APPENDIX B

Lead Analyzer Test Results

LEAD BASED PAINT SCREENING SUMMARY

NITON XLp-300A, Serial No. 81530

No.	SITE	INSPECTOR	ROOM	COMPONENT	SUBSTRATE	CONDITION	COLOR	Duration	Time	Depth Index	Results		
											LBP	mg/cm^2	+/- ERROR
1	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	-	SHUTTER CAL	-	-	-	82.41	5/17/2013 15:27	-	-	3.63	0.00
2	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	**-**	**CALIBRATION CK**	**-**	**-**	**RED**	**20.46**	**5/17/2013 15:27**	**1.13**	**Positive**	**1.20**	**0.10**
3	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	**-**	**CALIBRATION CK**	**-**	**-**	**RED**	**20.47**	**5/17/2013 15:28**	**2.69**	**Positive**	**1.20**	**0.10**
4	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	**-**	**CALIBRATION CK**	**-**	**-**	**RED**	**20.42**	**5/17/2013 15:29**	**1.14**	**Positive**	**1.20**	**0.10**
5	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	008	BEAM	METAL	INTACT	ORANGE	5.78	5/17/2013 15:30	1.62	Negative	0.06	0.03
6	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	008	BEAM	METAL	INTACT	ORANGE	5.80	5/17/2013 15:30	1.00	Negative	0.03	0.02
7	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	008	BEAM	METAL	PEELING	BLACK	5.78	5/17/2013 15:31	1.00	Negative	0.00	0.02
8	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	106	CEILING	PLASTER	INTACT	WHITE	6.94	5/17/2013 15:45	1.00	Negative	0.00	0.02
9	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	106	CEILING	PLASTER	INTACT	GREEN	5.40	5/17/2013 15:46	5.17	Negative	0.02	0.04
10	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	106	CEILING TRIM	WOOD	INTACT	WHITE	5.40	5/17/2013 15:46	3.02	Negative	0.12	0.06
11	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	106	CEILING TRIM	WOOD	INTACT	WHITE	5.39	5/17/2013 15:47	4.56	Negative	0.07	0.07
12	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	106	WALL	DRYWALL	INTACT	GRAY	5.77	5/17/2013 15:47	1.87	Negative	0.03	0.02
13	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	106	WALL TRIM	WOOD	INTACT	WHITE	6.18	5/17/2013 15:48	9.92	Negative	0.30	0.59
14	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	DOOR	WOOD	INTACT	GRAY	5.38	5/17/2013 17:06	1.53	Negative	0.50	0.10
15	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	DOOR TRIM	WOOD	INTACT	GRAY	6.16	5/17/2013 17:07	1.72	Negative	0.04	0.03
16	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	WALL	CONCRETE	INTACT	WHITE	6.53	5/17/2013 17:08	2.92	Negative	0.03	0.03
17	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	**001**	**DOOR**	**METAL**	**INTACT**	**ORANGE**	**5.40**	**5/17/2013 17:08**	**2.15**	**Positive**	**8.30**	**1.20**
18	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	DOOR TRIM	METAL	INTACT	ORANGE	6.57	5/17/2013 17:09	2.46	Negative	0.13	0.06
19	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	BOILER	METAL	INTACT	BLACK	5.77	5/17/2013 17:10	1.28	Negative	0.06	0.03
20	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	BOILER EXHAUST	METAL	INTACT	BLACK	5.80	5/17/2013 17:11	1.63	Negative	0.10	0.05
21	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	FLOOR	CONCRETE	INTACT	GRAY	5.39	5/17/2013 17:11	1.45	Negative	0.01	0.02
22	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	001	PIPE	METAL	INTACT	ORANGE	6.15	5/17/2013 17:16	3.75	Negative	0.01	0.02
23	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	**001**	**PIPE**	**METAL**	**INTACT**	**RED**	**5.81**	**5/17/2013 17:17**	**2.02**	**Positive**	**14.10**	**1.50**
24	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	002	WALL	DRYWALL	INTACT	BROWN	6.14	5/17/2013 17:19	2.86	Negative	0.17	0.49
25	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	**002**	**SINK**	**CERAMIC**	**INTACT**	**WHITE**	**6.57**	**5/17/2013 17:20**	**2.00**	**Positive**	**39.80**	**2.50**
26	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	002	DOOR TRIM	WOOD	INTACT	WHITE	5.77	5/17/2013 17:20	2.72	Negative	0.05	0.04
27	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	003	DOOR TRIM	WOOD	INTACT	WHITE	5.39	5/17/2013 17:22	1.21	Negative	0.04	0.02
