NAAMES III - Shipboard Operations

The R/V Atlantis based portion of the third field experiment of the NASA NAAMES Earth Venture Mission is generally described below to provide the captain, crew, and shore-based personnel insight into our activities on deck and to help facilitate discussion where necessary. A diagram of the main deck and lab spaces is provided below. Significant changes from previous cruises that more heavily impact ship operations are in **bold**.

Activities on the main deck (similar to NAAMES I and II expeditions):

1. CTD/Niskin rosette profiles – include multiple shallow (~300m) and deep (1500m) casts per day while on station
2. Optical package profiles – occur multiple times per day off starboard side – *working with ship to make this a smoother transition between CTD casts (Nelson/Siegel)*
3. Bio-optical float deployments – approximately 7 floats deployed per cruise (Boss)
4. Drifter deployments – plan for 40 drifters (total for cruise) to be deployed off the stern when approaching and on station (Gaube)
5. On-deck flowing seawater incubators (~5 plexiglass boxes with light screens) for 24 hour growth, grazing, and production experiments. (Menden-Deuer)
6. SeaSweep (custom floating seawater bubbler connected to port side aerosol van on O2 deck) deployed at each main station for as long as possible (sea state dependent). (Bates/Quinn)
7. Weather balloon deployment at each station off the stern of the ship. (Moore – aircraft based)
8. Free falling optics packages – deployed by hand from port stern (Nelson/Siegel)
9. RUMP – rigid acoustic arm deployed from starboard side (Gaube)
10. ChUMP – CTD/optics profiling package deployed using automated fishing gear from stern below A-frame (Gaube)
11. Zooplankton/Mesozooplankton net tows – occasional net tows while on station (Gaube)
12. Gas cylinder storage in the ROV hangar for use by groups in the Hydrographic lab. (Halsey)

Changes or additions to deck activities from previous expeditions:

1. Placement of a science van on aft port side for Peter Gaube's group that will be utilized by multiple science teams. This includes the use of the chemical fume hood for some groups to alleviate overuse of hood in main lab and may also house the tracking equipment for weather balloons that previously has resided in the Alvin hangar or the ROV hangar.

2. Additional between station CTD profiles may be included for NAAMES III (decision on this is pending development of detailed cruise science plan & schedule).
3. XBT deployments – A number of XBT deployments would like to be undertaken while underway to increase resolution of physical parameters, particularly when between stations or when crossing boundary features, and will provide validation of acoustic data for P. Gaube's group as well as the Atlantis.
4. **If Alvin remains on the Atlantis, space on the main deck may be needed for storage of bio-optical floats, and additional spaces will need to be found for storage of helium tanks for filling weather balloons, drifters, and the IOP optics package that have also been kept in the hangar on the previous two cruises. If possible, it is preferred that the helium and IOP packages would remain in the Alvin hangar.**
5. **It is currently unclear if the Atlantis's oxygen titration system will be available for use on NAAMES III. Liz Caporelli and the Behrenfeld group are working to find another system in the event we need to supply our own. If we bring our own, does the Atlantis provide the chemicals for titration as in previous cruises. We will provide the appropriate waste bins as on NAAMES I and II.**

No significant changes are being made in the science labs on the main deck and space allocation for each group can be seen in the lab diagram provided. Note the designations for both a walk-in refrigerator and freezer. Also note that the outer doors to the Wet Lab are to be kept shut throughout the cruise. As on previous cruises we will request that the Main Lab have a set temperature in order to maintain integrity of biological samples.

A custom seawater flow-through system using a diaphragm pump will be installed by Emmanuel Boss's group as before.

<u>Activities on the O2 deck (similar to NAAMES I and II expeditions):</u>

1. Aerosol vans that are relatively self-contained in regard to instrumentation and sampling will be placed on the O2 deck. Interactions or sampling outside of the vans is accomplished with the SeaSweep (see 6 above) and forward placement of air/aerosol intake lines.
2. An upward looking ceilometer (i.e. laser) will be mounted to the rail on one of the upper decks, as before.

