

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory
26 October 2016

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SWAB REPORT # 833

SWAB DATE: 17 October 2016

R/V Nathaniel B. Palmer

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Jamee Johnson

COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for ^3H and ^{14}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 dpm/m^2 . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m^2 . An error larger than the activity indicates that the activity is not significantly different from zero.

Criteria for SWAB Results

Category	^3H (dpm/m^2)	^{14}C (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}C and ^{35}S have peak energies of 156 and 167 KeV, respectively; thus ^{35}S will be registered as ^{14}C by our counting techniques. Categories A, B and C are not a health hazard.

Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

^3H : 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}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 ^3H .

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 insitution promptly by phone or email.

REPORT FOR SWAB # 833

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

DATE: 17 October 2016
TECHNICIAN: Charlene Grall

Sample # Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
	activity	error	activity	error
1 1st Vial Bkgnd	0	± 0	0	± 0
2 Initial bucket blank	9	± 50	-2	± 40
<u>Aft Dry Lab (Figure 1)</u>				
3 Inside top edge of Thermo -80 freezer	7	± 132	-9	± 22
4 Inside Percival incubator 0013153	-5	± 90	-4	± 64
5 Inside Powers incubator 021700	14	± 154	-21	± 59
6 Deck between Thermo freezer and incubators	17	± 160	-27	± 30
7 Inside Isotemp incubator 00113139	13	± 37	9	± 35
8 Deck below starboard side of Revco -80 freezer	40	± 73	-32	± 88
9 Center starboard bench	0	± 8	1	± 4
10 Starboard benchtop aft	-6	± 12	-7	± 22
11 Starboard benchtop fwd	6	± 19	-19	± 74
12 Deck in front of Isotemp freezer #00010623	3	± 101	-6	± 35
13 Deck at entrance to Gravity Room	-3	± 52	4	± 39
14 Port aft benchtop	14	± 117	-18	± 37
15 Port sink area	7	± 20	-22	± 85
16 Deck in front of aft Baltic doors	16	± 113	-21	± 22
17 Deck inside aft port entrance	35	± 59	-15	± 39
18 Aft sink area	-9	± 44	-15	± 47
19 Inside forward entrance	1	± 2	31	± 38
<u>Forward Dry Lab (Figure 2)</u>				
20 Deck in front of port entrance	9	± 76	-7	± 33
21 Deck in middle of lab near aft processing computers	9	± 69	-6	± 37
<u>Bio Lab (Figure 3)</u>				
22 Forward benchtop next to oven 00010037	-50	± 222	-9	± 32
23 Benchtop opposite of forward fume hood	-12	± 24	-21	± 55
24 Sink area aft of lab starboard entrance	-5	± 78	-5	± 30
25 Deck inside starboard entrance	5	± 27	8	± 36
26 Inside forward fume hood	4	± 368	-7	± 46
27 Port sink area	-28	± 99	-6	± 32
28 Inside aft fume hood	13	± 477	-25	± 67

