

GUEMES ISLAND FERRY REPLACEMENT Tonnage

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References

1. 46 CFR, *Shipping*, 2019.
2. *Tonnage Technical Policy*, USCG, MTN 01-99 CH-10, February, 2020.
3. *Structural Arrangement*, Glosten, Drawing No. 17097.02-100-03.

Summary

This report outlines the preliminary domestic Gross Registered Tonnage (GRT) calculations for the Guemes Island Ferry replacement vessel. The vessel particulars are as follows:

Service.....	Passenger (150 or less)
GRT.....	<100 (to qualify under 46 CFR Subchapter T)
Length Overall	160.00 ft
Beam Overall	53.00 ft
Depth at CL.....	13.45 ft
Depth at Side.....	13.00 ft

The estimated preliminary GRT of the subject vessel is 97.1 tons. This satisfies the <100 GRT tonnage requirement in order to have the vessel inspected under Reference 1, Subchapter T.

Procedure

GRT was calculated in accordance with the requirements of Reference 1 and the methodology described in Reference 2.

Under-Deck Tonnage

Under-deck tonnage is calculated applying Simpson’s first rule using the tonnage length and the half areas of the transverse sections in the specified tonnage stations, then multiplied by two as per §69.109. The tonnage length is measured between the intersection of the inboard faces of the ordinary stems at each end and the tonnage (main) deck, resulting in a length of 154.1 ft. This length is designated as a Class 4 subdivision, resulting in 12 divisions. The corresponding tonnage stations locations are shown in Figure 1.

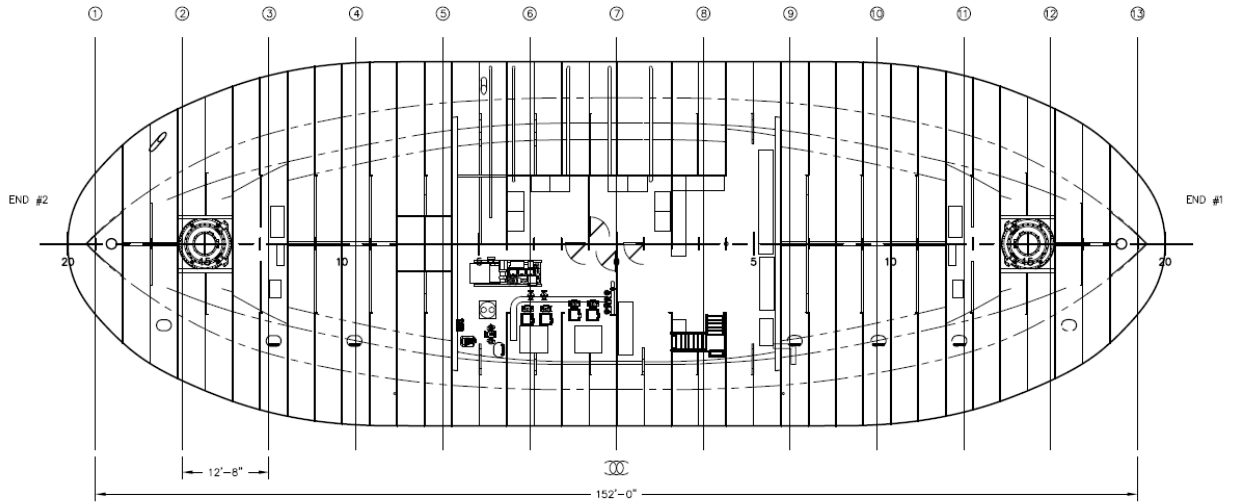


Figure 1 Hold Plan showing tonnage stations

The area of each station is calculated using Simpson's first rule using the tonnage depth at that station and the half breadths at each division measured from centerline to the inboard face of the line of ordinary frames. Each station was divided into four equal parts as the midpoint depth was less than 16 ft.

Superstructure Tonnage

Superstructure tonnage is calculated using volumetric formula for basic geometric shapes assuming the dimensions to the inboard face of the ordinary frames as per §69.113. The chain locker, Switchboard Room access, Switchboard and Generator Room vent trunks, Head, and Pilothouse are exempt from tonnage as per §69.117(b). The Main Deck Passenger Lounge, Upper Deck Crew Lounge, and Electronics Room were exempted from tonnage by designating them as open spaces using tonnage openings as permitted by §69.117(d). Tonnage opening locations are shown Figure 2 and Figure 3 below. The outboard facing tonnage openings on the main deck are permitted as they are within an enclosed space with end-facing exterior bulkhead openings. All other spaces are either open spaces and exempt from tonnage or closed spaces included in the tonnage volume for the vessel.