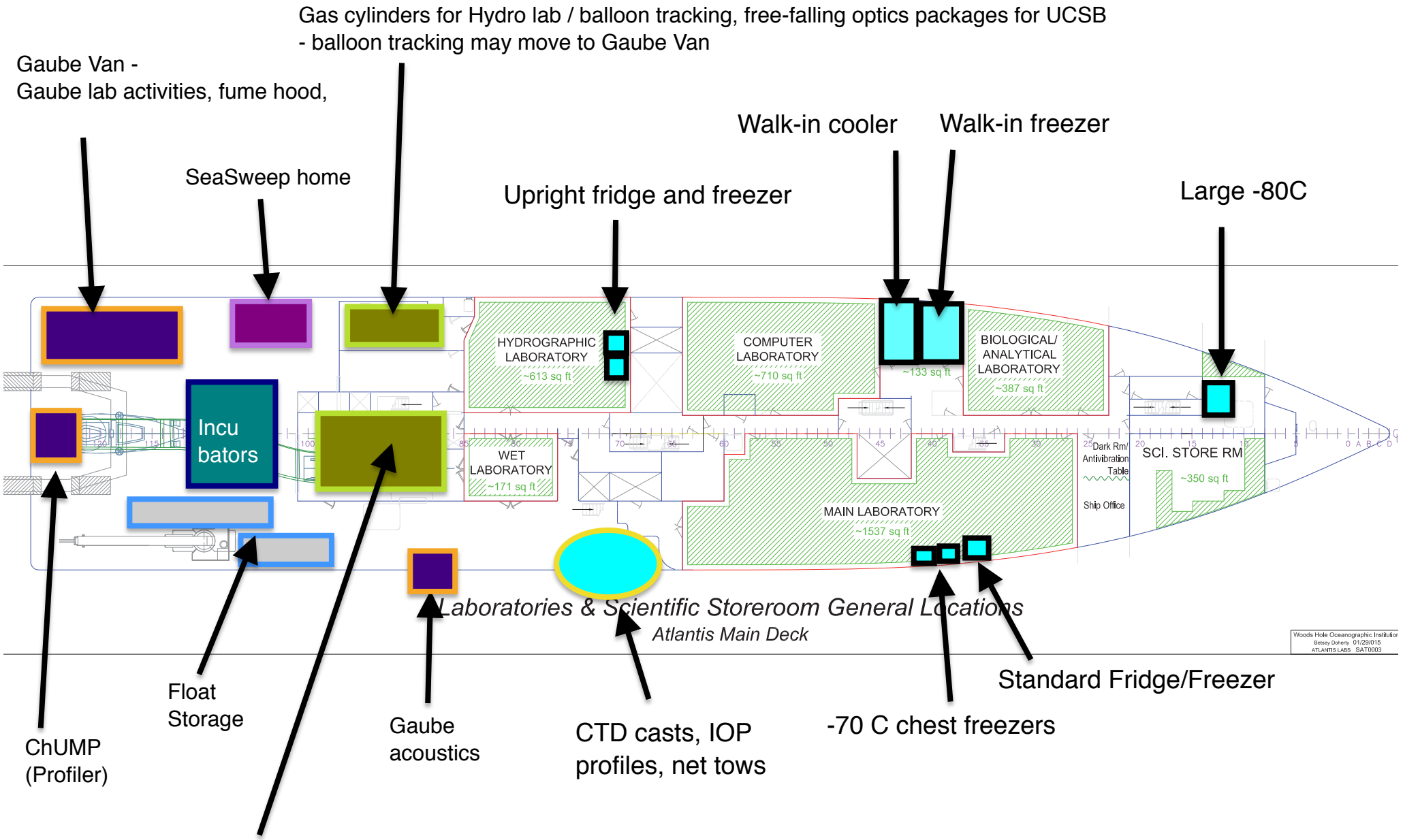
<u>Changes or additions to O2 deck activities</u>

No significant changes for the aerosol vans on the O2 deck with the exception of the request for flow-through seawater. To accomplish this, Tim Bates will work with E. Boss and SSSGs to evaluate if the existing custom diaphragm pump system can accommodate supplying water to the O2 deck or if an

