Islesboro-LincoInville Ferry

Presented by Nate Benoit and Bill Geary from MaineDOT

Naval Architect: Gilbert Associates

December 2025

Background

- Low Bid Received January 2025 for $41.5 million, $7 mil over budget
- Design was 207’-0” long, double-ended, with electric motor propulsion, 2 large battery rooms, shoreside rapid charging with automated charging gantry at pier
- Vessel length was 40’ longer than MCS ferry and required substantial pier upgrades
- To save substantial costs we needed to look at design alternatives to fit the budget

Reassessment

- All electric operations were a very expensive part of the vessel as bid, significant savings to modify to hybrid assist propulsion
- Double-Ended Design, with exposed rudder and propeller eliminates local repairs/inspection options
- The double ender should be abandoned for more conventional ferry (see details on next slide)
- Vessel design shortened to overall length of 172’-0” – likely saves close to 20 million in vessel construction and the pen improvement project modifications.
- Shorter, hybrid assist vessel eliminates 4 berthing dolphins, rapid charging dolphin, wave fencing, and E house
- 40’ beam width limitation for drydocking and to fit within existing pens limits vessel design alternatives

Double Ended Ferry Challenges

- Rockland Marine made a determination that their rail system can’t drydock a double ended ferry given their water depth, draft, and size of this ferry
- A travel lift would be required at a cost of $12 million
- Double ender has poor hydrodynamics; forward propeller runs in reverse; slower ferry than a conventional ferry; uses more fuel for the same speed
- A faster conventional ferry in transit will negate the 2 minute time needed to spin the ferry

Concept Design Alternatives

Design Arrangement Alternatives

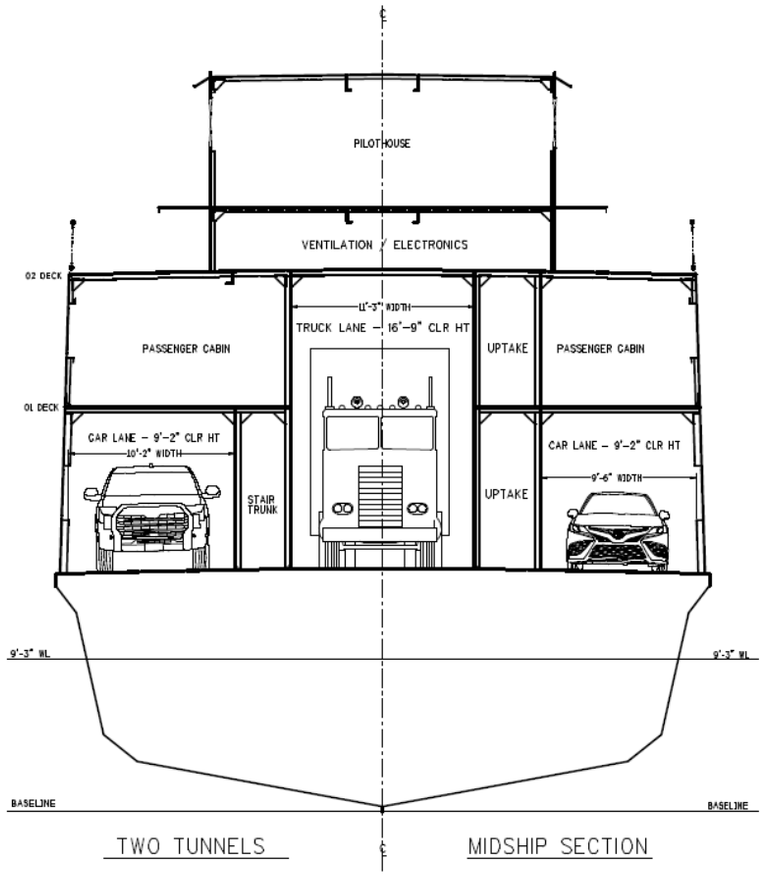
- Conventional balanced design similar to the MCS, but with improved horizontal and vertical clearances so that people can exit their vehicle
- Single tunnel with elevator and restrooms
- Single tunnel with max cabin seating and no elevator and no passenger restroom.
- Aircraft carrier design with small cabin to one side on the freight deck

Note that the Hull Arrangements below deck for each alternative are similar

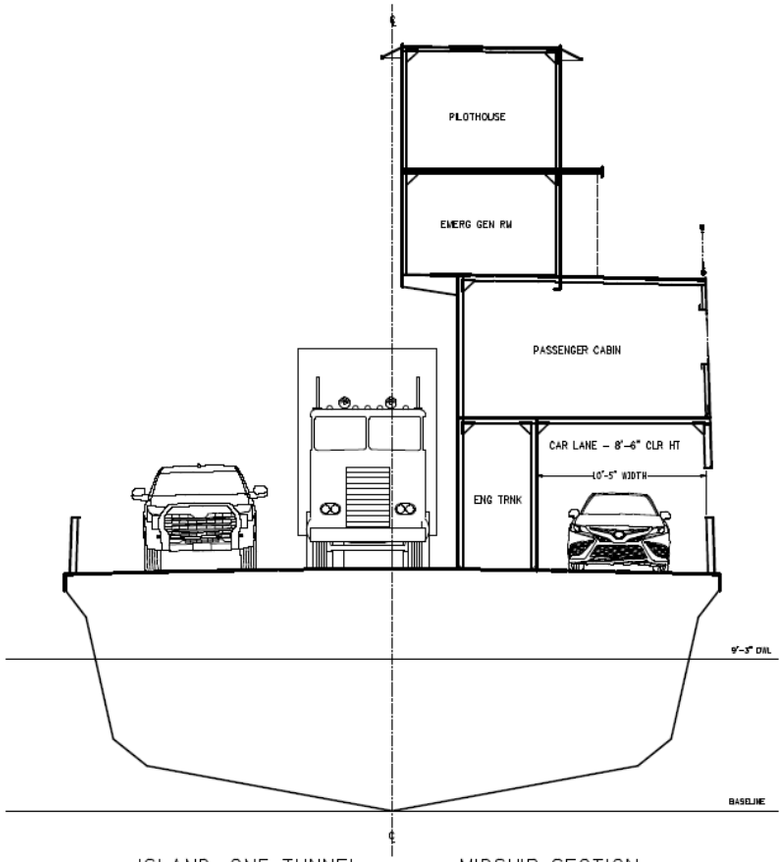
FTA grant funding requires a hybrid ferry.