28	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	003	WALL	DRYWALL	INTACT	WHITE	6.11	5/17/2013 17:23	1.00	Negative	0.00	0.02
29	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	007	WALL	CONCRETE	INTACT	WHITE	5.40	5/17/2013 17:24	4.57	Negative	0.08	0.07
30	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	007	AHU	METAL	INTACT	BLUE	5.80	5/17/2013 17:25	1.00	Negative	0.00	0.02
31	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	007	FLOOR	CONCRETE	INTACT	GRAY	5.75	5/17/2013 17:25	2.33	Negative	0.06	0.04
32	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	008	DOOR	METAL	INTACT	BROWN	5.80	5/17/2013 17:28	3.07	Negative	0.00	0.02
33	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	008	DOOR TRIM	METAL	INTACT	BROWN	5.41	5/17/2013 17:28	1.00	Negative	0.00	0.02
34	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	008	WALL	DRYWALL	INTACT	WHITE	5.39	5/17/2013 17:29	1.35	Negative	0.00	0.02
35	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	DOOR TRIM	WOOD	INTACT	ORANGE	6.16	5/17/2013 17:31	2.66	Negative	0.50	0.10
36	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	DOOR TRIM	WOOD	INTACT	WHITE	5.79	5/17/2013 17:31	3.42	Negative	0.05	0.05
37	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	WALL	WOOD	INTACT	BEIGE	5.41	5/17/2013 17:33	1.47	Negative	0.00	0.02
38	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	WALL	CONCRETE	INTACT	BEIGE	5.78	5/17/2013 17:33	1.20	Negative	0.00	0.02
39	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	DOOR TRIM	WOOD	INTACT	WHITE	5.38	5/17/2013 17:35	2.86	Negative	0.26	0.10
40	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	DOOR	WOOD	INTACT	WHITE	5.78	5/17/2013 17:35	10.00	Negative	-0.07	0.31
41	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	010	WALL	DRYWALL	INTACT	BEIGE	5.37	5/17/2013 17:36	1.46	Negative	0.00	0.02
42	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	070	COLUMN	METAL	INTACT	GREEN	5.38	5/17/2013 17:38	1.20	Negative	0.07	0.03
43	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	COLUMN	METAL	INTACT	WHITE	5.80	5/17/2013 17:38	3.74	Negative	0.26	0.12
44	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	TRIM	WOOD	INTACT	WHITE	9.64	5/17/2013 17:39	1.87	Negative	0.10	0.04
45	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	WALL	DRYWALL	INTACT	WHITE	5.76	5/17/2013 17:41	2.10	Negative	0.50	0.10
46	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	DOOR TRIM	WOOD	INTACT	WHITE	5.79	5/17/2013 17:41	1.16	Negative	0.01	0.02
47	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	DOOR	WOOD	INTACT	WHITE	5.38	5/17/2013 17:42	1.92	Negative	0.07	0.04
48	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	TRIM	WOOD	INTACT	WHITE	5.79	5/17/2013 17:42	2.52	Negative	0.04	0.04
49	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	050	WALL	WOOD	INTACT	WHITE	5.40	5/17/2013 17:43	2.49	Negative	0.10	0.05
50	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	060	WALL	CONCRETE	INTACT	WHITE	5.76	5/17/2013 17:44	1.57	Negative	0.01	0.02
51	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	060	WALL	CONCRETE	INTACT	WHITE	5.41	5/17/2013 17:51	2.18	Negative	0.02	0.02
52	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	040	DOOR TRIM	WOOD	INTACT	WHITE	5.38	5/17/2013 17:54	1.86	Negative	0.05	0.03
53	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	040	DOOR TRIM	WOOD	INTACT	YELLOW	5.78	5/17/2013 17:54	1.00	Negative	0.00	0.02
54	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	040	WALL	CONCRETE	INTACT	WHITE	6.17	5/17/2013 17:55	2.23	Negative	0.03	0.03
55	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	LOWER STAIRS	WALL	CONCRETE	INTACT	WHITE	6.15	5/17/2013 18:00	1.97	Negative	0.02	0.02
56	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	LOWER STAIRS	RISER	CONCRETE	INTACT	BROWN	5.77	5/17/2013 18:00	2.24	Negative	0.04	0.03
57	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	LOWER STAIRS	WALL	PLASTER	INTACT	WHITE	5.76	5/17/2013 18:02	2.38	Negative	0.06	0.04
58	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	LOWER STAIRS	DOOR	METAL	INTACT	WHITE	5.37	5/17/2013 18:03	1.00	Negative	0.00	0.02

