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A.M.H.S.

New

Vessels

**MULTI-PURPOSE REPLACEMENT VESSEL  
TALKING PAPER**

Revision 2.2

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**ALASKA MARINE HIGHWAY SYSTEM  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES  
STATE OF ALASKA**

**DRAFT**



INDEX

Introduction. . . . .	1
The Mission	
Mission Statement . . . . .	2
Mission Requirements. . . . .	2
The Design Process	
Design Schedule . . . . .	5
Step One - Initial vessel parameters	
Vessel particulars. . . . .	6
Vessel Arrangements:	
Profile . . . . .	7
Main Deck - 1 Deck . . . . .	8
2 Deck - 3 Deck . . . . .	8
4 Deck - 5 Deck . . . . .	9

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## INTRODUCTION

This paper describes the design process for the new Alaska Marine Highway System (AMHS) replacement vessel. Because of the need for employee and public involvement in the vessel design process, this paper is formulated to be a progress statement, presenting vessel characteristics as they are identified during the design process. As such, this paper varies with each edition; the vessel design loose and sketchy at first, becoming solid construction details at the end.

Because clear mission requirements are the fundamental basis of design, this paper presents the latest set of mission requirements, including a list of particulars and arrangements for each deck, for the new AMHS vessel.



## MISSION STATEMENT

*The new AMHS vessel will be required to successfully carry out the marine highway function, on the following routes, according to existing published schedules and:*

*serve as a S.E. mainline vessel for 4 or 5 months per year,  
must be able to complete 10 to 12 cross gulf trips between S.E. and S.W. a year,  
provide limited S.W. service when the M/V Tustumena is in overhaul,  
provide emergency response capability.*

## MISSION REQUIREMENTS

The intent of the mission requirements section is to define the mission statement into engineering parameters.

### **The Marine Highway Function Requirements**

Accommodate legal highway vehicle traffic (with length restriction), with car deck capacity no smaller than Taku  
Comfortably accommodate maximum number of passengers, both walk on and drive on, with:

- Maximum seating/viewing space
- Maximum number of staterooms per vehicle lane
- Amenities to provide a comfortable 1 to 7 day trip
- Maximum number of reasonably priced lodgings
- Flexible public space utilization
- Access for physically challenged
- Family oriented

MISSION REQUIREMENTS CONTINUED

**Other General Vessel Requirements**

U.S Flagged  
U.S Coast Guard, 46 CFR subchapter H, Approved  
American Bureau of Shipping, +A1, approved  
Same life saving appliances, and fire fighting equipment, as fleet standard  
Maximize equipment similarity with existing fleet, consistent with current technology  
Maximize vessel automation, to minimize operational costs  
64 year life span, through 1 re-engining, and two hotel refurbishment  
High reliability  
Low maintenance  
Proven technology  
Maximize revenue potential

**South West/South Central System - Requirements**

Ocean rated  
Dock, unassisted, at: Yakutat  
Valdez  
Cordova  
Seward  
Homer  
Kodiak  
King Cove  
Sand Point  
Cold Bay  
Dutch Harbor, in the following conditions:  
all tidal conditions,  
all current ranges,  
winds steady at 35 to 40 knots, gusting to 50,  
all visibility conditions,  
Operate in severe arctic conditions  
No Ice rating on hull strength  
Speed adequate to make schedule, no less than M/V Tustumena  
Load vehicles and passengers:  
at existing (as of 12/16/91) facilities of above defined ports,  
in a time span no greater than summer 1992 schedule,  
in all tidal conditions, except possible limitations in Homer  
Active motion control system

MISSION REQUIREMENTS CONTINUED

**South East Mainline System - Requirements**

Lakes, Bays, and Sounds rated  
Dock, unassisted, at:

Bellingham,  
Prince Rupert,  
Ketchikan,  
Hollis,  
Wrangell,  
Petersburg,  
Sitka,  
Juneau,  
Haines,  
Skagway, in the following conditions:

all tidal ranges,  
all current ranges,  
winds steady at 35 to 40 knots, gusting to 50,  
all visibility conditions,

Transit Wrangell narrows (at water greater than +3.0 ft. MLL) and Sergius narrows  
Speed adequate to make schedule, no less than M/V Taku

