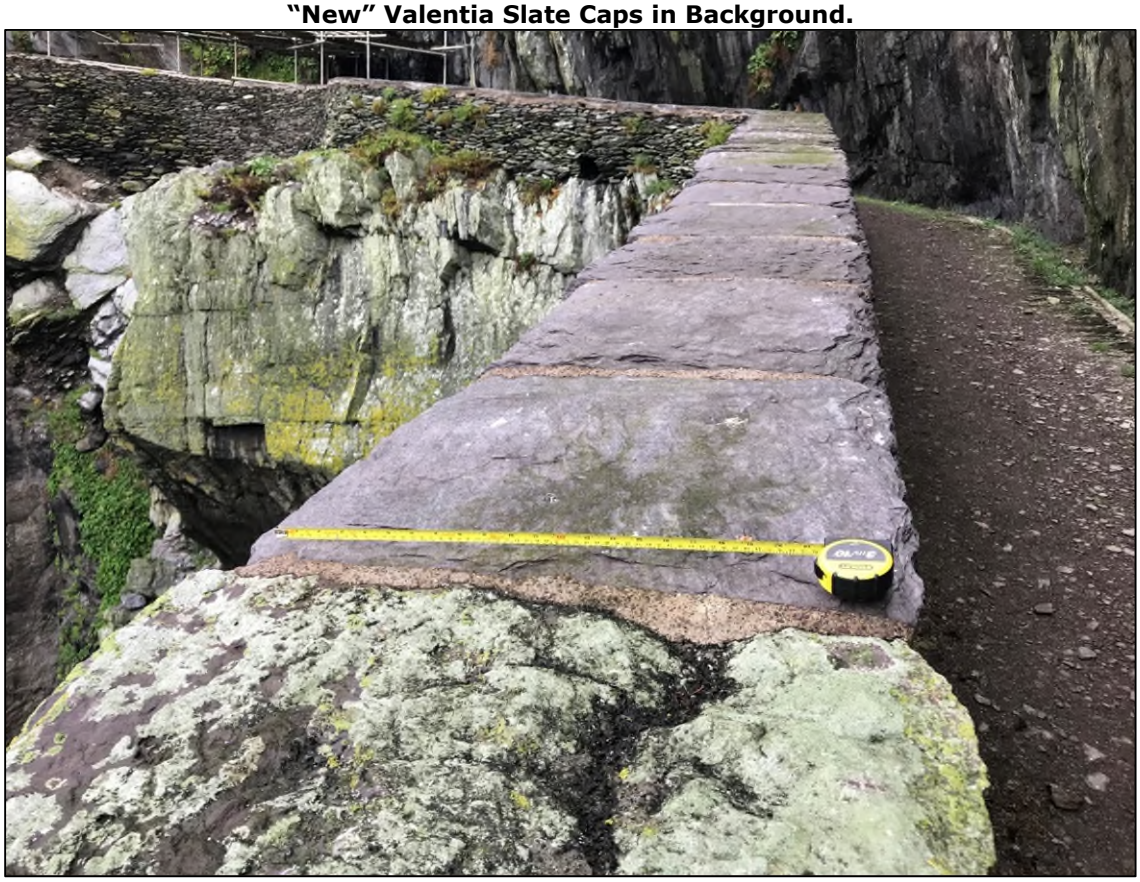
Photograph 7: Lower Lighthouse. Waste Chute to Seaward With Thick Yorkshire Flagstone Cap.



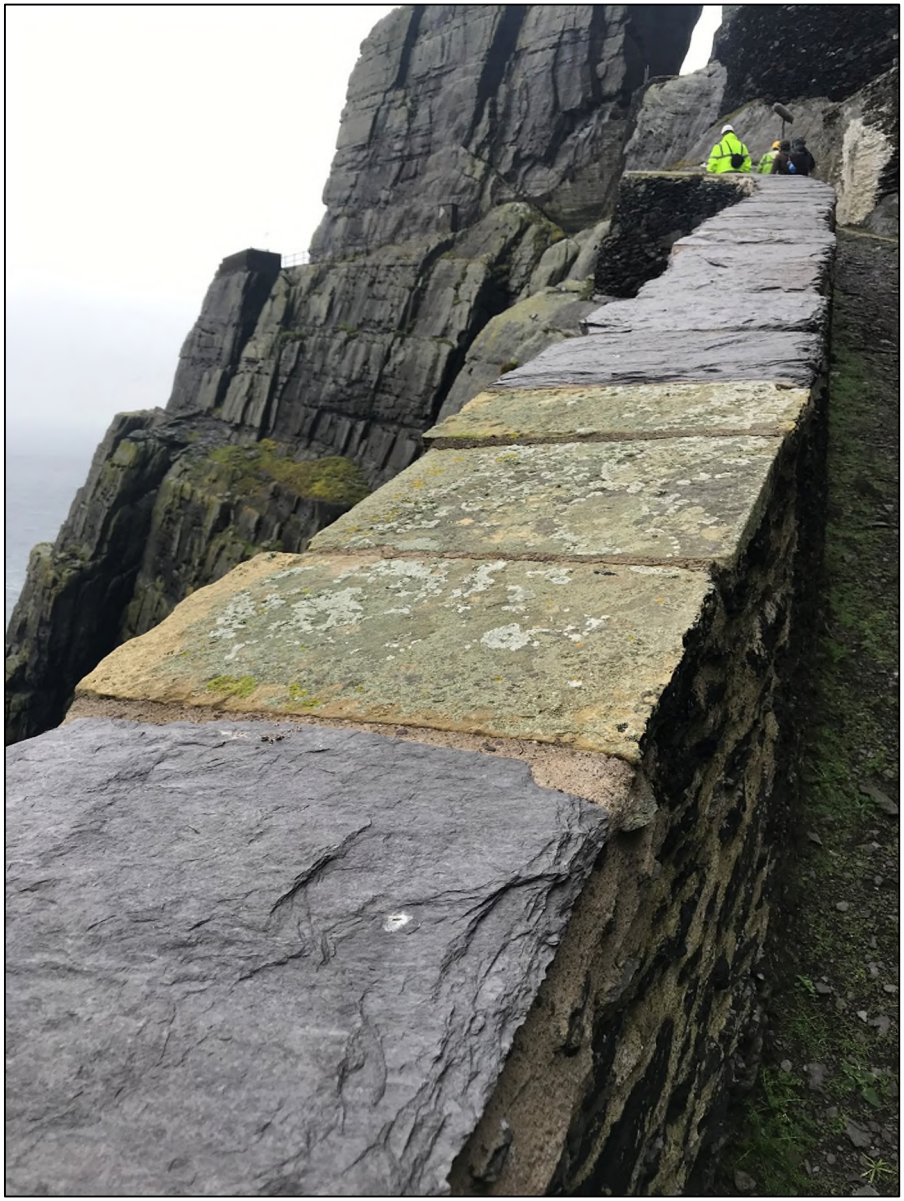
Photograph 8: Lower Lighthouse. Yorkshire Flagstone "Grill" at Surface Water Drainage Outlet.



