

A87 Dornie Village Junction and Bridge

Examination of Lighting Options

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SUMMARY

Existing lighting across Dornie Bridge has been removed in order to improve the visual amenity of the area and eliminate any local concerns about electrical safety standards.

Historically, the previous installation had required high levels of maintenance.

The study was initiated as the existing lighting installation was inoperable due to extensive and sustained vandalism. The short service life of the fluorescent lamps, method of mounting the lighting units and the remoteness of the location meant that the installation was both costly and difficult to maintain. The installation was also of a poor standard in relation to BS5489-1(2003): The Code of Practice for the Design of Road Lighting, and even when unlit was visually intrusive

1 Introduction

A need had previously been identified to upgrade the road lighting system which had been identified as being non-compliant with current lighting and electrical safety standards.

2 History of Existing Lighting and Surrounding Environment

The lighting installation on and around Dornie Bridge on A87 consisted of a total of 234 no. 36W fluorescent bulkhead fittings, mounted at a height of approximately 1m, with a spacing of approximately 2.4m. The installation was inoperable having suffered severe and prolonged vandalism where several lanterns had been broken and cables damaged. To ensure public safety was not compromised and to improve the visual amenity of the area, the fittings have all now been removed with the exception of 14 fittings adjacent to the two bus stops at the south end of the bridge. As an interim measure these have been refurbished to provide local lighting to the footways between the village and the bus stops.

Where units were mounted on the bridge parapet, they were considered to be difficult to maintain due to being located behind a wire mesh which was installed after the lighting units were commissioned. Access therefore either required the mesh to be removed which was very time consuming or for an operative to work behind the parapet, which involved additional safety measures having to be put in place due to the hazard of working over water.

The lighting units were mounted at drivers' eye level which caused glare problems, as well as significant upward light trespass. In view of this a scheme was previously undertaken to mask the top section of the light fittings. The low level lighting was originally installed on the South side of the bridge but, due to complaints of light trespass from the local community, was then removed and re-sited onto the North side.

The area is a seafront location and is immediately adjacent to Eilean Donan Castle and the village of Dornie. The area of the proposed work includes a road junction, providing local access to the village, 2 No Bus stops and a pedestrian underpass. Traffic flows are low at less than 7000 vehicles per day as are pedestrian movements.

The existing lighting scheme, being single sided and at low level, may have had a minimal effect on views to the castle which is one of the best known and most photographed landmarks in Scotland. It did however still cause glare, which to some

local people was unacceptable. The design of any new scheme will require prior consultation with and local residents, Highland Council Planning Department and Historic Scotland. Discussions have already been held with the local Community Council who have been of assistance in providing preliminary feedback on local views. Some of the residents of Dornie have questioned the need for lighting the bridge and have commented on the effects of spill and light pollution due to the existing equipment type.

3 Accident Statistics

Interrogation of the SERIS system shown no injury accidents have occurred within the study area in the past five years and so it is reasonable to conclude that the absence of lighting over a large part of that period, since the bridge-mounted fittings have been vandalised then switched, off has not contributed to accidents.

4 Recommended Lighting Levels

The lighting design should be in accordance with the appropriate Code of Practice for the Design of Road Lighting. This CP gives guidance on the selection of lighting classes for motorways and traffic routes. The lighting shall also follow the guidance contained within the Design Manual for Roads and Bridges and relevant technical advice documents.

The characteristics of this section of the A87 indicates that it would be appropriate to light the junctions, which are considered as conflict areas, in accordance with the requirements for a secondary distributor road in a rural area, carrying less than 7000 vehicles per day. It would not be normal practice to light the carriageway outwith a junction area, nor would it be normal practice to provide footway lighting adjacent to a road such as this.

5 Proposed Improvements

The 14 existing lighting fittings in the underpass are in a poor condition and some are badly damaged (Photograph 1 refers). It is recommended that these fittings are replaced, and that lighting be provided in both of the bus shelters, regardless of which option is chosen for lighting the junction area.

