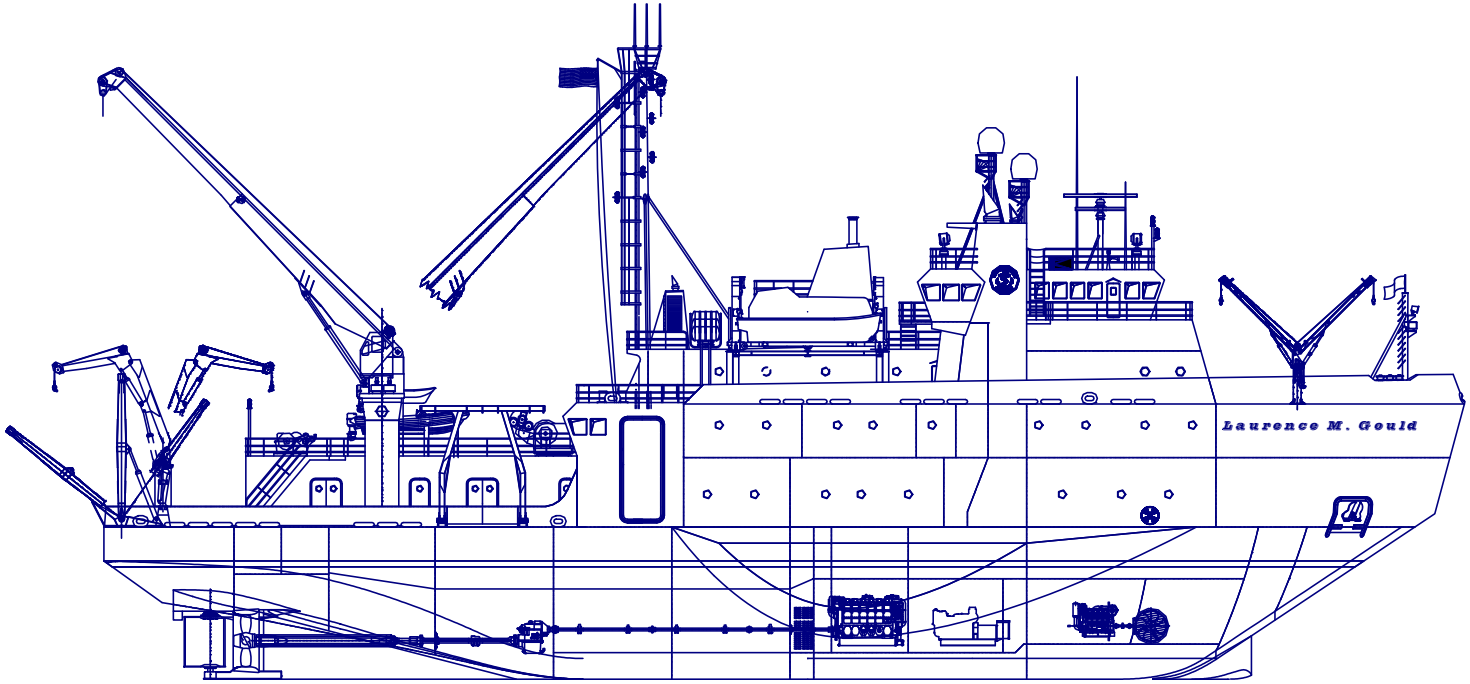
Laurence M. Gould

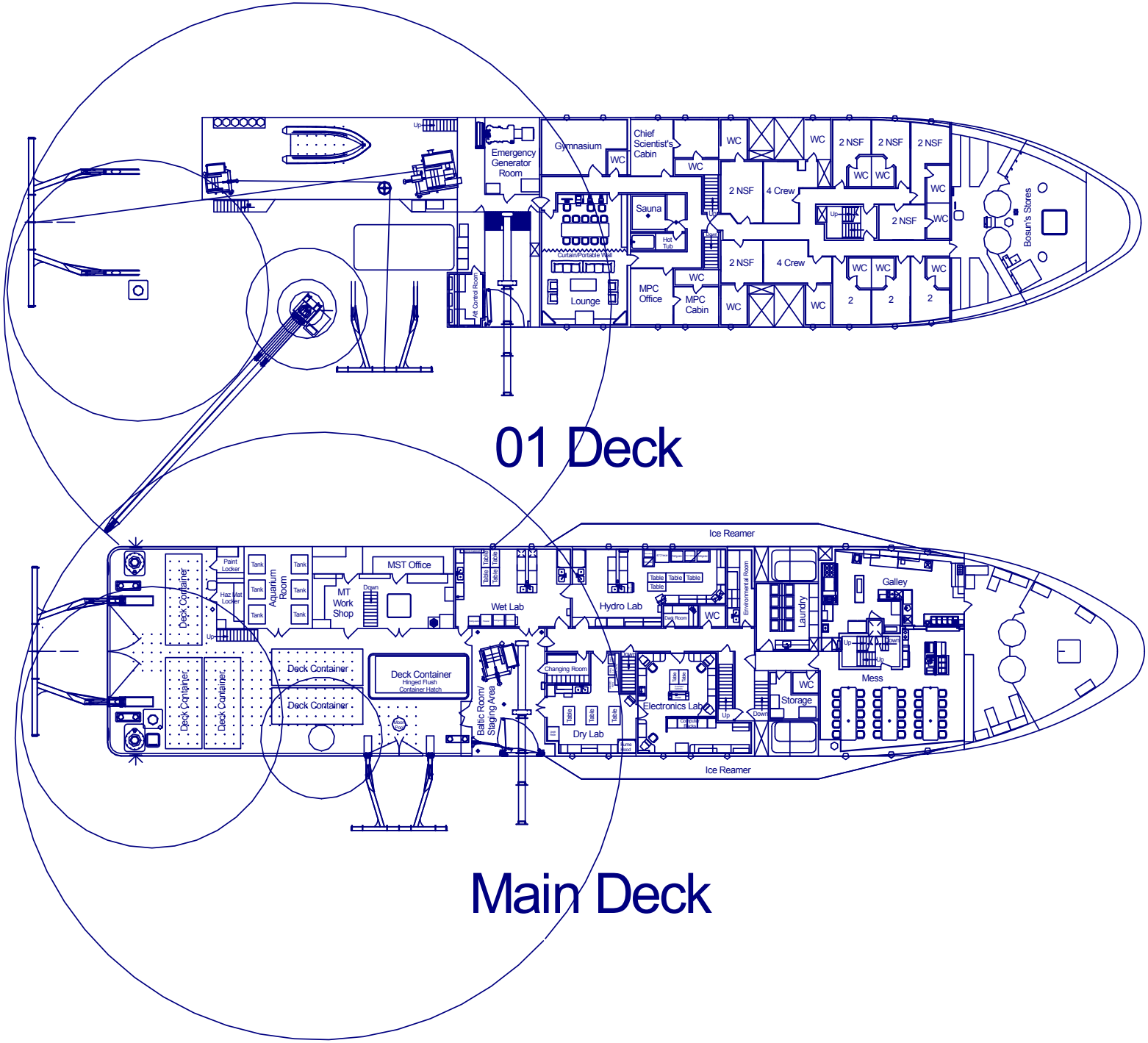
Antarctic Research and Supply Vessel

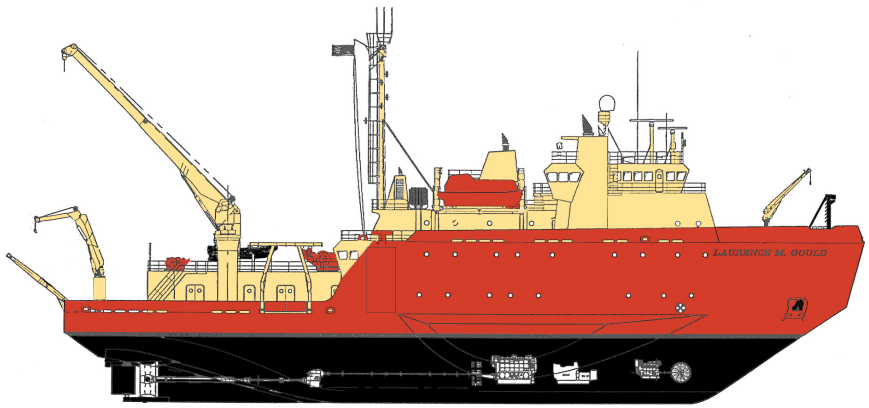


Operated for the
National Science Foundation, Office of Polar Programs
by

Raytheon Polar Services

Under a charter with
Edison Chouest Offshore


01 Deck
Emergency Generator Room
Gymnasium
Chief Scientist's Cabin
WC
2 NSF
4 Crew
Sauna
Hot Tub
Curtain/Portable Wall
Lounge
MPC Office
MPC Cabin
Air Control Room
Bosun's Stores
Up
Main Deck
Ice Reamer
Paint Locker
Haz Mat Locker
Tank
Aquarium Room
MST Office
MT Work Shop
Down
Deck Container
Hinged Flush Container Hatch
Wet Lab
Hydro Lab
Table
Dark Room
Environmental Room
Laundry
Galley
Mess
Changing Room
Baltic Room/ Staging Area
Dry Lab
Electronics Lab
Storage



The R/V Laurence M. Gould is operated by Raytheon Polar Services Company (RPSC) on a long-term charter from Edison Chouest Offshore (ECO). RPSC staffs the vessel with a charter representative to coordinate cruise planning and scheduling, and a technical staff to support science operations. ECO provides the vessel master, ice pilot, and crew.

Built in 1997, the Gould is 230 feet long, ice-strengthened, and rated Ice Class ABS A1, which means it is capable of breaking one foot of level ice with continuous forward motion. The vessel is a multi-disciplinary research platform designed for year-round polar operations and can accommodate up to 37 researchers and staff for missions lasting up to 75 days. The Gould's primary missions are to support research in the Antarctic Peninsula region and to re-supply and transport personnel and cargo between Palmer Station and South American ports.

The Gould was named in honor of Laurence McKinley Gould, polar explorer, geologist, teacher, and president of Carleton College. He was second-in-command on Admiral Richard E. Byrd's first Antarctic expedition of 1929-30. During that expedition Byrd established the base camp at Little America from which his team explored the continent, including flights over the South Pole. Gould, an international figure with 25 honorary degrees, and a principal architect of the Antarctic Treaty, died in 1995 at the age of 98. That same year, the National Science Foundation initiated the charter for the services of this ice-strengthened vessel to further its studies and knowledge of the Antarctic Peninsula and Southern Ocean.