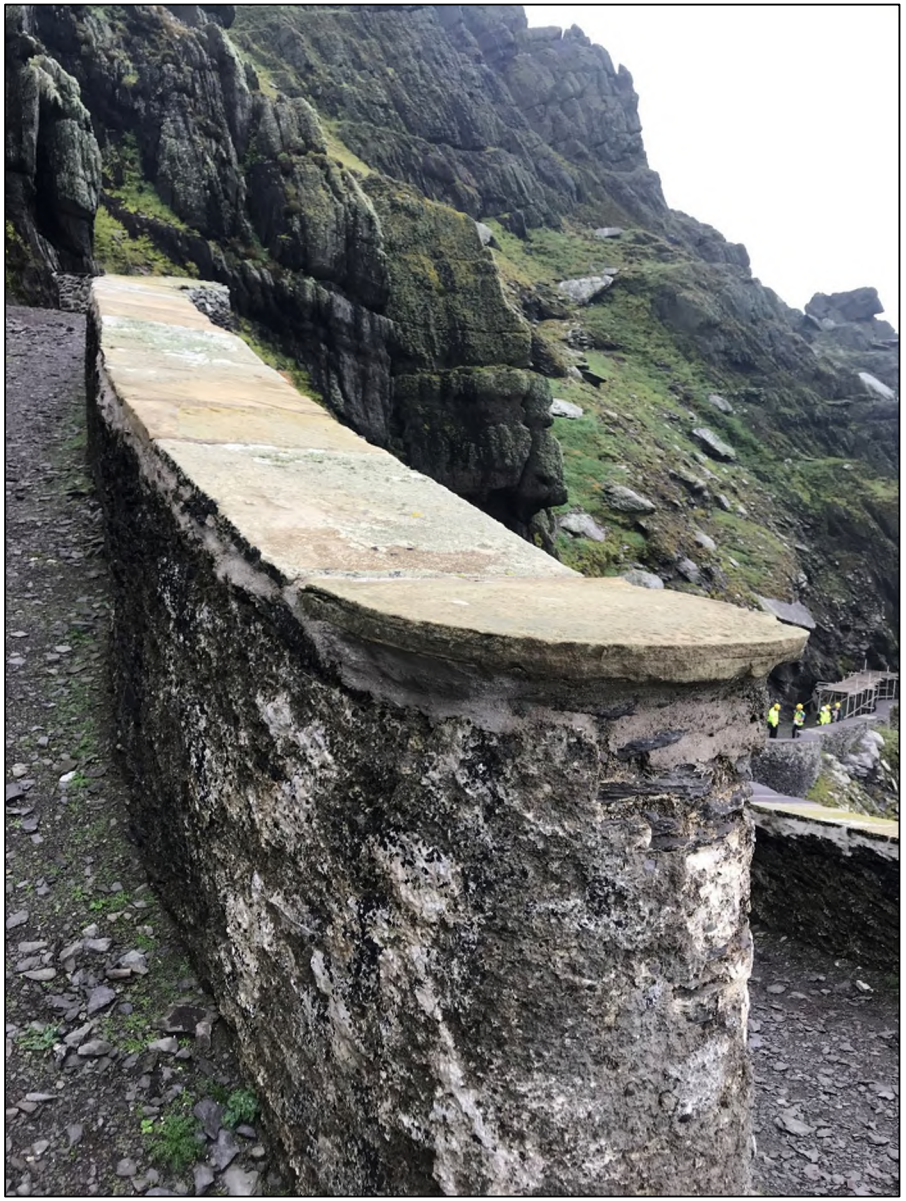
Photograph 9: Lighthouse Road Lower Section. Yorkshire Flagstone Cap in Foreground, "New" Valentia Slate Caps in Background.



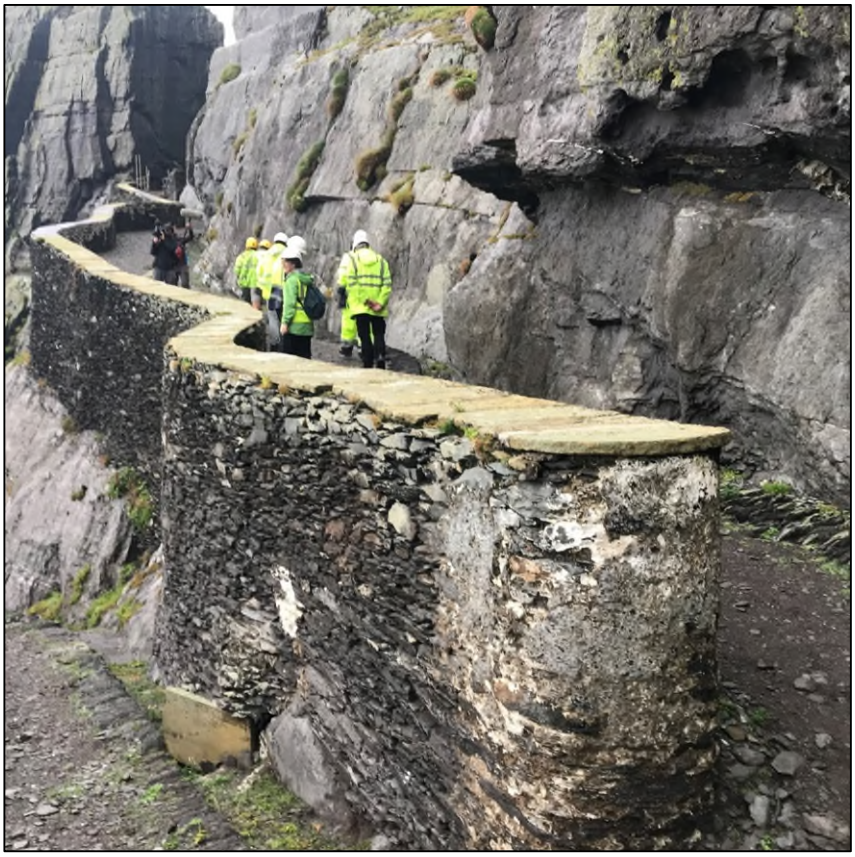
Photograph 10: Lighthouse Road Lower Section. "Old" Skellig Sandstone Cap in Foreground, "New" Valentia Slate Caps in Background.



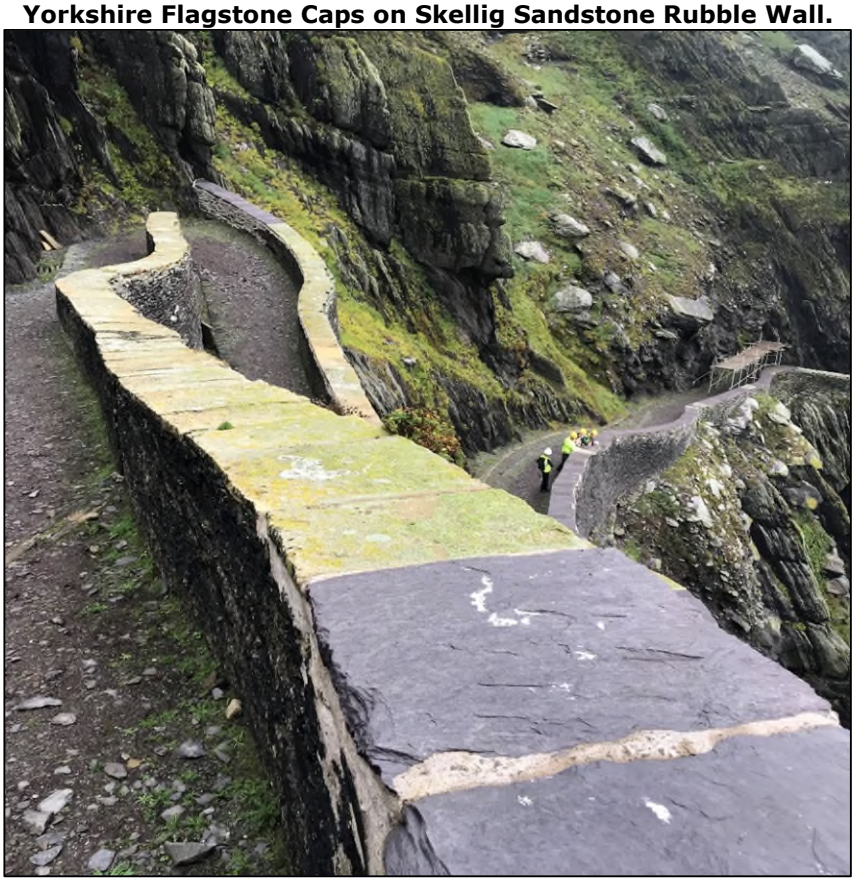
Photograph 11: Lighthouse Road Upper Section. Mix of "New" Valentia Slate and Yorkshire Flagstone Caps on Skellig Sandstone Rubble Wall.



