



Tritium Laboratory  
30 October 2014

SWAB REPORT #745

SWAB DATE: 22 October 2014

*R/V Nathaniel B. Palmer*

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James D. Happell  
Associate Research Professor

Distribution:  
SWAB Committee  
Jamee Johnson  
Tim McGovern

## COMMENTS TO SWAB REPORTS

12 May 2014

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 contact your institution's radiation safety office.

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

REPORT FOR SWAB # 745

LOCATION: Punta Arenas, Chile  
VESSEL: R/V Nathaniel B. Palmer

DATE: 22 October 2014  
TECHNICIAN: Charlene Grall

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	11	± 32	13	± 33
	<u>Aft Dry Lab (Figure 1)</u>				
3	Top of Thermo chest freezer	0	± 0	15	± 34
4	Inside Percival incubator 00011175	0	± 0	38	± 37
5	Inside Percival incubator 00011176	6	± 44	1	± 24
6	Deck below -80 Revco freezer 12063	0	± 0	10	± 38
7	Deck below Fisher freezer 00010623	25	± 37	18	± 32
8	Aft sink area	0	± 0	17	± 35
9	Stbd benchtop above flammable storage	0	± 0	0	± 0
10	Center starboard bench top, aft section	0	± 0	24	± 37
11	Center starboard benchtop, fwd section	0	± 0	14	± 37
12	Center benchtop, center section	0	± 0	15	± 35
13	Center port benchtop, forward section	0	± 0	7	± 42
14	Port benchtop aft section near entrance	0	± 0	17	± 35
15	Port sink area	4	± 11	33	± 35
16	Deck at aft door to Baltic Room	0	± 0	13	± 36
17	Deck inside aft entrance	3	± 37	2	± 31
18	Deck between forward entrance and Dry Lab entrance	0	± 0	19	± 35
	<u>Forward Dry Lab (Figure 2)</u>				
19	Deck inside Office supplies room	0	± 0	0	± 0
20	Deck inside port entrance	12	± 33	12	± 32
	<u>Bio Lab (Figure 3)</u>				
21	Benchtop adjacent to drying oven	0	± 0	41	± 45
22	Aft sink area	0	± 0	30	± 36
23	Deck inside starboard entrance	27	± 44	9	± 29
24	Benchtop port of aft sink	0	± 0	0	± 0
25	Benchtop across from forward fume hood	0	± 0	0	± 0
26	Deck below forward fume hood	8	± 40	4	± 30
27	Deck at forward entrance to lab	0	± 0	5	± 34
28	Benchtop aft of forward fume hood	0	± 0	18	± 34
29	Benchtop aft of port sink	0	± 0	28	± 37
30	Inside aft fume hood	0	± 0	11	± 37

Sample #	Sample Identification	$^3\text{H}$ dpm/m <sup>2</sup>			$^{14}\text{C}$ dpm/m <sup>2</sup>		
		activity	error		activity	error	
31	Deck below port sink area	28	±	43	12	±	30
32	Deck in front of refrigerators	0	±	0	4	±	45
33	Deck in front of aft fume hood	8	±	71	0	±	0
34	Benchtop inside forward science cooler	0	±	0	19	±	36
35	Benchtop inside aft science cooler	2	±	57	0	±	0
<u>Hydro Lab (Figure 4)</u>							
36	Starboard sink area	0	±	0	0	±	0
37	Aft sink area	17	±	41	8	±	30
38	Port benchtop beneath porthole	0	±	0	18	±	47
39	Forward benchtop	0	±	0	9	±	42
40	Inside Fisher refrigerator 00113124	0	±	0	20	±	35
41	Inside Fisher refrigerator 00113125	18	±	45	3	±	25
42	Initial bucket blank C. O. #2	10	±	30	14	±	33
43	Deck below aft sink	0	±	0	11	±	38
44	Deck between the two refrigerators	0	±	0	5	±	52
45	Benchtop across from starboard sink	32	±	54	0	±	0
46	Deck at forward entrance to lab	0	±	0	11	±	44
<u>Wet Lab (Figure 5)</u>							
47	Aft benchtop	0	±	0	18	±	38
48	Forward benchtop	9	±	40	4	±	30
49	Deck at forward entrance	17	±	33	22	±	33
50	Aft sink area	0	±	0	23	±	36
51	Forward sink area	6	±	48	0	±	0
52	Deck at port entrance	31	±	36	32	±	33
53	Deck in center of lab	1	±	5	22	±	35
54	Deck at starboard entrance to aft deck	49	±	35	48	±	34
<u>Aquarium (Figure 6)</u>							
55	Deck outside aft entrance	0	±	0	0	±	0
<u>Helo Workshop and 02 Deck (Figure 7)</u>							
57	Inside Baxter refrigerator 00011923	6	±	4	*159	±	40
58	Deck outside starboard aft door	95	±	39	*80	±	35
59	Deck near aft rail where incubator sat	0	±	0	22	±	36
60	Deck where door to Rad Van opened	0	±	0	*53	±	36
61	Deck where Rad waste was stored	0	±	0	45	±	37