ARSV Laurence M. Gould

Principal Features and Technical Information

General		
Vessel Owner	Edison Chouest Offshore Inc.	
Address	Galliano, Louisiana	
Builder	North American Shipbuilding, U.S.A.	
Year of Construction	1997	
Chartered for	Raytheon Polar Services Company	
Address	Centennial, Colorado	
Classification	Ice Class ABS A1	
Flag	U.S.A.	
Principal Dimensions		
Length Overall	230 ft	70.2 m
Length Between Perpendiculars	212 ft	64.7 m
Breadth (molded)	46 ft	14.02 m
Breadth (with ice reamers)	56 ft	17.1 m
Draft	18 ft	5.49 m
Depth	25.75 ft	7.85 m
Lightship Weight	2755 LT	2799 t
Deadweight	1025 LT	1041 t
Loadline Displacement	3780 LT	3841t
Gross Tonnage	2966 (international)	
Loadline Displacement	3780 LT	3841 t
Main Propulsion Machinery		
Shafts		
Number of Shafts	2	
Total Shaft Horsepower		
Open Water	4576 HP	
Ice Operations	3900 HP	
Main Engines		
Number of Engines	2	
Manufacturer	Caterpillar	
Model	3606	
Propellers		
Variable Pitch in Kort Nozzles		
Number	2	
Diameter	8.6 ft	2.65 m
Rudders		
High Lift	2	
Generators		
Number	3	
Rating	700 kW	
Manufacturer	Caterpillar	
Model	3508	
Emergency Diesel Generator		
Number	1	
Rating	500kW	
Manufacturer | Model	Caterpillar	3408
Cruising Range	12,000 miles	
Endurance	75 days	
Tank Capacities		
Fuel	245,400 gallons	
Fresh Water	37, 385 gallons	
Sewage and Wash water	12,142 gallons	
Ballast	322,218 gallons	
Accommodations		
Crew	16	
Scientist and Staff	28	
Berthing Van Capacity	9	
Total	53	

ARSV Laurence M. Gould

Principal Features and Technical Information

Over-The-Side Handling Equipment

Cranes		
Main Crane	13.5 ton	60 ft reach
Aft Knuckle Crane	3.5 ton	20 ft reach
Forward Auxiliary Crane	1/2 ton	
A-frames		
Stern A-frame	10 metric tons	7.5 m clearance
Starboard A-frame	5 metric tons	
Baltic A-frame	5 metric tons	
Winches		
DUSH 5 Hydrographic Winch (Baltic Room)	10,000 m of 0.322 in. electro mechanical cable	
DUSH 4 Winch (2 Interchangeable Drums)	One drum carries 9,000 m of 1/4 in. wire	One drum carries 6,000 m of 0.322 in. conducting wire
DUSH 11 Winch (Interchangeable Drums)	One drum carries 7,300 m of 9/16 in. torque balanced mechanical wire	One drum carries 5,000 m of .680 in. coaxial cable
Deck Tugger Winch	3/8 in. mechanical wire	
Deck Utility Winch	1/4 in. mechanical wire	
Mooring Winch	Interchangeable between vessels	
Streamer Winch	Interchangeable between vessels	