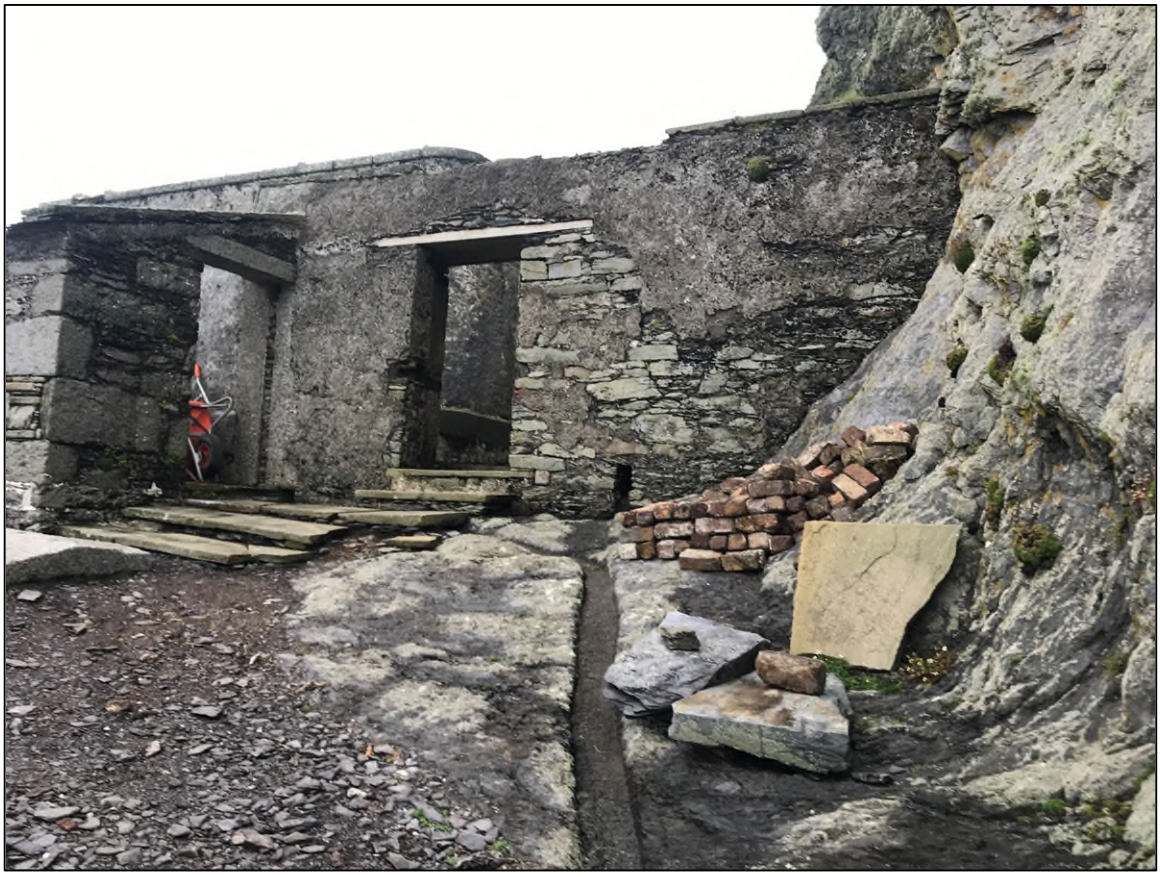
Photograph 12: Lighthouse Road Upper Section Dog-leg. Yorkshire Flagstone Caps on Skellig Sandstone Rubble Wall.



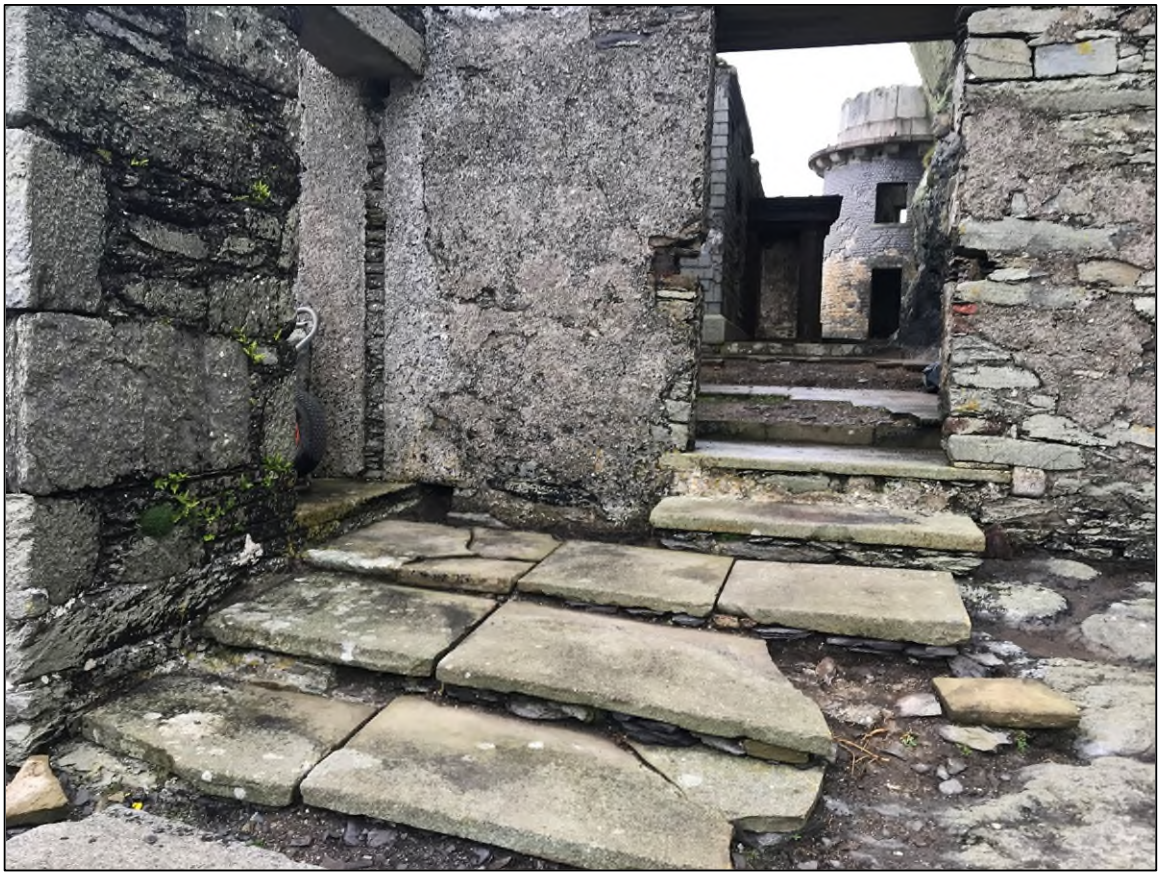
Photograph 13: Lighthouse Road Upper Section Dog-leg. Yorkshire Flagstone Caps on Skellig Sandstone Rubble Wall.



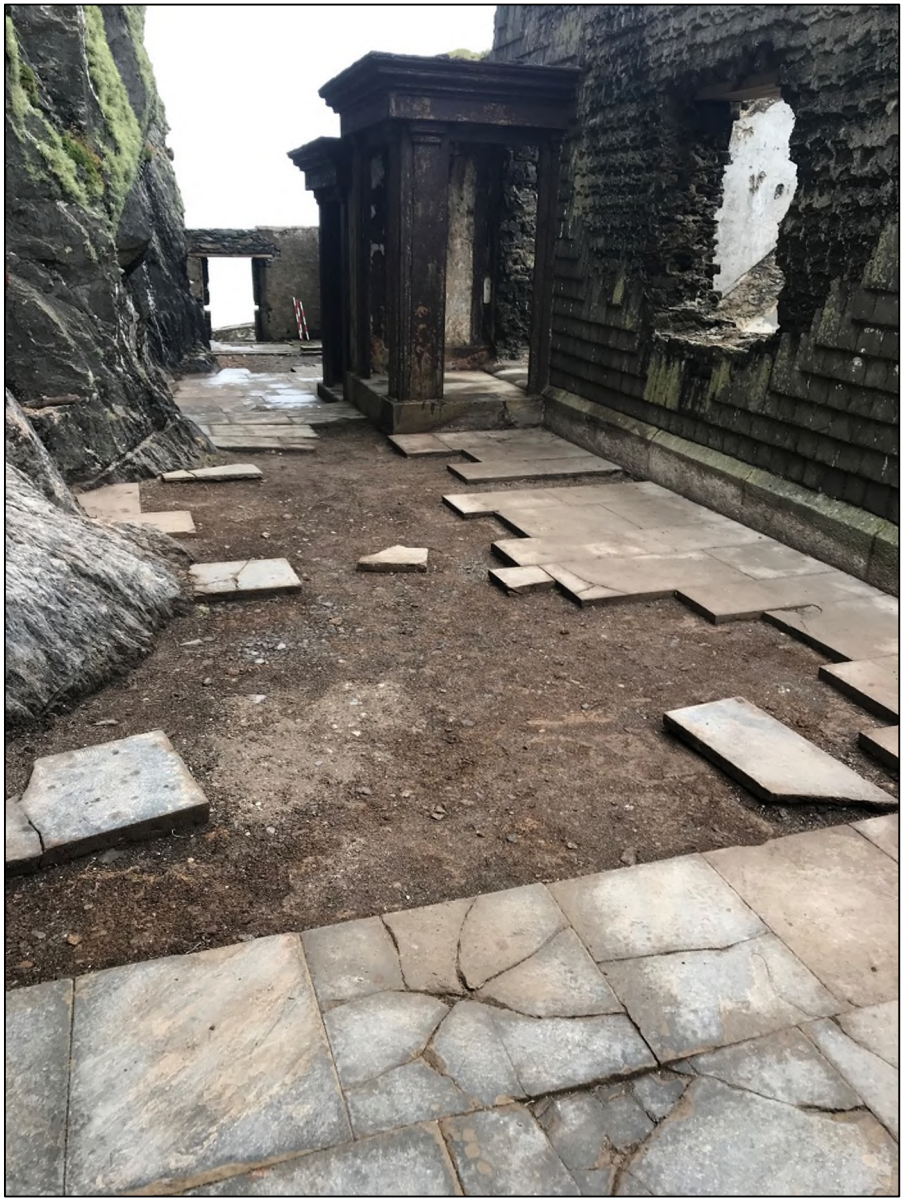
Photograph 14: Lighthouse Road Upper. Mix of Yorkshire Flagstone and "New" Valentia Slate Caps on Skellig Sandstone Rubble Wall.