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	
	<u>Miscellaneous areas (no Figure)</u>						
56	MLT Office deck inside entrance	0	±	0	15	±	35
62	MPC Science Office deck inside entrance	2	±	37	1	±	31
63	Final bucket sample CO#2	0	±	0	11	±	35

### Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. All areas on tested in the labs were free of radioisotope contamination that requires cleaning, except for three areas in the Helo Workshop that had minor <sup>14</sup>C contamination. These areas should be cleaned before any further use. It is not a good idea to store the rad waste outside of the rad van. All radioactive material, including waste, should be kept inside the rad van.

SWAB 745  
Figure 1  
10/22/2014

# Aft Dry Lab 1036 sq. ft.

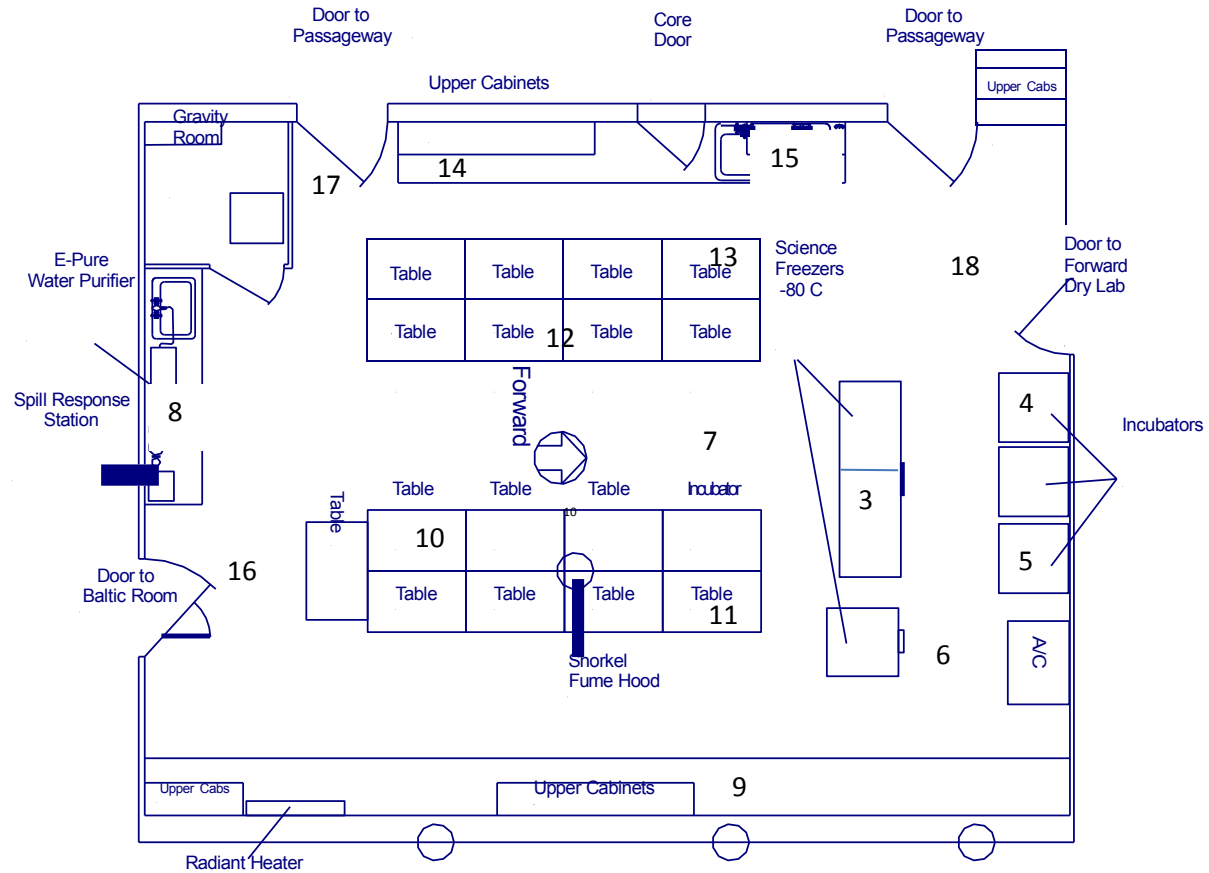
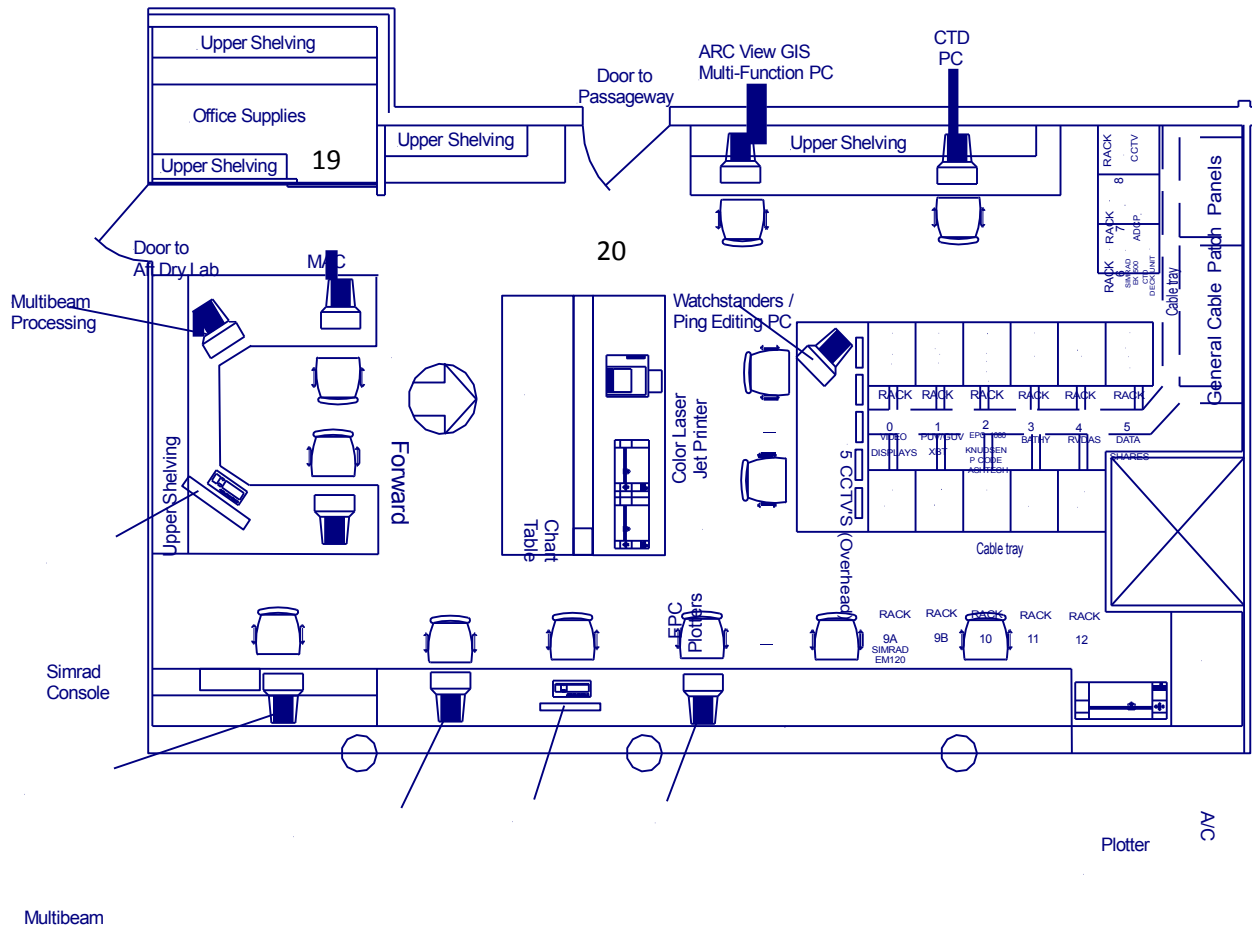