Water-Column-Sampling Equipment

Blake Trawl	5 ft	
Otter Trawls (2)	18 ft	30 ft
Isaac Kidd Midwater Trawl	1 m	
Flat Trawl	35 ft	
MOCNESS	1 m	10 m
Tucker Trawl, opening/closing	3 nets	
Optical Plankton Counter		

Conductivity Temperature Depth (CTD) Sensors

Description:
The Sea-Bird 911+ offers real-time operation via sea cable telemetry, includes a solid state memory module, and has a maximum depth of 6800 m. The CTD is mounted on a 24 bottle General Oceanics rosette. Five, 12, and 30L bottles available.

Altimeter	Benthos	PSA-916
Altimeter	Datasonics	PSA-900D
Conductivity	Sea-Bird	4-02/O
Conductivity	Sea-Bird	4C (6800 m)
CTD Fish	Sea-Bird	SBE 9+
CTD Pressure Sensor	Paroscientific	410K-105
Dissolved Oxygen	Sea-Bird	SBE 43
CTD Pump	Sea-Bird	SBE 5
CTD Pump	Sea-Bird	5T
Fluorometer	Wet Labs	FLRTD
Fluorometer	Wet Labs	AFLT
PAR	Biospherical Instruments	QSP-200L4S
PAR	Biospherical Instruments	QSP-2300
Temperature	Sea-Bird	3-02/F
Temperature	Sea-Bird	3plus, 6800 m
Transmissometer	WET Labs	C-Star
XBT (auto launcher) / XCTD	Sippican MK-21	

Diving Equipment

Dive Compressors (1 on board)	Bauer	Fills to 3000 psi
Dive Van (for storage/setup of dive equipment)		20’ x 8’ x 8.5’
DAN (Divers Alert Network) Oxygen Kit		

Water Purification Equipment

E-pure Four Holder System	Barnstead	Type I water quality (ultrapure), 2L/minute
Reverse Osmosis & De-ionized (DI) Water System	Aqua Solutions Aqua-1 Compact	Type II water quality (analytical grade DI)

ARSV Laurence M. Gould

Principal Features and Technical Information

Uncontaminated Seawater System

Description:
The seawater system supplies uncontaminated seawater to the Aquarium Room, Wet Lab and Hydro Lab. Green strand piping, a non-metallic, chemically resistant material, has been used throughout the system to minimize algae and bacterial growth. It also maintains its structural integrity under low temperatures. Large diameter piping and a minimum of 90° turns helps to prevent the formation of frazil ice in the system. The sea-water system is also equipped with a centrifugal ice-strainer/de-bubbler.

Three Intakes		
Main	At Skeg	
Secondary	At Moon Pool	3 ft above keel
Tertiary(used mainly for removing ice)	At Moon Pool	below water line
Surface Seawater Sampling Equipment		
Fluorometer	Wet Labs	FLRTD
Micro Thermosalinograph	Sea-Bird	45
Transmissometer	WET Labs	C-Star 25 cm
pCO_2 Equilibration System	Lamont-Doherty Earth Observatory	
Aquaria and Deck Incubators		
Aquaria	6 Fiberglass	1000L Xactic Tanks
Deck Incubator	3 Plexiglas	UV Transparent

Bottom-Sampling Equipment

Dredges	
Deep-Sea Rock Dredge	Scripps Institute of Oceanography
Small Chain Dredge, Rock Dredge	Kahl Scientific
Large Chain Dredge, Rock Dredge	Kahl Scientific
Coring Equipment	

Description:
The vessel can be equipped with several coring devices for vertical sediment sampling.

Box Corer	Ocean Instruments
Jumbo Piston Corer	Woods Hole Oceanographic Institute
Grab Sampler	Smith-MacIntyre
Gravity Corer	
Kasten Corer	State University of New York/Ocean Instruments
Mega Corer	Mark I
Standard Piston Corer	Woods Hole Oceanographic Institute

Sonar Systems

Acoustic Doppler Current Profiler (ADCP)	RD Industries	150 kHz Narrow Band VM-150
3.5 kHz Sub-Bottom Profiler	Knudsen	320 B/R
12 kHz bottom tracker	Knudsen	320 B/R
38/120 kHz Towed Bio-Acoustic Sonar	HTI	
Chirp Sidescan Sonar / Sub-Bottom Profiler	Datasonics	SIS-1000, max. depth 2000m
12 kHz Sonar Receiver	Raytheon PDR	for pinger tracking
Pinger 12 kHz	OIS	6000 (6000 m)
Thermal Graphics Recorder	EPC-1086	for pinger plotting
Thermal Graphics Recorder	EPC-9802	for Knudsen plotting

Meteorological Sensor Suite

Humidity/Wet Temperature	RM Young	41372LC
Anemometer	Gill	1390 Ultrasonic
Barometer	RM Young	61201
PIR (pyrgeometer)	Eppley	PIR
PSP (pyranometer)	Eppley	PSP
PAR Radiometer	Biospherical Instruments	QSR-240/P
PUV (underwater)	Biospherical Instruments	PUV-/683500
PUV (underwater)	Biospherical Instruments	PUV-2500
GUV (mast)	Biospherical Instruments	GUV-2511

Time and Navigation Instruments

Attitude GPS	Ashtech	ADU2
P-Code GPS	Trimble	Centurion
GPS	Garmin	GA29

ARSV Laurence M. Gould

Principal Features and Technical Information

Communication Equipment

The LMG is Global Maritime Distress Safety System (GMDSS) compliant. This means that there is automatic and complete redundancy for each mode of communication for ship to ship and ship to shore.

Fleet 77	Sailor	Fleet 77+
Inmarsat-B	NERA Saturn-B HSD	
Inmarsat-C	Sailor	
VHF		
Sailor	RT146	Bridge to Bridge
Sailor	RT2048	Main
Sailor	RM2042	Watch Receiver
VHF H/H		
Sailor	SP300	
Sailor	T2130	

Computers and Networking

Description:
Support Windows, Macintosh and Linux operating systems. There are usually 6 to 8 computers available for general use in the E-Lab and in the 01Lounge.

