Archaeological Impact and Mitigation Strategy for the installation of Three Crash Decks, Lighthouse Roadway, Skellig Michael, Co. Kerry

Ministerial Consent C0001053, Excavation license no. E005336 & detection license no. R000560

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Introduction

Three steel and aluminium crash decks / canopies are to be installed, one on the lower lighthouse roadway and two on the upper lighthouse roadway in areas that are prone to stonefall because of their geological structure (fig. 1).

The lighthouse roadway on Skellig Michael was built between 1821 and 1825. It is an important archaeological and historical structure and retains most of its original features. The most significant archaeological features of the roadway are:

-its supporting parapet wall;
-the vertically-set stone edging on the internal side of the roadway;
-the vertically-set stone-floored lateral drain between the inner edging and the rising cliff;
-the stone lined and grilled shores in the lateral drain;
-the transverse stone-lined surface and subsurface drains in and under the roadway;
-1914-era moulded and lidded, concrete cable channel on the upper lighthouse roadway leading up the fog station;
-a mass concrete-walled 'pond' in the area of Crash Deck 1.

General Archaeological Impact

The planned crash decks will have a major impact on the original and surviving features (road edging, lateral drain and cable channel) on the inner side of the roadway, and will require their removal before construction and their reinstatement afterwards.

The parts of the trenches to be dug into the road surface itself will generally have little impact as they will be excavated through its loose clay and stone fill .

There is one original 1820s subsurface drain in the area of Crash Deck 3 which is a vital part of the drainage system on the roadway. Any part of this drain to be disturbed will have to be archaeologically recorded, removed by hand under archaeological supervision and the drain will have to be fully reinstated in its original position and at its original level to maintain the drainage system.

No excavation, ground disturbance or interference with any archaeological features must be undertaken without the presence of or express permission of the archaeologist. Adequate advance notice must be given to the archaeologist of any works to be undertaken which might have a potential archaeological impact. All the persons undertaking the proposed works must be made aware of and must agree to be bound by these requirements and by all the specific details described below.

Specific Impact on Archaeological features

Archaeological features present on the three areas of the roadway where the crash decks are to be installed will be impacted by the proposed construction.

Crash Deck 1- (fig. 2). Lower lighthouse roadway, beside men's huts. Not archaeologically excavated and recorded. Fallen material from a recent sweep is obscuring the archaeological features will have to be removed to reveal the underlying archaeological features and the area will have to be planned and recorded archaeologically before construction begins

The foundations for the beam on the inner side of the roadway will be cut through the vertically set stone floor of the lateral drain. Two of the cross beams will cut through the edging on the inner side of the roadway and the third will cut through the concrete wall of the 'pond'. The inner end of the first beam (as marked by a blue pained rebar on site) and the line of the inner beam at the back of the first bay appears to lie to far towards the cliff face and would require removal of a substantial part of the cliff face above modern ground level. This would be unacceptable and so the lines of theses beams will have to be altered to avoid this impact

Crash Deck 2- (fig. 3). Second corner on upper lighthouse roadway Archaeologically excavated, recorded and planned at a scale of 1:20 or 1:50 in 2018-19. Fallen material from a recent sweep and from several years of build-up which is obscuring the archaeological features will have to be removed to reveal the underlying archaeological features before construction begins

The construction of the inner beams will require the removal of the cable channel and the lateral drain and will also require the removal of parts of the inner road edging. The inner ends of the beams crossing the road wall all require the removal of sections of the road edging, lateral drain and cable channel.

Crash Deck 3- (fig. 4). Above the fourth corner (known as *Eliza's Corner*) on the upper lighthouse roadway. Archaeologically excavated, recorded and planned at a scale of 1:20 or 1:50 in 2018-19. Fallen material from several years of build-up which is obscuring the archaeological feature will have to be removed to reveal the underlying archaeological features before construction begins

A number of the proposed beams on the inner side of the roadway on the earlier plans have been dispensed with and so will lessen the impact of the proposed works on the inner side of the roadway .

Working uphill, the foundations for the first longitudinal inner beam will require the removal of a length of the cable channel, the base of the lateral drain and possibly part of the inner road edging.

The next two inner beams have been omitted and the third will remove only a short section of cable channel and lateral drain flooring.

The fourth and fifth original rear beams have also been omitted. These would have had an unacceptable impact on the stone shore (one of only two of this type which survive).

The beams crossing the road will also impact at their inner ends on the road edging, cable channel and lateral drain. The second last from the top in its original placement would have required the removal of the shore referred to above which would have un unacceptable. Following discussion it is possible to move this beam 1m uphill, which would mean it had no impact on the shore.

