

# Appendix E – Parametric Vessel Cost Estimates

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## Methodology

Preliminary approximate vessel construction cost ranges are generated using the Coastwise Parametric Vessel Construction Cost Model (CPVCCM). A parametric cost estimate is similar to getting a price per square foot for a new house, it is only a rule-of-thumb unit cost, times the anticipated number of units. In the case of vessel parametric cost models, the usual comparison unit is price per cubic feet, although the CPVCCM uses several other methods. This produces planning level estimates, with a confidence range of plus or minus 10 percent, to be used until detailed design plans are available for more specific cost estimating.

The CPVCCM is based on the cost of previously constructed ro/ro ferry vessels delivered to the West Coast of the USA. Most of these costs were based on low-bid public procurement methods and vessel construction occurred at shipyards with significant new vessel construction experience. Unit costs are updated to the present year using relevant Bureau of Labor Statistics indices for labor and other relevant indices for material costs. Parametric cost analysis occurs using a variety of structural and outfitting categories. This version of the CPVCCM is designed to forecast costs for US Coast Guard inspected ro/ro passenger vehicle ferries exclusively.

The CPVCCM calculates a construction cost range, which is the cost necessary to pay the contractor for the construction of the vessel, assuming the contractor is provided a reasonably detailed set of vessel construction drawings.

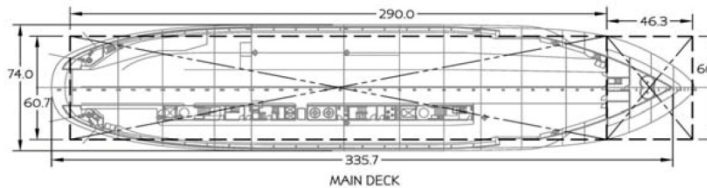
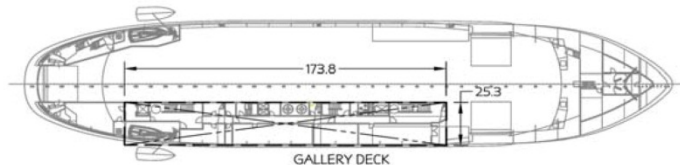
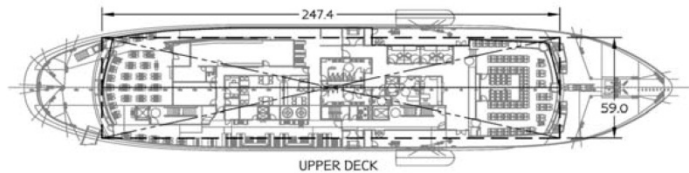
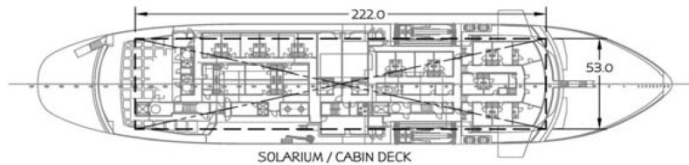
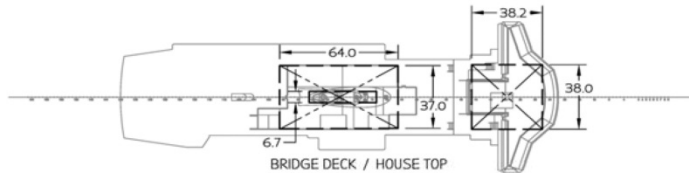
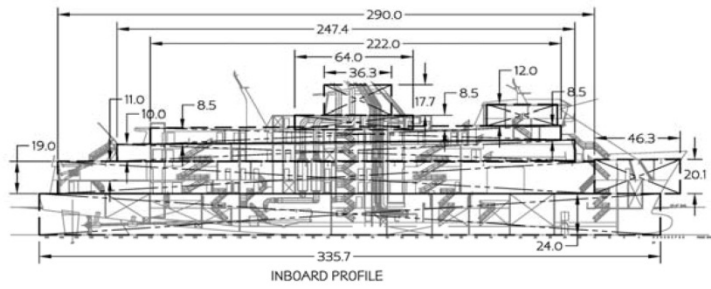
## Input Data

A draft CPVCCM analysis of vessel costs for the 350-foot concept ACF was completed in support of the Southeast Alaska Transportation Plan and the Juneau Access Improvements supplemental EIS. Subsequently, the “Roadmap” Day Boat ACF arrangements have been used to estimate the construction cost range for this vessel. The CPVCCM requires input vessel dimensions segregated by area. Below are the input sheets for both the 350-foot ACF and the Day Boat ACF.