Sample #	Sample Identification	^3H dpm/m ²		^{14}C dpm/m ²	
		activity	error	activity	error
29	Deck inside Auto Sal Room	-5	33	-11	49
30	Deck outside entrance to Science Cooler	258 ±	65	-38 ±	87
31	Aft benchtop	-11 ±	33	10 ±	40
32	Inside Fisher refridgerator 00011986	-6 ±	28	-8 ±	52
33	Inside Fisher refridgerator 00011985	25 ±	106	-26 ±	92
34	Deck in center of lab between lab benches	-15 ±	72	0 ±	83
35	Benchtop inside forward Science Cooler #918	12 ±	68	-9 ±	56
36	Benchtop inside aft Science Cooler #920	12 ±	44	1 ±	22
<u>Hydro Lab (Figure 4)</u>					
37	Starboard sink area	3 ±	31	2 ±	35
38	Aft sink area	-2 ±	18	-14 ±	38
39	Aft section of port benchtop	-9 ±	25	-12 ±	32
40	Forward benchtop	-8 ±	37	-18 ±	47
41	Inside Fisher refridge 00113125	-21 ±	86	7 ±	45
42	Deck inside forward entrance	16 ±	95	-18 ±	55
43	Deck in front of aft sink	42 ±	56	-13 ±	32
44	Final bucket sample (C.O.#1)	0 ±	14	-2 ±	1
45	Initial bucket sample (C.O.#2)	1 ±	29	0 ±	7
46	Center workbench aft section	29 ±	43	6 ±	30
47	Center workbench	0 ±	32	0 ±	19
48	Deck outside starboard entrance in passageway	-26 ±	98	25 ±	41
<u>Wet Lab (Figure 5)</u>					
49	Aft mud sink area	5 ±	56	-2 ±	29
50	Forward sink area	26 ±	82	-25 ±	41
51	Deck inside forward entrance	8 ±	44	-27 ±	42
52	Forward stainless steel bench	8 ±	104	-10 ±	32
53	Deck in center of lab	14 ±	174	-22 ±	37
54	Deck at aft starboard double door entrance	1 ±	16	-10 ±	36
<u>Miscellaneous Areas (No Figures)</u>					
55	Passageway at base of aft stairs to 01 Deck	38 ±	70	-28 ±	31
56	Deck in center of MLT office	-23 ±	35	-6 ±	101
57	Deck in center of MPC office	3 ±	22	-6 ±	99

Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
	<u>Helodeck (Figure 6)</u>				
58	Starboard aft deck where incubators stood	3	± 11	-6	± 72
59	Aft deck starboard of stair to 01 deck	52	± 40	10	± 29
60	Deck in front of waste storage containers	18	± 23	43	± 38
61	Deck where the two rad van doors opened	2	± 21	0	± 37
62	Helicopter hanger deck between shop and container	14	± 51	-1	± 41
63	Deck of shop between rad fridge and sink area	4	± 25	-16	± 76
64	Inside radioisotope storage refrigerator	41	± 53	-8	± 33
65	Final bucket blank (C.O.#2)	-32	± 98	-12	± 52

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. All areas tested on the ship were free from any isotope contamination that requires cleaning.

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Figure 1

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Aft Dry Lab 1036 sq. ft.