Only one each of the front and central longitudinal beams will have an archaeological impact. These are the two beams in the second last bay from the top of the canopy which will

intersect the line of a subsurface drain running from the stone shore mentioned above to and through the parapet wall. This drain takes away all the water from a steep and c 50m length of the roadway and so is of vital importance. The beams crossing its line cannot block it and must be installed either fully beneath it or fully above it.

The level of the drain beneath the roadway is not known and a test trench will have to be excavated to reveal the drain and the drain will have to be archaeologically recorded before construction work begins.

Strategy and Methodology to Mitigate Impact

The sections of the road edging, the floor of the lateral drain and any lengths of the cable channel, to be removed will have to be carefully removed by hand under strict archaeological supervision. It may be necessary to remove all of the base of the lateral drain in the area of some of the beams on the inner side of the roadway as once part of it is removed the remainder is vulnerable and likely to collapse into the excavated trenches.

The cable channel is composed of old and poor quality moulded concrete and will have to be cut into sections using a con saw and each section will have to be carefully removed supported on a plank, and safely and securely stored so that it can be reinstated.

The concrete wall of the 'pond' in the Area of Crash Deck 1 will have to be cut by consaw to facilitate the construction of a cross beam.

The level of the drain beneath the roadway in the Area of Crash Deck 3 is not known. It is proposed that a test trench should be excavated along the line of the drain to reveal the level of its top and base, which will also need to be archaeologically recorded. Depending on the level of the drain the level of the proposed beams crossing it may have to be altered. This may affect the length of the uprights supported on these beams. If the proposed beams lie above the drain then a waterproof barrier will be required in the base of their foundations to prevent any concrete entering the drain. If the beams will lie below the drain then the stones of the drain will have to be planned fully, numbered where appropriate, removed by hand and securely stored so the drain can be reconstructed after construction is complete.

Any and all parts of any features removed before or during construction will have to be carefully stored, separate from other materials. After construction as much as possible of the original features will have to be reinstated in the position in which they originally lay by suitably qualified persons.

Other Potential Impacts and their Mitigation

Access route through Lower Lighthouse

The rendered concrete block walls on the left after entering the lighthouse complex stand on the original chamfered stone footing of the 1820s general store which is an archaeological feature and so will require ministerial consent to remove. A section of the corner of the concrete block part of the wall above it was removed and the ground level was raised here with spoil to facilitate transport of steel for Crash Decks 2 and 3 around this tight corner. If the access ramp is to be extended to make it less steep then it will lie on original sandstone paving which must be protected beforehand.

Much of the area in front of the dwellings and lighthouse of the lower station is paved with the original 1820s, yellow, Yorkshire sandstone flags. The route up to Crash Decks 2 and

3 crosses this area. The paving is vulnerable and must be suitably covered if loaded vehicles are to be driven across it or if there is to be a lot of traffic across it. The cover should consist of a cushioning material (that will not scratch or mark the paving) covered by a sheeting that will bear the weight of the traffic without moving around.

Mechanical Excavators

It is a standard policy on archaeological sites that all mechanical excavation must only be undertaken using untoothed buckets unless ripping rock, tarmac or concrete slabs. This is because the teeth can dig into and disturb something before it can be seen. For this reason mechanical excavators on Skellig must only be used with toothless buckets unless they are ripping bedrock.

Construction trenches

The stone edging of the inner side of the road, the lateral drain between it and the rising cliff and the 1914-era cable channel near the rising cliff are all important archaeological features and will be vulnerable during construction.

As a result construction trenches that cut through these features must be kept to the absolute minimum size required and the edges protected to ensure parts of these features outside the trenches do not collapse into the trenches.

The Cable Channel

Mechanical excavators, dumpers, forklifts etc. must avoid driving on and no material can be placed on the concrete 1914-era concrete cable channel as it is very vulnerable to damage. Spoil is to be deposited outside and inside the north gate to the lower lighthouse where the cable channel is present and it must be protected here if machinery is going to drive across it. Placing scaffold planks over it would suffice.

Spoil

Excavated spoil is to be stored on the roadways as it cannot be disposed off until after the end of the nesting season. It must not block the lateral drain on the inner side of the roadway. It should be placed on the outer side of the roadway but not heaped against the parapet wall. Sufficient space must be left on the inner side of the spoil to allow safe foot passage.

Mixing and pouring of concrete

There must be no spillage of concrete onto adjoining archaeological features at any stage during the construction. A waterproof barrier will have to be installed where the foundation trenches lie adjacent to the parapet wall of the roadway or where they cross or underlie drains to prevent any leakage of concrete into these structures.

