UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE

Tritium Laboratory
4600 Rickenbacker Causeway
Miami, Florida 33149-1031

Ph: 305-421-4100
Fax:305-421-4112
E-mail: Tritium@rsmas.miami.edu

Tritium Laboratory
22 March 2019

SWAB REPORT # 938

SWAB DATE: 16 March 2019

R/V Endeavor and Van #625.5.02

James Happell
Digitally signed by James Happell
Date: 2019.03.22 11:32:24 -04'00'

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Bill Fanning
Tom Glennon
Lynne Butler

COMMENTS TO SWAB REPORTS 12 May 2014

Typical LSC instrument background values for ^{3}H 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	^{3}H (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 dpm/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 Proceedure

Wearing ordinary household rubber gloves:

^{3}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}C: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}CO_2$). Follow up with wash as if for ^{3}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 insitution promptly by phone or email.

REPORT FOR SWAB # 938

LOCATION: St. Georges, Bermuda
DATE: 16 March 2019
VESSEL: *R/V Endeavor*
TECHNICIAN: Jim Happell

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	-8	±	29	4	±	42
	Wet Lab (Figure 1)						
3	Sink area	9	±	405	-17	±	41
4	Starboard benchtop aft of sink	-13	±	41	16	±	39
5	Inside shelf of hood/sink	2	±	7	-14	±	36
6	Deck inside aft entrance	7	±	72	-4	±	24
7	Port benchtop	-15	±	47	16	±	40
8	Deck inside port entrance	21	±	45	6	±	31
	Special Purpose Lab (Figure 1)						
9	Inside fume hood	-15	±	48	25	±	39
10	Top of Kenmore freezer	0	±	3	16	±	38
11	Benchtop opposite of Kenmore freezer	8	±	30	11	±	36
12	Forward benchtop	6	±	20	-24	±	60
13	Starboard sink area	-13	±	42	21	±	39
14	Starboard benctop adjacent to -80oC freezer	13	±	40	6	±	34
15	Inside Revco refrigerator	44	±	57	-9	±	47
16	Deck between forward benchtop and refrigerator	-34	±	66	4	±	76
17	Deck inside entrance	-10	±	36	6	±	41
	Main Lab (Figure 2)						
18	Aft center benchtop	5	±	378	-9	±	23
19	Mid center benchtop	10	±	30	13	±	36
20	Deck at top of stairs to living quarters	18	±	51	0	±	23
21	Deck inside starboard entrance	-9	±	32	1	±	3
22	Inside Laminar Flow Hood	-4	±	58	16	±	38
23	Port benchtop	32	±	62	-13	±	32
24	Deck at forward entrance	8	±	44	2	±	31
25	Deck between middle & forward benches	10	±	129	-12	±	30
26	Forward center benchtop	10	±	360	-17	±	43
27	Deck in front of aft sink	26	±	88	-18	±	46
28	Aft sink area	-1	±	5	-23	±	58
29	Port sink area	-23	±	45	2	±	108

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		^{3}H dpm/m^{2} error	^{14}C dpm/m^{2} activity		^{14}C dpm/m^{2} error
	Main Deck (Figure 1)						
30	Aft deck below Van door	6	±	75	-4	±	25
31	Aft deck where incubator stood	-39	±	75	-4	±	24
32	Aft deck under A-frame	29	±	44	8	±	31
	01 Deck and Upper Lab (Figue 3)						
33	Starboard aft benchtop	0	±	1	-15	±	38
34	Deck inside aft entrance	-25	±	48	4	±	53
35	Deck at bottom of stairs to bridge	-11	±	35	-3	±	17
36	Deck aft of Electronic Repair Shop	-19	±	61	-6	±	31
37	Center benchtop	14	±	62	-5	±	29
	Rad Van #625.5.02 (Figure 4)						
38	Sink area	*1011	±	99	35	±	16
39	Benchtop adjacent to sink	*1878	±	128	*63	±	17
40	Inside fume hood	16	±	54	-3	±	14
41	Benchtop adjacent to fume hood	177	±	59	13	±	22
42	Inside refrigerator	13	±	32	15	±	36
43	Inside freezer	91	±	42	*70	±	37
44	Benchtop next to LSC	190	±	58	31	±	29
45	Benchtop across from sink	30	±	44	10	±	32
46	Deck between LSC & fume hood	*767	±	89	32	±	17
47	Deck in middle of van	165	±	59	5	±	14
48	Deck at entrance	*589	±	82	5	±	5
49	Final bucket blank	-2	±	6	-18	±	45