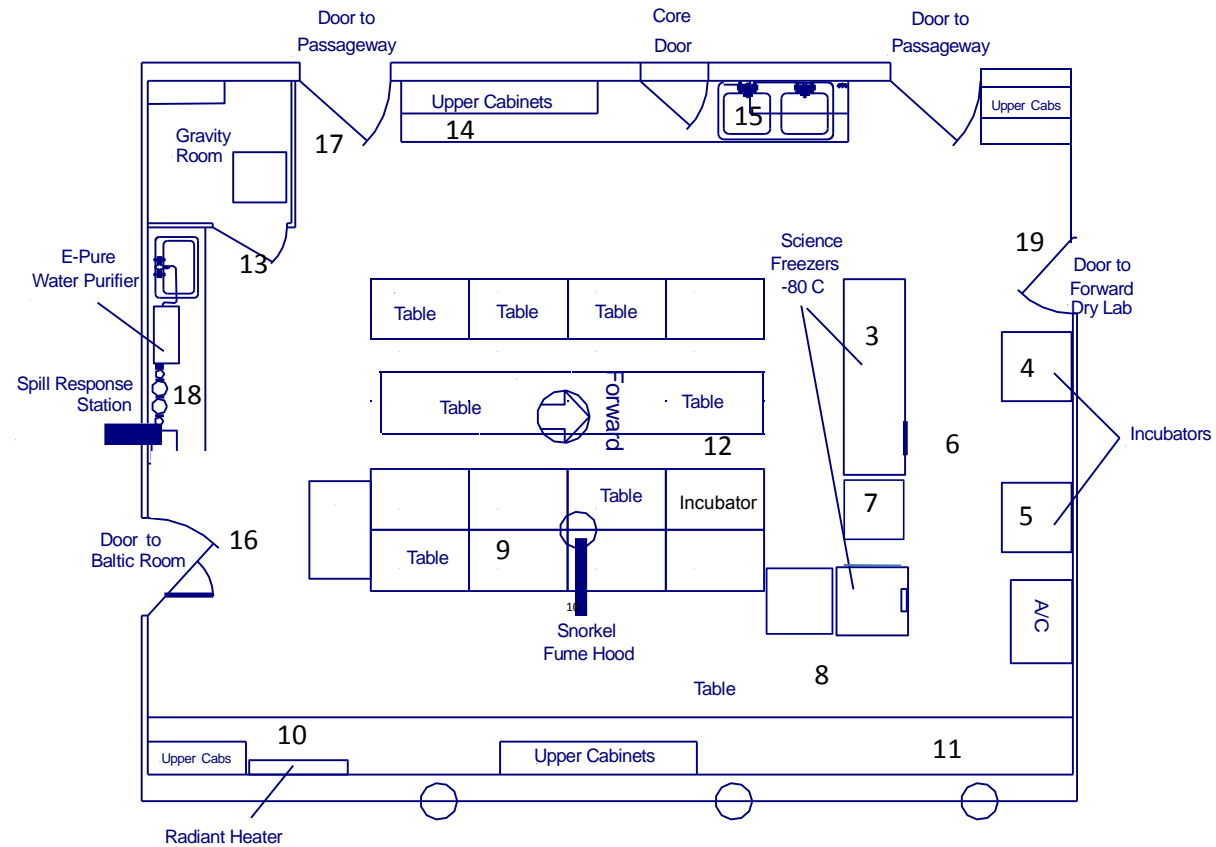


Figure 2
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Forward Dry Lab

1150 sq. ft.