Load vehicles and passengers:

at existing (as of 12/16/91) facilities of above defined ports,  
in a time span no greater than that shown on summer 1992 schedule,  
in all tidal conditions,

**Emergency Response Requirements**

Provide hazardous material response to any ice free port in Alaska  
Provide housing and amenities for response personnel  
Provide communications/vessel traffic platform  
Provide ample enclosed work space  
Provide limited medical facility  
Load and unload ro/ro cargo from undeveloped docks  
Provide support base for smaller vessels  
Be well maintained and ready to respond

DESIGN AND CONSTRUCTION SCHEDULE

The following design and construction time line describes the required events, and when they must occur, to obligate FY 1993 Federal Highway Funds.

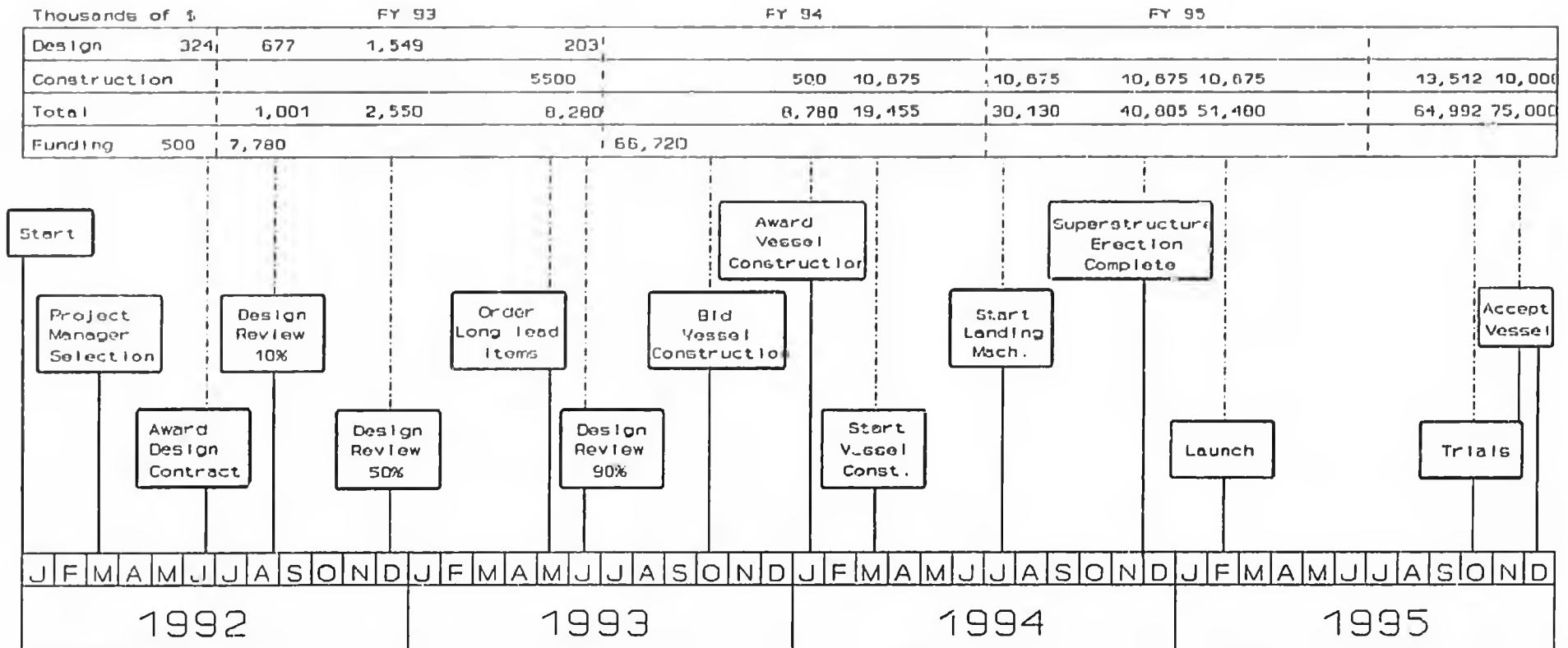


Figure 2 - Design and Construction Time Line

STEP ONE - INITIAL DESIGN PARAMETERS

<b>VESSEL PARTICULAR:</b>	<b>ESTIMATED VALUE:</b>	<b>FINAL DETERMINATION BY:</b>
<b>Classification:</b>		
	ABS +A1	Determined by owner insurance/maintenance requirements
	U.S.C.G., Oceans	Determined by U.S. Flag requirements
<b>Dimensions:</b>		
Length BP	340 to 380 ft	Min. by sea keeping, Max. by port restrictions and cost
Beam	65 to 74 ft	Min. by intact stability, Max by hull form and cost
Depth	19 to 24 ft	Min by strength & regulatory, Max by Damage stability & weight
Draft	15 to 20 ft	Min by hydrostatic, Max by waterway restrictions