No.	SITE	INSPECTOR	ROOM	COMPONENT	SUBSTRATE	CONDITION	COLOR	Duration	Time	Depth Index	Results		
											LBP	mg/cm^2	+/- ERROR
59	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	LOWER STAIRS	DOOR TRIM	METAL	INTACT	WHITE	5.38	5/17/2013 18:03	4.19	Negative	0.02	0.04
60	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	104	DOOR TRIM	WOOD	INTACT	YELLOW	6.17	5/17/2013 18:04	2.17	Negative	0.01	0.02
61	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	104	DOOR	METAL	INTACT	YELLOW	5.37	5/17/2013 18:05	2.00	Negative	0.00	0.02
62	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	104	WALL	DRYWALL	INTACT	YELLOW	5.40	5/17/2013 18:05	1.67	Negative	0.00	0.02
63	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	104	TRIM	WOOD	INTACT	WHITE	5.77	5/17/2013 18:06	9.16	Negative	0.30	0.42
64	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	104	TRIM	WOOD	INTACT	WHITE	5.40	5/17/2013 18:07	1.47	Negative	0.00	0.02
65	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	103	WALL	DRYWALL	INTACT	BEIGE	5.39	5/17/2013 18:08	6.68	Negative	0.21	0.14
66	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	103	WALL	CERAMIC	INTACT	WHITE	5.41	5/17/2013 18:09	5.39	Negative	0.04	0.08
67	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	103	FLOOR	CERAMIC	INTACT	WHITE	5.43	5/17/2013 18:09	1.03	Negative	0.01	0.02
68	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	103	WINDOW SILL	WOOD	INTACT	WHITE	6.56	5/17/2013 18:10	4.52	Negative	0.03	0.04
69	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	103	WINDOW CASING	WOOD	INTACT	WHITE	6.95	5/17/2013 18:10	4.36	Negative	0.22	0.10
70	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	103	SINK	CERAMIC	INTACT	WHITE	5.78	5/17/2013 18:11	10.00	Negative	-0.18	0.75
71	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	102	DOOR TRIM	WOOD	INTACT	WHITE	5.40	5/17/2013 18:12	1.00	Negative	0.00	0.02
72	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	102	DOOR	WOOD	INTACT	WHITE	5.78	5/17/2013 18:12	1.40	Negative	0.00	0.02
73	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	105	WALL	DRYWALL	INTACT	WHITE	5.38	5/17/2013 18:13	1.00	Negative	0.00	0.02
74	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	105	HEATER SHROUD	METAL	INTACT	WHITE	6.53	5/17/2013 18:15	10.00	Negative	0.18	0.63
75	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	105	DOOR TRIM	WOOD	INTACT	WHITE	5.80	5/17/2013 18:15	1.53	Negative	0.01	0.02
76	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	108	WALL	DRYWALL	INTACT	WHITE	5.38	5/17/2013 18:16	2.48	Negative	0.20	0.67
77	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	108	WALL	DRYWALL	INTACT	BEIGE	5.39	5/17/2013 18:19	1.00	Negative	0.00	0.02
78	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	108	TRIM	WOOD	INTACT	WHITE	5.77	5/17/2013 18:20	1.68	Negative	0.00	0.02
79	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	107	WALL	DRYWALL	INTACT	GREEN	5.76	5/17/2013 18:25	1.00	Negative	0.00	0.02
80	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	107	TRIM	WOOD	INTACT	WHITE	5.76	5/17/2013 18:25	1.02	Negative	0.00	0.02
