[redacted]

MV MAID OF GLENCOUL

LOADING RAMPS ALIGNMENT NOTE

1.1 Introduction

MV Maid of Glencoul is a roll on / roll off ferry operated by The Highland Council as the relief vessel between Corran and Ardgour. The vessel was built in 1975, is 32metres long and has a car capacity of 14.

The Loading Ramps are fitted on the Bow and Stern quarters arranged to land on the concrete Slipways at Corran and Ardgour.

Each Ramp made up of 4 interlocking welded mild steel Slabs. A short, hinged steel Finger Flap extension is fitted on the end of each Slab. Each Slab is supported at its outer end with a substantial steel Stool, angled to mate with the slipway during berthing, and intended to support the expected reactions under load. The grounding areas of the Stools are, over time, subject to aggressive abrasive wear under contact with the Slipway and are therefore built up with sacrificial heavy steel Wear Bars. These bars are not considered as contributory to the overall structural strength of the ramp and are there solely to protect the principal structural items.

The following image shows one of the Ramps, upside down following repair works. The sacrificial Wear Bars and Stools are indicated:

Figure 1 - Underside of Maid of Glencoul Ramp

Other than wear and tear, the geometry of the Ramps has been unchanged for the duration of the Vessel's operation on this route.

1.2 2025 Annual Overhaul

During the 2025 Annual Overhaul a rebuild of the Stool, Wear Bars and Finger Flaps was undertaken to address excessive wear damage. A separate Note was written by [redacted] explaining the works undertaken and best endeavours undertaken to return the Stools and Wear Bars to their original height. There are no design drawings available to indicate the original geometry of the ramps, so this was the best approach that could be taken.

The end of the [redacted] Note highlights this, stating:

> *"While this solution was considered the best option to minimise the potential for error, it was recognised that regardless of degree of care, heights could be nothing other than best estimate. In addition, indeterminate factors such as possible ramp slab structural deformation, changes in vessel loading etc., may have come into play since the last replacement of the grounding bars, all having the potential to alter the required stool and grounding bar geometry. Unfortunately, this would only be evident following return to service and post repair berthing trial."*

1.3 Berthing Trials

As stated, it was intended that berthing trials would be undertaken following these works on the Ramps. These were undertaken and the initial interface between Ramp and Slipway was poor. This was quickly identified as the bolts between each of the Ramp Slabs being too tight and restricting the relative movement between each Slab preventing the downhill Slab from making easy contact with the concrete. These bolts were adjusted resolving this issue.

Thereafter, the repaired Ramp geometry and interface with the Slipway was considered acceptable for return to service when the main vessel, MV Corran left for her Annual Overhaul.

1.4 Ramp Interface Issues

Since returning to service, a number of cars have been damaged due to contact with either Ramp or Slipway when moving from Slipway to Ramp, or vice versa.

There are many variables that influence the geometry of the interface between the Ramp and concrete Slipway, including the fore & aft alignment of the Vessel to the parallel centre of the Slipway, Vessel Loading Condition and Sea State.

The speed of the car crossing the Finger Flaps has a great influence on the likelihood of making contact with the Ramp or Slipway. Moving at anything other than dead slow means that the reaction time of the car suspension reduces the effective ground clearance.

It is also noted that during the lifetime of the Vessel, car design has evolved substantially, including longer and lower overhangs at the bumpers and underskirt. For this reason, the ramps of modern roll on / roll off ferries tend to have much longer Finger Flap geometry giving a more gradual transition between Slipway and Ramp.

With the relatively short Finger Flap length on MV Maid of Glencoul, even slight variations in the height of the Stool and Wear Bar can significantly affect the slope of the Finger Flap. This is illustrated in Figure 2 below.

Figure 2 - Finger Slope and Stool Height

After return to service and the incidence of vehicle contacts, the Wear Bars have been further modified and reduced in height slightly.

This is believed to have improved the Slipway / Ramp interface. However, it is acknowledged that the quality of this interface is limited by the 50-year-old design geometry of the Ramps.

1.5 Potential Further Works

The Highland Council are investigating whether changes can be made to the design geometry of the Ramps that may improve the Slipway / Ramp interface. If acceptable improvements are identified, these may be undertaken during the 2026 Annual Overhaul.

This is a challenging task as any change to the Ramps is limited by:

- Not increasing the overall weight of the Ramps on the vessel to the detriment of cargo capacity.
- Not increasing the loading on the Ramp hydraulic actuating cylinders, hydraulic pipework and hydraulic power pack. Overloading any part of this system could increase the risk of in-service breakdown of the Ramp system.
- Not increasing the structural loading of the Ramp onto the ship structure.