<b>Tonnage:</b>		
Gross tonnage	2800 to 3900 tons	By international convention, total of inside space, less deductions
<b>Passengers:</b>		
Passengers	350 to 500	By vessel size, and quantity of lifesaving appliances
2 person Staterooms	40 to 65	By vessel size, arrangement, load character
4 person Staterooms	25 to 40	By vessel size, arrangement, load character
<b>Vehicles:</b>		
Max lane length	1500 to 2100 ft	By final vessel size, lane width, island width, clear height
<b>Crew:</b>		
1 person Berth	8 to 12	By regulatory requirement, and vessel functions
2 person Berth	16 to 24	By regulatory requirement, and vessel functions
<b>Machinery:</b>		
Main Engines	7000 to 9000 HP	By necessary speed requirement, propulsive efficiency
Electrical	1200 to 1700 KW	By size of hotel load
Propeller (C.P.)	1 to 3	By maneuvering and safety considerations
Bowthruster	1 to 2	By maneuvering, environmental considerations
Stern thruster	0 to 1	By severe maneuvering vs environmental considerations
Stabilizers	Passive or active	By seakeeping, hull form, cost
<b>Speed:</b>		
Service speed	15 to 20 kt	By schedule requirement

## VESSEL DRAWINGS

The following drawings reflect the current designed shape and character of the new replacement vessel. At present, the design is in a very preliminary stage. *Therefore, these drawings are suitable for general discussion only.* As the design progresses, these drawings will be updated until the vessel evolves into its final form.