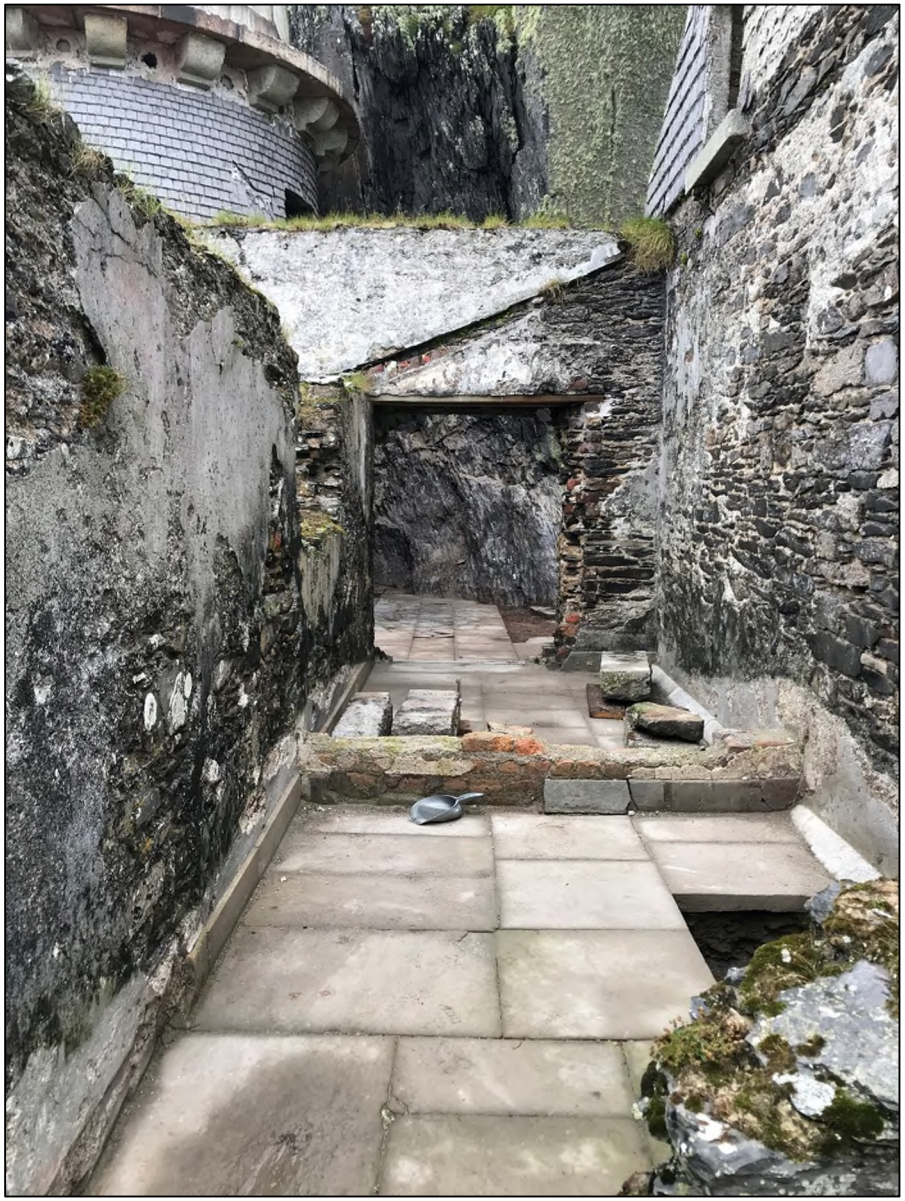
Photograph 15: Upper Lighthouse Entrance With Bedrock Surface Water Drainage Channel.



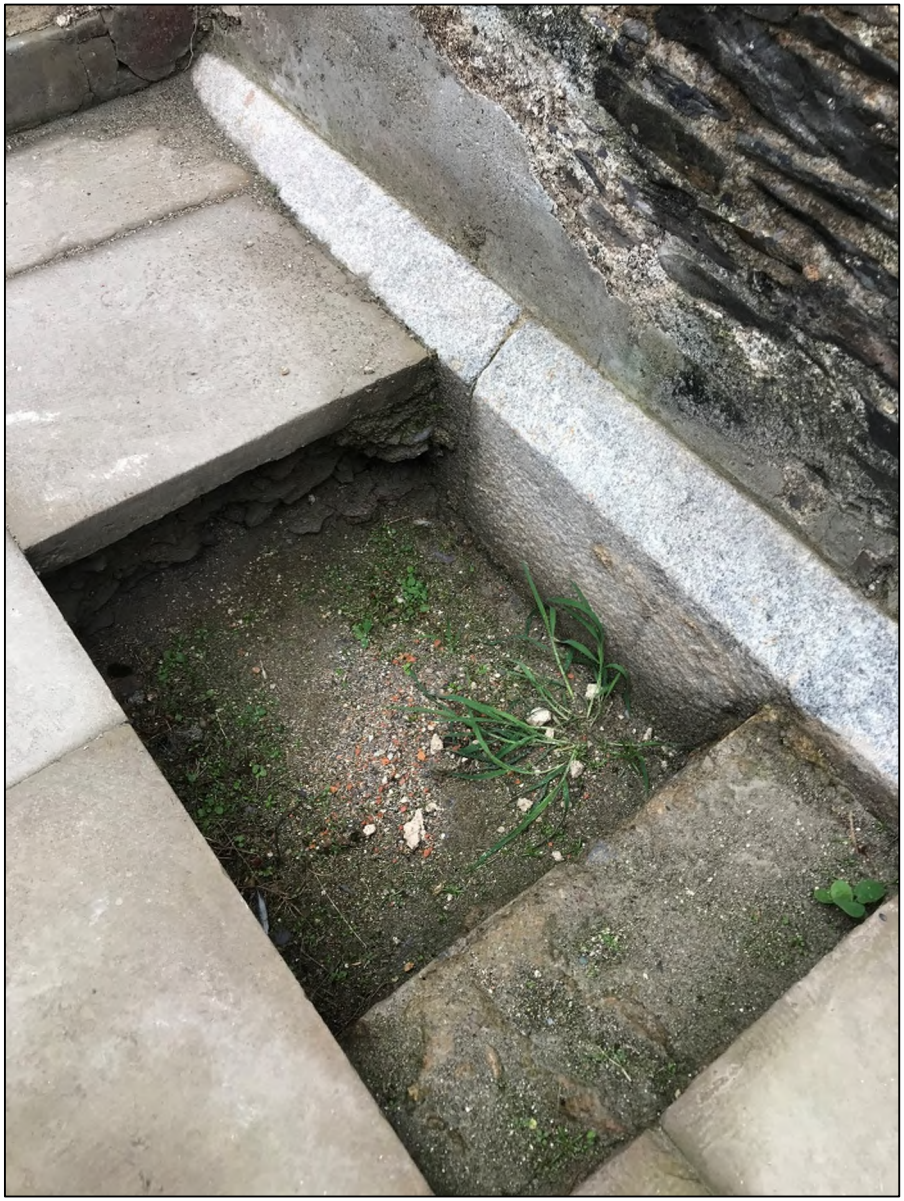
Photograph 16: Upper Lighthouse Entrance With Yorkshire Flagstone Steps.