81	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	109	DOOR TRIM	WOOD	INTACT	WHITE	5.39	5/17/2013 18:26	1.61	Negative	0.01	0.02
82	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	VOID	VOID	VOID	VOID	VOID	VOID	5/17/2013 18:27	VOID	VOID	VOID	VOID
83	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	BROWN	6.17	5/17/2013 18:28	10.00	Negative	0.19	0.73
84	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	BLUE	5.76	5/17/2013 18:28	1.00	Negative	0.00	0.02
85	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	YELLOW	5.77	5/17/2013 18:29	1.00	Negative	0.00	0.02
86	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	201	WALL	DRYWALL	INTACT	GRAY	5.38	5/17/2013 18:30	1.93	Negative	0.08	0.04
87	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	201	WALL	DRYWALL	INTACT	WHITE	5.77	5/17/2013 18:31	3.04	Negative	0.07	0.05
88	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	201	WALL	DRYWALL	INTACT	YELLOW	6.55	5/17/2013 18:32	2.13	Negative	0.05	0.03
89	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	201	CEILING	DRYWALL	INTACT	WHITE	5.78	5/17/2013 18:33	1.23	Negative	0.05	0.03
90	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	201	WINDOW CASING	METAL	INTACT	WHITE	5.79	5/17/2013 18:33	1.73	Negative	0.18	0.05
91	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	UPPER STAIRS	HAND RAIL	WOOD	PEELING	WHITE	5.40	5/17/2013 18:34	1.09	Negative	0.00	0.02
92	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	YELLOW	8.46	5/17/2013 18:36	3.86	Negative	0.01	0.02
93	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	CURB	CONCRETE	INTACT	GREEN	5.78	5/17/2013 18:37	1.57	Negative	0.00	0.02
94	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WINDOW CASING	WOOD	INTACT	YELLOW	5.82	5/17/2013 18:38	2.40	Negative	0.40	0.10
95	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	DOOR	METAL	INTACT	GREEN	5.79	5/17/2013 18:39	1.00	Negative	0.00	0.02
96	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	DOOR TRIM	METAL	INTACT	GREEN	5.78	5/17/2013 18:39	2.71	Negative	0.01	0.02
97	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	YELLOW	5.38	5/17/2013 18:40	1.00	Negative	0.00	0.02
98	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	GREEN	5.77	5/17/2013 18:41	2.72	Negative	0.02	0.03
99	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	RAIN GUTTER	METAL	INTACT	YELLOW	6.15	5/17/2013 18:46	4.83	Negative	-0.39	0.32
100	JUNEAU-DOUGLAS CITY MUSEUM	OTTOSEN	EXTERIOR	WALL	CONCRETE	INTACT	GREEN	5.77	5/17/2013 18:53	3.81	Negative	0.02	0.04
101	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	-	**CALIBRATION CK**	-	-	**RED**	**20.09**	**5/17/2013 18:58**	**1.14**	**Positive**	**1.20**	**0.10**
102	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	-	**CALIBRATION CK**	-	-	**RED**	**20.46**	**5/17/2013 18:58**	**2.80**	**Positive**	**1.20**	**0.10**
103	**JUNEAU-DOUGLAS CITY MUSEUM**	**OTTOSEN**	-	**CALIBRATION CK**	-	-	**RED**	**20.46**	**5/17/2013 18:59**	**1.12**	**Positive**	**1.20**	**0.10**