Figure 2  
SWAB #745  
10/22/2014

# Forward Dry Lab

1150 sq. ft.



Multibeam

Multi-Purpose  
UNIX Work Station

MAC

PC

Figure 3  
SWAB #745

# Bio Lab

460 sq. ft.

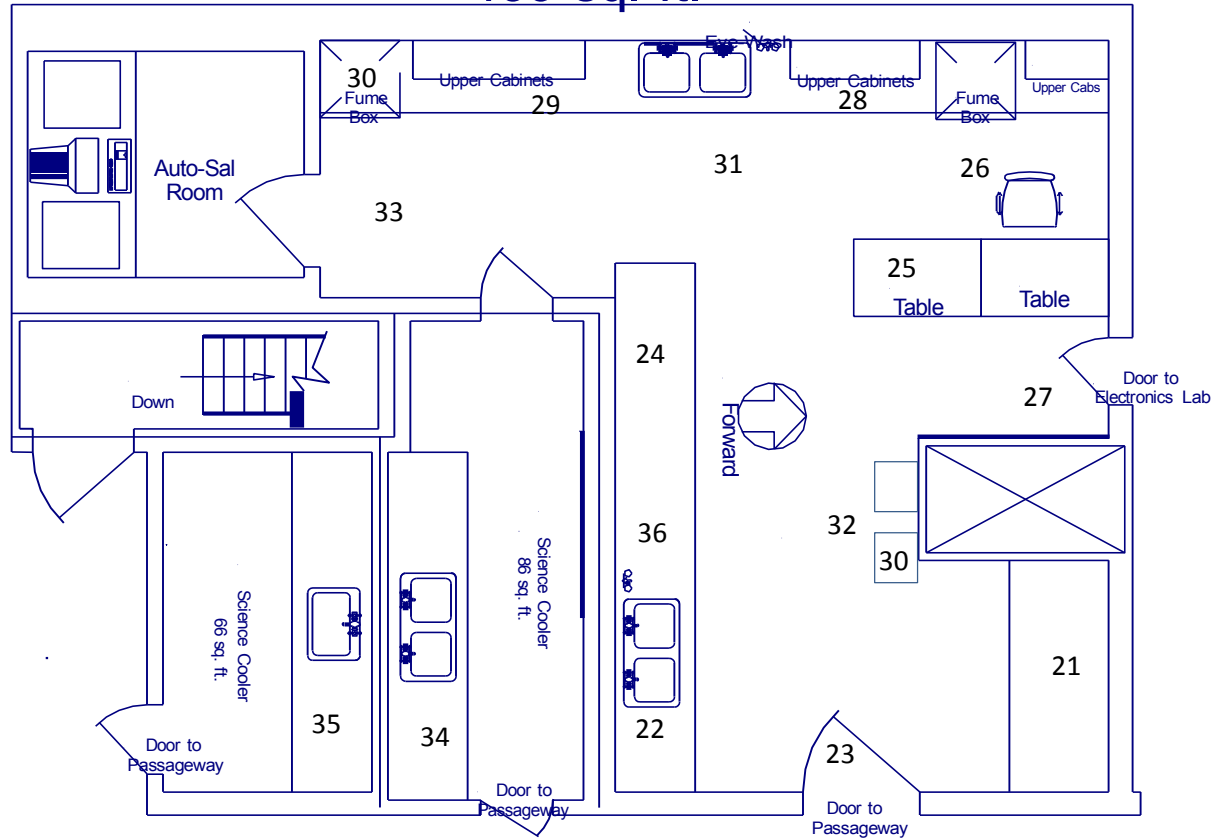




Figure 4  
SWAB #745

# Hydro Lab

445 sq. ft.

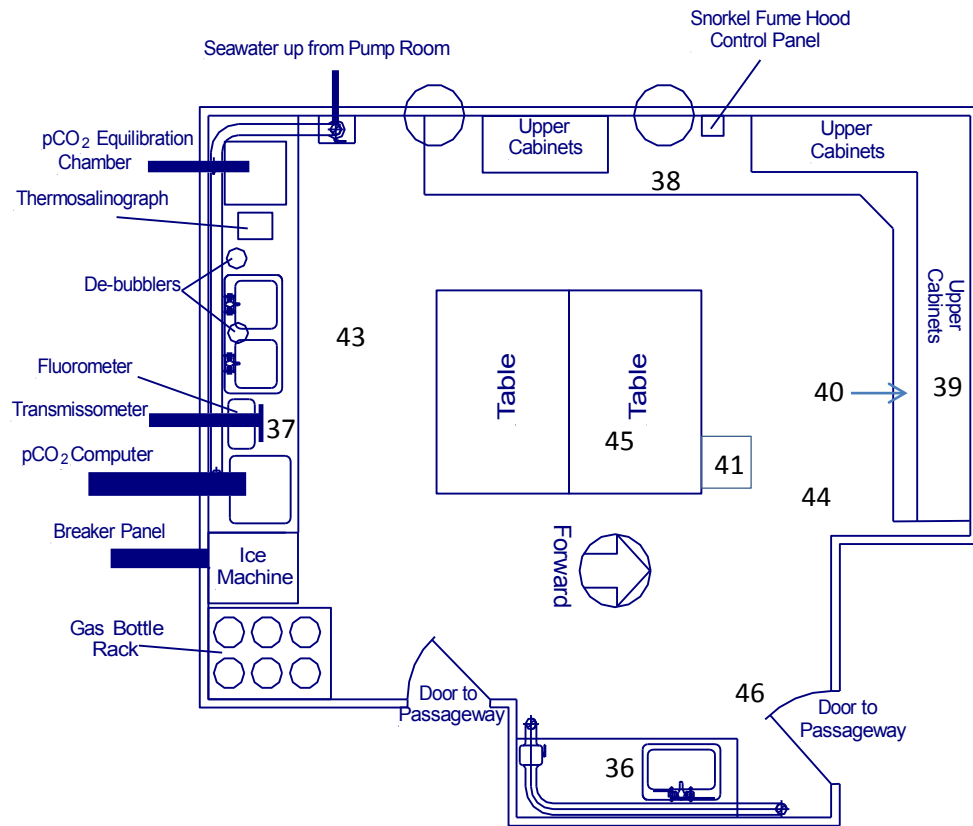


Figure 5  
SWAB #745

# Wet Lab

416 sq. ft.

