

UNIVERSITY OF MIAMI  
ROSENSTIEL  
SCHOOL of MARINE &  
ATMOSPHERIC SCIENCE



Tritium Laboratory  
11 February 2014

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SWAB REPORT # 715

SWAB DATE: 25 January 2014

*R/V N. B. Palmer*  
Radioisotope Van #4

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Dr. James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Jamee Johnson

## COMMENTS TO SWAB REPORTS

23 November 2010

Typical LSC instrument background values for  $^3\text{H}$  and  $^{14}\text{C}$  are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in  $\text{dpm}/\text{m}^2$ . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in  $\text{dpm}/\text{m}^2$ . An error larger than the activity indicates that the activity is not significantly different from zero.

### Criteria for SWAB Results

Category	$^3\text{H}$ ( $\text{dpm}/\text{m}^2$ )	$^{14}\text{C}$ ( $\text{dpm m}^2$ )	Recommendations
A	<500	<50	No action
B*	500-10,000	50-10,000	Needs cleaning before any natural tracer work. Decks in radiation vans with activities above $1000 \text{ dpm}/\text{m}^2$ should be cleaned.
C**	10,000-100,000	10,000-50,000	Must be cleaned before any use.
D***	>100,000	>50,000	May be a health hazard. Notify local radiation safety official.

Note:  $^{14}\text{C}$  and  $^{35}\text{S}$  have peak energies of 156 and 167 KeV, respectively; thus  $^{35}\text{S}$  will be registered as  $^{14}\text{C}$  by our counting techniques. Categories A, B and C are not a health hazard.

### Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

$^3\text{H}$ : Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml COUNT-OFF to 4 liters of water), using sponges to distribute solution and reabsorb it.

$^{14}\text{C}$ : Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing  $^{14}\text{CO}_2$ ). Follow up with wash as if for  $^3\text{H}$ .

### Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D dispose in radiation waste system.

Note: If category C or D is encountered, we try to notify the insitution promptly by phone or email

REPORT FOR SWAB # 715

LOCATION: Hobart, Tasmania  
VESSEL: R/V N. B. Palmer

DATE: 25 January 2014  
TECHNICIAN: John Betz

Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>		<sup>14</sup> C dpm/m <sup>2</sup>	
		activity	error	activity	error
1	1st Vial Bkgnd	0	± 0	0	± 0
2	Initial bucket blank C. O. # 1	0	± 0	0	± 0
	<u>Radioisotope Van #4 (Figure 1)</u>				
3	Inside fume hood	226	± 65	0	± 0
4	Sink area	0	± 0	0	± 0
5	Benchtop left of sink	66	± 19	*333	± 48
6	Waste collection area	303	± 43	*567	± 53
7	Top of LSC	12	± 1	*3878	± 111
8	Benchtop across from sink	84	± 62	0	± 0
9	Benchtop across from freezer	32	± 53	0	± 0
10	Inside freezer	425	± 74	14	± 14
11	Inside refrigerator	296	± 45	*454	± 50
12	Deck in front of fume hood	372	± 59	*289	± 44
13	Deck under escape hatch	209	± 46	*236	± 43
14	Deck inside entrance	153	± 48	*112	± 39
15	Intermediate bucket blank	0	± 0	0	± 0
	<u>02 Deck (Figure 2)</u>				
16	Waste storage area	0	± 0	0	± 0
17	Deck outside rad van entrance	0	± 0	0	± 0
18	Hallway by Helo Workshop	10	± 0	0	± 0
	<u>Helo Hangar/Shop (Figure 2)</u>				
19	Deck by chem van	0	± 0	0	± 0
20	Bottom of Rad refrigerator inside	52	± 9	*836	± 61
21	Top of Rad refrigerator inside	10	± 0	0	± 0
22	Deck by sink	28	± 129	0	± 0
23	Deck by Rad refrigerator	0	± 0	0	± 0
24	Inside rad freezer	0	± 0	0	± 0
25	Entrance to Helo Hangar	0	± 0	0	± 0
	<u>Bio Lab (Figure 3)</u>				
26	Bio Lab Deck inside entrance	7	± 0	0	± 0
27	Deck by fwd entrance	0	± 0	0	± 0
28	Deck by aft fume hood	0	± 0	0	± 0
29	Deck in front of refrigerators	0	± 0	0	± 0

Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>		<sup>14</sup> C dpm/m <sup>2</sup>	
		activity	error	activity	error
30	Outboard sink	0	± 0	0	± 0
31	Inboard sink	0	± 0	0	± 0
32	Inside fwd fume hood	6	± 0	0	± 0
33	Inside aft fume hood	12	± 0	0	± 0
34	Big Antarctica sink area	0	± 0	0	± 0
35	Little Antarctica benchtop by sink	54	± 89	0	± 0
50	Bio Lab Deck outside Big Antarctica door	0	± 0	0	± 0
51	Deck outside Little Antarctica door	0	± 0	0	± 0
<u>Aft Dry Lab (Figure 4)</u>					
36	Top of Revco freezer	0	± 0	0	± 0
37	Deck by Revco freezer 12063	12	± 0	0	± 0
38	Inside inboard incubator	0	± 0	0	± 0
39	Deck between tables	0	± 0	0	± 0
40	Port sink	17	± 0	0	± 0
41	Deck by aft door	0	± 0	0	± 0
42	Deck to Baltic Room	23	± 95	0	± 0
43	Aft sink area	0	± 0	0	± 0
44	Deck inside fwd door	4	± 0	0	± 0
45	Intermediate bucket blank	0	± 0	0	± 0
46	Inside Fisher freezer	0	± 0	0	± 0
47	Inside inboard incubator	0	± 0	0	± 0
48	Outboard fwd benchtop	13	± 0	0	± 0
49	Deck by aft sink	0	± 0	0	± 0
52	Entrance to fwd Dry Lab	0	± 0	0	± 0
53	Deck by hallway entrance to Baltic Room	0	± 0	0	± 0
54	Fwd door deck to Hydro Lab	0	± 0	0	± 0
55	Intermediate bucket blank	0	± 0	0	± 0
<u>Hydro Lab (Figure 5)</u>					
56	Hydro Lab Inside Summit refrigerator	0	± 0	0	± 0
57	Inside Fisher refrigerator	0	± 0	0	± 0
58	Stbd sink area	0	± 0	0	± 0
59	Aft benchtop	0	± 0	0	± 0
60	Deck by aft sink	0	± 0	0	± 0
61	Deck by stbd sink	24	± 2089	0	± 0
<u>Wet Lab (Figure 7)</u>					
62	Wet Lab Deck inside fwd door	0	± 0	0	± 0
63	Aft sink area	0	± 0	0	± 0
64	Stbd benchtop	15	± 0	0	± 0

Sample #	Sample Identification	<sup>3</sup> H dpm/m <sup>2</sup>			<sup>14</sup> C dpm/m <sup>2</sup>		
		activity	error		activity	error	
65	Deck inside port doors	0	±	0	0	±	0
66	Deck inside stbd doors	0	±	0	0	±	0
67	Aft benchtop	0	±	0	0	±	0
	<u>Aquarium Room (Figure 7)</u>						
68	Deck by entrance to Aquarium Rm	0	±	0	0	±	0
69	Final bucket blank C. O. #2	8	±	0	0	±	0

### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. Radioisotope Van #4 contained minor <sup>14</sup>C and <sup>3</sup>H contamination but cleaning is not required. All areas tested in the ship were free from <sup>3</sup>H contamination that requires cleaning. The "rad" refrigerator (sample 20) on the ship had <sup>14</sup>C contamination that requires cleaning. All other areas on the ship were free from <sup>14</sup>C contamination. All radioisotope work should be conducted in a Rad Van. The "rad" refrigerator should be in the Rad Van.