Network	100 LAN drops throughout the ship, including cabins	
E-mail		
Transmitted twice daily via satellite. User allotment of 25 KB per day to be used any time during the cruise		
Size Restrictions:	100 KB outgoing	75 KB incoming

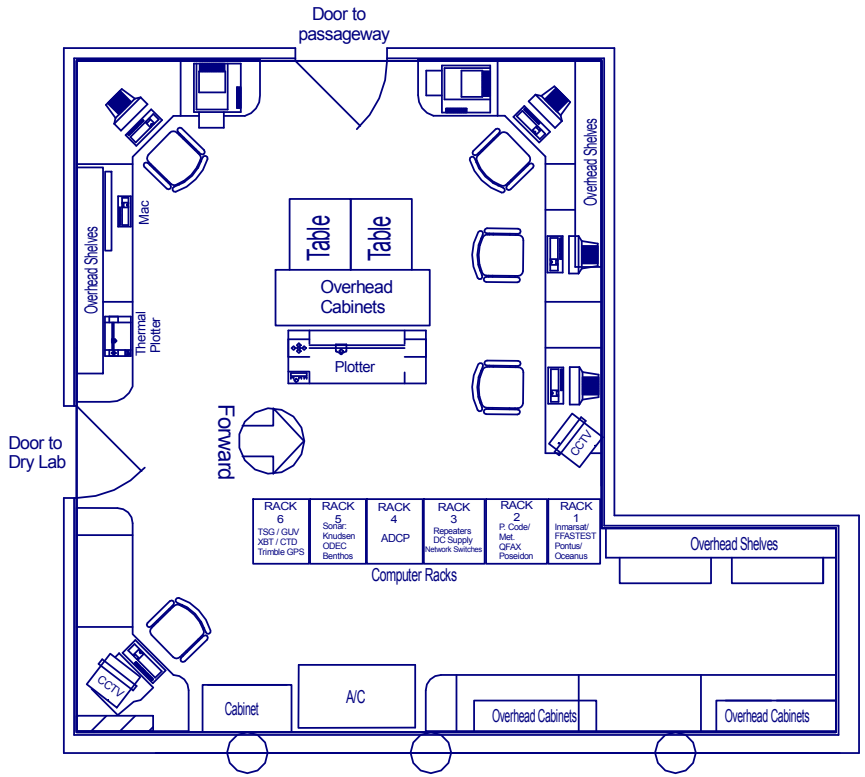
Space Allocation

Scientific Laboratory Spaces	
Wet Lab	425 sq. ft
Hydro Lab	526 sq. ft
Dry Lab	356 sq. ft
Electronics/ Computer Lab	460 sq. ft
Aquarium Room	270 sq. ft
Environmental Room	48 sq. ft
Microscope Room	25 sq. ft
Science Workshop	380 sq. ft
Changing (Mud) Room	58 sq. ft
Baltic Room/Scientific Changing Room	427 sq. ft
Exterior Main Deck	
Deck tie down points are located at 2 ft centers on the main deck	
Lower Deck	
Scientific Storage	Four 20 ft containers

Science Vans		
Radioisotope Vans	2 vans	20’ x 8’ x 8’
Freezer Lab	2 vans	20’ x 8’ x 8’
Garage/Trace Metal Clean Lab	1 van	20’ x 8’ x 8’
Recreation / Leisure Spaces		
Lounge / Library	670 sq. ft	
Gymnasium	196 sq. ft	
Sauna / Jacuzzi	144 sq. ft	

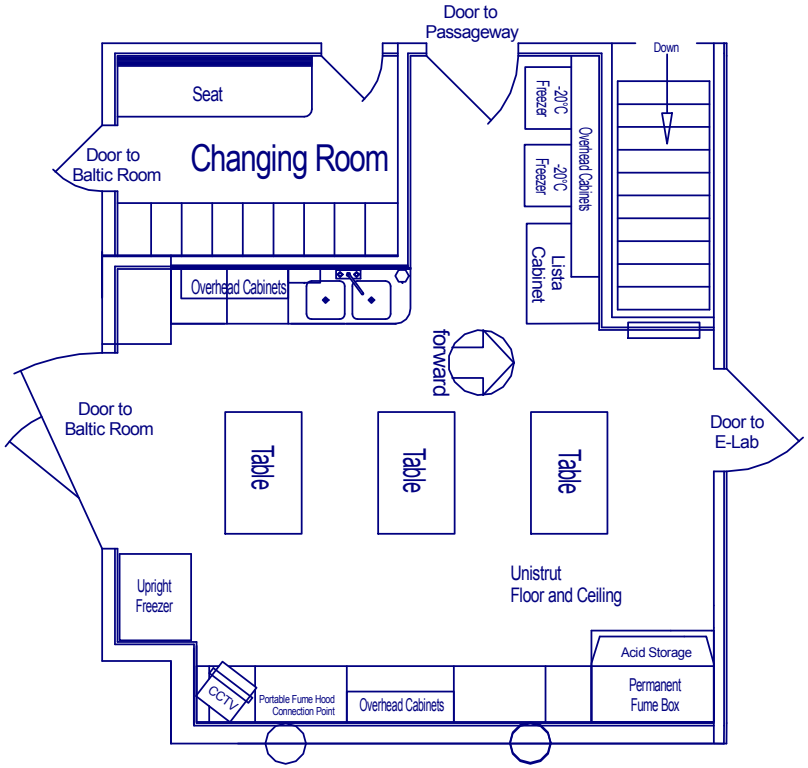
Electronics Lab

460 sq. ft.

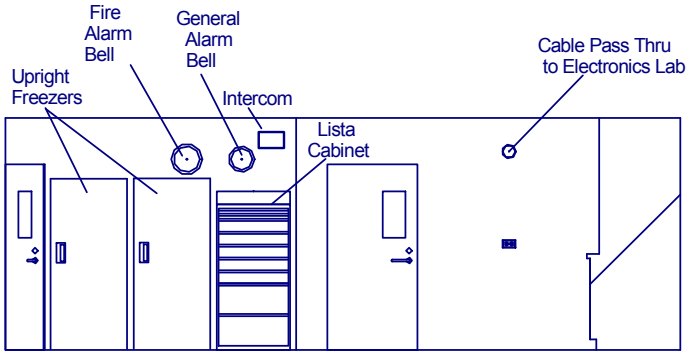


Dry Lab

356 sq. ft.