- Parallel **hybrid** assist system; functions in all diesel mode, electric boost mode, and EV mode; quieter at port with main diesel engines turned off and electric motors used to push the ferry against the dock.

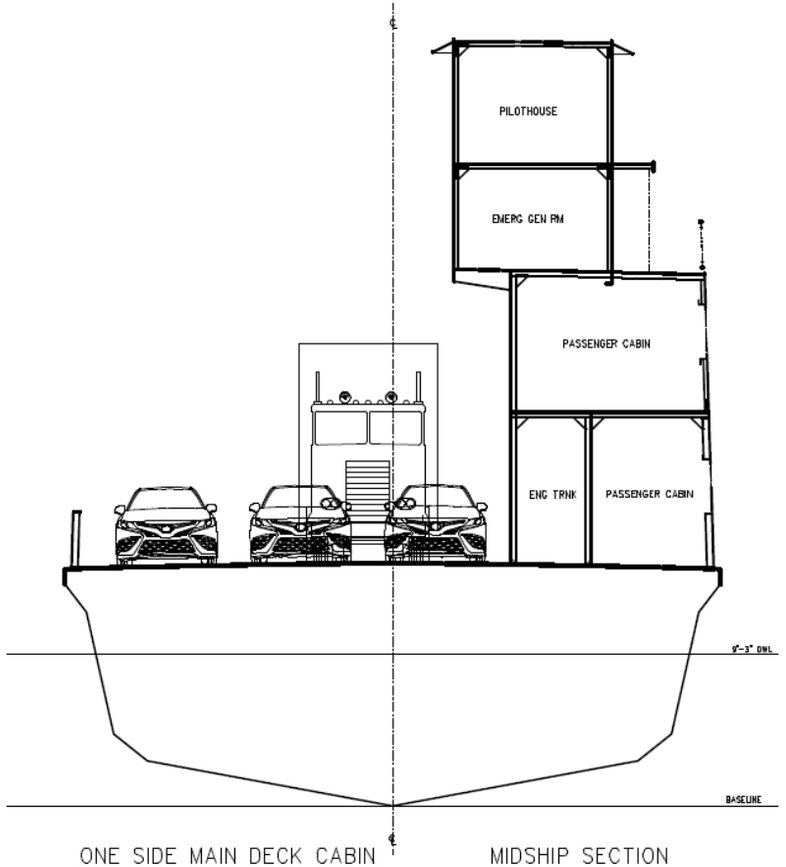
Cross Sections – 3 Alternatives



TWO TUNNELS MIDSHIP SECTION



ISLAND, ONE TUNNEL MIDSHIP SECTION



ONE SIDE MAIN DECK CABIN MIDSHIP SECTION

Single Tunnel Challenges

- Doesn’t provide enough cabin seats for morning walk-ons (110) even with elevator and restrooms removed.
- Ferry will list both empty and loaded and adds drydocking challenges
- Center truck lane is off centered because of the ADA cabin on freight deck; 2 less cars capacity with the truck lane fully loaded
- 4 Lane Vermont-NY ferry shown (44’ beam) is too wide for our location

Challenges with the aircraft carrier design

- Ferry will list (drydocking challenges)
- Reduction in vehicle capacity with the truck lane loaded
- Substandard cabin space for walk-ons
- No good location for a rescue boat
- Ferry shown right is 52’ beam and too wide for our location – 6 minute transit time and people stay in their vehicle; poor hydrodynamics

Recommendation

MaineDOT and the Maine State Ferry Service recommends the two tunnel balanced design.

- Has adequate cabin seating for morning walk-ons w/ restrooms
- Can open doors for fullsize pickup trucks under the tunnels when loaded with proper planning.
- Widest horizontal clearance and highest vertical clearance of any ferry in the MSFS fleet.
- Conventional ferry can be maintained at Rockland Marine
- Minimal listing issues with a balanced design (truck lane is centered)
- Full ADA compliance with ADA restroom and elevator
- Ample deck space for rescue boat, gear, ventilation uptakes, outside seating

Two tunnel design is recommended

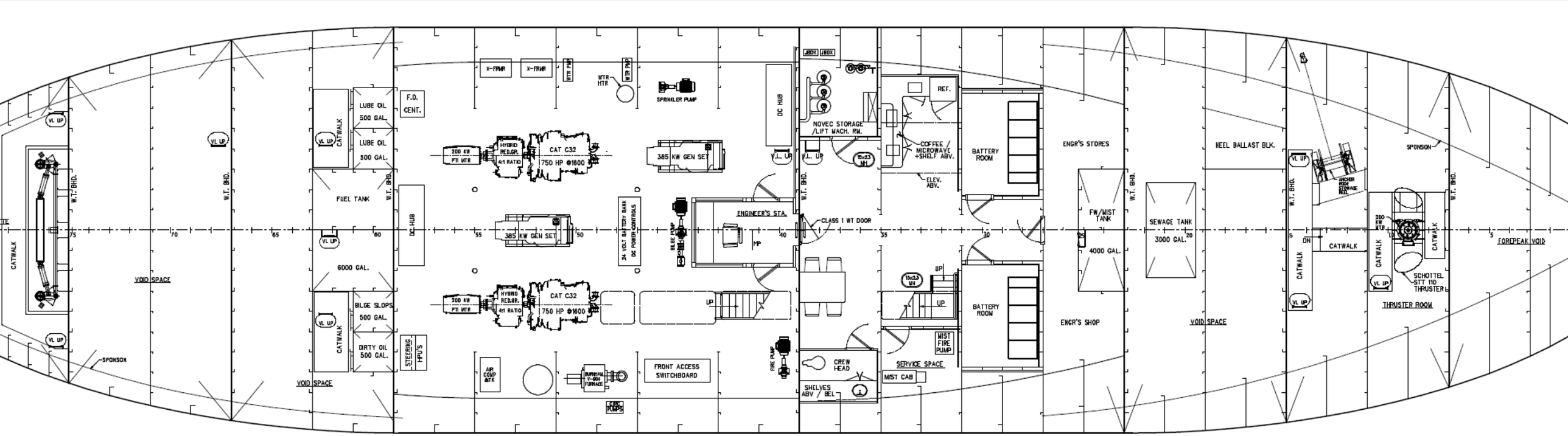
- Has the best freight carrying capacity with the truck lane loaded at the center of the ferry
- MCS design shown right will be improved with over a foot of additional vertical clearance by raising the height of the 01 deck
- Horizontal clearances under the tunnels will also be improved so that fullsize pickup trucks can be loaded in the outer lanes and allow passengers to open their door to get out.
- Mitchell Ferry will have narrow trunks (7” per side); out to out superstructure width is 6” greater than the MCS; 22” greater tunnel lanes, 2” wider truck lane; more accessible stair locations;