# *R/V Nathaniel B. Palmer*

## Radioisotope Van #4

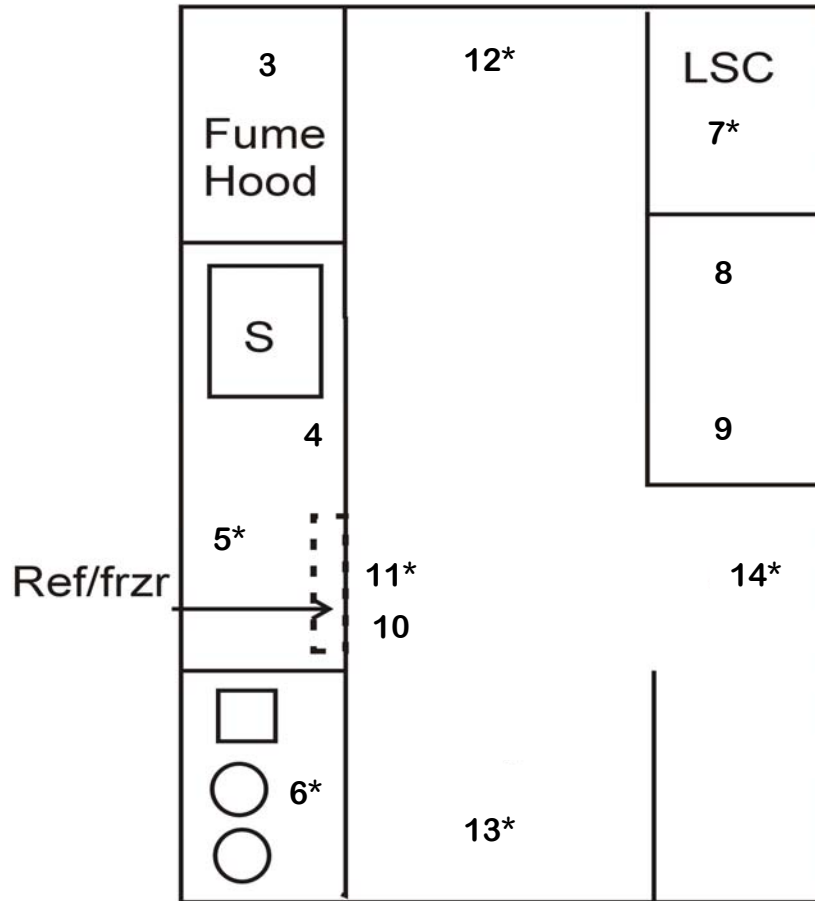
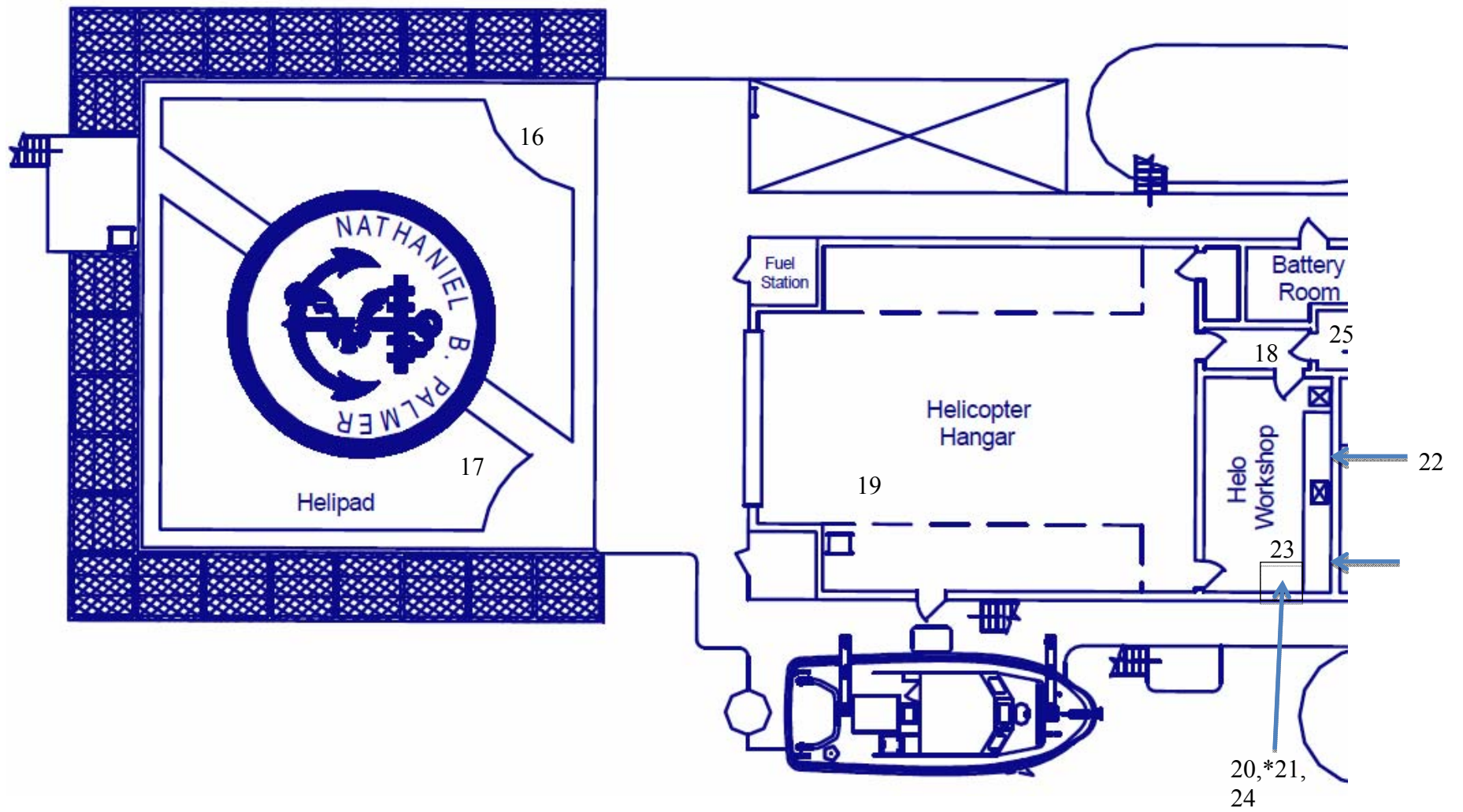