Table Heading Descriptions: See Next Page

Depth Index: Indicates the relative depth of the lead. A Depth Index (DI) of less than 1.5 indicates lead very near the surface layer of paint. A DI between 1.5 and 4.0 indicates moderately covered lead. A DI greater than 4.0 indicates the lead paint is deeply buried beneath multiple layers of paint.

LBP: Results are shown as positive (POS $\geq$ 1.0 mg/cm^2), inconclusive (INC) or negative (NEG < 1.0 mg/cm^2). The results are based on the combined results of the K and L shell readings. L shell and K shell readings are not provided, but are available. Positive results are shown in bold print.

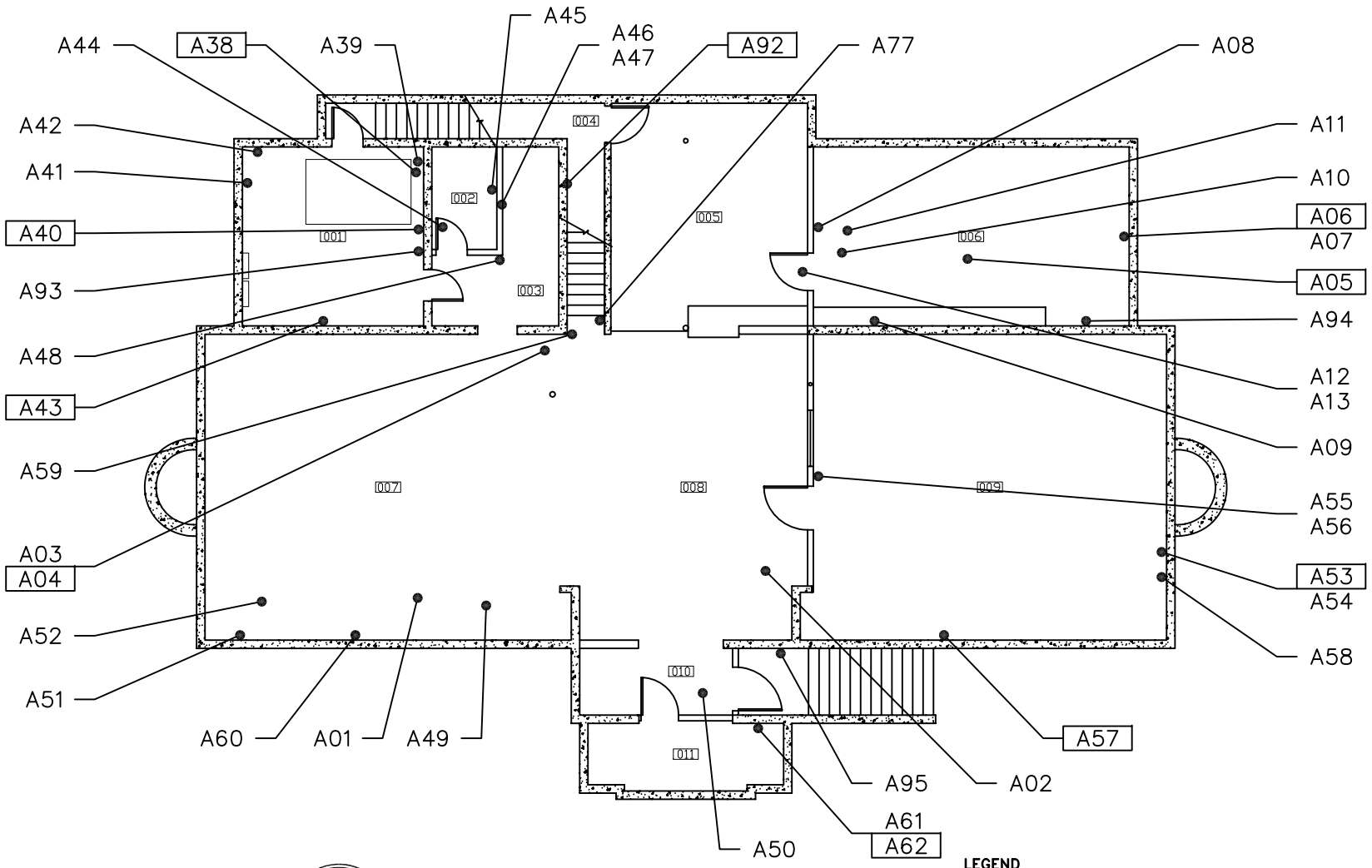
mg/cm2: This is the testing results produced by the NITON XLp-300A instrument in milligrams of lead per square centimeter (mg/cm^2). The EPA defines lead based paint as paint containing lead at 1.0 mg/cm^2 or greater. A negative number is a result of an internal computation made by the instrument and should be interpreted as zero. Even though paint may be termed negative (less than 1.0 mg/cm^2) by EPA definition, disturbance of the paint may still be regulated by OSHA under 29 CFR 1926.62. Where lead is present at any level, appropriate engineering controls, work practices and personal protective equipment should be used until a negative exposure assessment can be determined. <LOD indicates that the lead present was less than the limits of detection of the instrument (very little or no lead present).

VOID: This indicates that the test was intentionally terminated by the operator due to operator error (e.g. - operator moved analyzer while testing).

Substrate: Where ceramic is shown as a substrate, lead content is typically from the glazing on the tile unless the tile is painted.