## 350 ft ACF

### Capital Cost Model Input Data

## 350-foot ACF



All dimensions in feet.

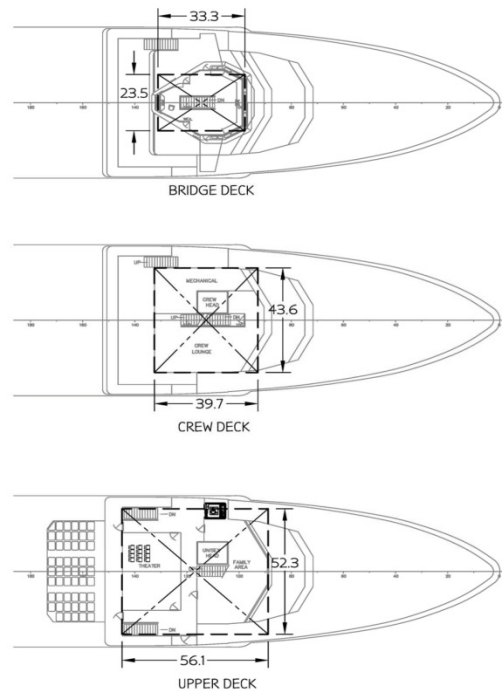
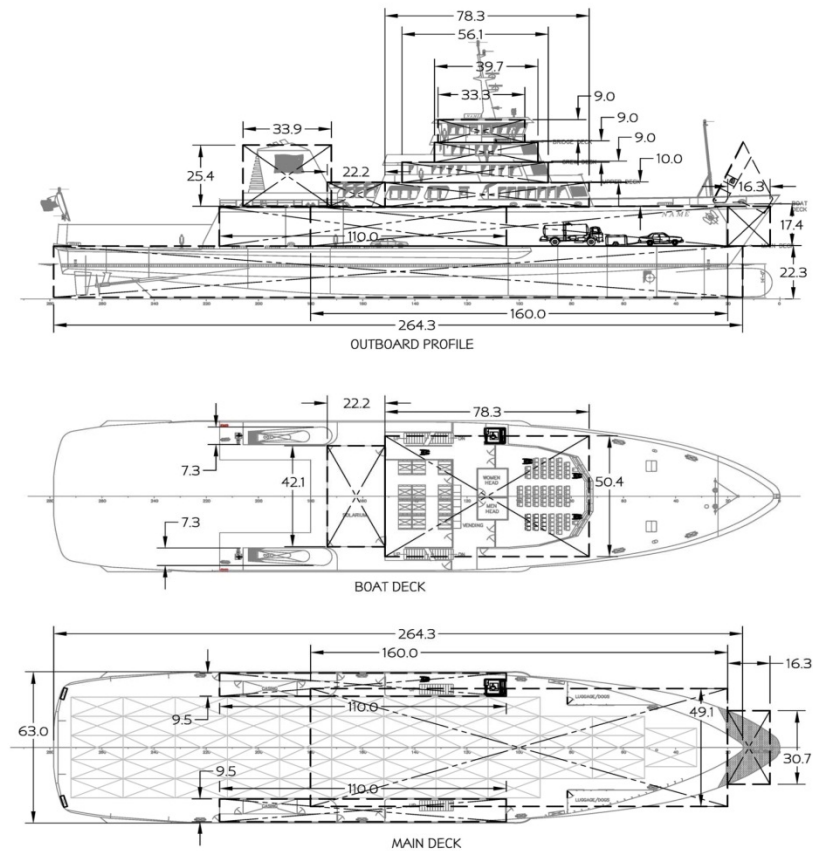
A) Hull Structure		Length	Breadth	Height	Block Coef.
1	i) Hull <sup>(1)</sup>	335.7	74.0	24.0	0.500
	ii) % Tonnage Framing				
	iii) Foclse <sup>(2)</sup>	46.3	60.4	20.1	0.450
2 Hull Crew/Passenger Flats					
	i) Space #1 <sup>Gallery Deck</sup>	173.8	25.3	11.0	1.00
	ii) Space #2				
B) Superstructure (Above Main Deck)					# of Decks
1 Superstructure					
	i) Passenger Decks				
	a) Deck #1 <sup>Upper Deck</sup>	247.4	59.0	10.0	1.00
	b) Deck #2 <sup>Cabin Deck</sup>	222.0	53.0	8.5	1.00
	c) Deck #3				
	ii) Wheelhouse	38.2	38.0	12.0	
	iii) Stack	36.3	6.7	17.7	
	iv) Misc #1 <sup>House Top</sup>	64.0	37.0	8.5	
	v) Misc #2				
2 Enclosed Car Deck					
	i) Main Car Deck	290.0	60.7	19.0	
	ii) Second Car Deck				
C) Accommodation Outfit			% Low Density	% High Density	
	i) Passenger Decks				
	a) Deck #1 <sup>Upper Deck</sup>		40%	60%	
	b) Deck #2 <sup>Cabin Deck</sup>		5%	95%	
	c) Deck #3				
	iii) Wheelhouse			100%	
	iv) Misc #1 <sup>House Top</sup>				
	v) Misc #2				
	vi) Passenger Decks				
	a) Space #1 <sup>Gallery Deck</sup>		100%		
	b) Space #2				
3 Enclosed Car Deck		Length	Breadth	% Outfit	
	i) Main Car Deck	290.0	60.7	100%	
	ii) Second Car Deck				
D) Machinery					
1	Engines, propulsion, etc	Installed HP			10,000
	Day Boat Machinery Reduction				
2	Special equipment				
3	Electrical Equipment	Installed KW			1,680
	Day Boat Electrical Reduction				
F) SOLAS		% Increased Cost			10%