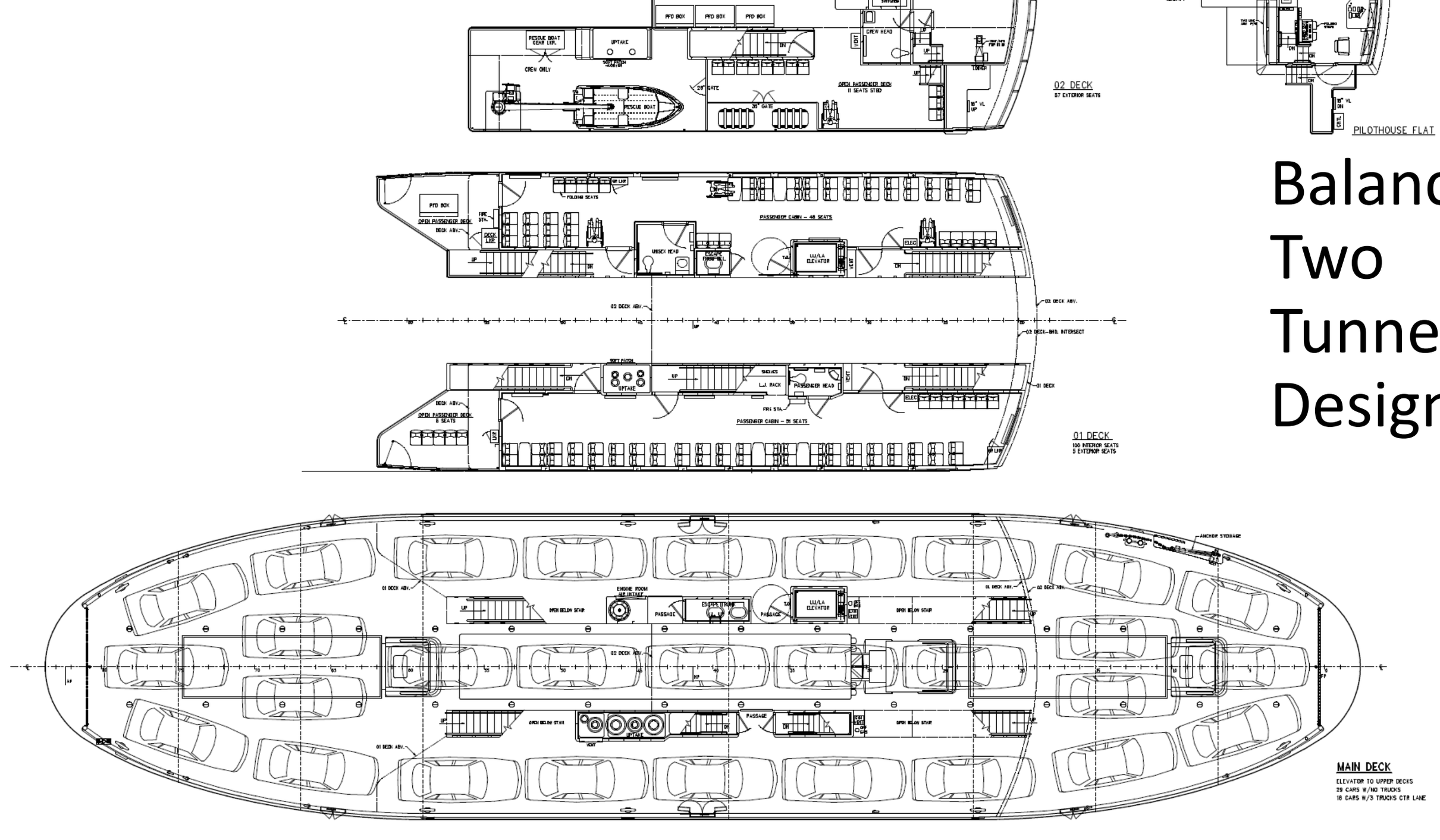
Balanced and Conventional Design

- Richard G. Spear ferry design will be upsized by increasing the length, height, and width.
- Has adequate cabin space and outdoor seating
- More room available for storing safety gear and greater deck space for a rescue boat
- ADA elevator and restroom

Summary	Listing Issues	Cabin Seats	Amenities	Freight Capacity
Balanced with 2 tunnels	minimal	100	62 outdoor seats 2 restrooms (1 ADA) 5 tables space for gear, carts, and bikes	18 cars, 3 large trucks
Single tunnel with elevator	yes	59	1 ADA restroom no outdoor seats no tables	18 cars, 3 large trucks
Single tunnel, no elevator no restrooms	yes	94	no passenger restrooms no tables no outdoor seating	18 cars, 3 large trucks
Aircraft Carrier Design	yes	83	2 restrooms (1 ADA) no tables, no outdoor seating no rescue boat location	12 cars, 3 large trucks