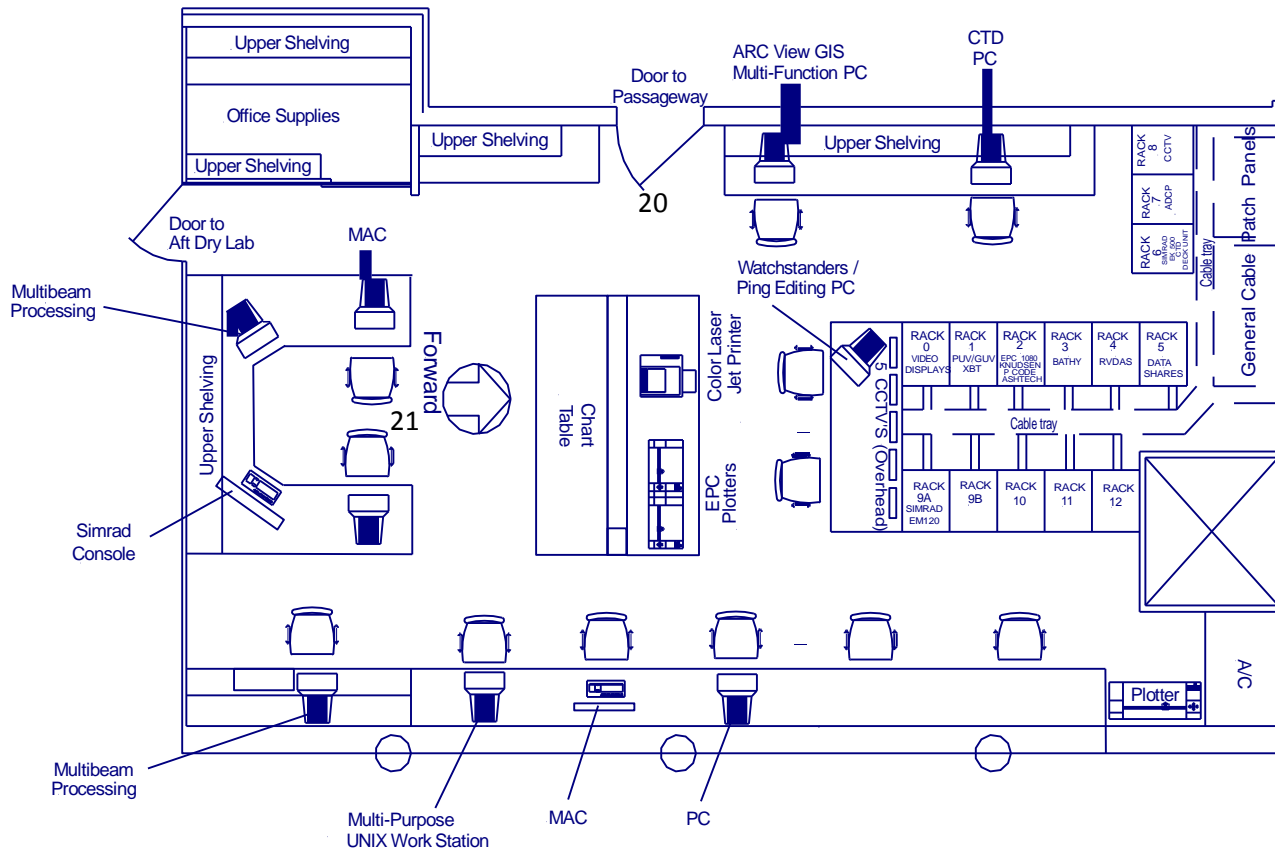


Figure 3
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Bio Lab

460 sq. ft.