Notes:

- 1) Hull block coefficient estimated
- 2) Focls block coefficient estimated

Capital Cost Model Input Data

Day Boat ACF



All dimensions in feet.

		Length	Breadth	Height	Block Coef.
<b>A) Hull Structure</b>					
1	i) Hull <sup>(1)</sup>	264.3	63.0	22.3	0.447
	ii) % Tonnage Framing				
	iii) Focls <sup>(2)</sup>	16.3	30.7	17.4	0.400
<b>2 Hull Crew/Passenger Flats</b>					
	i) Space #1				
	ii) Space #2				
<b>B) Superstructure (Above Main Deck)</b>					# of Decks
<b>1 Superstructure</b>					
	i) Passenger Decks				
	a) Deck #1 Boat Deck	78.3	50.4	10.0	1.00
	b) Deck #2 Upper Deck	56.1	52.3	9.0	1.00
	c) Deck #3 Crew Deck	39.7	43.6	9.0	1.00
	ii) Wheelhouse	33.3	23.5	9.0	
	iii) Stack	33.9	14.6	25.4	
	iv) Misc #1 Solarium	22.2	42.1	10.0	
	v) Misc #2 Casings	110.0	19.0	17.4	
<b>2 Enclosed Car Deck</b>					
	i) Main Car Deck	160.0	49.1	17.4	
	ii) Second Car Deck				
<b>C) Accommodation Outfit</b>				% Low Density	% High Density
	i) Passenger Decks				
	a) Deck #1 Boat Deck			90%	10%
	b) Deck #2 Upper Deck			90%	10%
	c) Deck #3 Crew Deck			90%	10%
	ii) Wheelhouse				100%
	iv) Misc #1 Solarium				
	v) Misc #2 Casings				
	vi) Passenger Decks				
	a) Space #1				
	b) Space #2				
<b>3 Enclosed Car Deck</b>		Length	Breadth	% Outfit	
	i) Main Car Deck	160.0	49.1	100%	
	ii) Second Car Deck				
<b>D) Machinery</b>					
1	Engines, propulsion, etc	Installed HP		6,000	
	Day Boat Machinery Reduction			20%	
2	Special equipment				
	Bow door (0.25), stern thruster (0.1)			0.35	
3	Electrical Equipment	Installed KW		1,200	
	Day Boat Electrical Reduction			20%	
<b>F) SOLAS</b>				% Increased Cost	

Notes:

- 1) Hull block coefficient estimated based on M/V Taku
- 2) Focls structure block coefficient estimated, additional bow door costs captured in D)2)

## Vessel Construction Cost Summary

	Alaska Class		Day Boat ACF	
A) Hull Structure (Below Main Deck)	21.8	M \$	10.6	M \$
B) Superstructure (Above Main Deck)	14.3	M \$	6.7	M \$
C) Accommodation Outfit	65.5	M \$	13.0	M \$
D) Machinery	20.7	M \$	14.6	M \$
E) Lofting/Trials&Testing/Insurance	11.6	M \$	4.3	M \$
F) SOLAS	13.4	M \$		
<b>Vessel Construction Cost Range</b>	132.5 - 162.0	M \$	44.3 - 54.1	M \$