APPENDIX C

Drawings of Sample Locations



1
C-1

BASEMENT
NTS

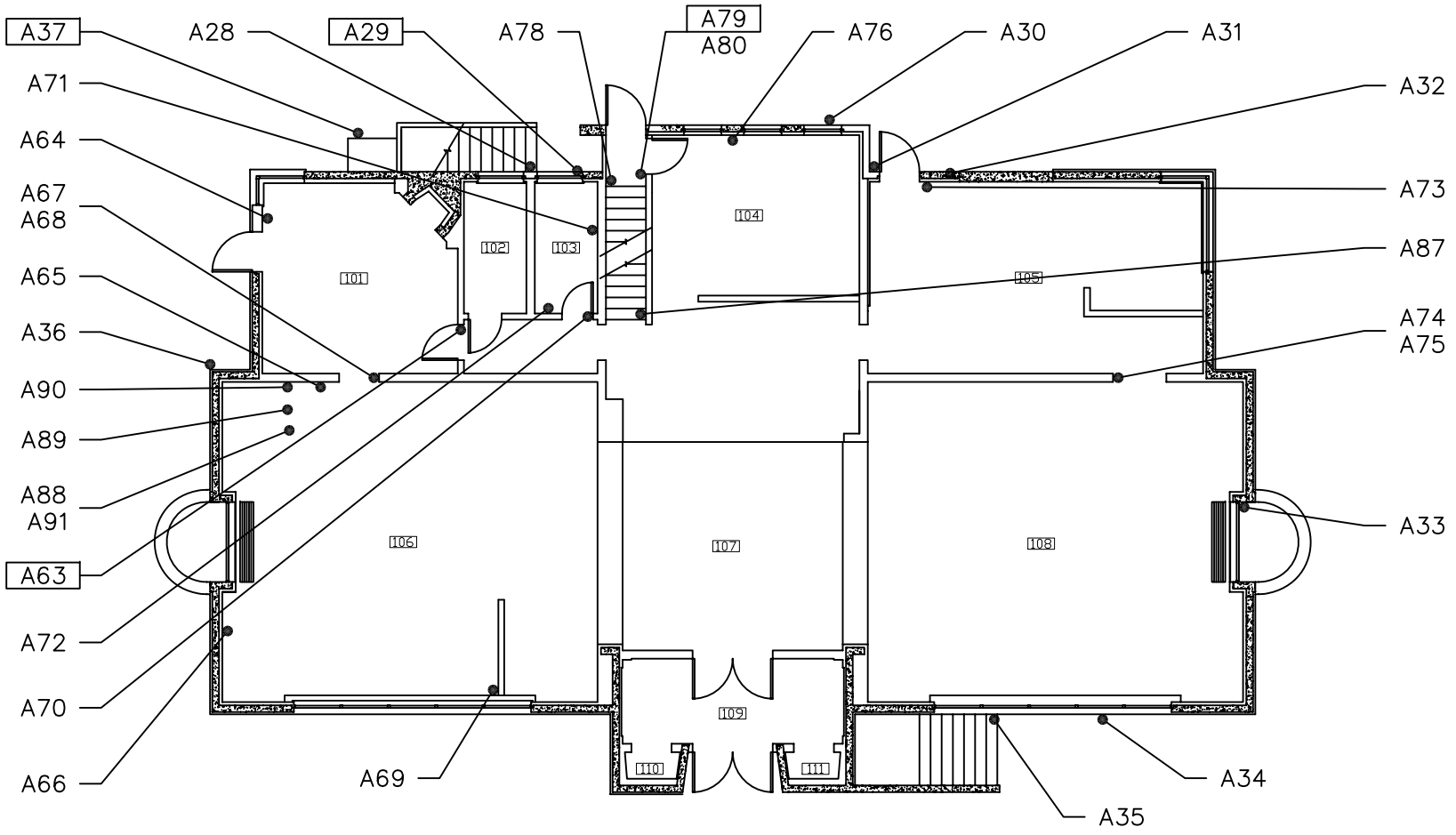
N

LEGEND

- AXX — ASBESTOS TEST LOCATION
- [AXX] — LAB TEST RESULTS POSITIVE FOR ASBESTOS

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS. ALL SAMPLES HAVE JDM0513– PREFIX.