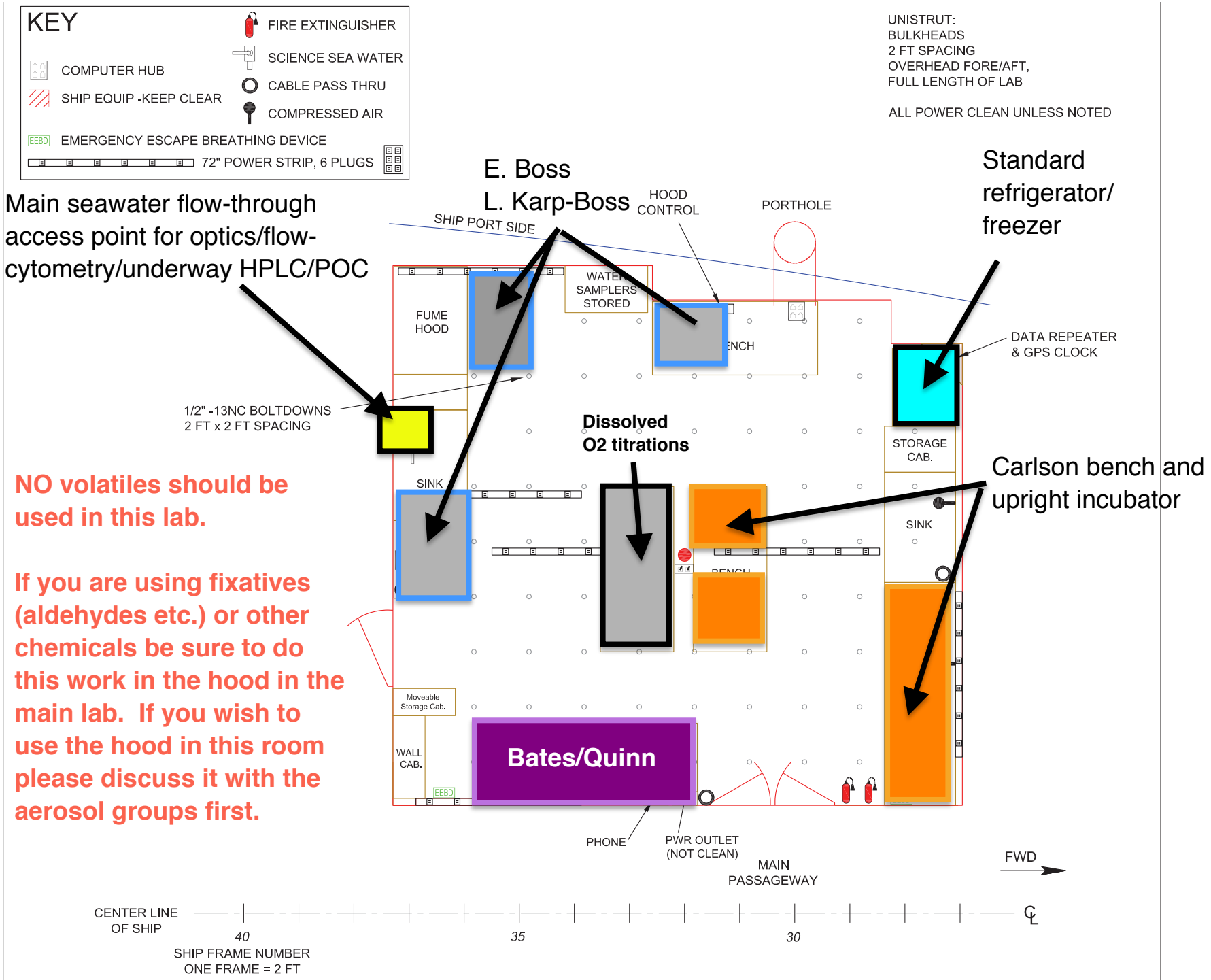
additional pump needs to be added to the custom system to meet this new request.

Due to the highly sensitive nature of aerosol and volatile organic carbon measurements on this cruise, both on the O2 deck and in the Hydrographic and Wet Labs, we kindly request that all smoking be done at the stern of the ship (not in the hangers) and that painting and other work that creates smoke or volatile emissions be halted during this cruise. The captain and crew of the R/V Atlantis were extremely gracious towards this request during our first two field campaigns and we are most thankful for their understanding and support of our science in this regard. We also request that the lights above the Alvin hangar, or any that illuminate the region of the on-deck incubators, be turned off at night in order to mitigate light impacts on incubator experiments.