Cement waste

The water used to rinse concrete mixers, machine buckets, shovels etc. will contain cement which will harden with time. Therefore this water cannot be disposed over the cliff nor can it be dumped on the roadway. It will have to poured into suitable containers that can be sealed and removed off the island by boat.

Figures

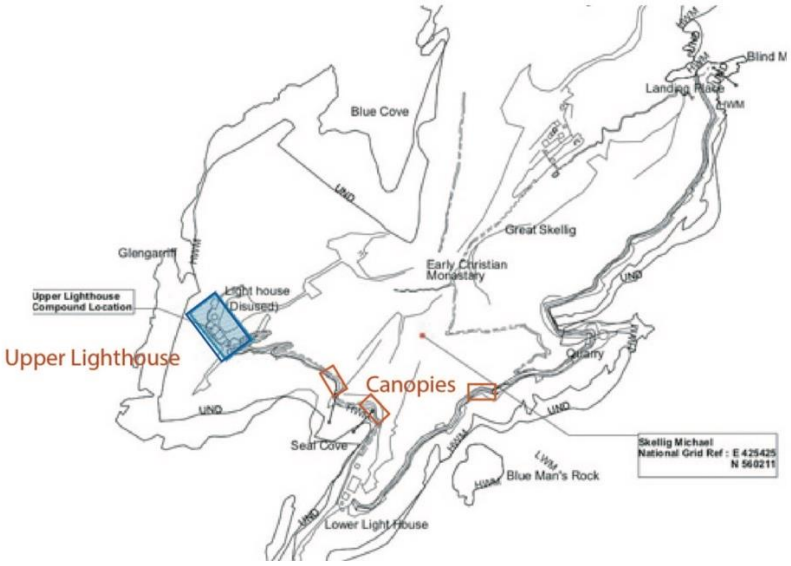

Fig. 1 Location of Canopies / Crash Decks 1-3.

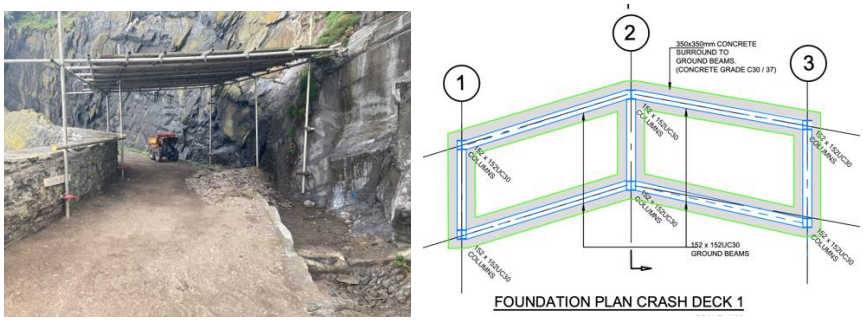

Fig 2. Photograph of location of Crash Deck 1 and plan of proposed foundations Crash Deck 1.

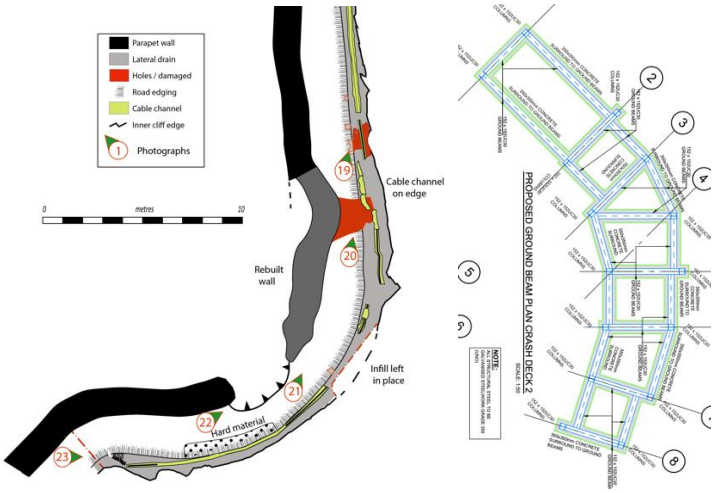

Fig 3. Plan of archaeological features of in area of Crash Deck 2 and proposed foundations of Crash Deck 2.

Fig. 4. Plan of archaeological features in area of Crash Deck 3 overlain on plan of proposed Crash Dec 3k groundworks with location of shore and drain and beam to be relocated marked with red circle.