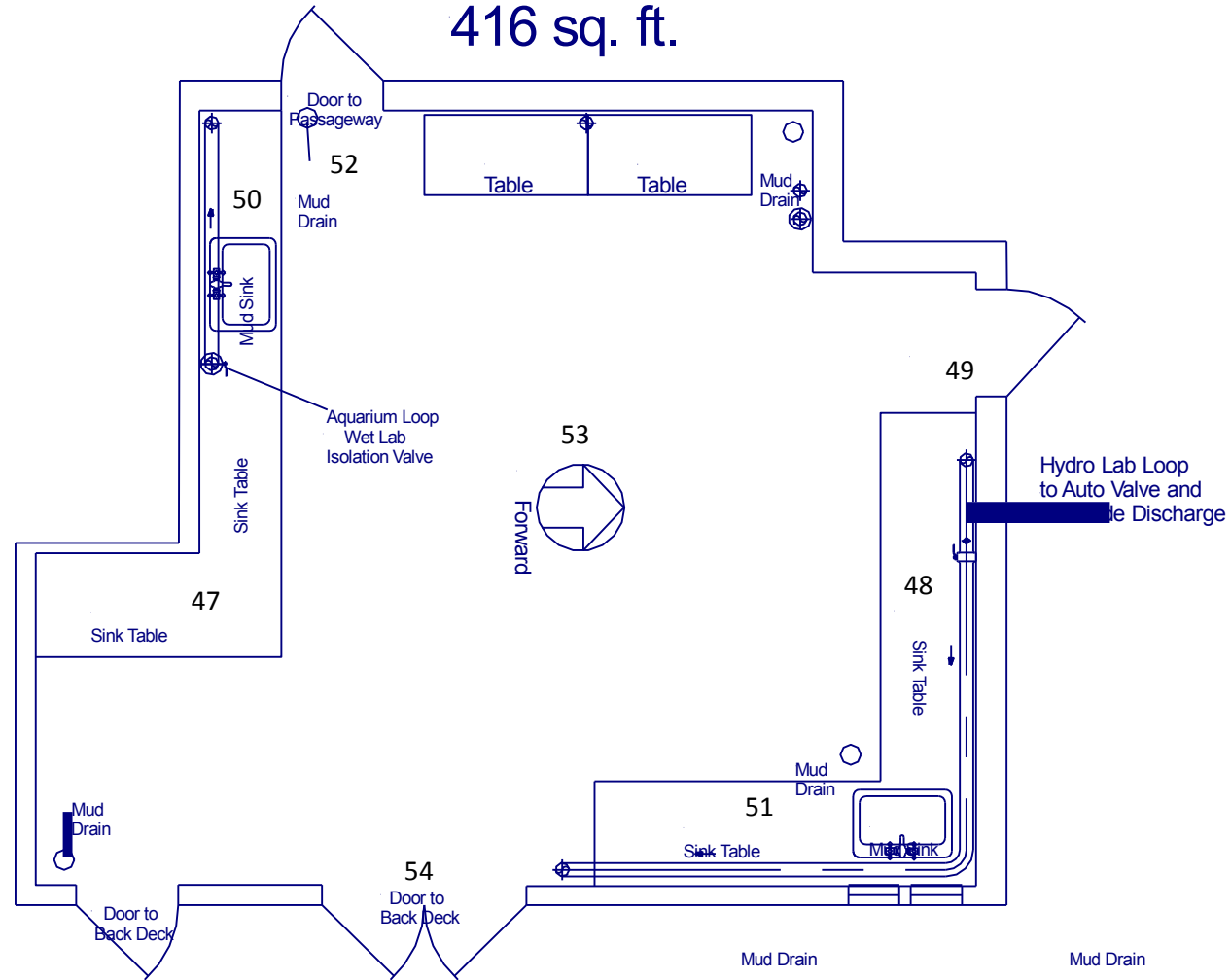


Figure 6  
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# Aquarium Room

298 sq. ft.