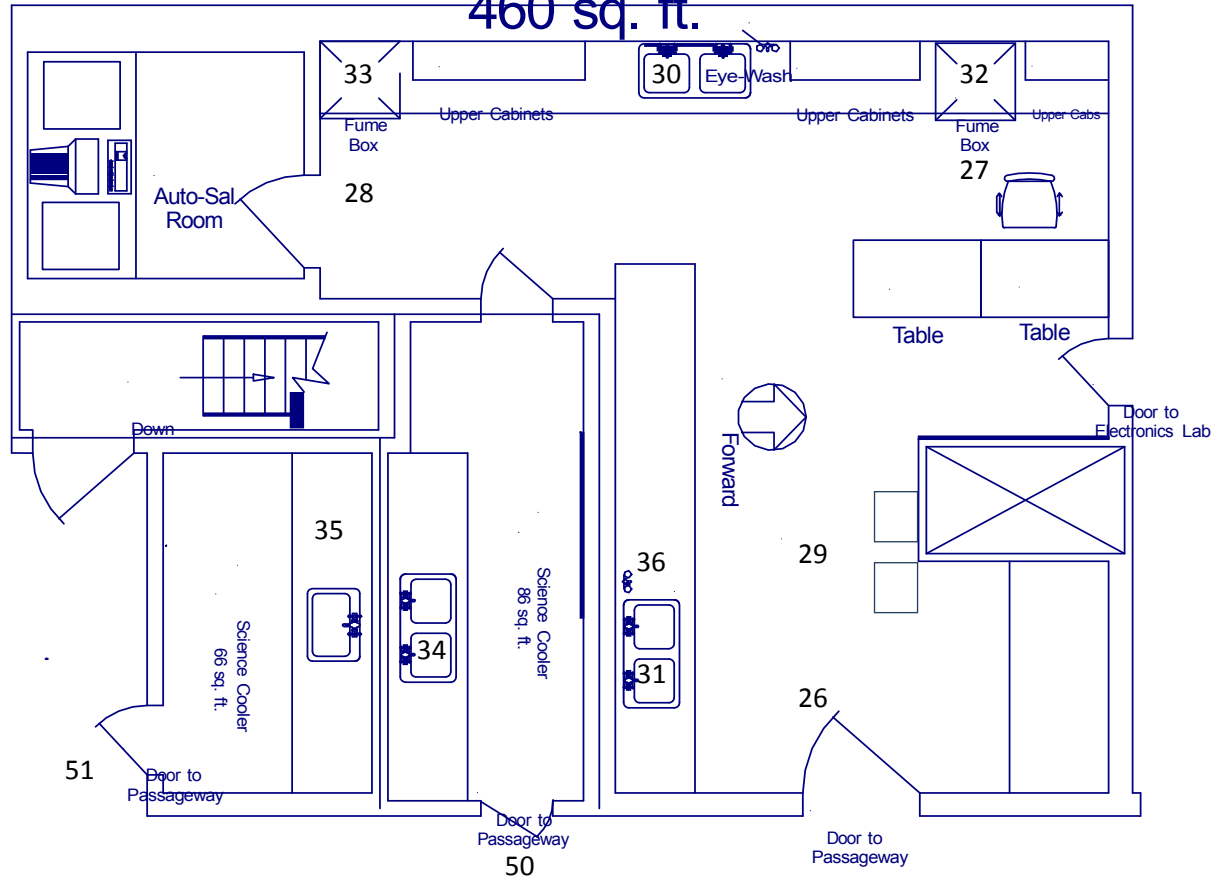
Figure 2 SWAB #715 Nathaniel B. Palmer



Nathaniel B. Palmer  