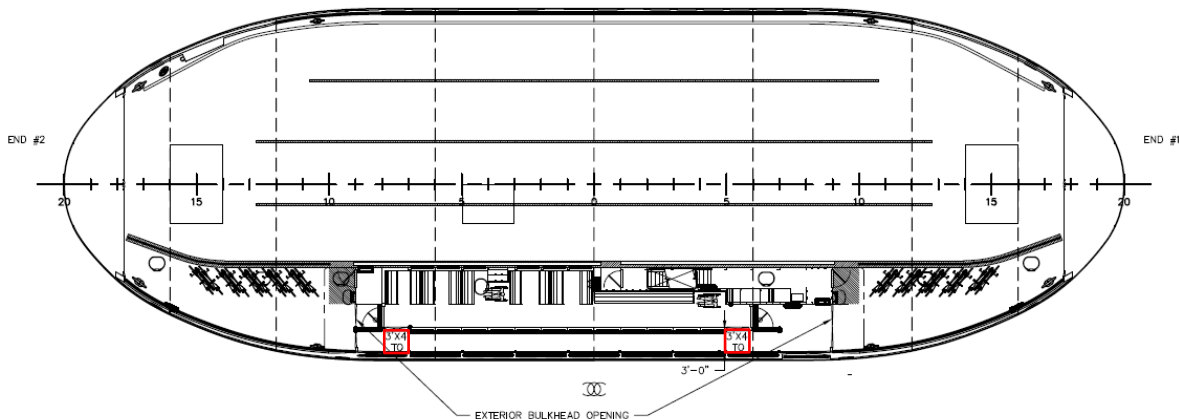


Figure 2 Main Deck Plan showing location of exterior bulkhead openings and tonnage openings

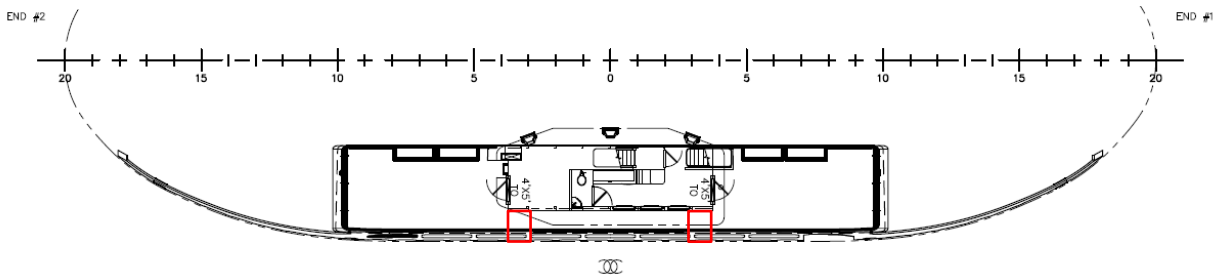


Figure 3 Upper deck plan showing location of tonnage openings

Calculations

The tonnage calculations are shown below:

SIMPSON'S 3-DIMENSIONAL FIVE BREADTHS UNDER-DECK (HULL) TONNAGE CALCULATION									
MTN 01-99 CH-10 §69.109									
Tonnage Length =		152.00 ft			Midpoint Depth at Amidships =		9.67 ft		
Number of Divisions =		12			Camber Height =		0.42 ft		
Station Spacing =		12.67 ft			Depth Deduction =		0.14 ft		
1/3 Common Interval =		4.22 ft			Tonnage Depth =		9.53 ft		
Station No.	Half Breadths (ft) with "1" as uppermost					Depth (ft)	Sect Half Area (sqft)	Simpson's Multiplier	Products
	1	2	3	4	5				
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4	0.00
3	1.50	1.50	1.50	1.50	1.50	5.78	8.67	2	17.34
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2	0.00
6	10.00	10.00	10.00	10.00	10.00	9.53	95.31	4	381.25
7	10.00	10.00	10.00	10.00	10.00	9.53	95.31	2	190.63
8	10.00	10.00	10.00	10.00	10.00	9.53	95.31	4	381.25
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4	0.00
11	1.50	1.50	1.50	1.50	1.50	5.78	8.67	2	17.34
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00
Sum of Products =								987.81	
1/3 common interval =								4.22	
Total Under-Deck Volume =								8341.53	
Ballast Tank Volume =								0.00	
Total Under-Deck Volume with Ballast Exemption =								8341.53	
Under-Deck Tonnage =								83.42	
PRISMATIC SUPERSTRUCTURE (ABOVE DECK) TONNAGE CALCULATION									
MTN 01-99 CH-10 §69.113									
Space category & frame location (or equivalent)	Shape	Lgth (ft)	Wdth (ft)	Hght (ft)	Tonnage				
Main deck "mud" room	Rectangular prism	4.00	4.88	8.50	1.66				
Main deck stowage locker	Rectangular prism	4.00	4.88	8.50	1.66				
Main deck crew day room	Rectangular prism	12.00	4.88	8.50	4.97				
01 Deck Stairs	Trapezoidal prism	5.27	3.00	8.50	1.34				
01 Deck Landing (upper)	Trapezoidal prism	13.17	3.00	8.17	3.23				
02 Deck Stairs	Triangular prism	6.67	3.00	8.17	0.82				
Total Superstructure Tonnage =								13.68	
Vessel Gross Register Tonnage =								97.1	