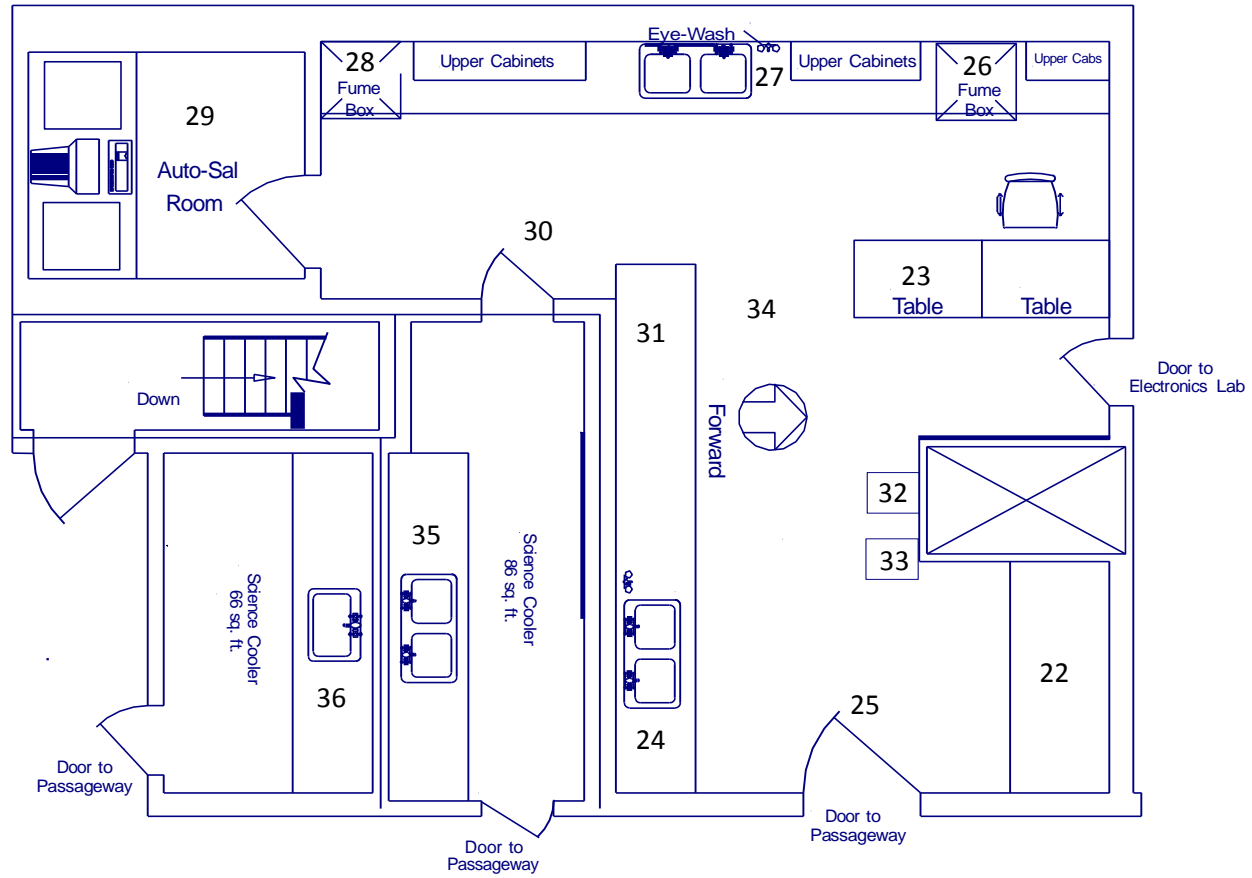


Figure 4
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Hydro Lab 445 sq. ft.

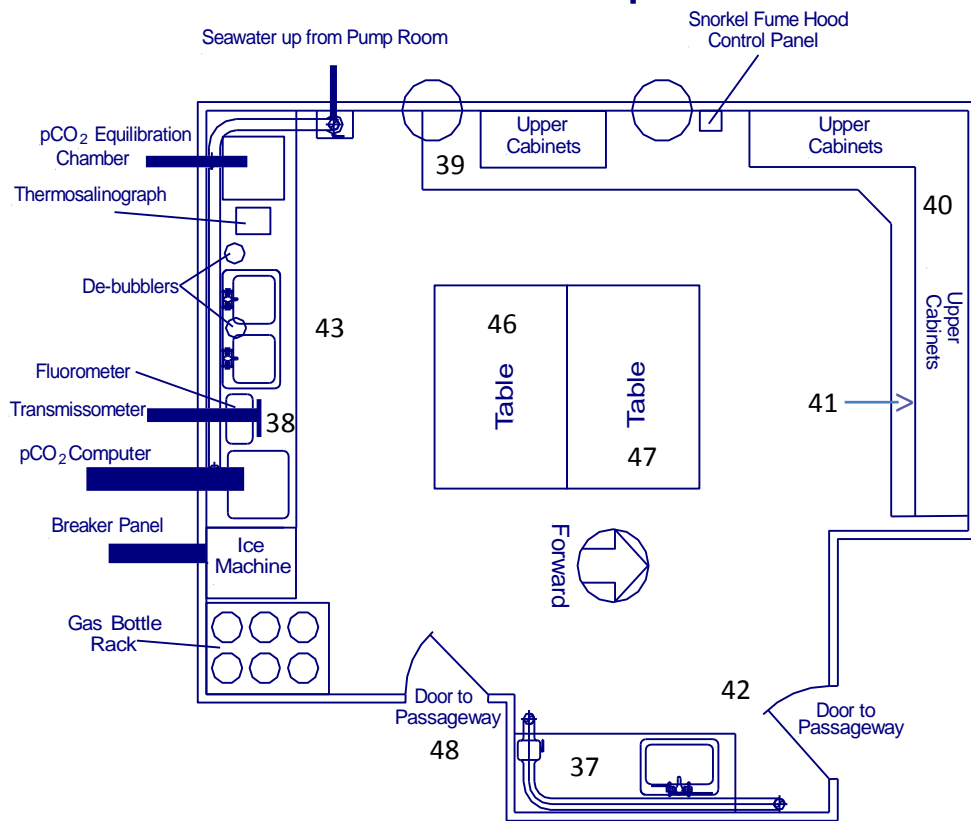


Figure 5
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Wet Lab

416 sq. ft.