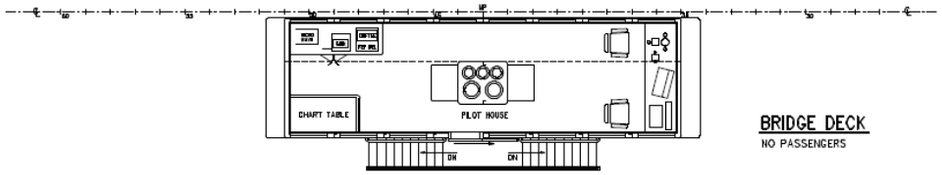
Hull General Arrangements



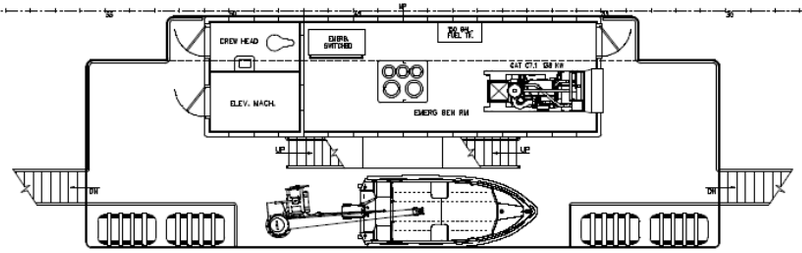


Balanced Two Tunnel Design

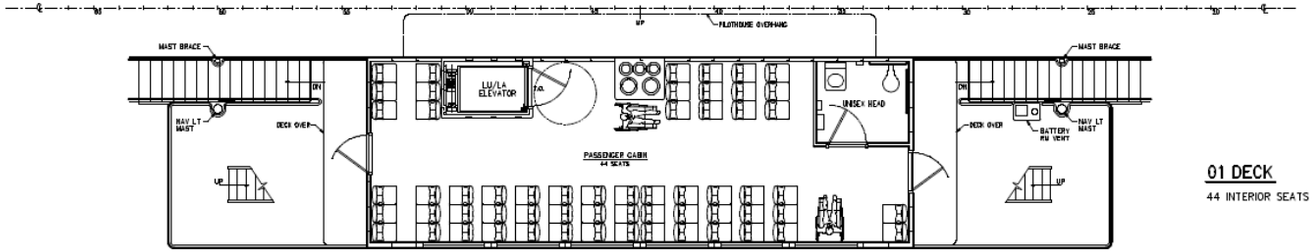
Single Tunnel with Elevator & Restroom



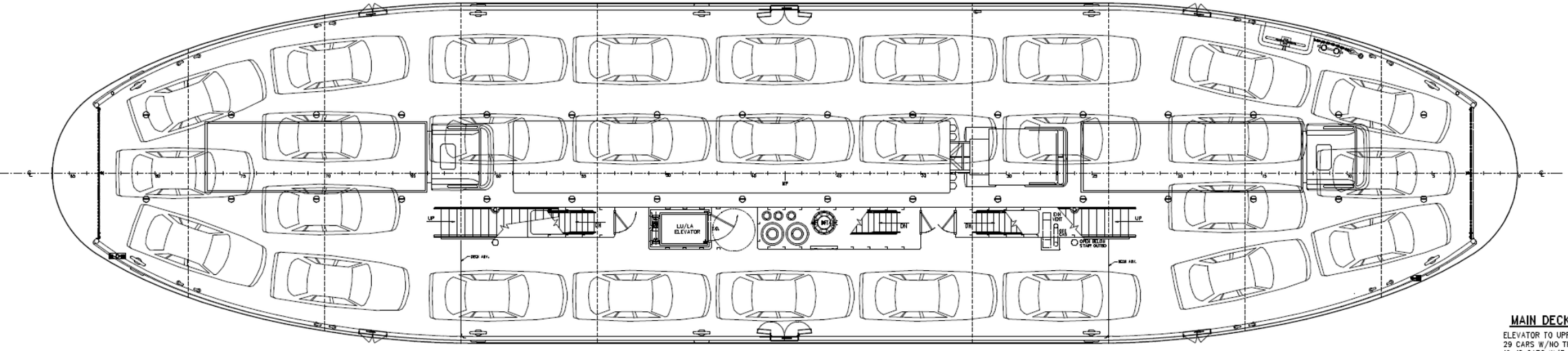
BRIDGE DECK
NO PASSENGERS



02 DECK
NO PASSENGERS

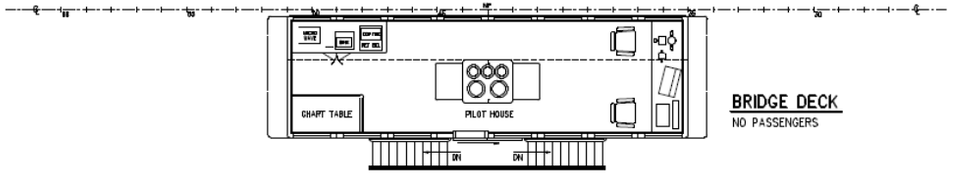


01 DECK
44 INTERIOR SEATS

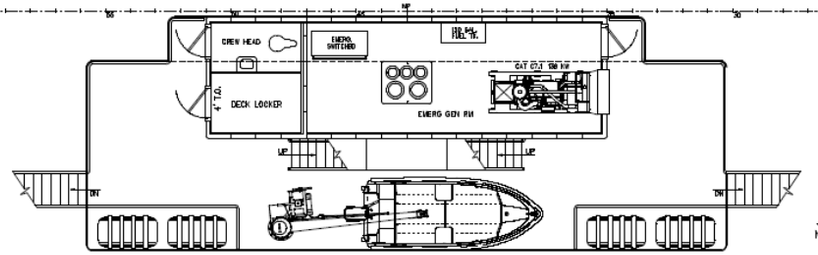


MAIN DECK
ELEVATOR TO UPPER DECK CABIN