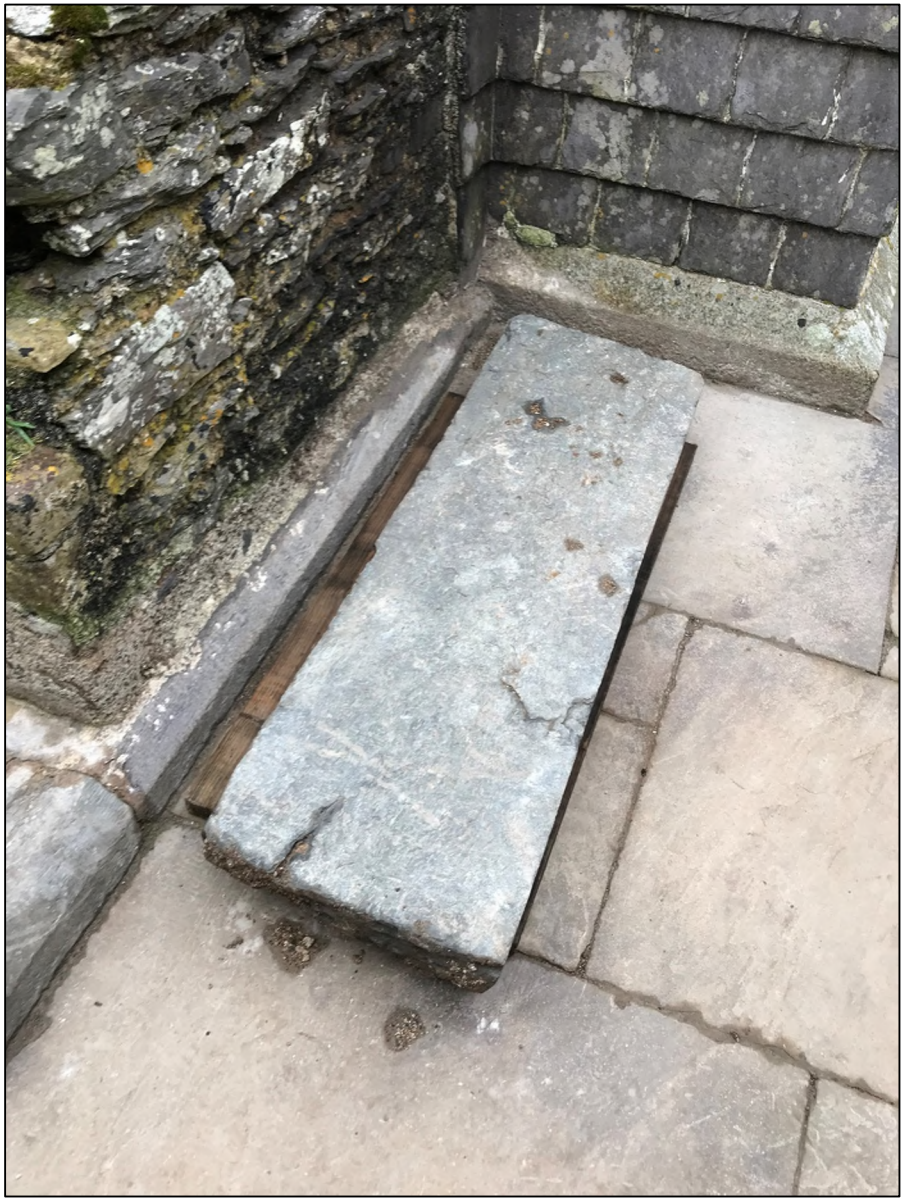
Photograph 17: Upper Lighthouse View to Southeast. Yorkshire Flagstone Setts in Front of Lighthouse Keepers' Cottages.



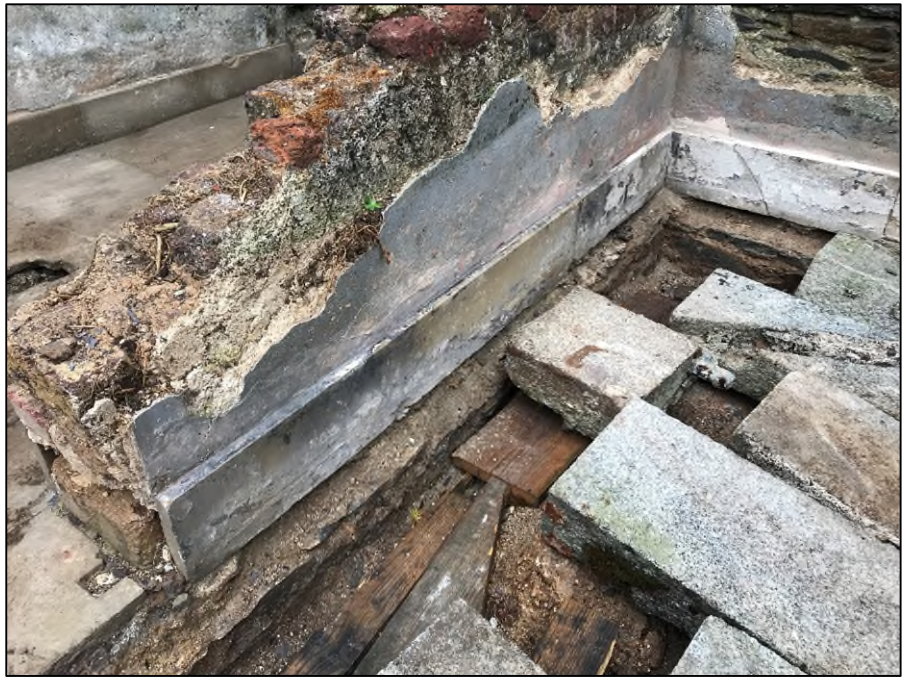
Photograph 18: Upper Lighthouse View to Northeast. Yorkshire Flagstone Setts in Extension to Lighthouse Keepers' Cottages.



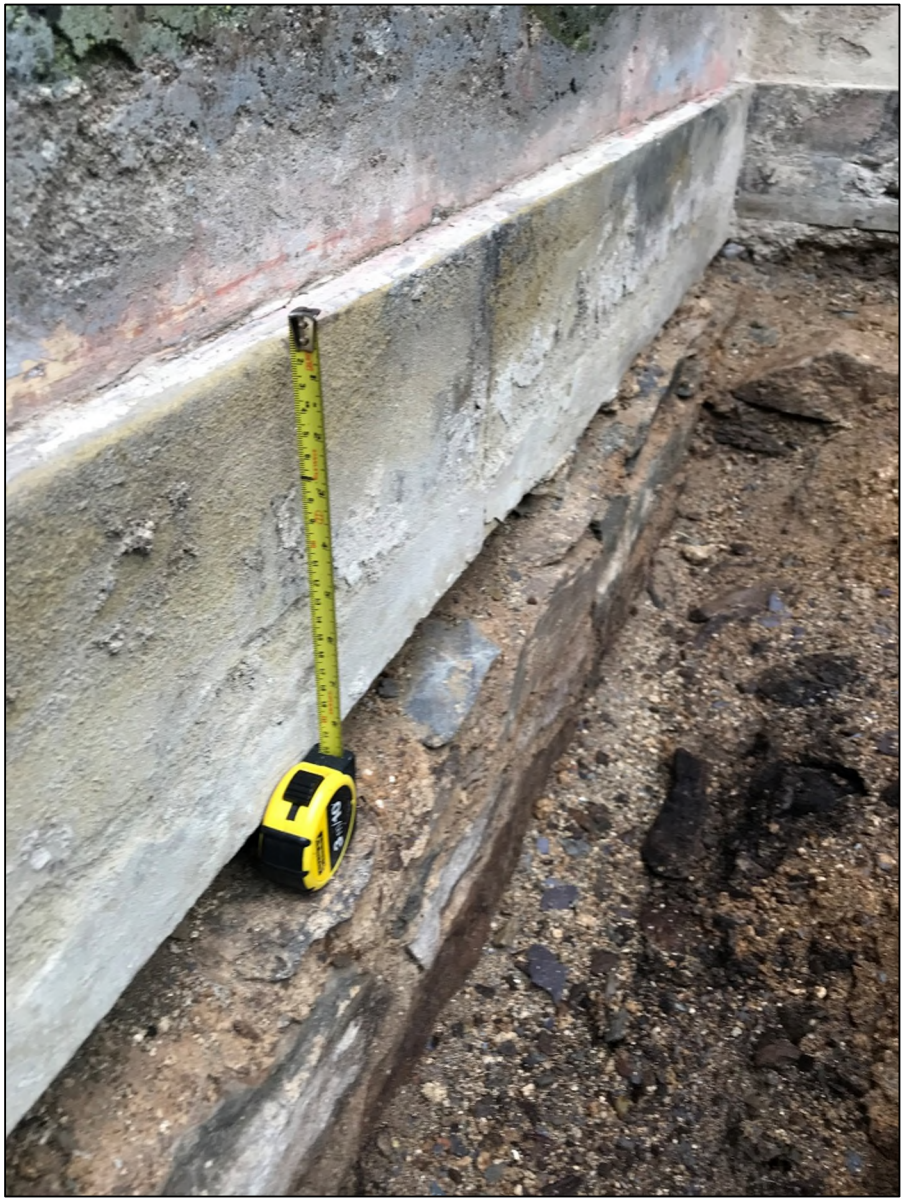
Photograph 19: Detail of Wicklow Granite Base Plinth to Lighthouse Keepers' Cottages.