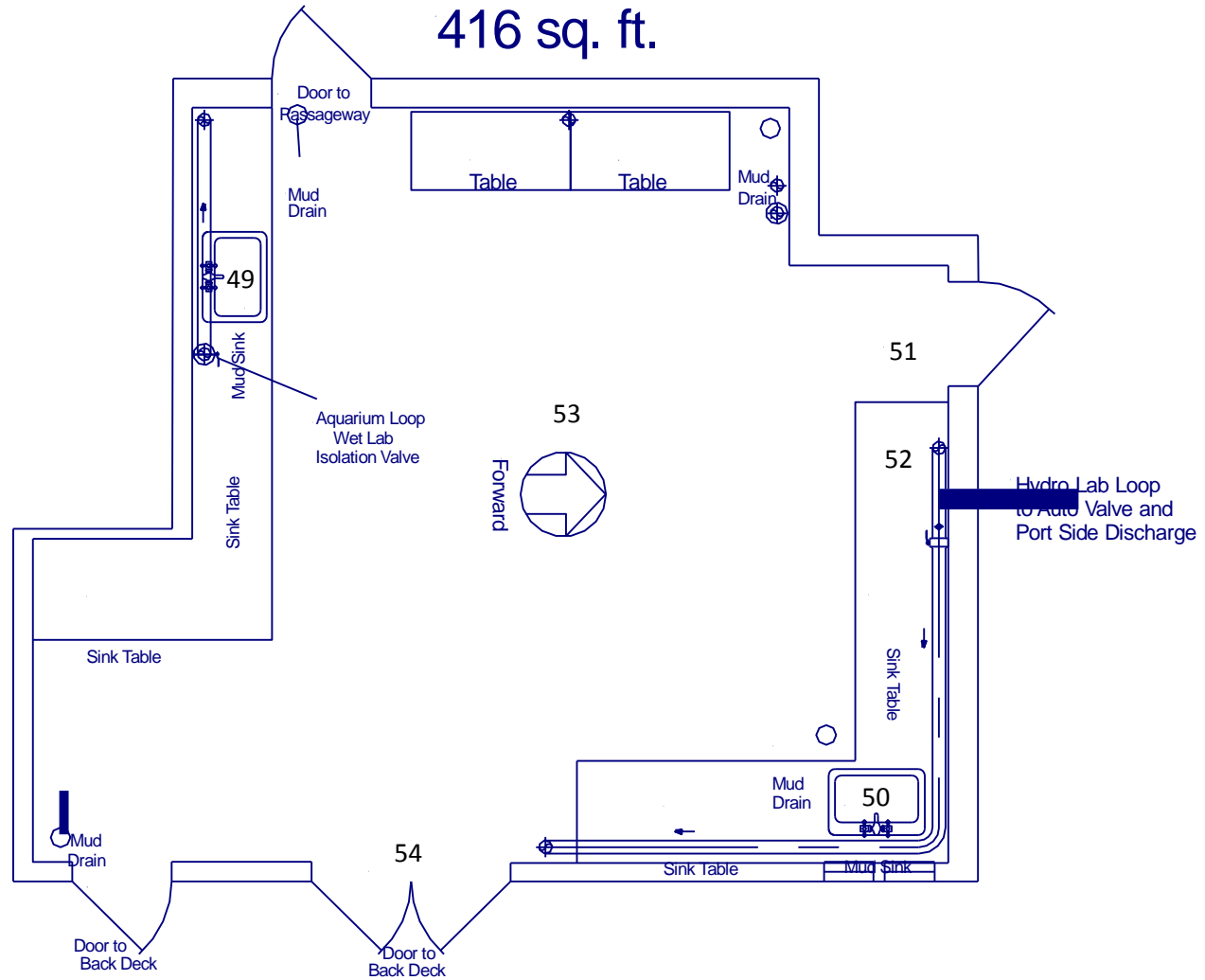


Figure 6
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