29 CARS W/NO TRUCKS
16-18 CARS W/3 TRUCKS CTR LANE

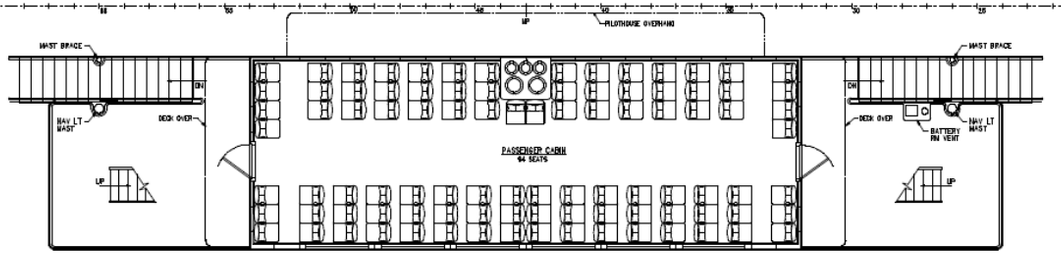
Single Tunnel
No Elevator
No Restroom



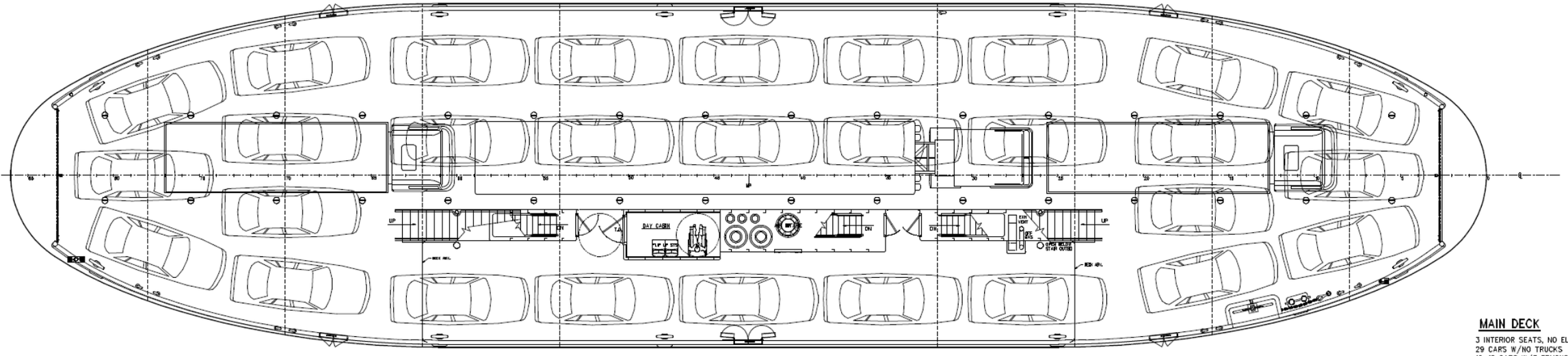
BRIDGE DECK
NO PASSENGERS



02 DECK
NO PASSENGERS

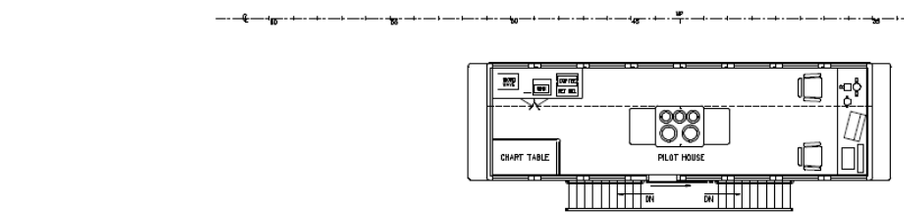


01 DECK
94 INTERIOR SEATS

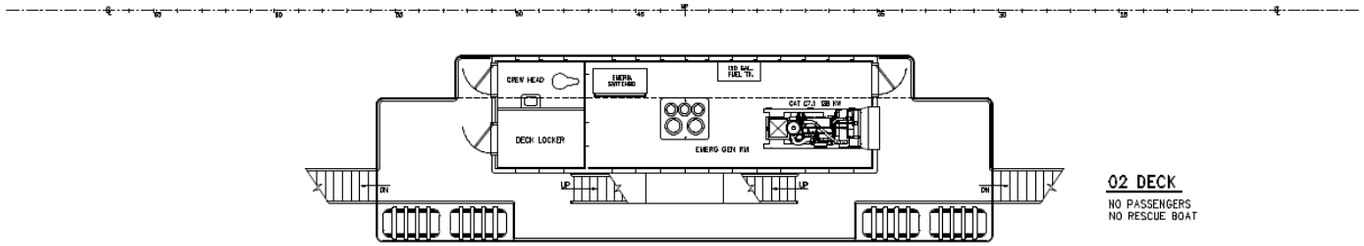


MAIN DECK
3 INTERIOR SEATS, NO ELEVATOR
29 CARS W/NO TRUCKS
16-18 CARS W/3 TRUCKS CTR LANE

Aircraft Carrier Design

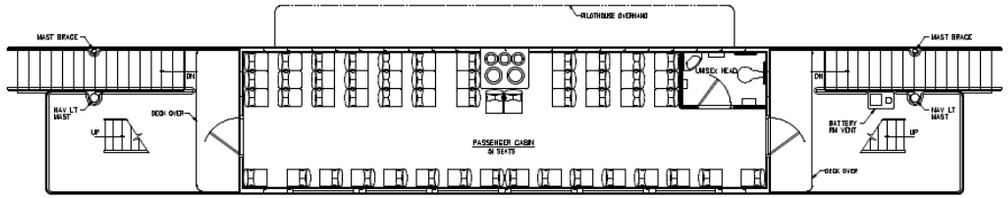