CITY & BOROUGH OF JUNEAU	JUNEAU-DOUGLAS CITY MUSEUM JUNEAU, ALASKA ASBESTOS SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENGINEERING, HEALTH & SAFETY CONSULTANTS	DRAWN: CTO CHECK: RAF	DATE: 05/16/2013
			FILE #: 7202-SL	DWG.NO: C-1



1
C-2

FIRST FLOOR
NTS

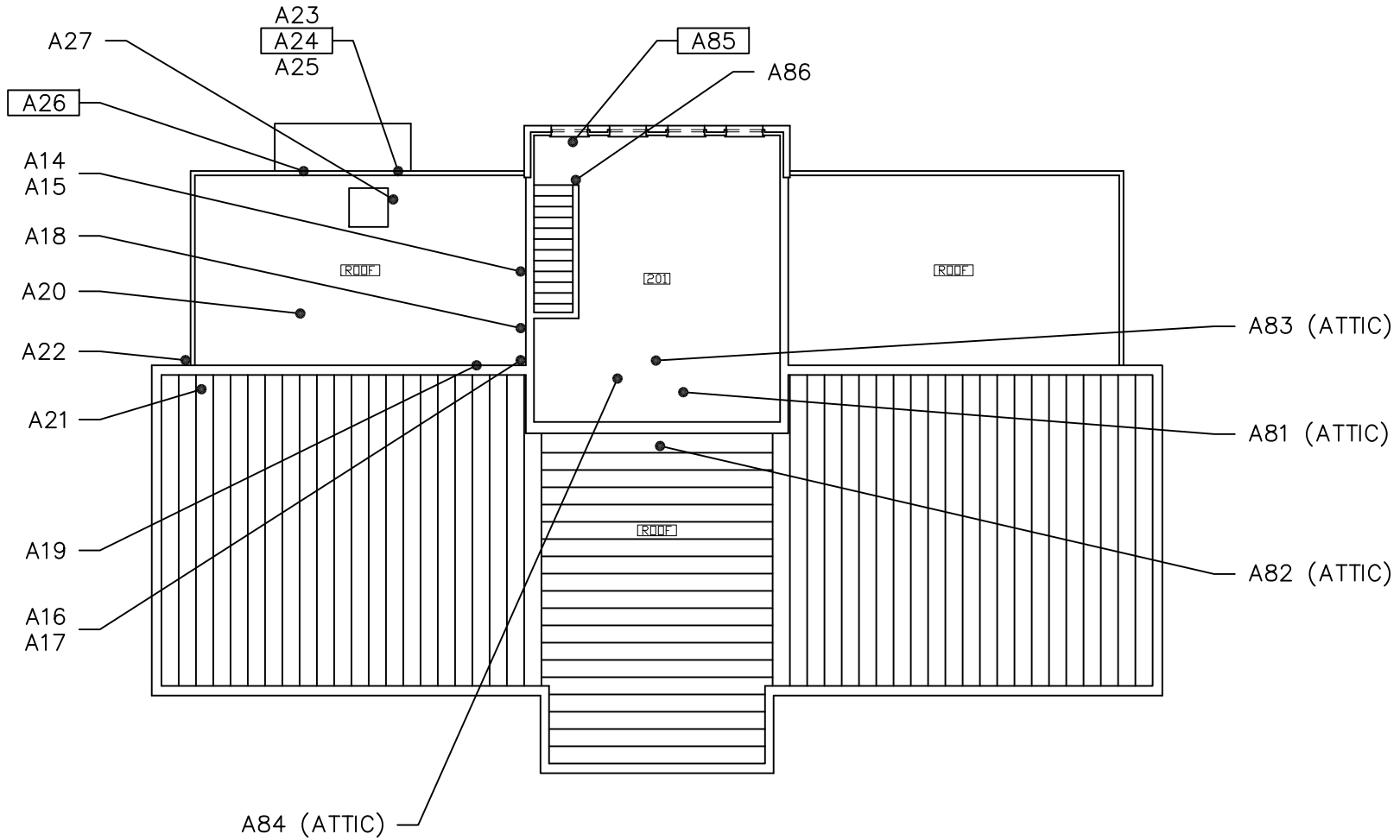
N

LEGEND

- AXX — ASBESTOS TEST LOCATION
- [AXX] — LAB TEST RESULTS POSITIVE FOR ASBESTOS

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS. ALL SAMPLES HAVE JDM0513– PREFIX.