Lastly, is it possible to securely store chemicals in the chemical locker on the Atlantis or somewhere at WHOI between cruises? Shipping unused chemicals is not only difficult but also expensive. We will encourage shipmates to identify colleagues at WHOI that may be able to store them between cruises, but for those who cannot, it would be highly appreciated to know if storage on the ship or elsewhere is possible.



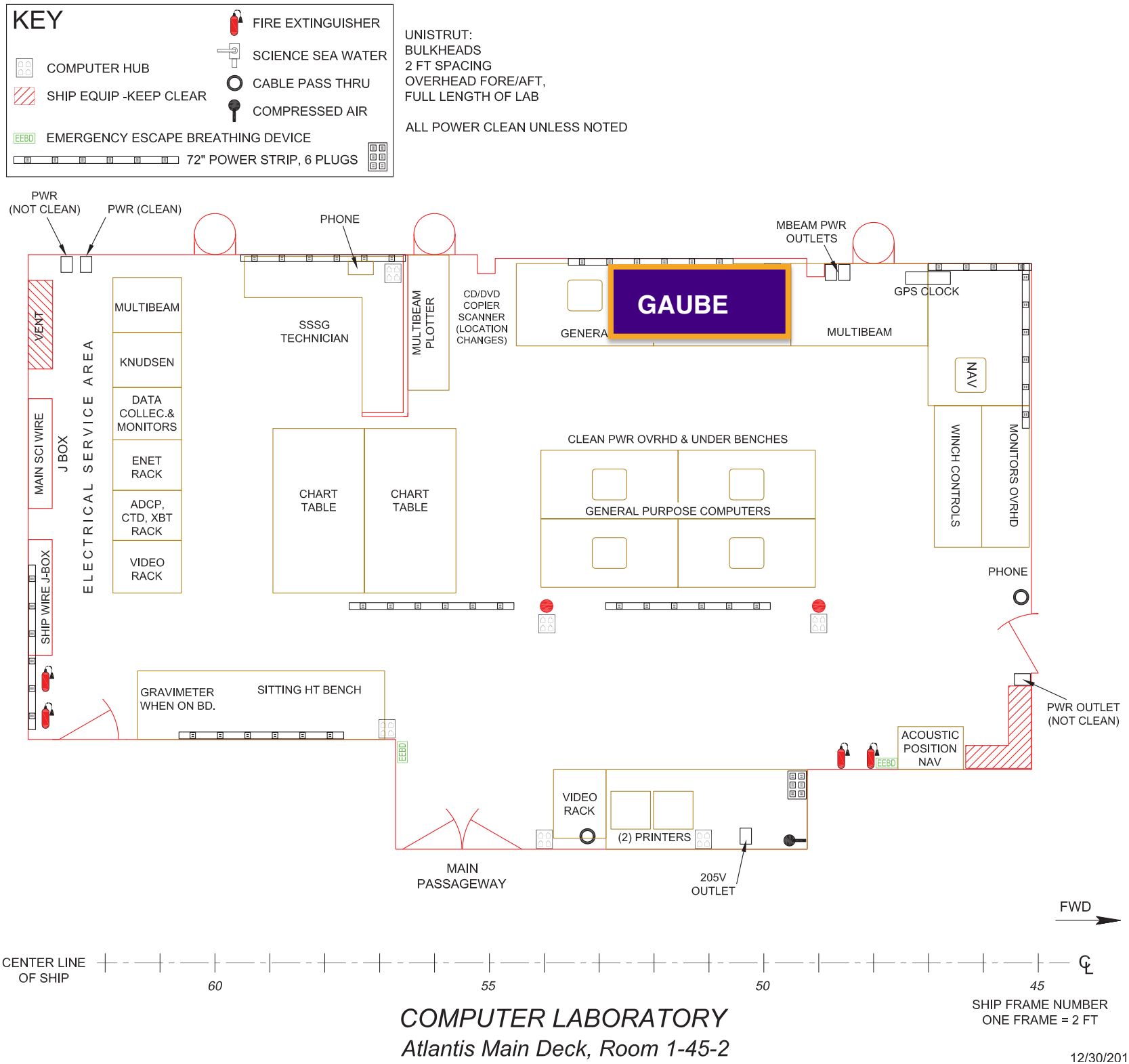
Floats / drifters / helium / IOP optics package - assumes Alvin is not on board
If on board, drifters move to other decks, science hold, etc., float can probably move to starboard side deck, unsure where IOP package goes or if helium moves to Gaube van or if room will still exist for these items here