Figure 3  
SWAB #715

# Bio Lab

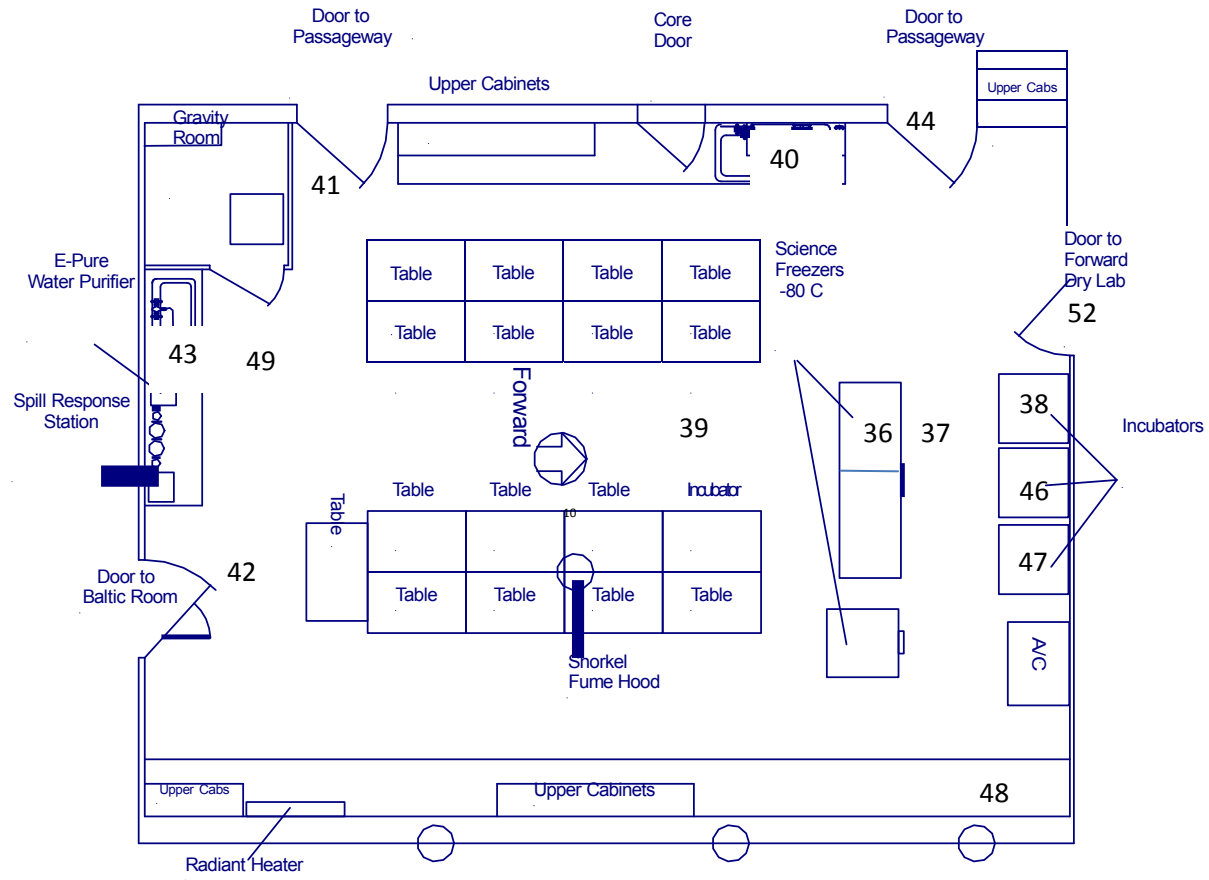
460 sq. ft.