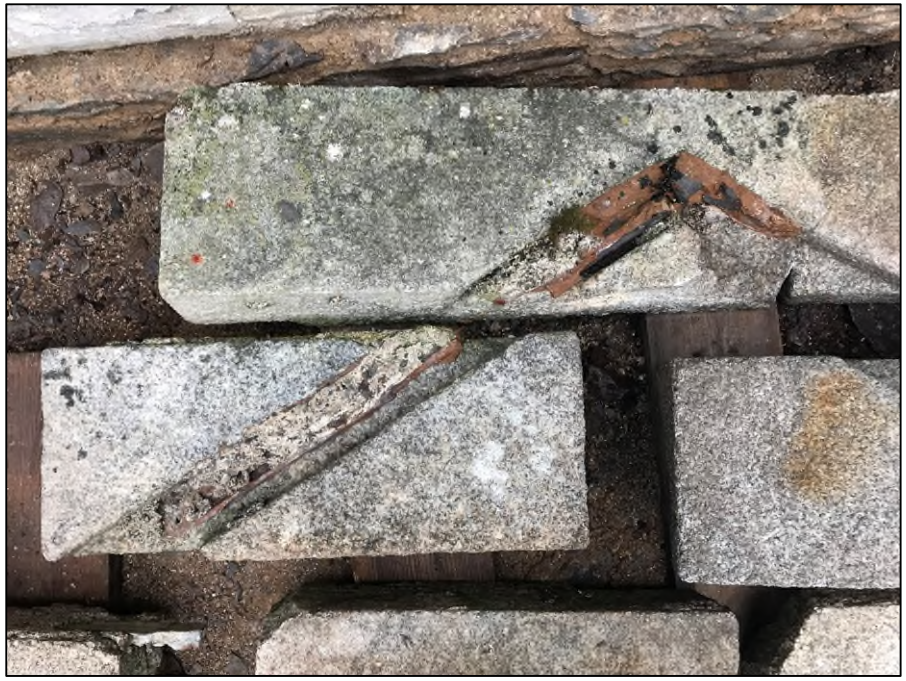
Photograph 20: Detail of Valentia Slate Base Plinth to Lighthouse Keepers' Cottages. Note Valentia Slate Plug.



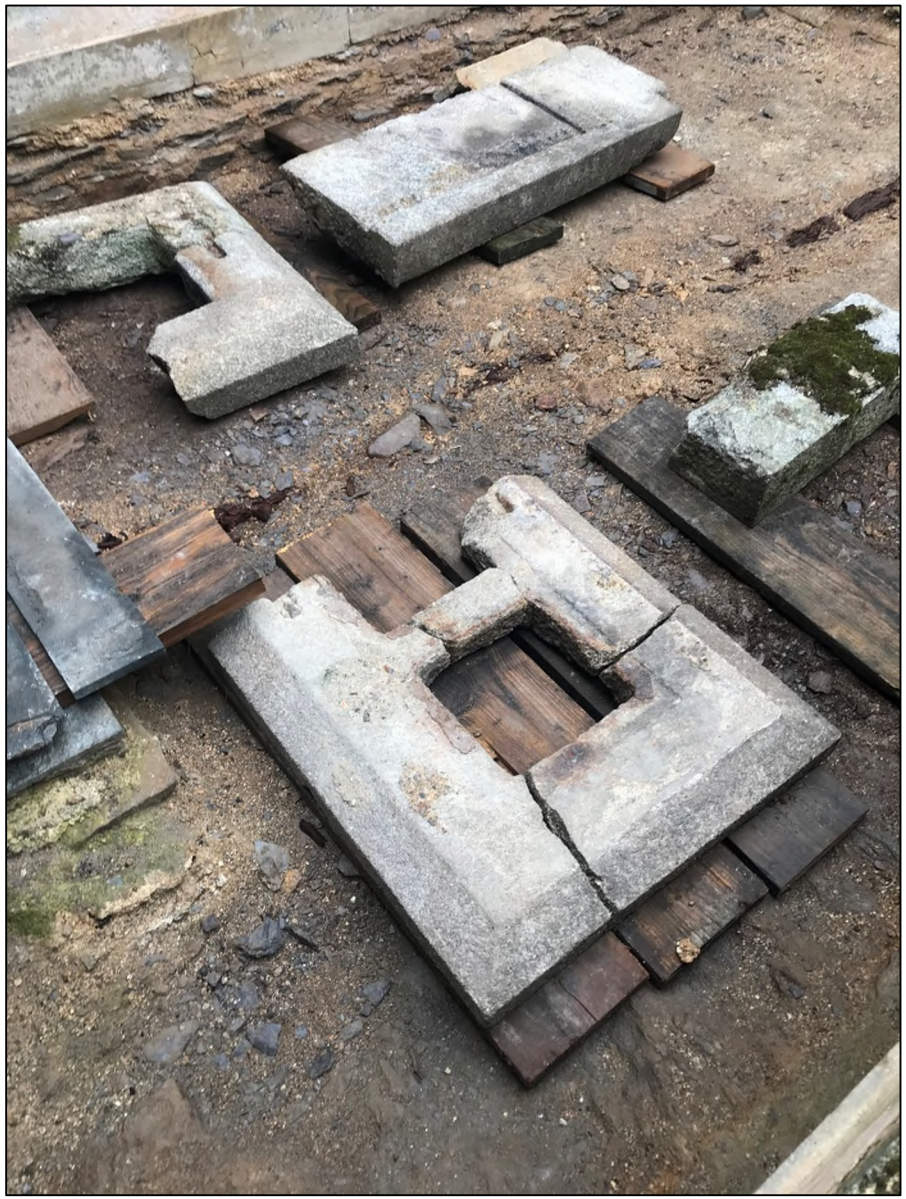
Photograph 21: Yorkshire Flagstone "Skirting Board" in Lighthouse Keepers' Cottages.



Photograph 22: Detail of Yorkshire Flagstone "Skirting Board" in Lighthouse Keepers' Cottages.