BRIDGE DECK
NO PASSENGERS

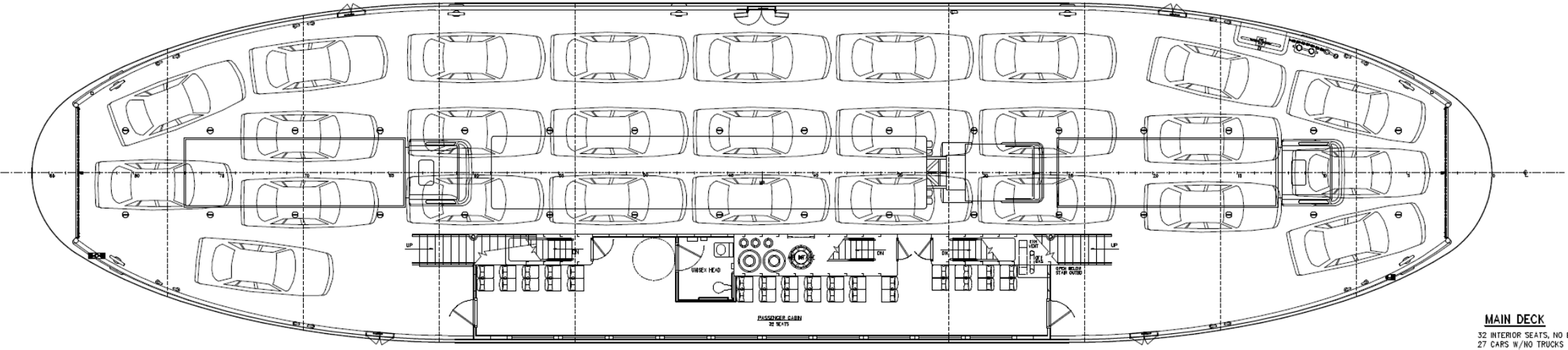


02 DECK
NO PASSENGERS
NO RESCUE BOAT

LINCOLNVILLE END — ISLESBORO END

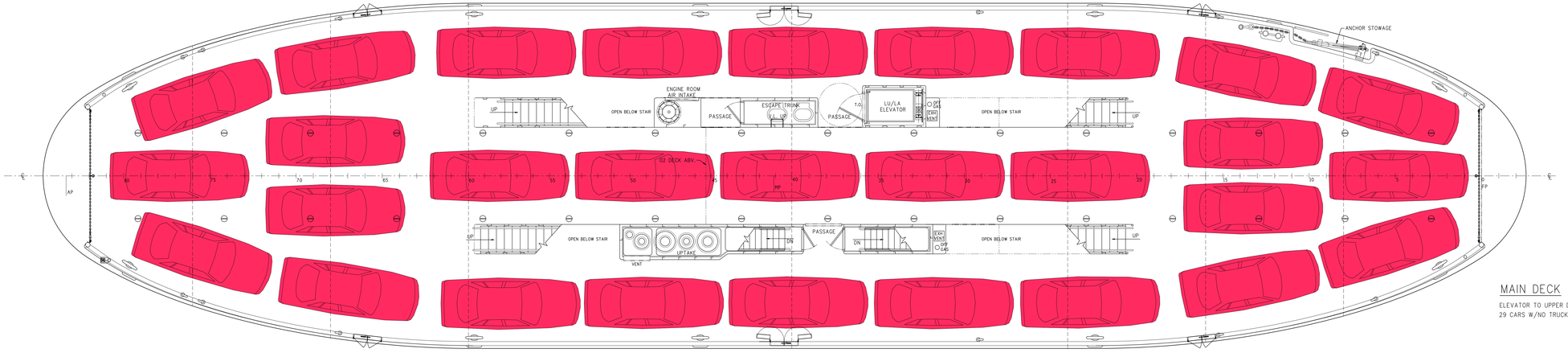


01 DECK
51 INTERIOR SEATS



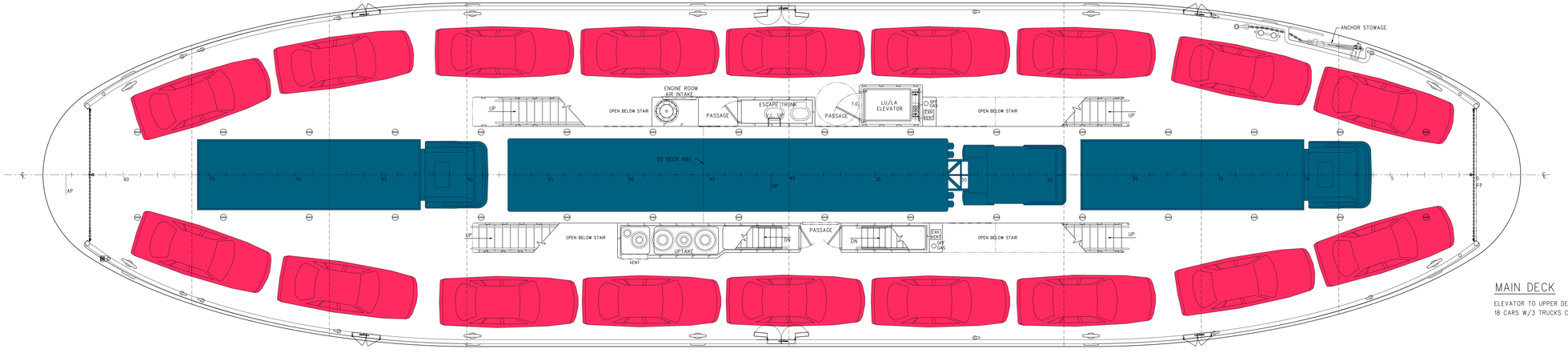
MAIN DECK
32 INTERIOR SEATS, NO ELEVATOR
27 CARS W/NO TRUCKS
11 CARS W/3 TRUCKS CTR LANE

2 Tunnel (MCS 2.0)



MAIN DECK

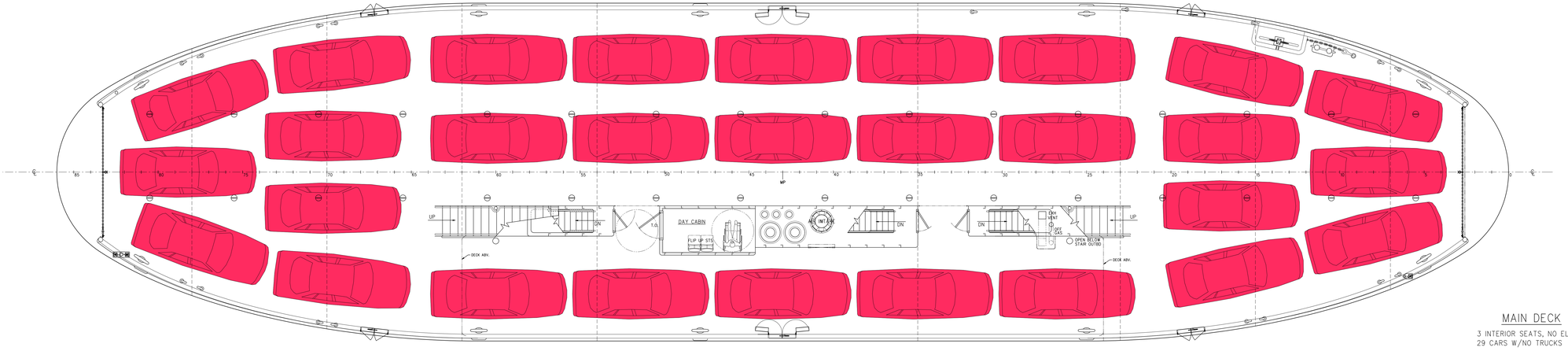
ELEVATOR TO UPPER DECKS
29 CARS W/NO TRUCKS



