

MV Maid of Glencoul Bow & stern loading ramps repairs

*The vessel's vehicle & passenger loading ramps are made up of 4 interlocking welded mild steel slabs, each with a hinged steel finger flap extension. 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. Wear down in the bars is to be expected, with their replacement at extended intervals necessary as part of any ongoing maintenance program.*

*Inspection of the underside of the ramps during the most recent annual slipping and out of water survey, found numerous weld failures and structural defects, cumulatively having a potentially significant detrimental effect on the structural integrity and safe working loads of the ramps under their current routine vehicle loading expectations. In addition it was clear that the grounding bars had abraded to the extent that they were no longer providing effective protection to the structural steel work, and in fact had worn to the extent that they were no longer fit for purpose, with key areas of the ramp slabs principal structural members and finger hinge plates having been making contact and abrading on concrete slipway, with the resultant loss of metal effecting the load bearing capacity of those members.*

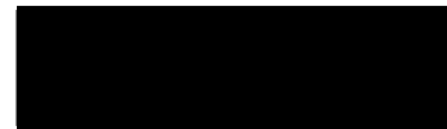
*In order to comply with, and close out, Marine & Coastguard Agency passenger certificate survey deficiencies, a detailed inspection was carried out and a repair schedule prepared and agreed with the repair yard, for returning the principal structural steel work members back to sound condition in accordance with good shipbuilding repair practice.*

*The repair schedule also included the need to replace the grounding bars, as necessary to protect the existing and repaired load bearing structural steel work. The height & geometry of the underside of the stool has an important bearing on the interface between ramp and slipway, and in this respect the specified height and cross section of the sacrificial steel grounding bars play an important part. Without the benefit of, or ability to reasonably obtain accurate in-service dimensions and clearances the decision was made to attempt to return grounding bars and overall stool heights to their original pre-wear dimensions, but with nothing to physically measure, this could only be established by best estimate, achieved by: -*

- a) Establishing datum heights at the extreme outboard end of outer slab stools 1 & 4 as accurately as possible by extending the line of any existing available sound or near intact material; &*

- b) *In so far as practical, creating a straight bearing surface transversely across the 4 ramp slabs between the two outer datums.*

*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.*



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