Dry Lab Elevations



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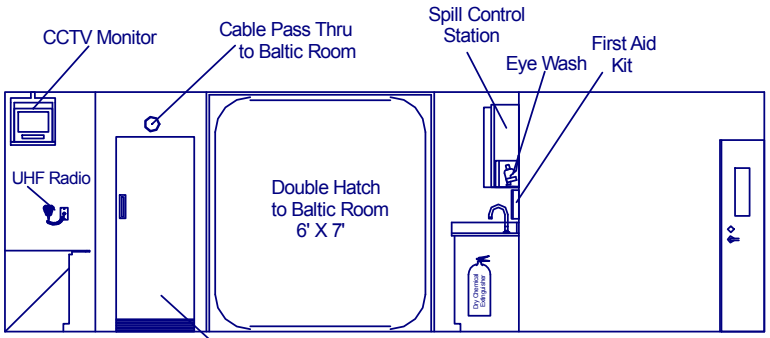
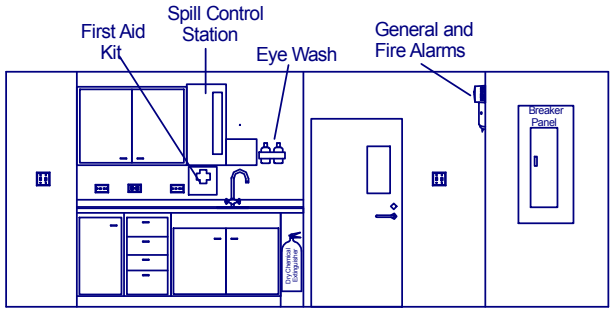
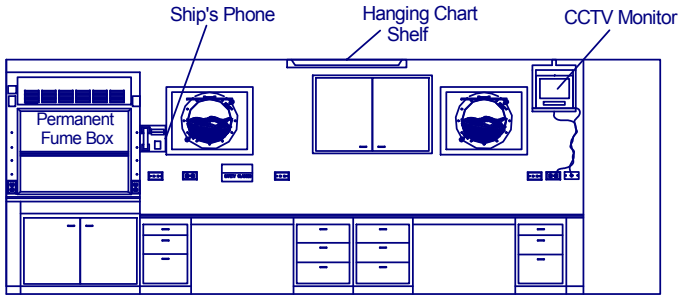


Aft

Dry Lab Elevations



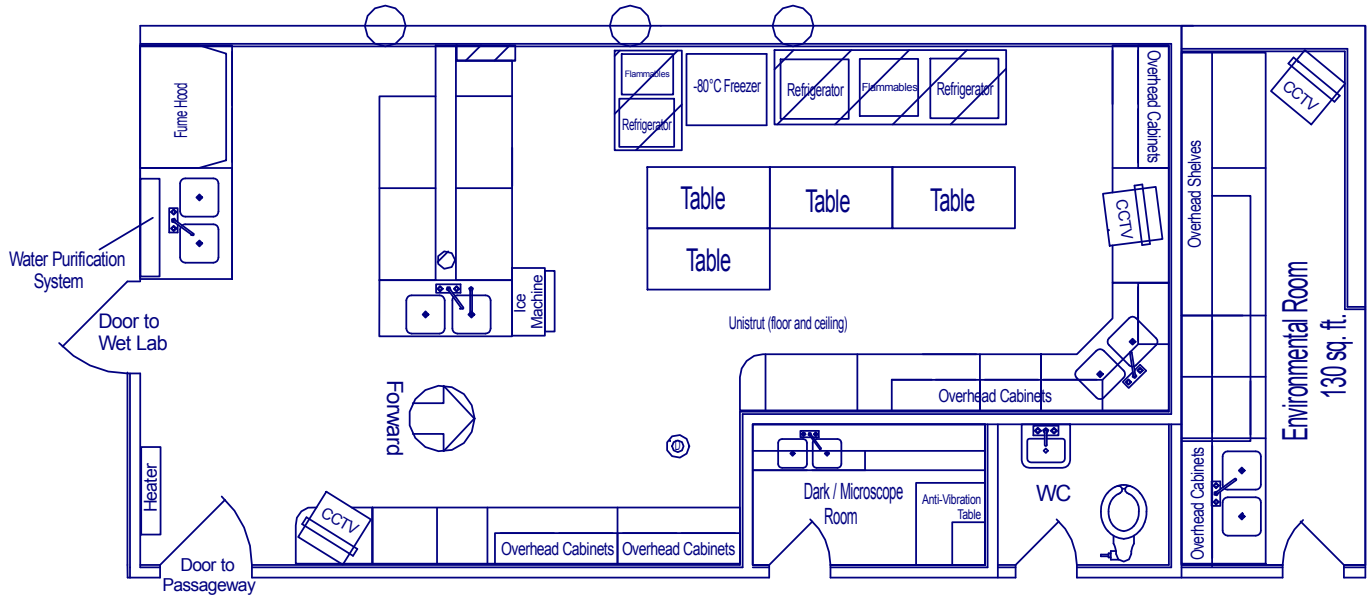
Port



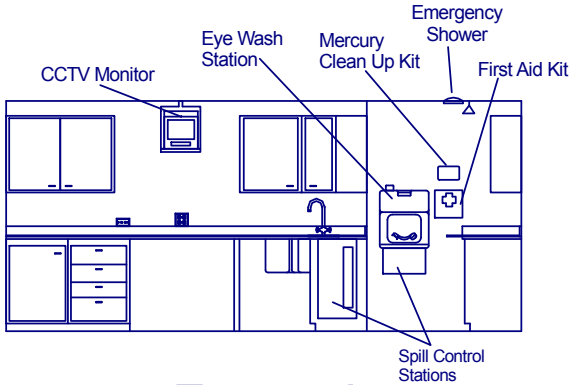
Starboard

Hydro Lab

526 sq. ft.



Hydro Lab Elevations



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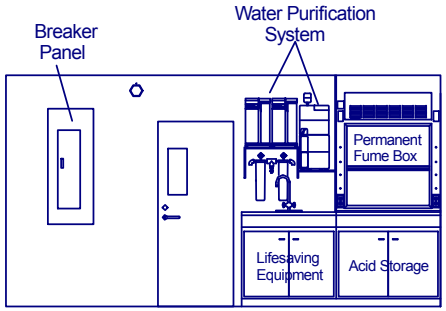
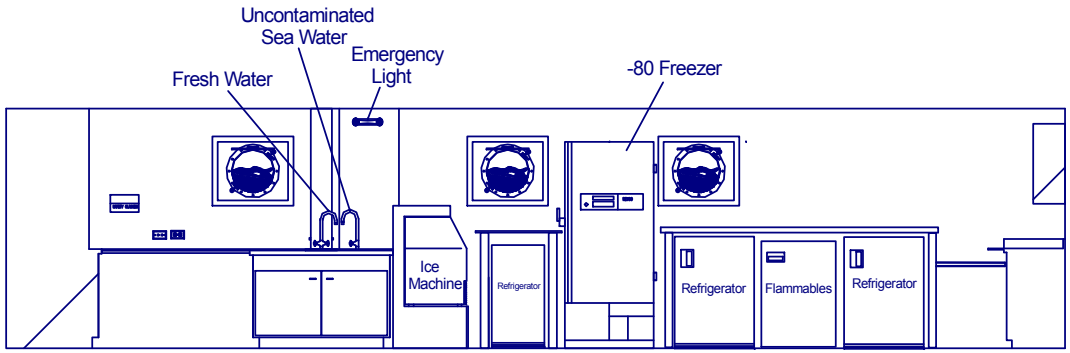