Nathaniel B. Palmer  
SWAB 715  
Figure 4

# Aft Dry Lab 1036 sq. ft.



# Hydro Lab

445 sq. ft.

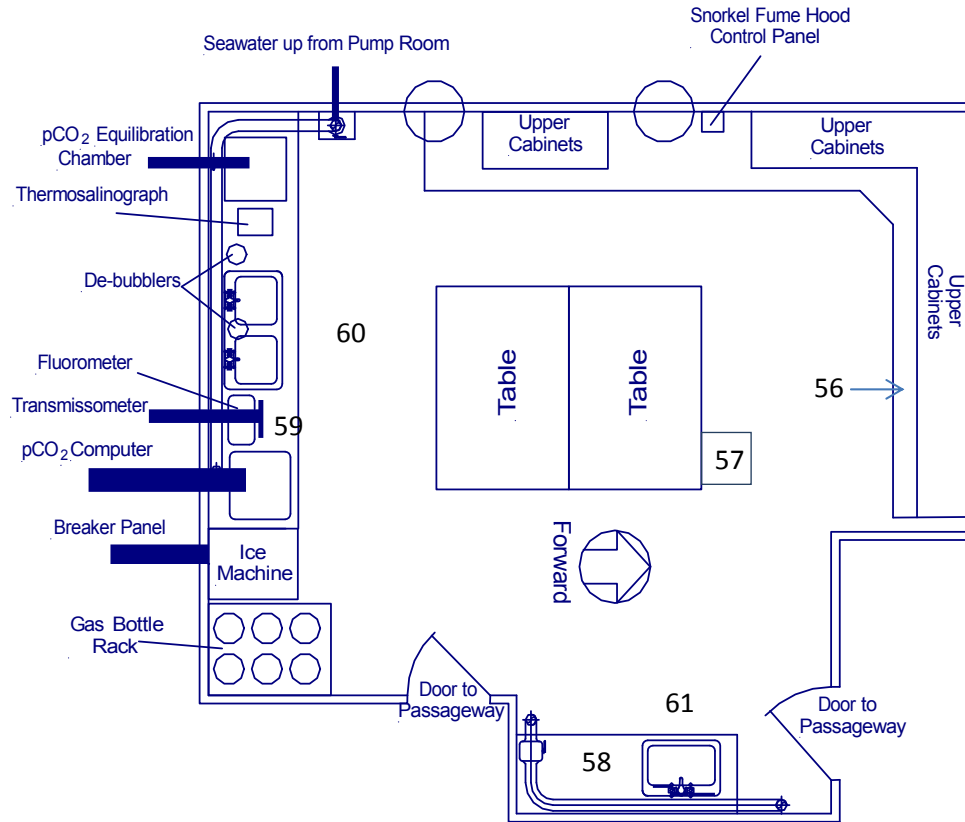