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 of isotope contamination that requires cleaning. Minor ^{3}H and ^{14}C contamination was found in the Rad Van. No action is neccessary

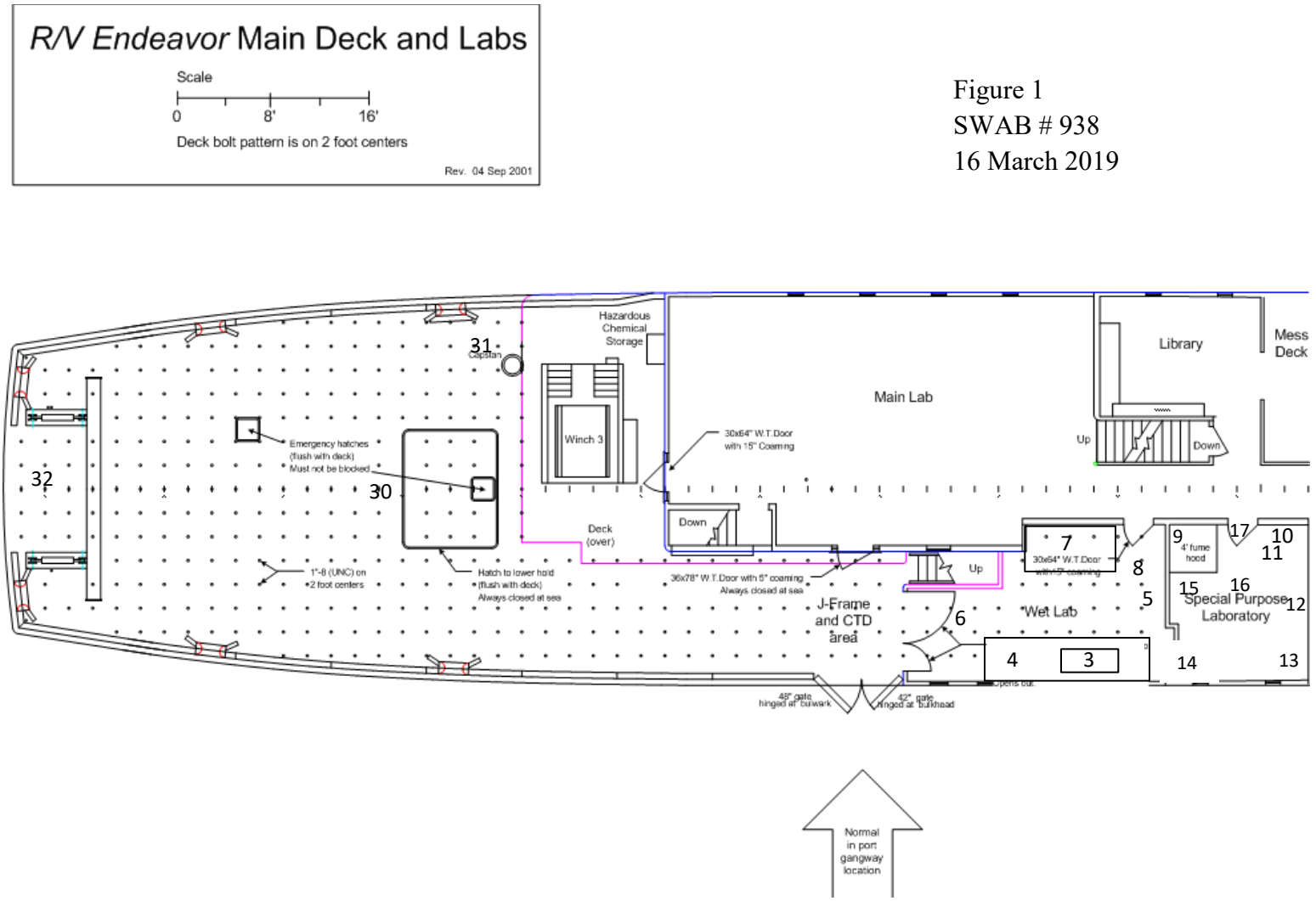


Figure 1
SWAB # 938
16 March 2019

Figure 2
SWAB #938