Aft

Hydro Lab Elevations



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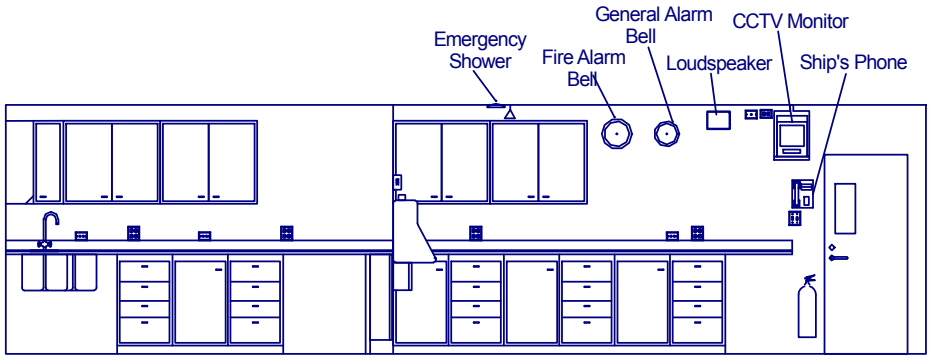
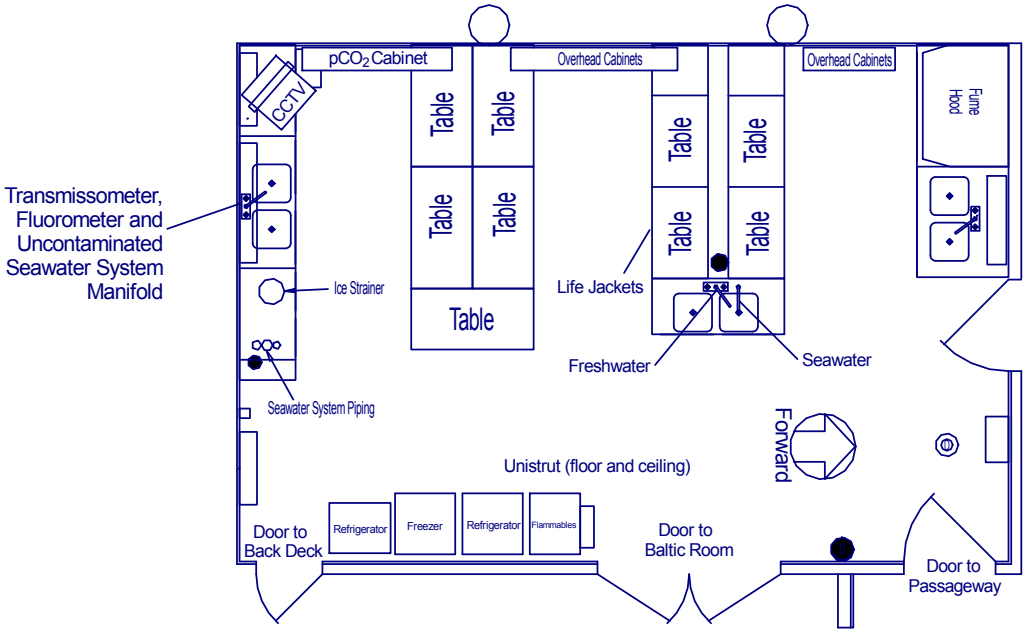


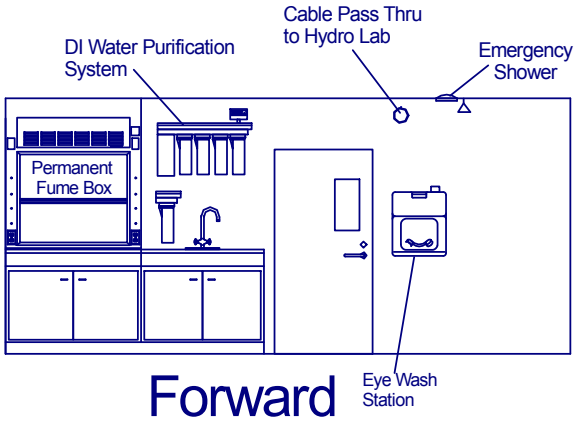
Starboard

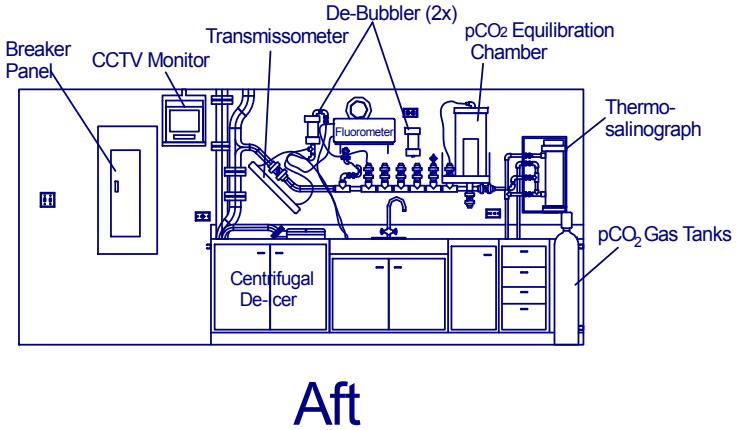
Wet Lab

425 sq. ft.