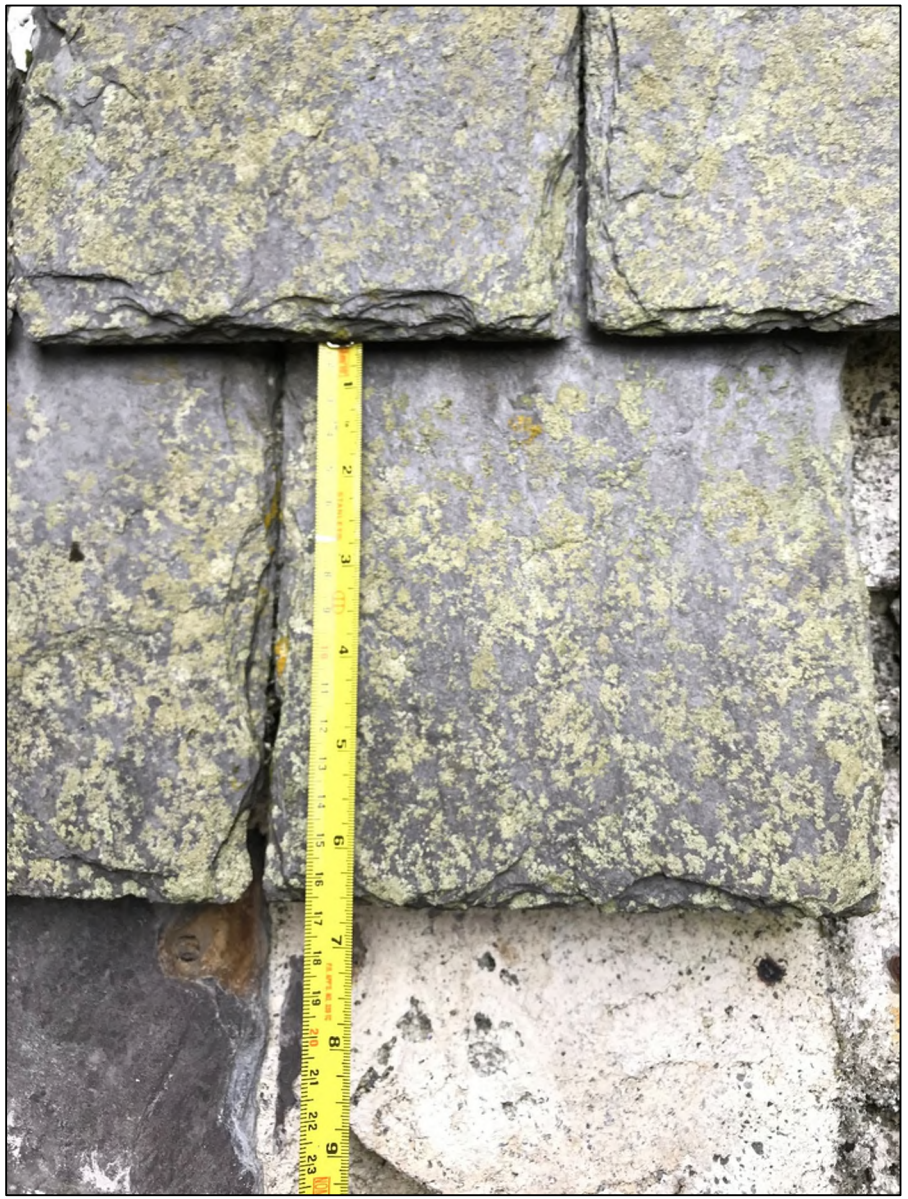


Photograph 23: Lighthouse Keepers' Cottages Roof Barge in Wicklow Granite Showing Outline of Roof Apex.

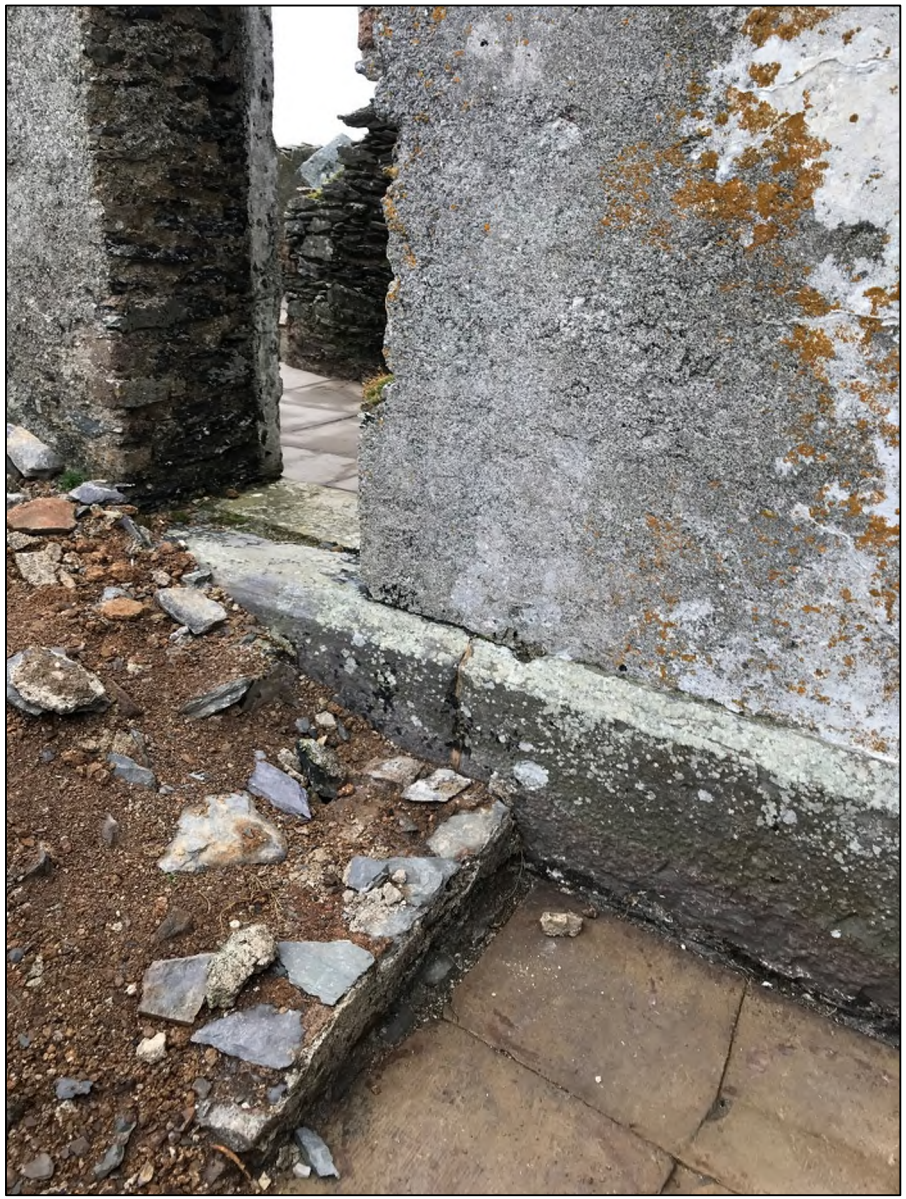


Photograph 24: Lighthouse Keepers' Cottages Chimney Basal Plinth in Wicklow Granite.