16 March 2019

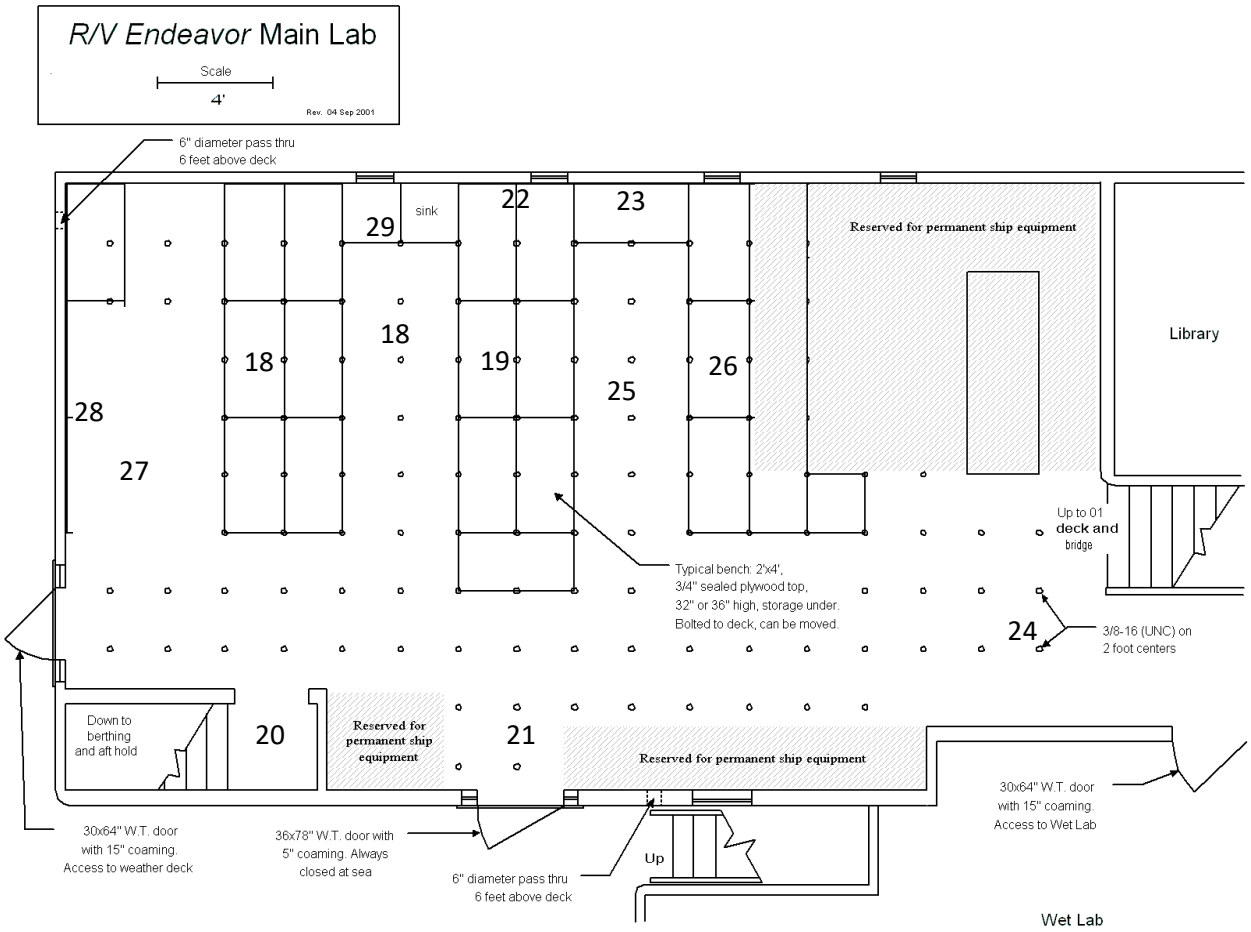
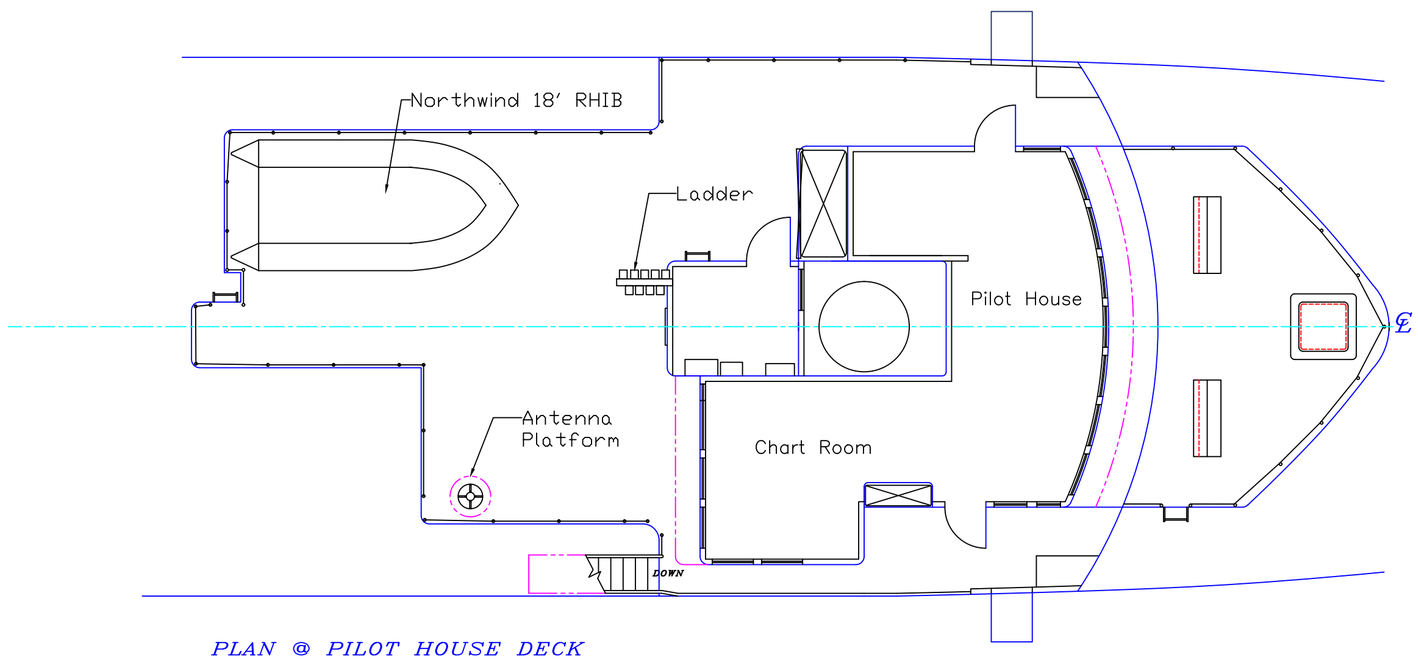
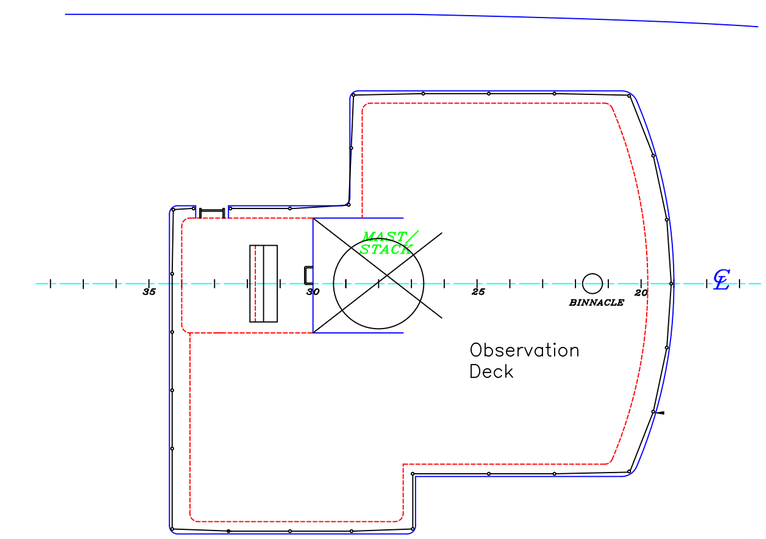