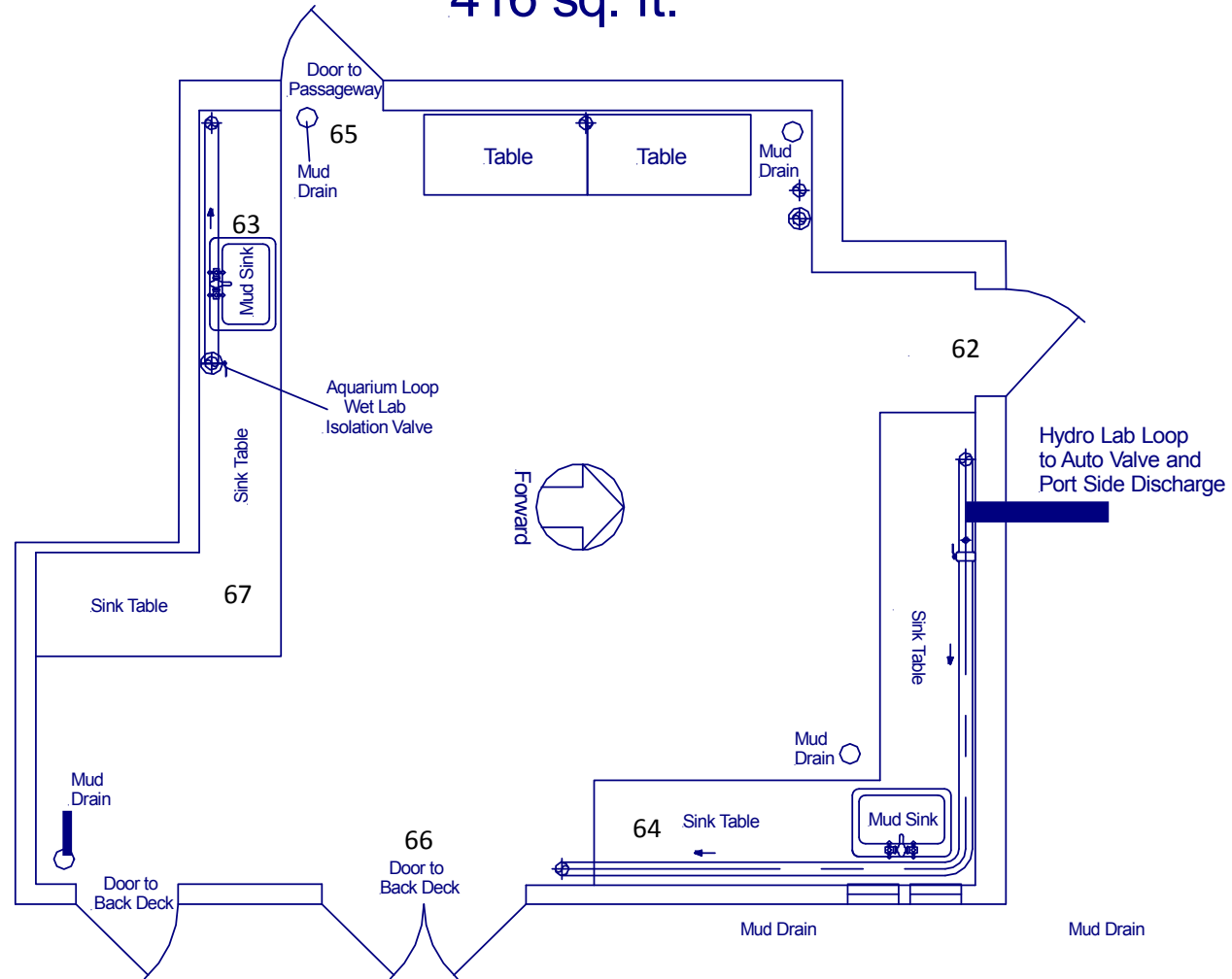


Figure 6 SWAB #715

# Wet Lab

416 sq. ft.



Nathaniel B. Palmer  
Figure 7  
SWAB #715

# Aquarium Room

298 sq. ft.