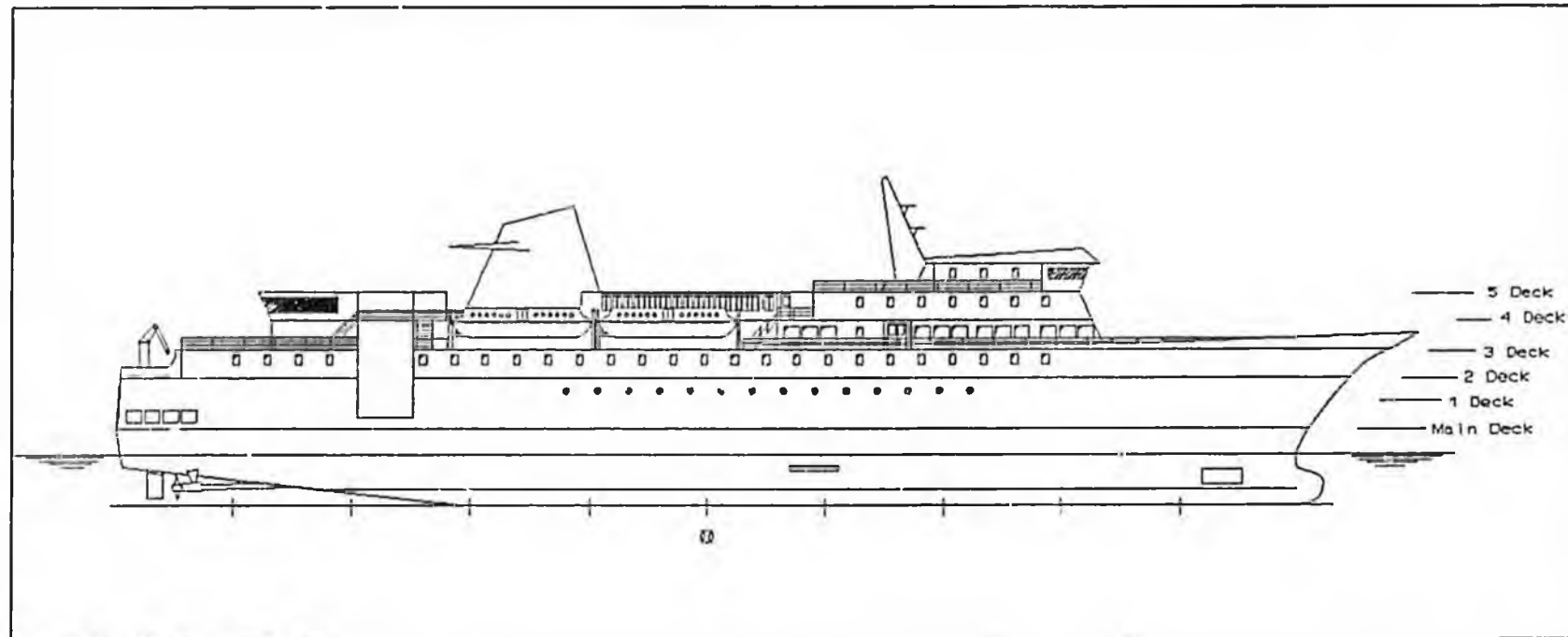


Figure 3 - Outboard Profile

VESSEL DRAWINGS CONTINUED

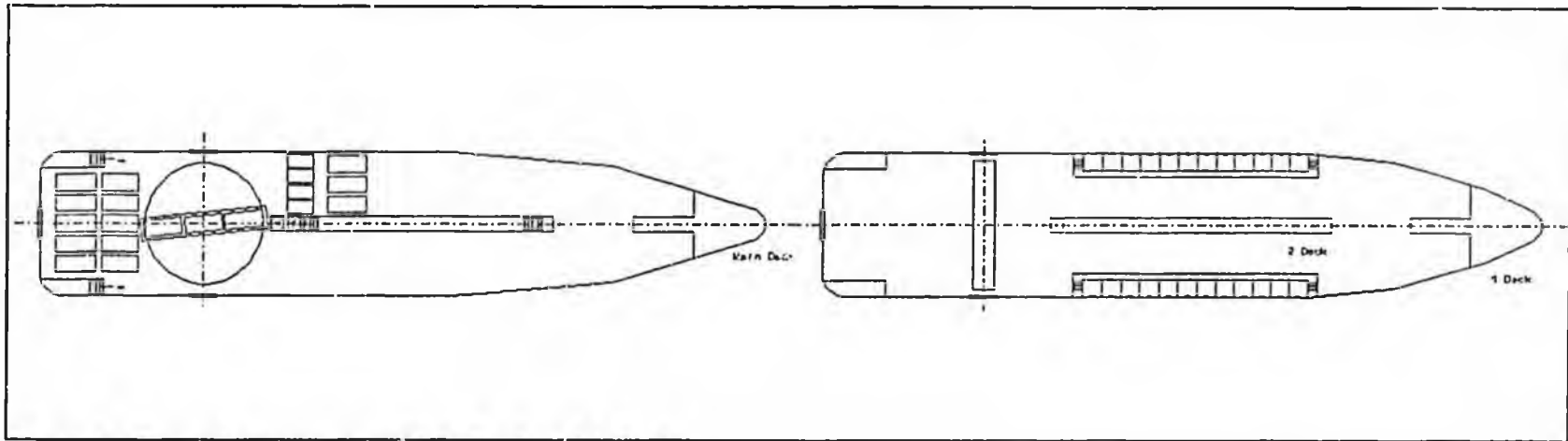


Figure 4 - General Arrangement Main Deck and 1 Deck

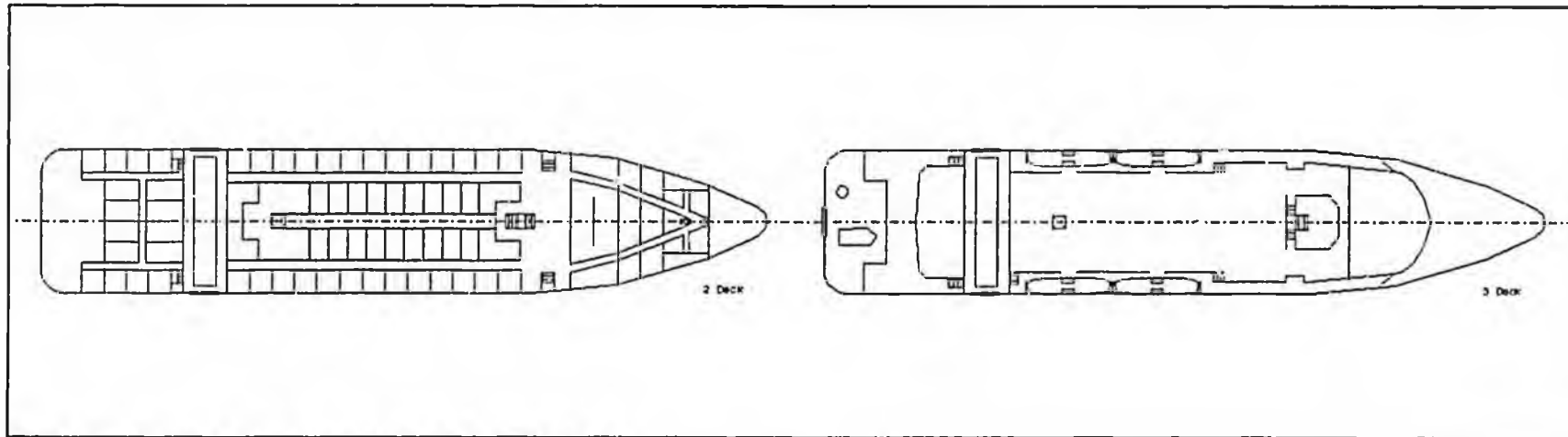