BIOLOGICAL/ANALYTICAL CLEAN LABORATORY

Atlantis Main Deck, Room 1-27-2

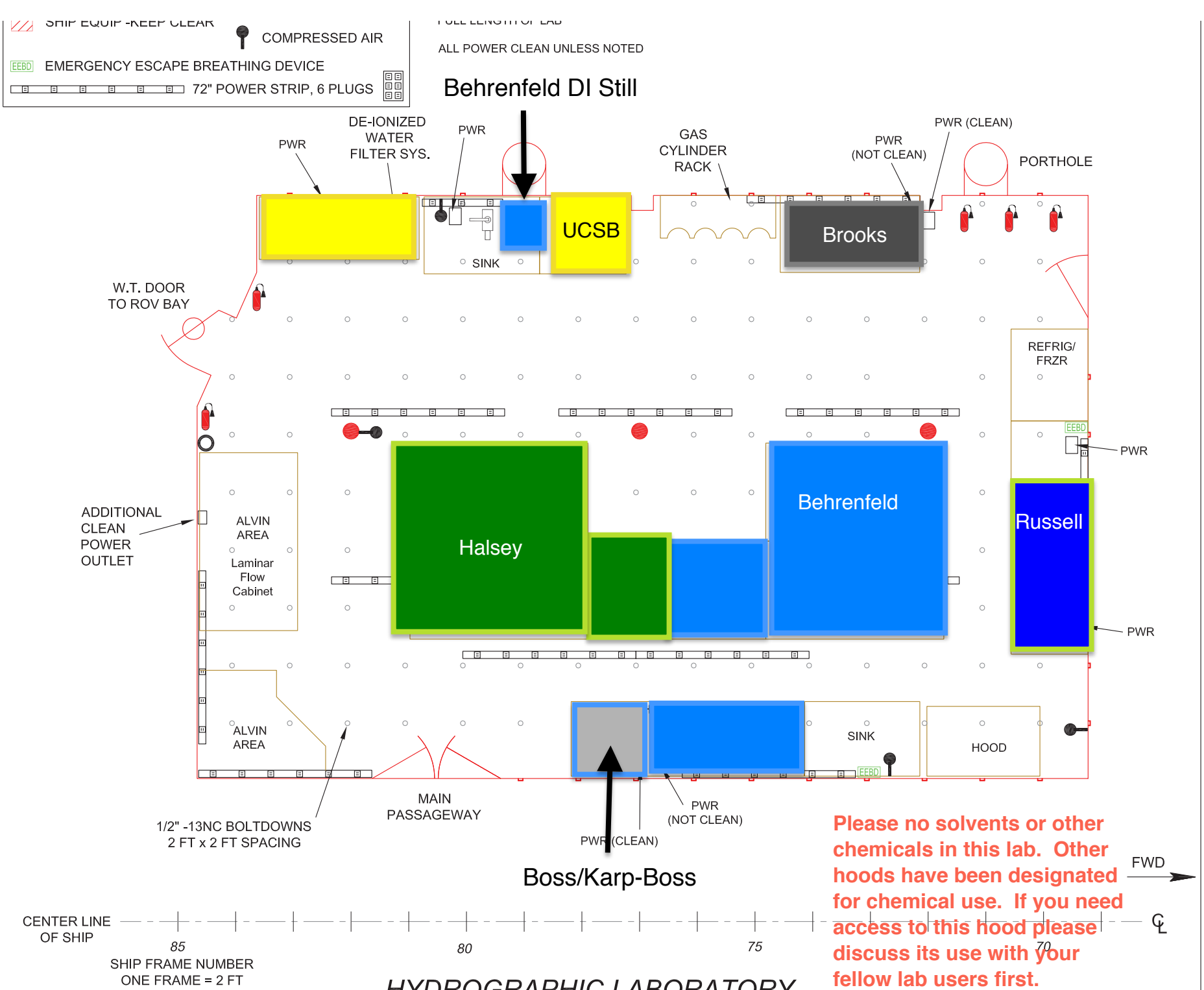
12/30/2013



COMPUTER LABORATORY

Atlantis Main Deck, Room 1-45-2

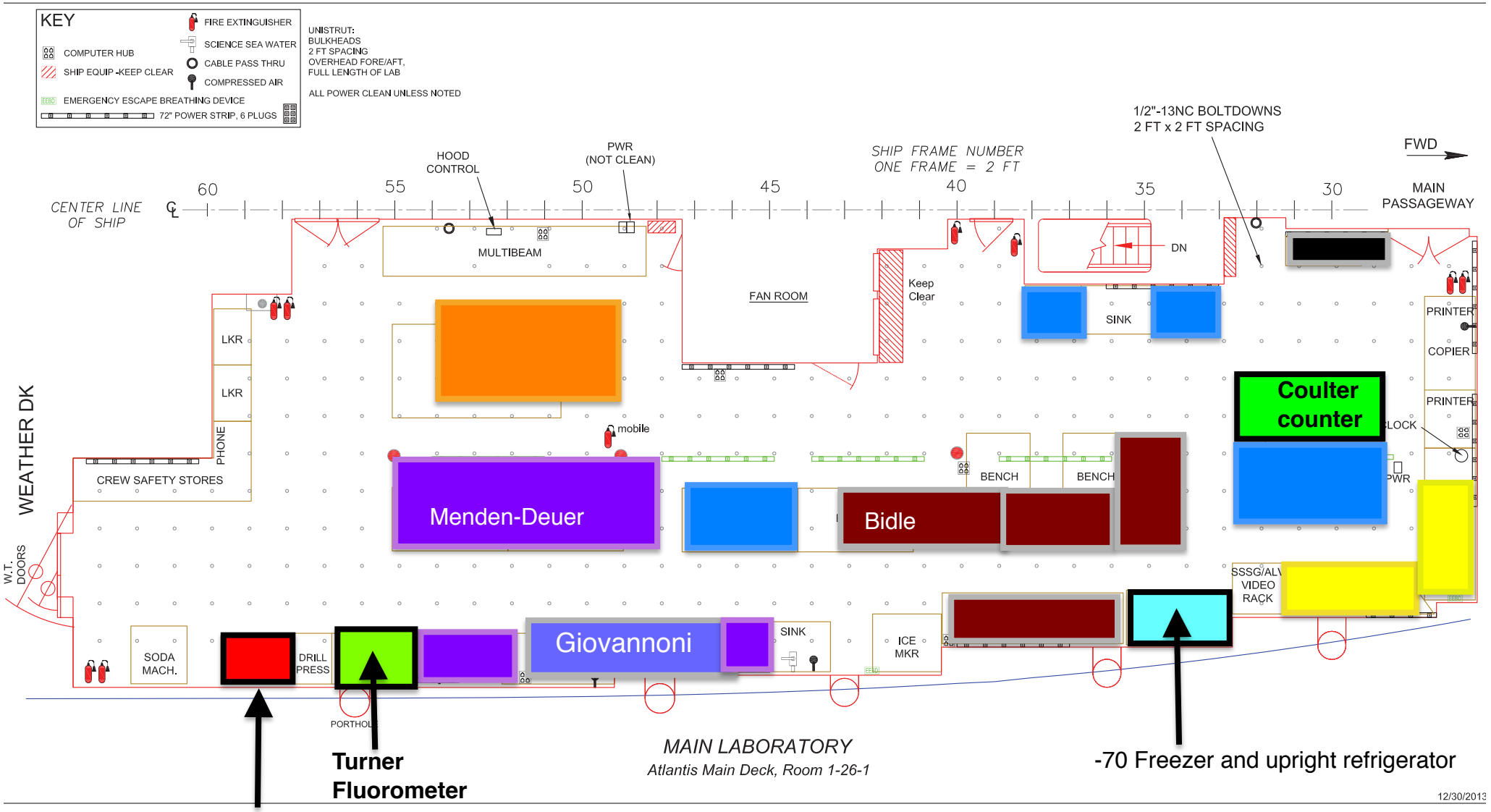