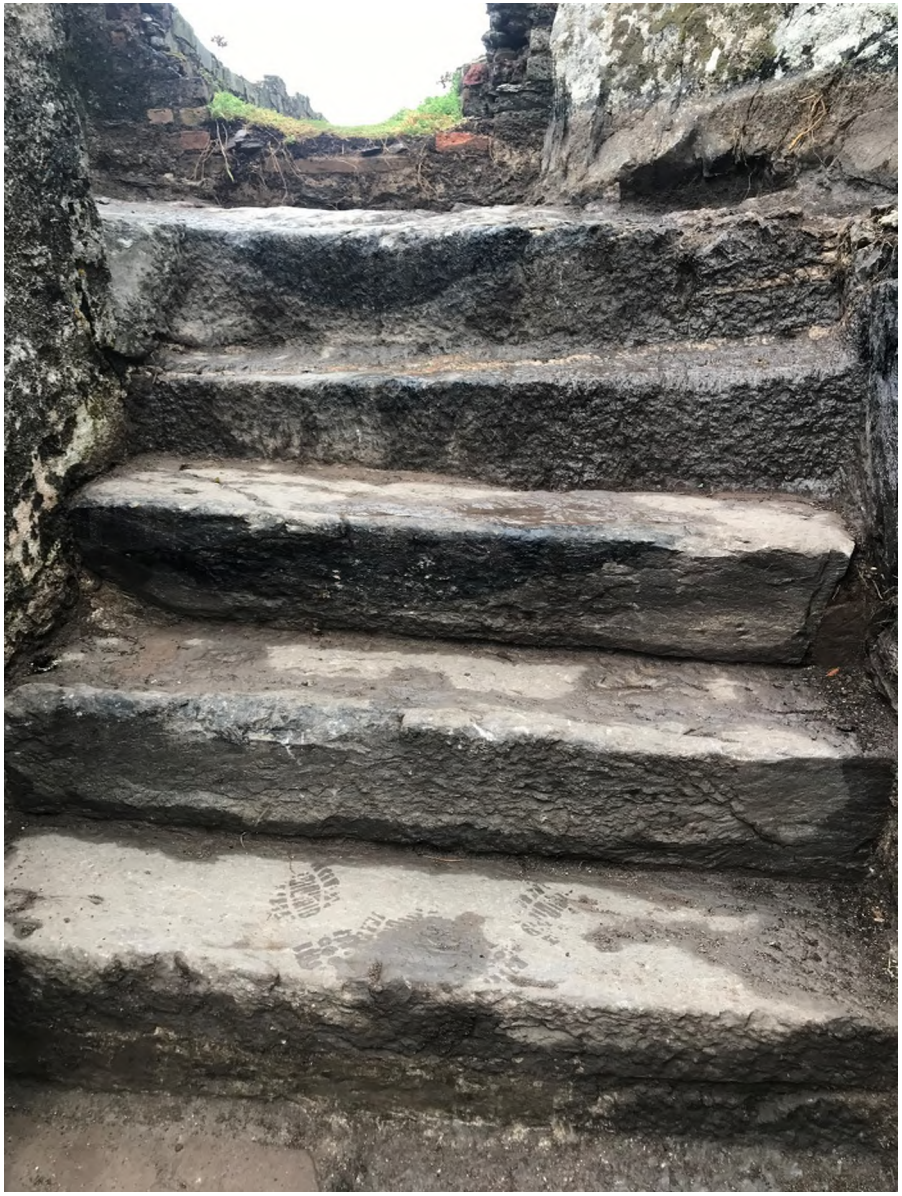
Photograph 25: Lighthouse Keepers' Cottages Cladded in Skellig (Silty) Sandstone.



Photograph 26: Lighthouse Keepers' Cottages Cladded in Valentia Slate.



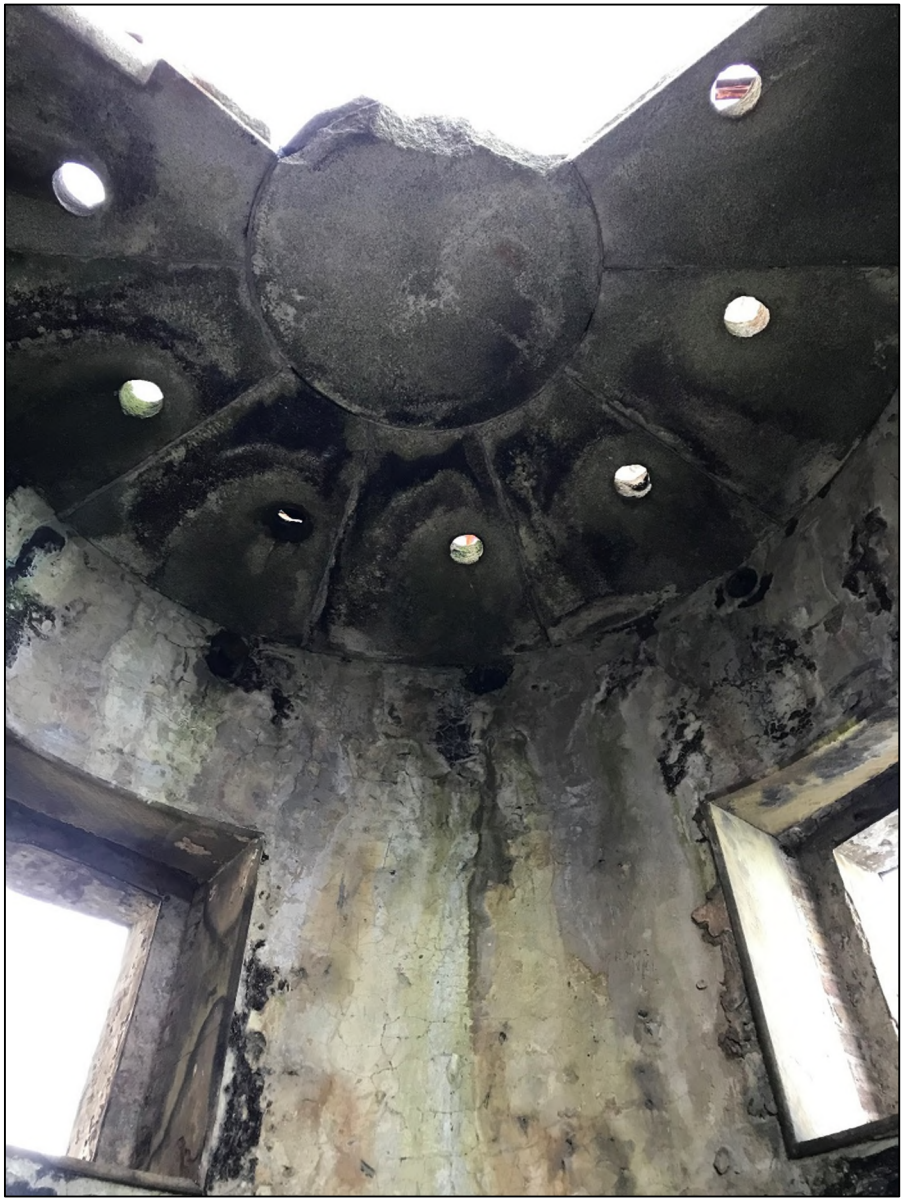
Photograph 27: Lighthouse Keepers' Cottages Base Plinth in Valentia Slate.



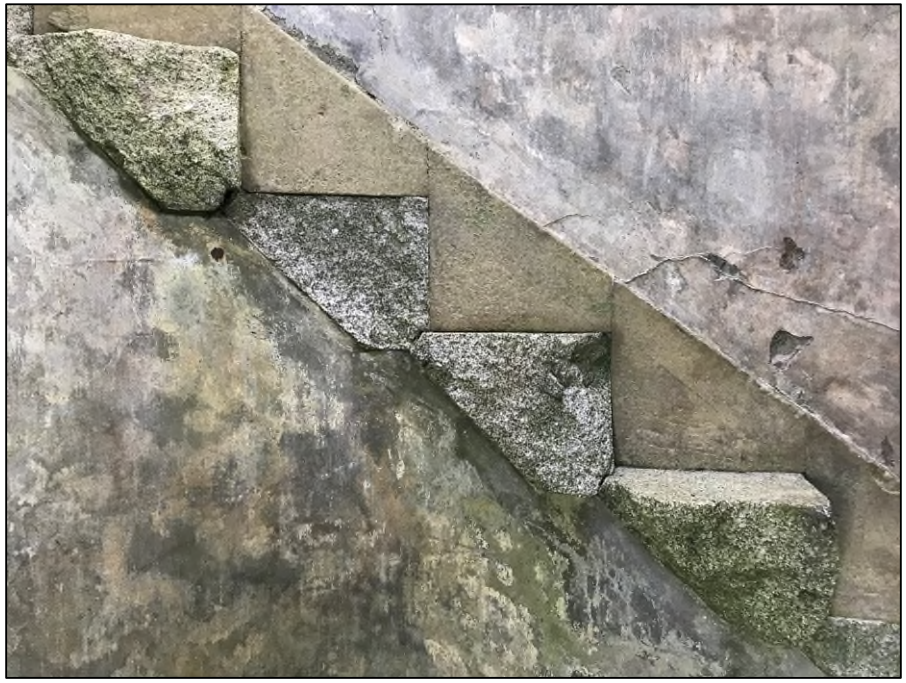
Photograph 28: Mix of Bedrock Cut Steps and Valentia Slate (?) Stone Steps to Northeast of Upper Lighthouse.

Photograph 29: Valentia Slate Cladding to Upper Lighthouse With Wicklow Granite Detailing to Sill and Upper Corbel Plinth.

Photograph 30: Valentia Slate Cladding to Upper Lighthouse With Wicklow Granite Detailing to Sill and Upper Corbel Plinth.



Photograph 31: Upper Lighthouse Wicklow Granite Corbel Plinth Roof with Yorkshire Flagstone Surrounds to Window Opes.



Photograph 32: Upper Lighthouse Wicklow Granite Cantilevered Steps.