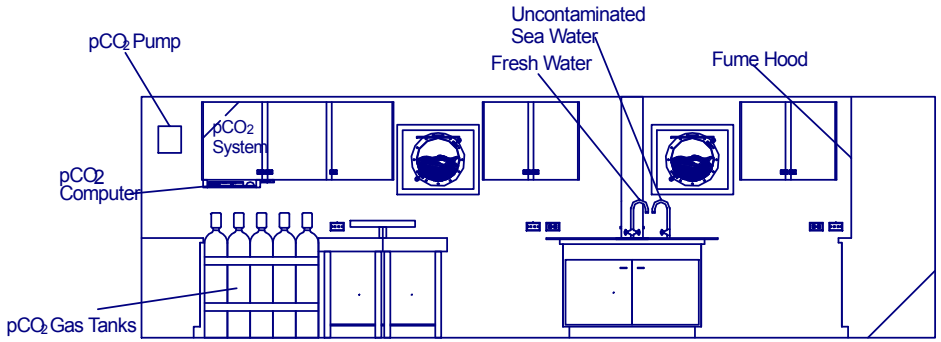


Wet Lab Elevations





Wet Lab Elevations



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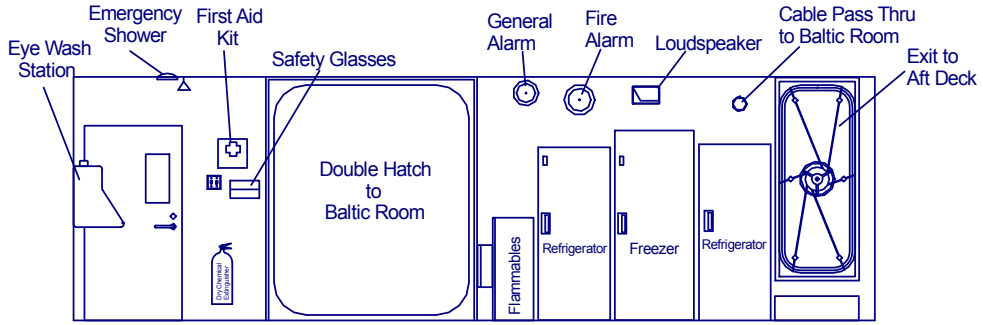
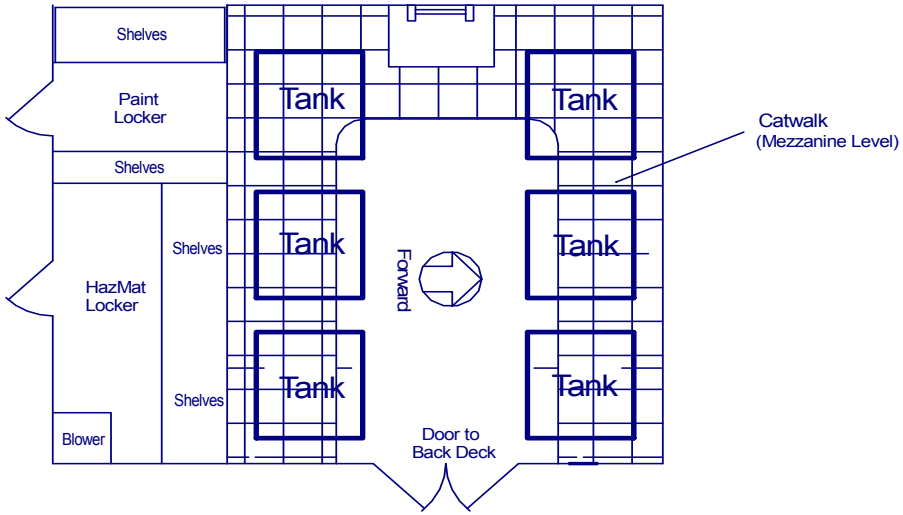


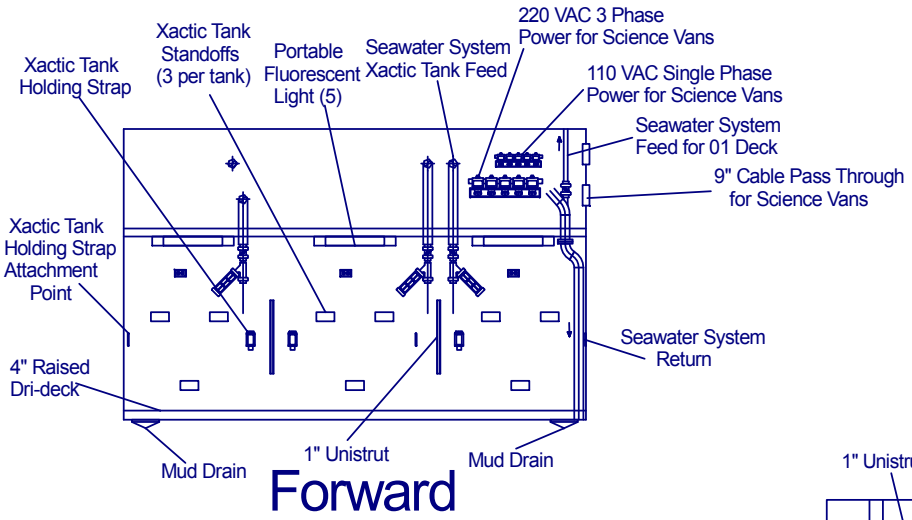
Starboard

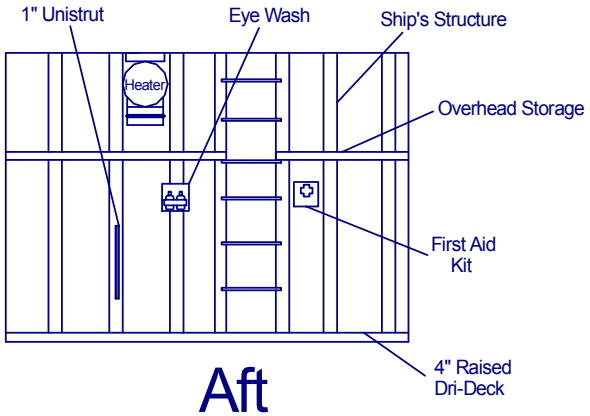
Aquarium Room

270 sq. ft.