12/30/2013



HYDROGRAPHIC LABORATORY

Atlantis Main Deck, Room 1-64-2

12/30/2013



MAIN LABORATORY

Atlantis Main Deck, Room 1-26-1

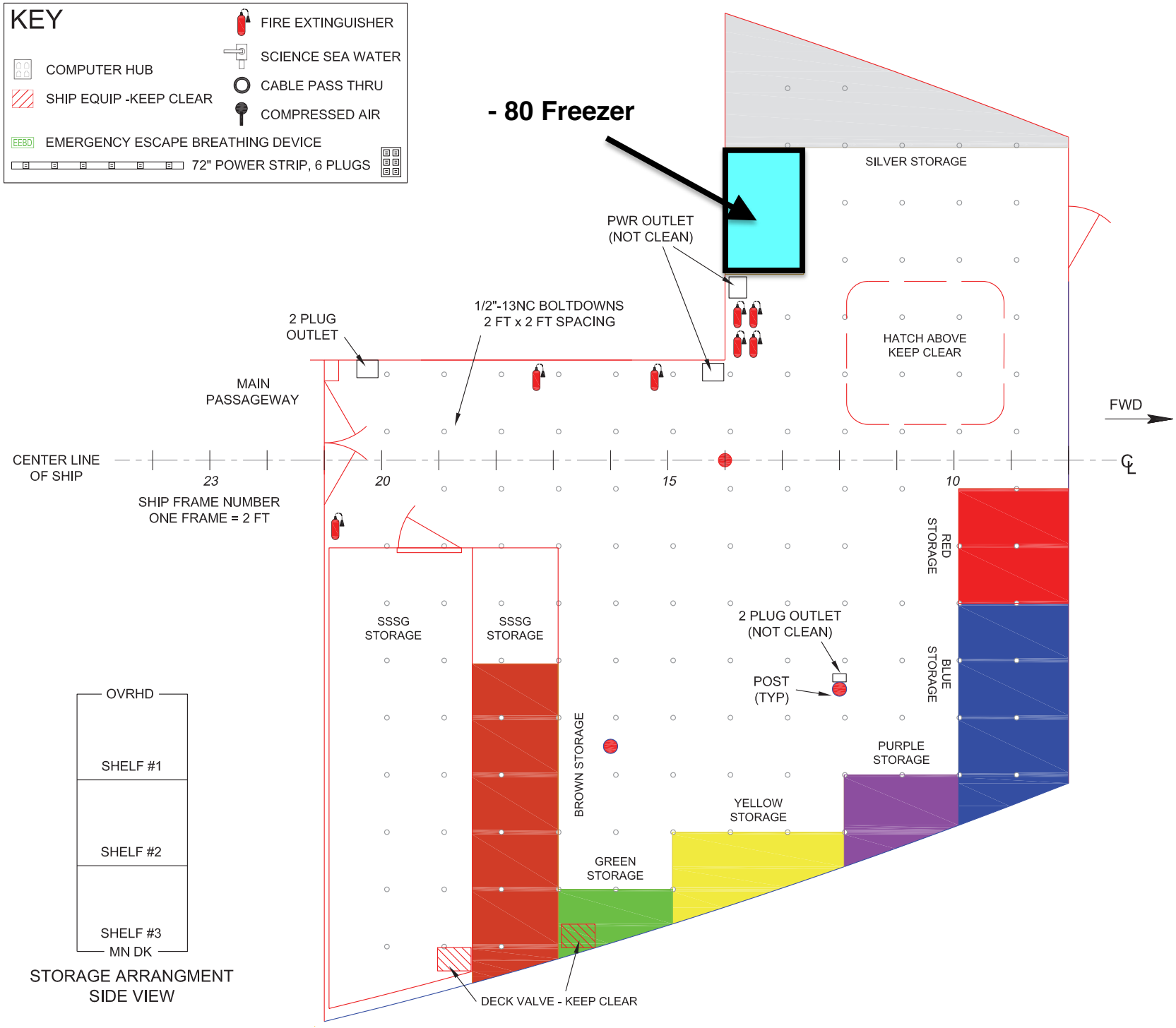
Primary chemical hood

Turner Fluorometer

-70 Freezer and upright refrigerator

Please use this as the primary hood for dispensing fixatives and other chemicals to minimize exposure by people and to not compromise sensitive measurements

