HP/906/362
Ardrossan - New vessel compatibility review
This report does not provide a review of infrastructure condition

Vessels considered for Basis of Evaluation:-

	MV Caledonian Isles	*MV Hebrides*	*100m Vessel*
Length (OA) (m)	94.25	99.4	102.4
Length (BP) (m)	85.2		unknown
Beam (m)	16.32	16.32	17.0 (17.5m including belting)
Draught (design) (m)	3.165	3.3	3.4
DWT (Tonnes)	735	660	900 at 3.4m draught 1200 at 3.6m draught
Gross Tonnage (Tonnes)	5221	5506	unknown
Displacement (Tonnes)	3139	3493	4300-4400 at 3.4m draught 4600-4700 at 3.6m draught

Outcomes of review

Infrastructure	Aspect 1	Aspect 2	Review/outcome	Initial outcome	Comments
Bathymetry			The bed level is sufficient along the berth and on approach		• It is relatively shallow directly in front of the Linkspan ramp, may require localised dredging.
Ramp/Linkspan interface	Horizontal/Vertical	Bow in Stern In	Based on design drawing provided and current fender positions;-	Bow in ok Stern in ok with 2 parts of ramp, mid and land side section (4.5m total)	• The condition of existing Linkspan and supports has not been considered.
Passenger Door Position	Vertical/Horizontal	Stern in Bow In	Based on plan provided	Slope should not be greater than 1:10 for	• Deck for door could be moved lower • Build platform such as Kennacraig for gangway to land to,

Infrastructure	Aspect 1	Aspect 2	Review/outcome	Initial outcome	Comments
				design and 1:12 at springs, These gradients cannot be achieved with a 25m gangway Existing PAS not compatible.	• Existing PAS could be moved (pier deck strength would have to be checked)
Fendering **See Note at end**	New Vessel ; Caledonian Isles; Hebrides; midship contact	Roundhead	Max 0.265m/s Max 0.325m/s Max 0.308m/s	New vessel Below Min Code Requirements	• Increased risk of damage to vessel, pier and fendering • Insurance would be void as below min requirements (if known). • Reduce vessel approach speed and weather conditions for berthing. • Improved fendering arrangements required **Note:** -A detailed analysis of the pier and fendering system is essential to ensure that the structural capacity of the pier (not the fendering) is capable of withstanding the forces exerted by the new ship
	New Vessel ; Caledonian Isles; Hebrides; angle of approach 10°	Main Berth	Max 0.279 m/s Max 0.348 m/s Max 0.328 m/s	New vessel Below Min Code Requirements Below Min Code Requirements	• Increased risk of damage to vessel, pier and fendering • Insurance would be void as below min requirements (if known). • Reduce vessel approach speed and weather conditions for berthing. • Improved fendering arrangements required • **Note:** -A detailed analysis of the pier and fendering system is essential to ensure that the structural capacity of the pier (not the fendering) is capable of withstanding the forces exerted by the new ship

Infrastructure	Aspect 1	Aspect 2	Review/outcome	Initial outcome	Comments
Bollards			Capacity of existing bollards unknown.	Mooring forces from new vessel is 29% higher than current vessel	• Subject to bollard testing • Subject to review of mooring arrangements
Pier Length	Based on new vessel	102.4m		overhang	• Subject to review of mooring arrangements • Subject overnight berthing position
Marshalling	Current capacity	190			
	New vessel	136			• 40 m short of capacity +50%

Fender Capacity Calculation

Design codes require min approach speed at 0.30m/s, BS6349; part 4;

This is a triangular calculation normally calculated with Displacement and Approach Speed to give fender capacity requirements, on this occasion we have had to work backwards with fender capacity (as designed) and displacement to give approach speed.

There are no calculations available on the design displacement used in building the berth or dolphins.

Summary of (25m) Gangway Gradients (Expressed as 1 in X)

Vessel	*Draught (m)*	*Gangway slope at HAT (1 in X)*	*Gangway slope at MHWS (1 in X)*	*Gangway slope at MLWS (1 in X)*	*Gangway slope at LAT (1 in X)*
MV Caledonian Isles	3.15	4.23	4.66	10.15	12.15
MV Hebrides	3.2	3.87	4.23	8.42	9.75
MV Hebrides	3.3	3.94	4.31	8.71	10.15
100m' Vessel	3.4	3.38	3.65	6.50	7.28
100m' Vessel	3.7	3.54	3.84	7.07	8.00