MAIN DECK

ELEVATOR TO UPPER DECKS
18 CARS W/3 TRUCKS CTR LANE

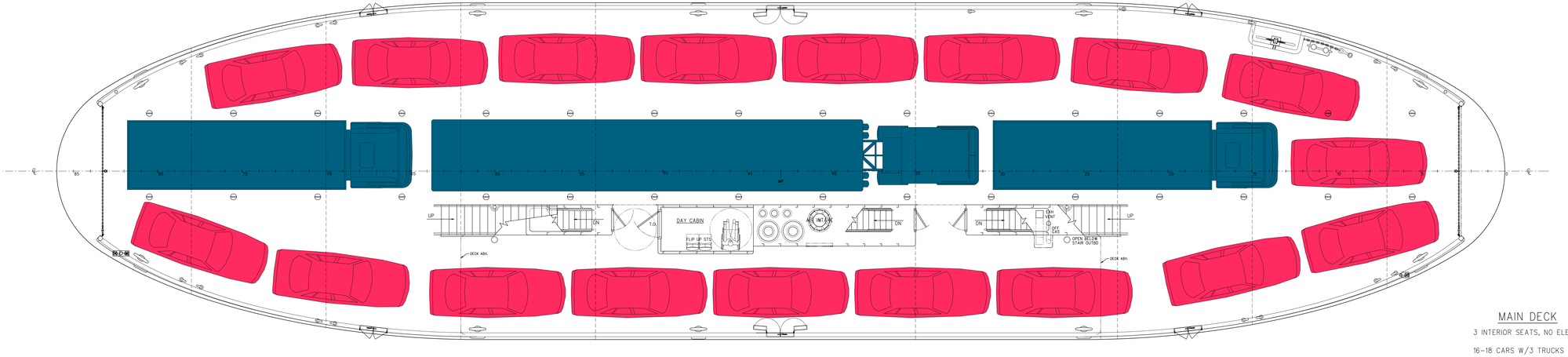
Single Tunnel, no Elevator



MAIN DECK

3 INTERIOR SEATS, NO ELEVATOR

29 CARS W/NO TRUCKS

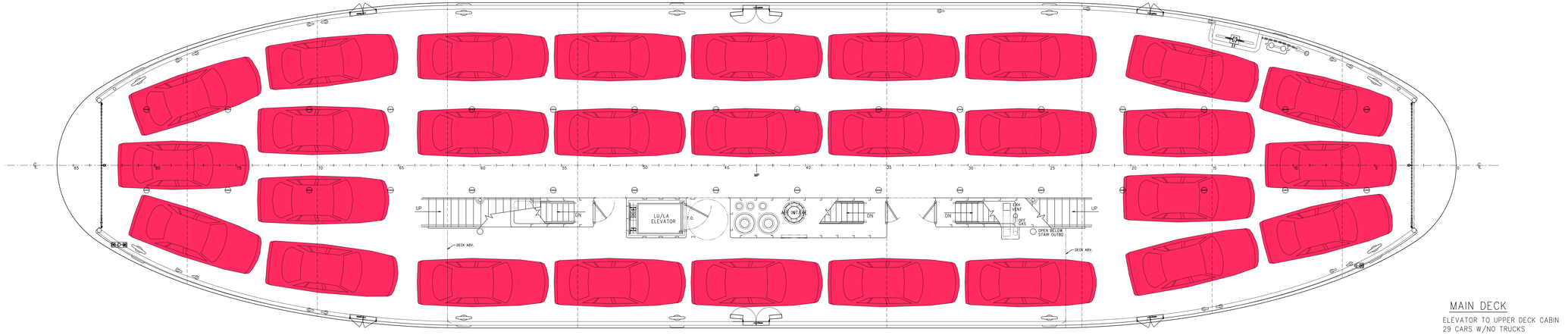


MAIN DECK

3 INTERIOR SEATS, NO ELEVATOR

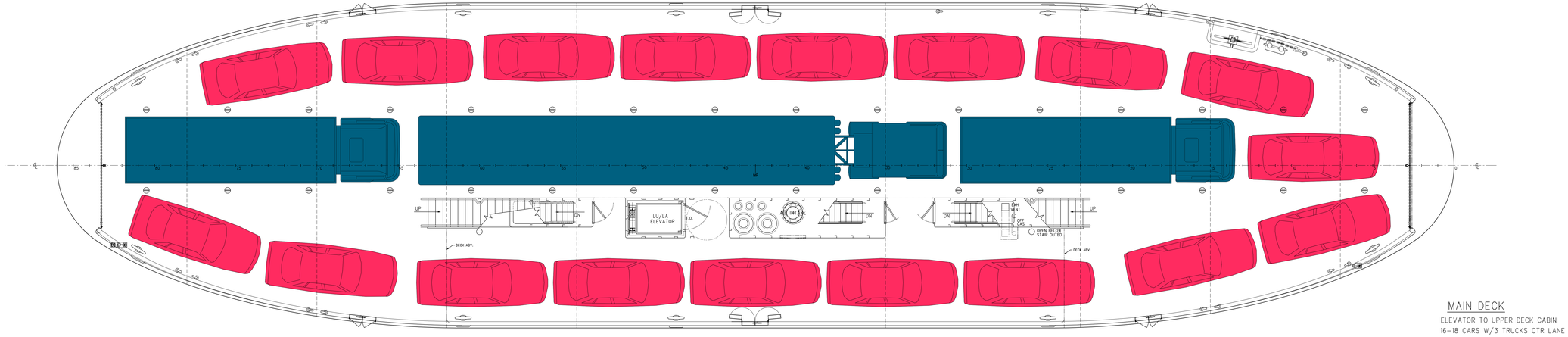
16–18 CARS W/3 TRUCKS CTR LANE

Single Tunnel with Elevator



MAIN DECK

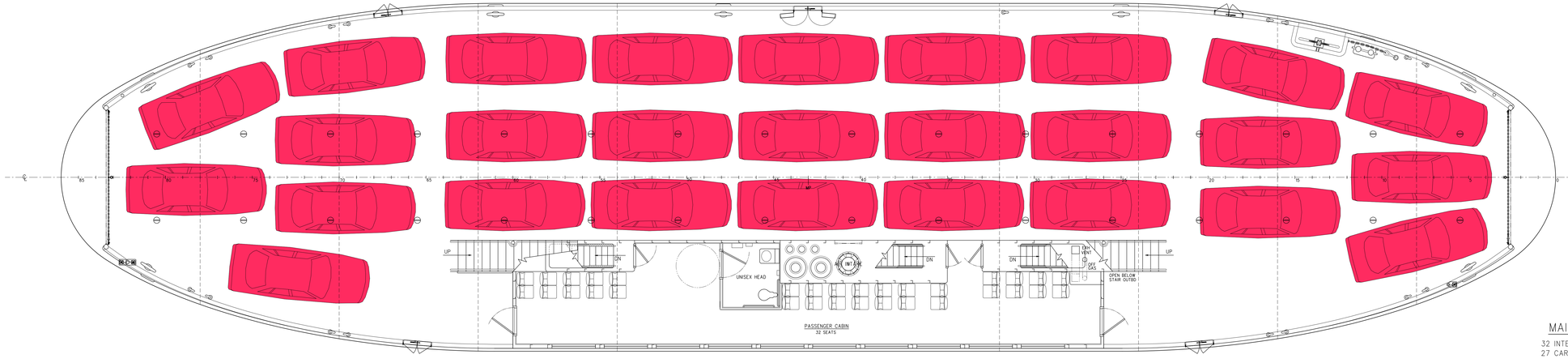
ELEVATOR TO UPPER DECK CABIN
29 CARS W/NO TRUCKS



MAIN DECK

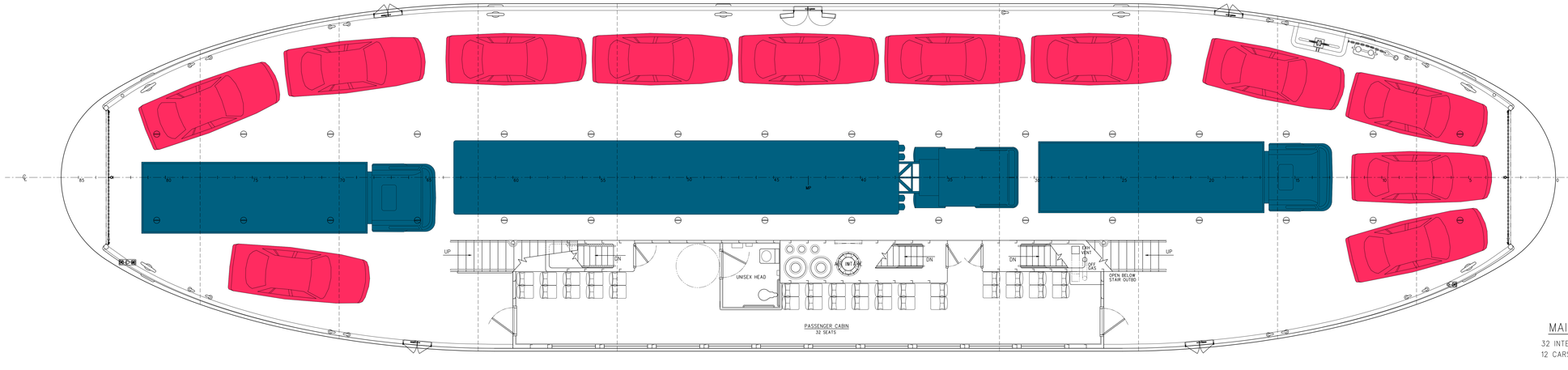
ELEVATOR TO UPPER DECK CABIN
16–18 CARS W/3 TRUCKS CTR LANE

Aircraft Carrier Design



MAIN DECK

32 INTERIOR SEATS, NO ELEVATOR
27 CARS W/NO TRUCKS



MAIN DECK

32 INTERIOR SEATS, NO ELEVATOR
12 CARS W/3 TRUCKS CTR LANE

Can I open my door and escape?

- Lane width under the tunnels is 10’2” or 122”
- Ford F150 & Silverado is 80” wide without the mirrors
- 122-80=42” to work with or 21” on each side of a large vehicle.
  (MCS has only 10” on each side for a F150)
- 18” is the minimum to open a door and escape
- Fullsize trucks to not be loaded at the elevator or uptake

Passenger vehicle widths without mirrors

- Toyota RAV4: 73.4”
- Subaru Forester: 72”
- Subaru Crosstrek: 71”
- Honda CRV: 73.2”

At the **Elevator** the lane width is 105”

- 105”-73 = 32” of available space **(16” to open a door)**
- **Best for the ABs to not position vehicle doors right at the elevator**

At the **uptake** the lane width is 114”

