

Flood Times

LAZ Compartment (1,150 ft^3)		
Hole Size (inches)	Equilibrium/Casualt y	Type
1	350 minutes	Equilibrium
2	87.5 minutes	Equilibrium
3	38 minutes	Equilibrium
4	20 minutes	Equilibrium
5	13.5 minutes	Equilibrium
6	9.5 minutes	Equilibrium

ER/AUX Compartment (7,167 ft^3)		
Hole Size (inches)	Equilibrium/Casualt y	Type
1	360 minutes	Casualty
2	90 minutes	Casualty
3	40 minutes	Casualty
4	22 minutes	Casualty
5	14.5 minutes	Casualty
6	10 minutes	Casualty

Drainage

Drainage Requirements 46CFR28.555	
Length of vessel	80 ft
Length of bulwark	80 ft
Reg length of bulwark (0.7*L)	56 ft
Freeing Port Area	48.94 sqft
For Bulwark >4ft	
Bulwark Height	7.75 ft
Length of higher bulwark	44 ft
Increase in freeing port area	6.6 sqft
For Bulwark <3ft	
Bulwark Height	3 ft
Length of lower bulwark	20 ft
Decrease in freeing port area	0 sqft
Total Freeing Port Area Req	55.54 sqft

Actual Drainage	
Freeing Port Length	1.75 ft
Freeing Port Height	1.25 ft
Freeing Port Area	2.1875 sqft
Number of Freeing Ports	12
Total Actual Freeing Port Area	26.25 sqft
Restrictor Plates	
Hole Radius (4" hole)	0.167 ft
Area of Half Hole	0.044 sqft
Number of Holes per Plate	3
Number of plates	12
Total Freeing Port Area w/ Plat	1.57 sqft
Required Freeing Port Area	55.54 sqft
Difference w/o plates	-29.29 sqft
Difference w/ restrictor plates	-53.97 sqft

Heeling Moment

Constant Heeling Moment till Casualty

Moment (FT-LT)	Heel Angle (Degrees)	Righting Energy (Degrees)	Downflooding Occurs (Degrees)
95	12.1	30.4	53.8
105	13.4	28.6	53.8
115	15.0	26.6	53.8
125	17.5	23.5	53.8
130	Capsize	Capsize	Capsize

Cosine Heeling Moment till Casualty

Moment (FT-LT)	Heel Angle (Degrees)	Righting Energy (Degrees)	Downflooding Occurs (Degrees)
105	13.0	31.2	53.8
115	14.3	29.5	53.8
125	16.1	27.5	53.8
137.5	20.5	22.5	53.8
140	Capsize	Capsize	Capsize

*Righting energy is limiting

**Applying cosine HMMT is more realistic