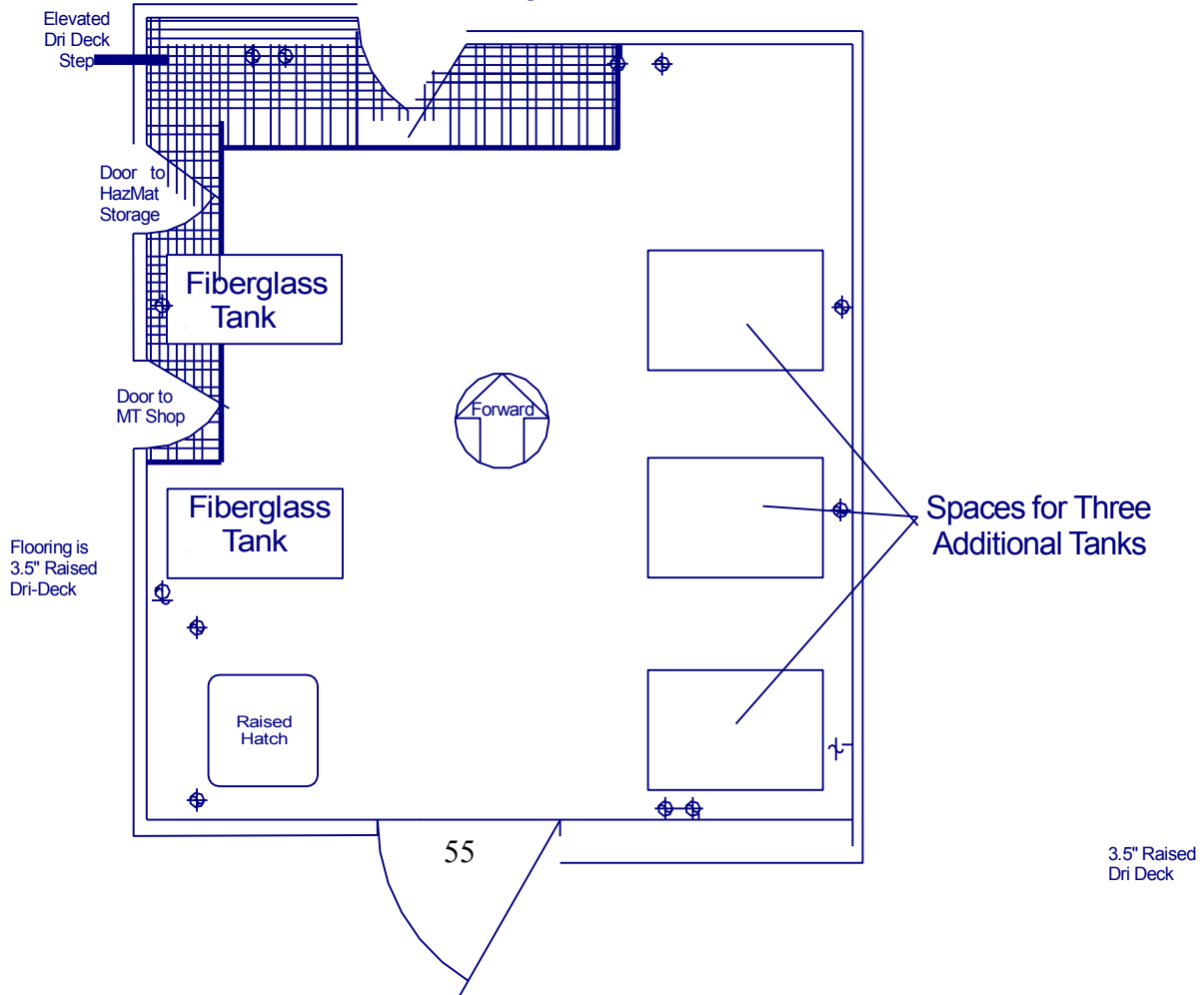


Figure 7  
SWAB #745  
October 22, 2014