- 114-73=41” of available space **(20.5” to open a door)**

MCS PORT TUNNEL

- Handrail to Bulkhead: 100” or 8’4”
- Between Bumpers: 86” or 7’2”

Mitchell ferry tunnel is 122”

- Door fenders may reduce this dimension as well as construction tolerances

MCS Center Truck Lane

- Bulkhead-to-Bulkhead: 144” or 12’
- Between Handrails:133” or **11’1”**
- Between Bumpers: 117” or 9’9”

Mitchell Ferry Truck lane is 11’3”

MCS Starboard TUNNEL

- Head to Bulkhead: 96” or 8’
- Handrail to Bulkhead: 100” or 8’4”
- Between Bumpers: 86” or 7’2”

Mitchell ferry tunnel is 122”

- Door fenders may reduce this dimension as well as construction tolerances

Fullsize truck door opened 22”

Advantages of Mitchell design versus MCS

- 6’ longer and more available deck space
- 6” wider superstructure (39’6” versus 39’)
- 7” Narrower trunks (41” versus 48”)
- No wheel guards and no interior handrails
- 2” wider truck lane (11’ 3” versus 11’ 1” rail to rail)
- 22” wider tunnels (122” versus 100”)
- 8” greater vertical clearance of the tunnels (9’2” versus 8’6”)
- Full ADA compliance with ADA elevator and restroom
- Hybrid propulsion system, quieter at port with main engines turned off, 20% fuel savings , overnight trickle charge of the batteries, variable speed generators also charge the batteries
- Bridge wings with ferry controls, larger pilot house, electric bow thruster
- Space for gear, carts, and bikes under the stair towers
- Better stair access on each end (MCS enters from truck lane – aft end)

Questions?