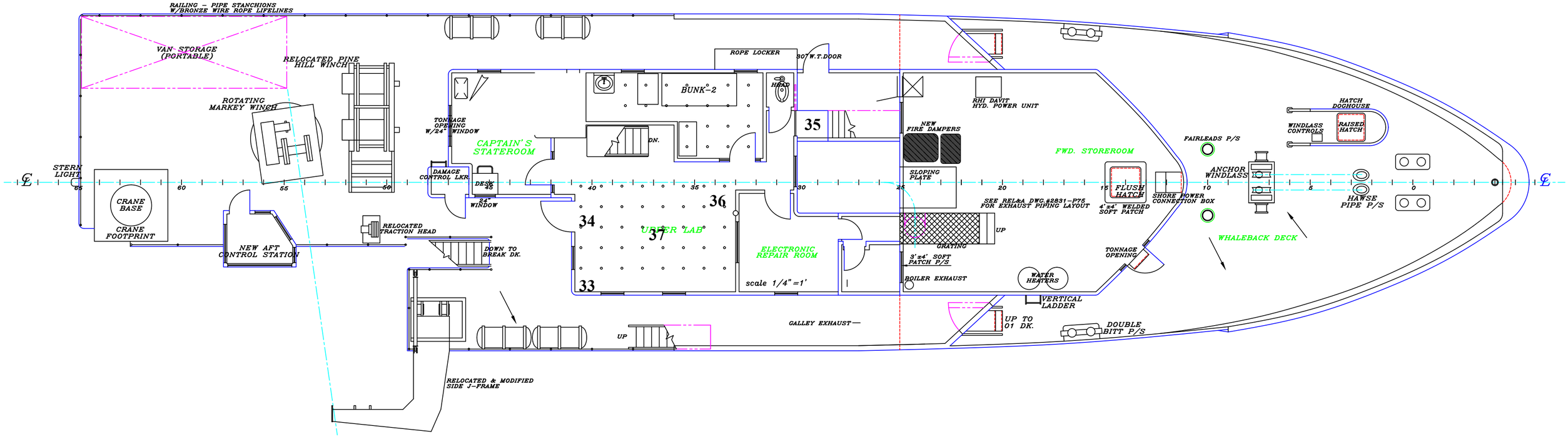
Figure 3
SWAB #938
16 March 2019



PLAN @ PILOT HOUSE DECK



PLAN @ PILOT HOUSE TOP



PLAN @ 01 DECK

East Coast Van Pool Van #625.5.02

Figure 4
SWAB #938
16 March 2019