12/30/2013



SCIENTIFIC STOREROOM ARRANGEMENT

Atlantis Main Deck, Room 1-8-0

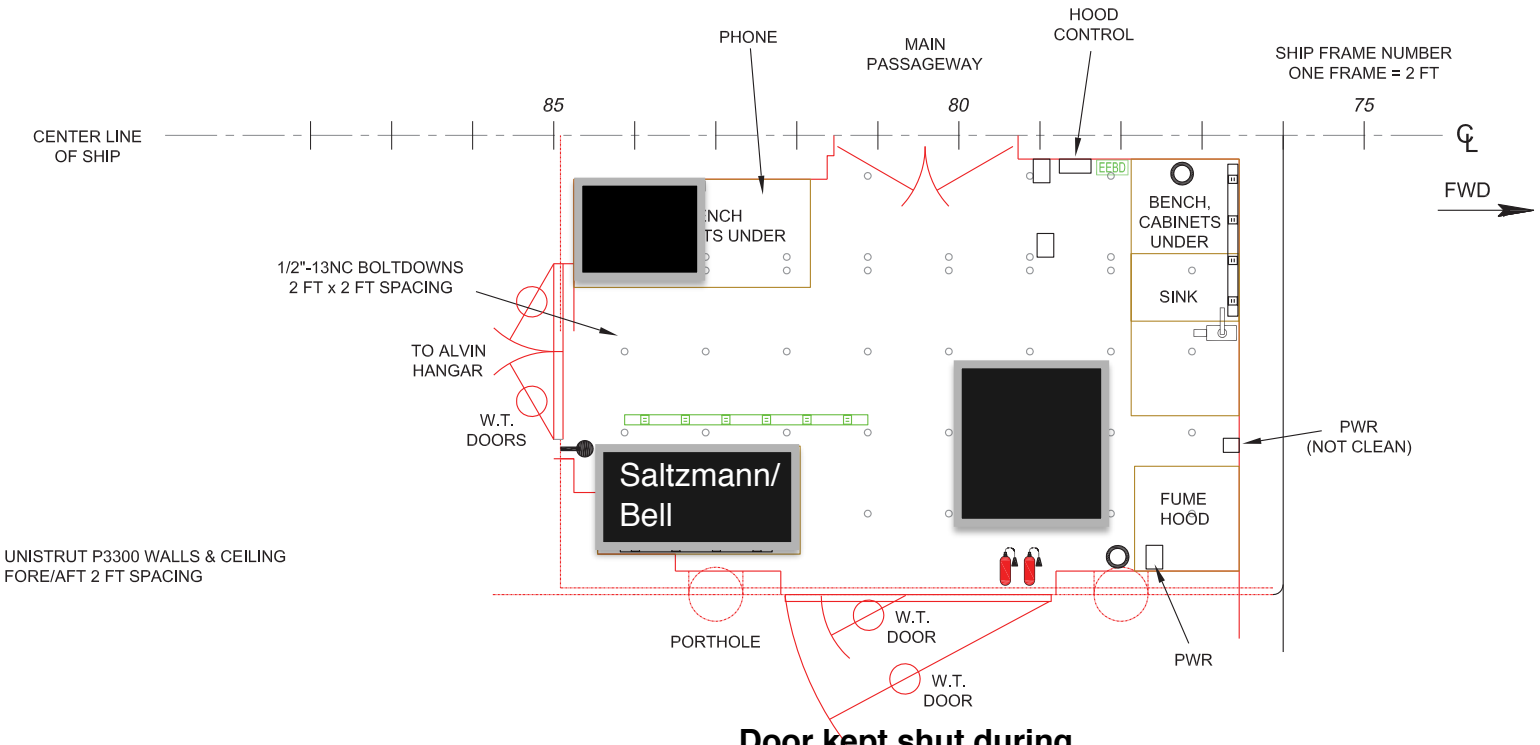
12/30/2013

KEY

- FIRE EXTINGUISHER
- SCIENCE SEA WATER
- CABLE PASS THRU
- COMPRESSED AIR
- COMPUTER HUB
- SHIP EQUIP -KEEP CLEAR
- EEBD EMERGENCY ESCAPE BREATHING DEVICE
- 72" POWER STRIP, 6 PLUGS

UNISTRUT:
BULKHEADS
2 FT SPACING
OVERHEAD FORE/AFT,
FULL LENGTH OF LAB

ALL POWER CLEAN UNLESS NOTED



Door kept shut during cruise

WET LABORATORY

Atlantis Main Deck, Rm 1-76-1

12/30/2013