Figure 5 - General Arrangement Deck 2 and Deck 3

VESSEL DRAWINGS CONTINUED

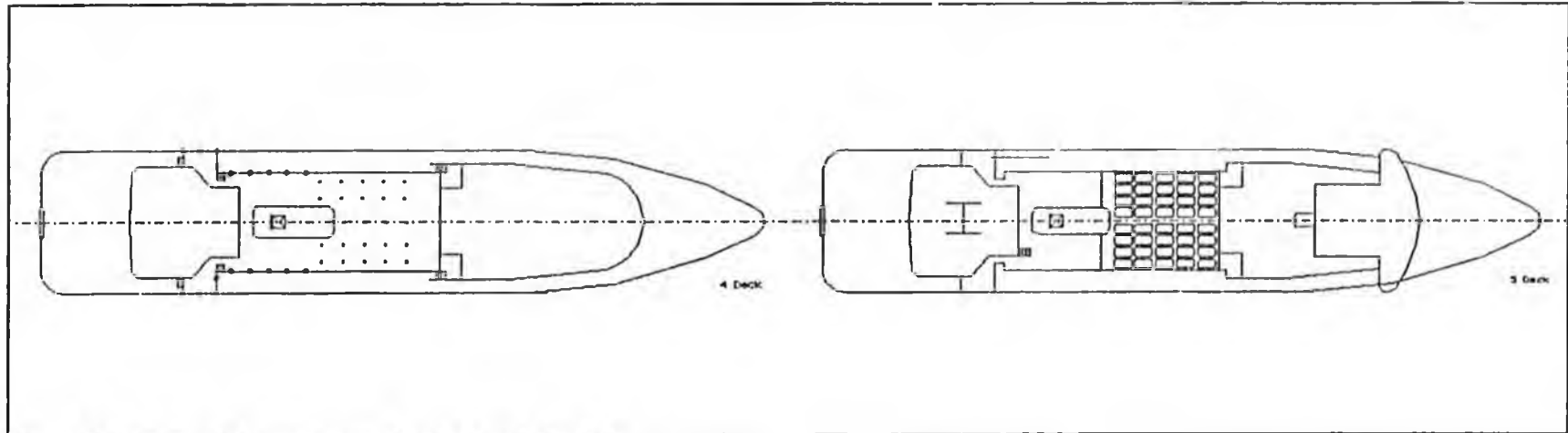


Figure 6 - General Arrangement Deck 4 and Deck 5

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