With regards to the road and footpath lighting a number of options have been investigated:-

- Option 1 - Lighting at junction and to bus stops using columns
- Option 2 - Option 1 together with low level bridge fittings
- Option 3 - Keep existing limited junction lighting and low level lighting between bus-stops and underpass only
- Option 4 - Install limited number of lighting columns between bus-stops and underpass

Option 1 - Lighting at junction and to bus stops using columns.

New 6m aluminium columns could be installed which would cover the junction conflict area. The use of aluminium is proposed in order to prolong the service life of the installation. These should be fitted with post mounted 150W SON lanterns in a generally single sided arrangement on the east side of the road. In order to reduce clutter, it is proposed that a lighting column be used as one of the supports for the array of direction signs at this location. Flat glass (full cut off) lanterns are proposed to minimise the visual impact on the surrounding area and prevent upward light trespass. This is the only option which will ensure the provision of a fully compliant lighting design at the junction. However the use of lighting columns on the junction may result in critical comment from some local residents or Historic Scotland in relation to the setting of Eilean Donan Castle. In order to address these concerns the lighting scheme could be controlled in such a way that only those lanterns at safety critical locations are switched on as dusk approaches, with others not coming on until the area has become slightly darker. This would provide a period of transitional lighting, less intense than with a traditional switching arrangement and provide a shorter period of darkness when there is full illumination. The type of 'full cut off' lanterns being proposed also reduces light scatter and principally directs light downward onto the road surface.

Option 2 - Lighting on Bridge using low level fittings.

If lighting is to be provided across the bridge, in conflict with good lighting practice in such a rural location, it would be necessary mount vandal resistant fittings on to the parapet posts at a spacing of 5m. One product considered is a Designplan Callisto LED anti vandal unit, mounting at a height of 1m which would provide footway lighting. However these units would require to be fitted to the front of the parapet where, on the basis of past experience they would be at risk of being vandalised. The fittings are also likely to produce a degree of glare toward drivers which was a source of complaint with the previous installation. It is also detrimental to road safety.

Option 3 - Keep existing limited junction lighting and low level lighting between bus-stops and underpass.

Fourteen fittings from the original installation were retained to provide temporary guidance lighting from the underpass to the two bus-stops serving the village. These could be retained permanently with an additional 6 units installed to complete the lighting of the routes to and from the bus-stops.

This option will provide only limited carriageway lighting and guidance lighting for pedestrians. It would not produce a modern, compliant design for lighting of a conflict (junction) area. The fittings are not resistant to vandalism and the top of the fitting would require to be shielded to avoid glare to motorists. In addition, the fittings may be considered by some to be out of place in the surrounding area of high amenity.

Option 4 - Install limited number of lighting columns between bus-stops and underpass.

A limited number of lighting columns could be installed between the underpass and the bus-stops. This would provide guidance lighting for pedestrians and an improvement to the present carriageway lighting, but it would not produce a modern, compliant design for lighting of a conflict (junction) area. Three number 6 metre columns would be required on the north side of the carriageway, and silhouetted against the hills these are not considered to be intrusive on the landscape or conflict with any neighbouring properties. A single 6 metre column would suffice on the south side of the carriageway opposite the junction. This would provide effective lighting levels for pedestrians and provide a cost effective solution with regard to the glare and vandalism associated with low level lighting.

6 Recommendations

It is recommended that Option 1 to provide an appropriate, compliant, level of lighting-around the junction conflict area be agreed. This will include appropriate control gear to provide adjustable levels of lighting to different parts of the lit area. An upgrade of the underpass lighting and the provision of lighting at the two bus shelters will be included. The use of aluminium columns and lanterns will provide an extended service life and is anticipated to provide an installation which has a minimal visual impact in this very scenic area. In terms of sustainability the use of lighting columns and the control strategy outlined will reduce power consumption of the installation.

RPKM

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Photograph 1 - Showing the Existing Underpass lighting (Photo 2 omitted)



Photograph 3 - Showing an artists impression of a column installation at the bus-stops to the south of Dornie junction.