

**Reconnaissance Report  
Geological Context of Rockfall  
Monday 13th June 2022  
Lower Lighthouse Road,  
Skellig Michael**



on behalf of  
the Office of Public Works

June 2022

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# **Reconnaissance Report**

## **Geological Context of Rockfall – Monday 13<sup>th</sup> June 2022**

### **Lower Lighthouse Road, Skellig Michael**

## **1.0 Introduction**

This reconnaissance report is based on a site visit to Skellig Michael on Friday, 17<sup>th</sup> June 2022 in the company of Fergus McCormick, senior architect, OPW, and Jack O'Leary, director, Malachy Walsh & Partners Consulting Engineers. The purpose of the visit was to examine the site of a recent rockfall on the lower lighthouse road which occurred on Monday, 13<sup>th</sup> June 2022 adjacent to Cross Cove (see Figure 1). The inspection occurred between 11:00-15:00. Conditions on the day were fair, and dry with moderate winds which did not impede access or inspection.

## **2.0 Location**

Skellig Michael is situated 11.6km west-northwest, 0.4km north from Bolus Head, Co. Kerry, at latitude 51°41'N and longitude 10°42'W. The island is 0.8km long, 0.4km wide, elongate NE-SW, and approximately 1.6ha in area. Two peaks, separated by a central high level col, dominate the Island. The col reaches to 130m asl while the northern and southern peaks rise to 183.5m and 214m asl respectively. The monastery site is located at 160 m asl on the Northern peak.

## **3.0 Geology**

The Old Red Sandstone (Devonian) sediments exposed on Skellig Michael were deposited in the alluvial and fluvial environments of the Munster Basin. The present outcrop pattern of the bedrock is due to subsequent structural deformation. This compression or folding of the rocks occurred during the Hercynian 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 10° to 070° east-northeast. Conjugate joint sets are generated symmetrically about this axis while an intensive cleavage fabric parallels the axis orientation.

## **4.0 Rockfall Site**

### **4.1 Geology**

The geology at the fall site comprises a thick sequence of interbedded sandstones and siltstones, lithostratigraphically correlated with the onshore St. Finan's Sandstone Formation. A thick (>50m) volcanic sequence of pyroclastic lithic and welded tuffs interrupt the exposure midway on the rock slope between Cross Cove and the monastic site on the north peak (see Photograph 1).

### **4.2 Superficial Features**

High above the fall site (c. 50-100m) two distinct rock scree zones may be identified (see Photograph 1). An upper scree zone comprising "cleavage slabs" upwards of 5m x 5m (estimate) in size approximately aligned on the upper boundary of the exposed tuffs, and a lower zone also comprising "cleavage slabs" up to c. 2m x 2m (estimate) in size (see Photograph 1). The dominant superficial

feature immediately above the fall site (<50m) is that of a number of cross cutting joint planes, striking 130°-140° and dipping 65°-80° to the east. At least four such joint plane zones are identifiable as vegetation filled gullies immediately adjacent to the lower lighthouse road to the east of the protective canopy at Cross Cove (see Photographs 1 to 5). The gullies at this location allow for rockfalls directly on to the lower lighthouse road.

### 4.3 Rockfall

The particular rockfall of Monday, 13<sup>th</sup> June at this site largely comprised a single rock 0.5m x 0.5m x 0.2m of interbedded sandy siltstone. The rock displayed conspicuous weathering on both its principal faces (see Photographs 6 and 7). From observation it appears that the rock originated c. 20m above the lower lighthouse road and was dislodged by bird action (burrowing/perching).

## 5.0 Rockfall Potential

Skellig Michael is an isolated rock precipice situated in the Atlantic subject to the highly erosive effects of wind, rain and temperature fluctuation. Rockfalls are a characteristic feature of the island and may occur at any location at any time.

With regard to the potential for rockfall in the narrow and very specific area between the pier at Blindman's Cove and the rock canopy at Cross Cove, the reconnaissance inspection allowed for the identification of most, moderate and least rockfall potential zones (see Figure 1), viz:

- A. Most Potential: Joint plane exposed zone with associated scree slopes.
- B. Moderate Potential: Narrow road zone adjacent to the landing at Blindman's Cove with cleavage rock faces above.
- C. Least Potential: Nineteenth century rock blasted zone between Zones A and B.

For clarity and avoidance of doubt this is a relative and not absolute assessment. Equally, a least potential assessment does not connote the absence of the potential for a rockfall. The nature and timing of prospective interventions to protect these areas are not considered in this geological report.