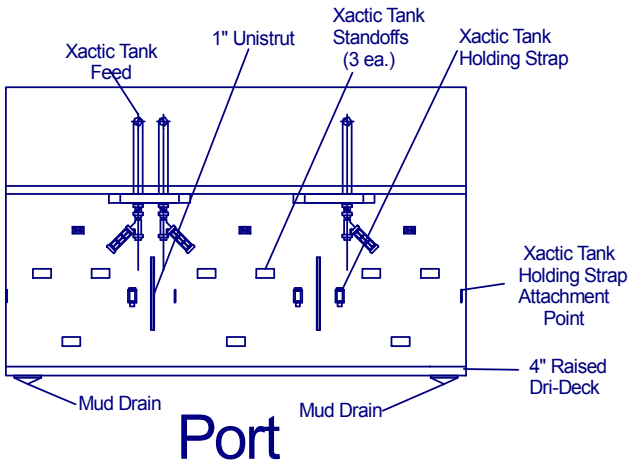


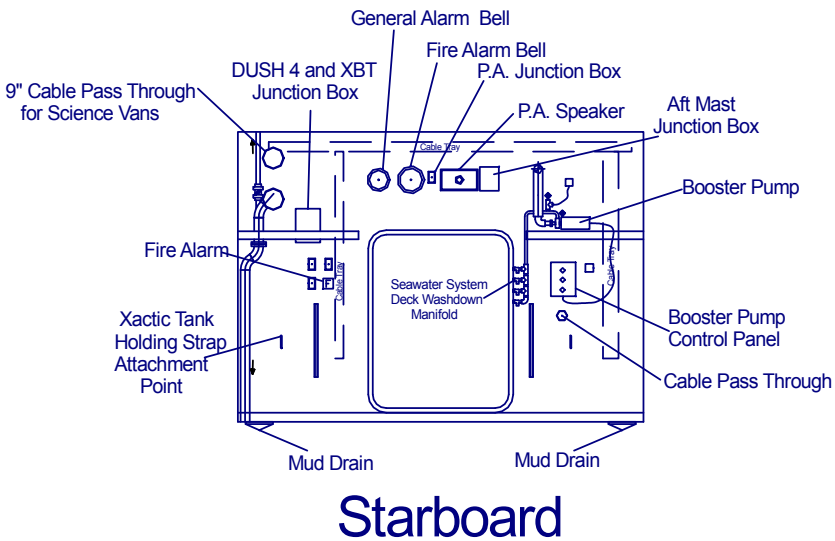
Aquarium Room Elevations



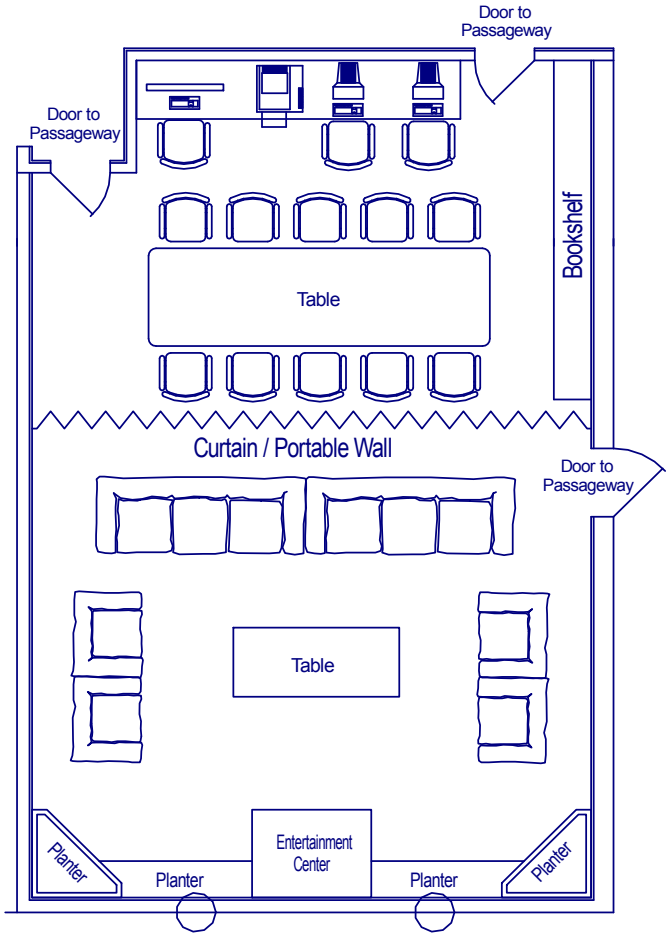


Aquarium Room Elevations

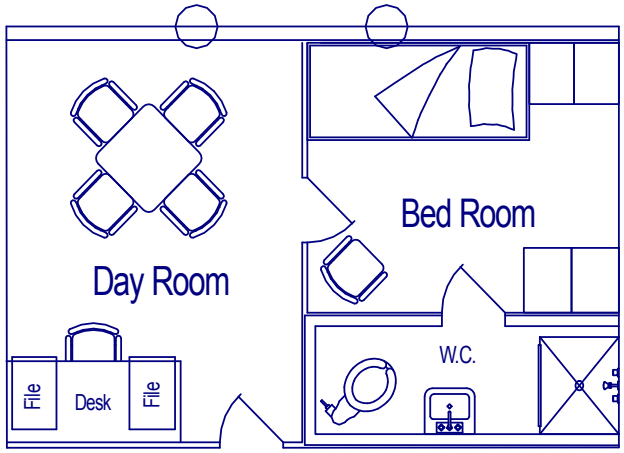


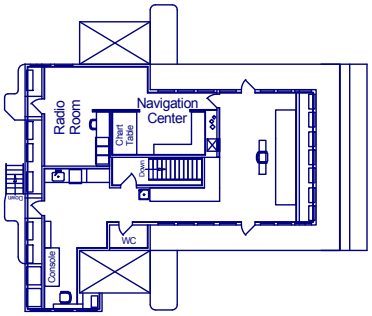


Lounge/Conference Room
670 sq ft

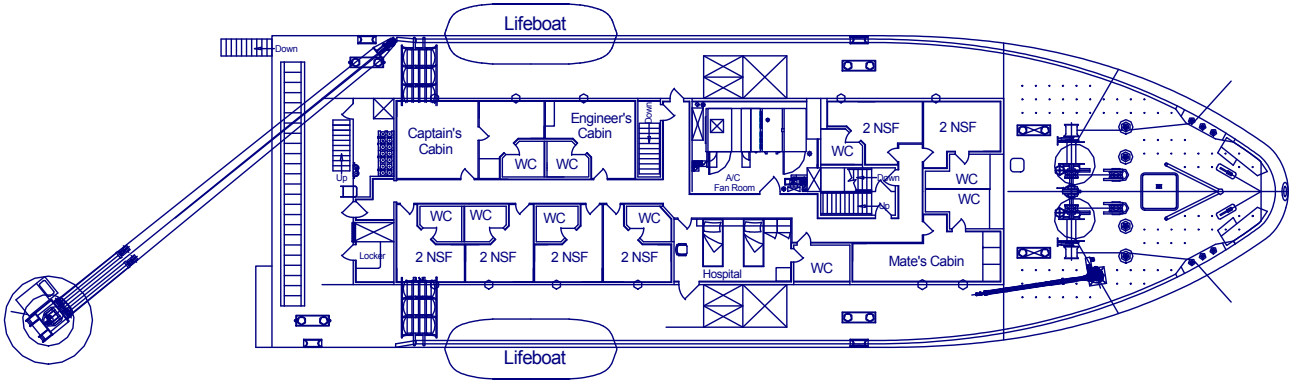


Chief Scientist's Cabin





Bridge



03 Deck

RPSC-08-220