Michael O'Sullivan  
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Sunday, 19<sup>th</sup> June 2022



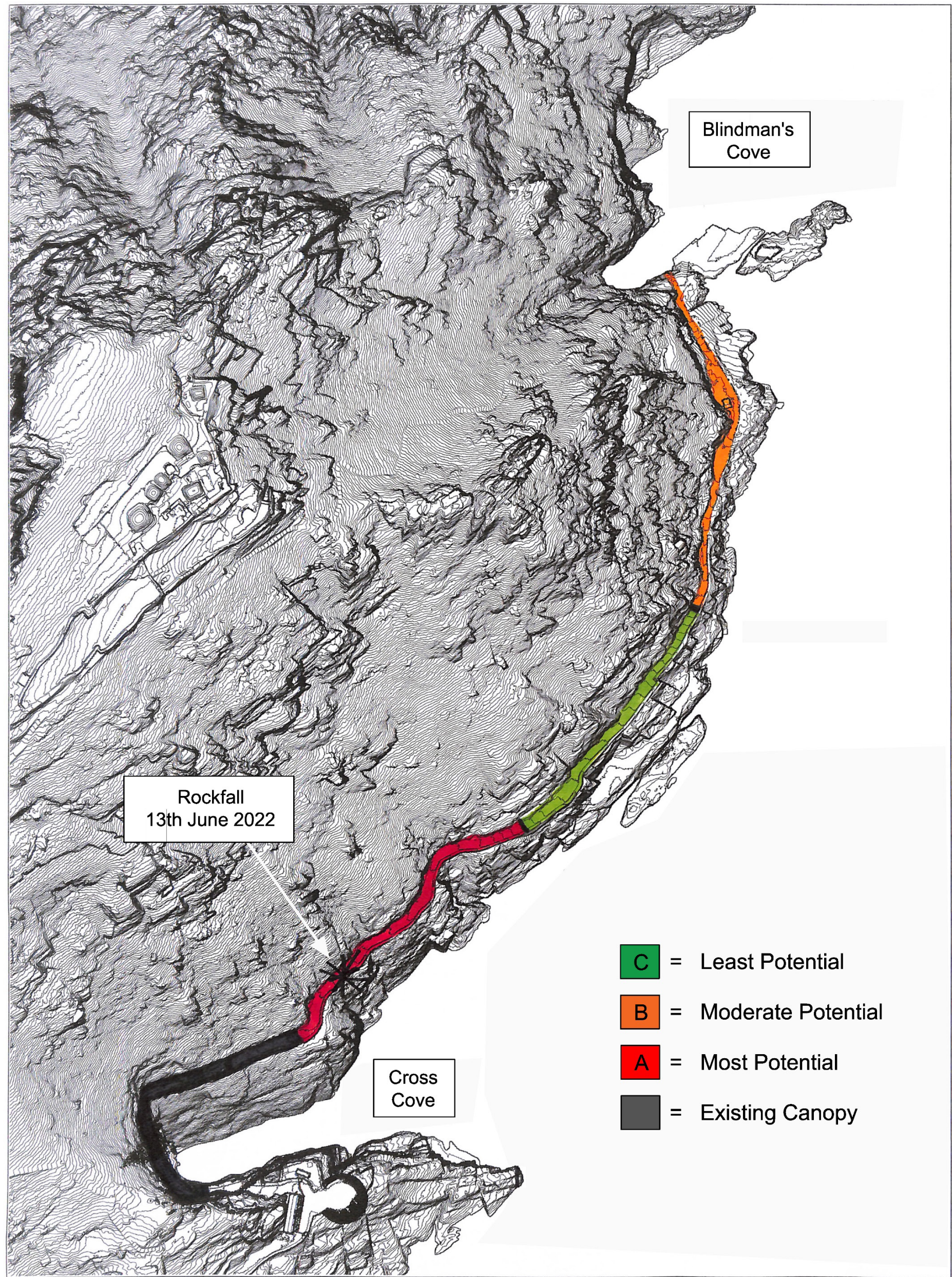


Figure 1. Potential for Rockfall: Lower Lighthouse Road – “Relative” Assessment.





**Photograph 1. Geological Context of Rockfall Site.**





**Photograph 2. Joint Plane Zone 1 (for location see Photograph 1).**





**Photograph 3. Joint Plane Zone 2 c. 20m east of Joint Plane Zone 1. The rockfall of 13<sup>th</sup> June occurred c. 7m to the west of this location (for location see Photograph 1).**





**Photograph 4. Joint Plane Zone 3 (for location see Photograph 1). This zone c. 40m from Joint Plane Zone 2.**





**Photograph 5. Joint Plane Zone 4 (for location see Photograph 1). This zone c. 10m from Joint Plane Zone 3.**





**Photograph 6. Rockfall – Face 1.**





**Photograph 7. Rockfall – Face 2.**

*13th June 2022, Lower Lighthouse Road*