CITY & BOROUGH OF JUNEAU	JUNEAU-DOUGLAS CITY MUSEUM JUNEAU, ALASKA ASBESTOS SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENGINEERING, HEALTH & SAFETY CONSULTANTS	DRAWN: CTO CHECK: RAF	DATE: 05/16/2013
			FILE #: 7202-SL	DWG.NO: C-2



1 / C-3 SECOND FLOOR & ROOF
NTS

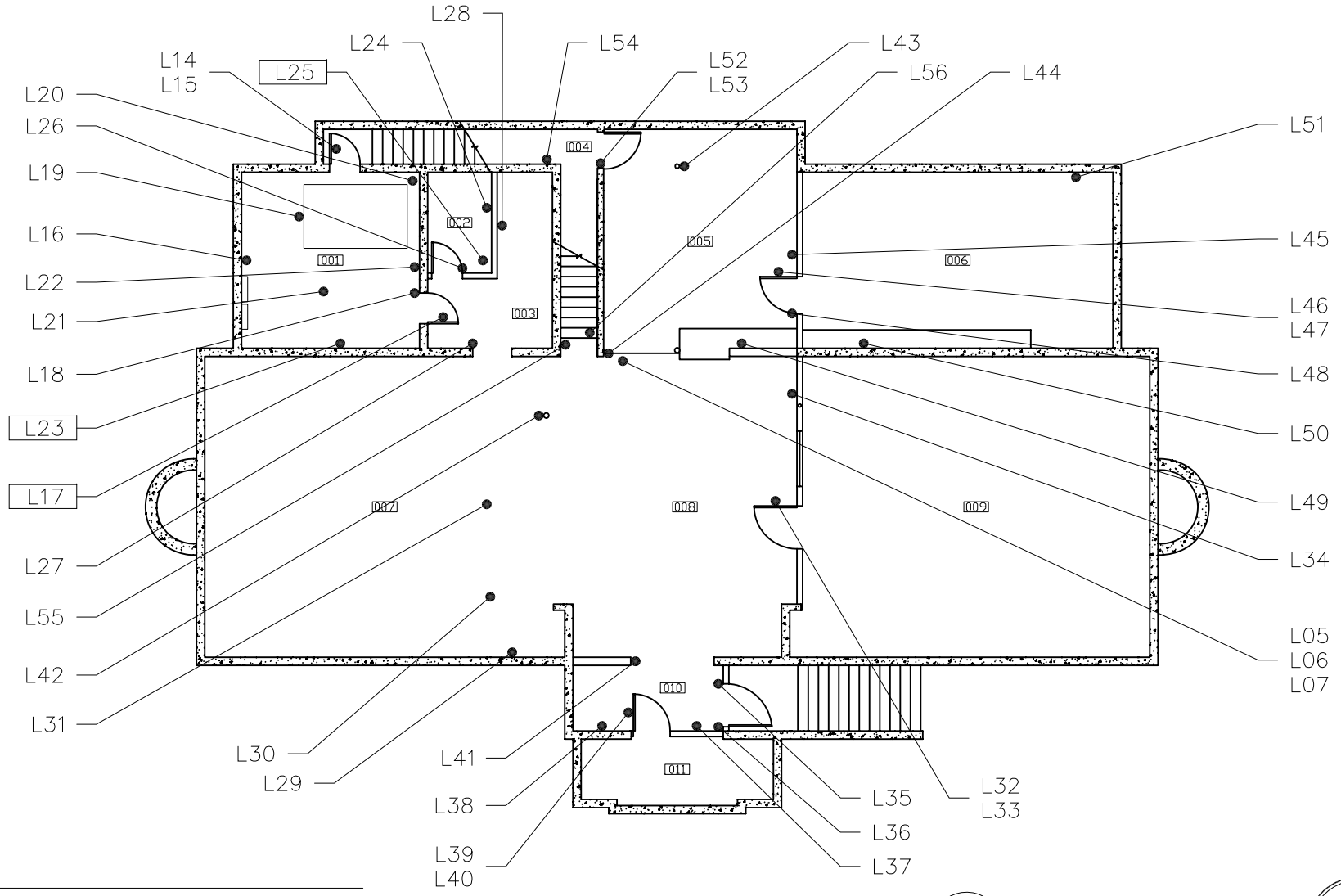
N

LEGEND

- AXX — ASBESTOS TEST LOCATION
- AXX — LAB TEST RESULTS POSITIVE FOR ASBESTOS

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS. ALL SAMPLES HAVE JDM0513– PREFIX.

CITY & BOROUGH OF JUNEAU	JUNEAU-DOUGLAS CITY MUSEUM JUNEAU, ALASKA ASBESTOS SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENGINEERING, HEALTH & SAFETY CONSULTANTS	DRAWN: CTO CHECK: RAF	DATE: 05/16/2013
			FILE #: 7202-SL	DWG.NO: C-3



LEGEND

LXX LEAD TEST LOCATION

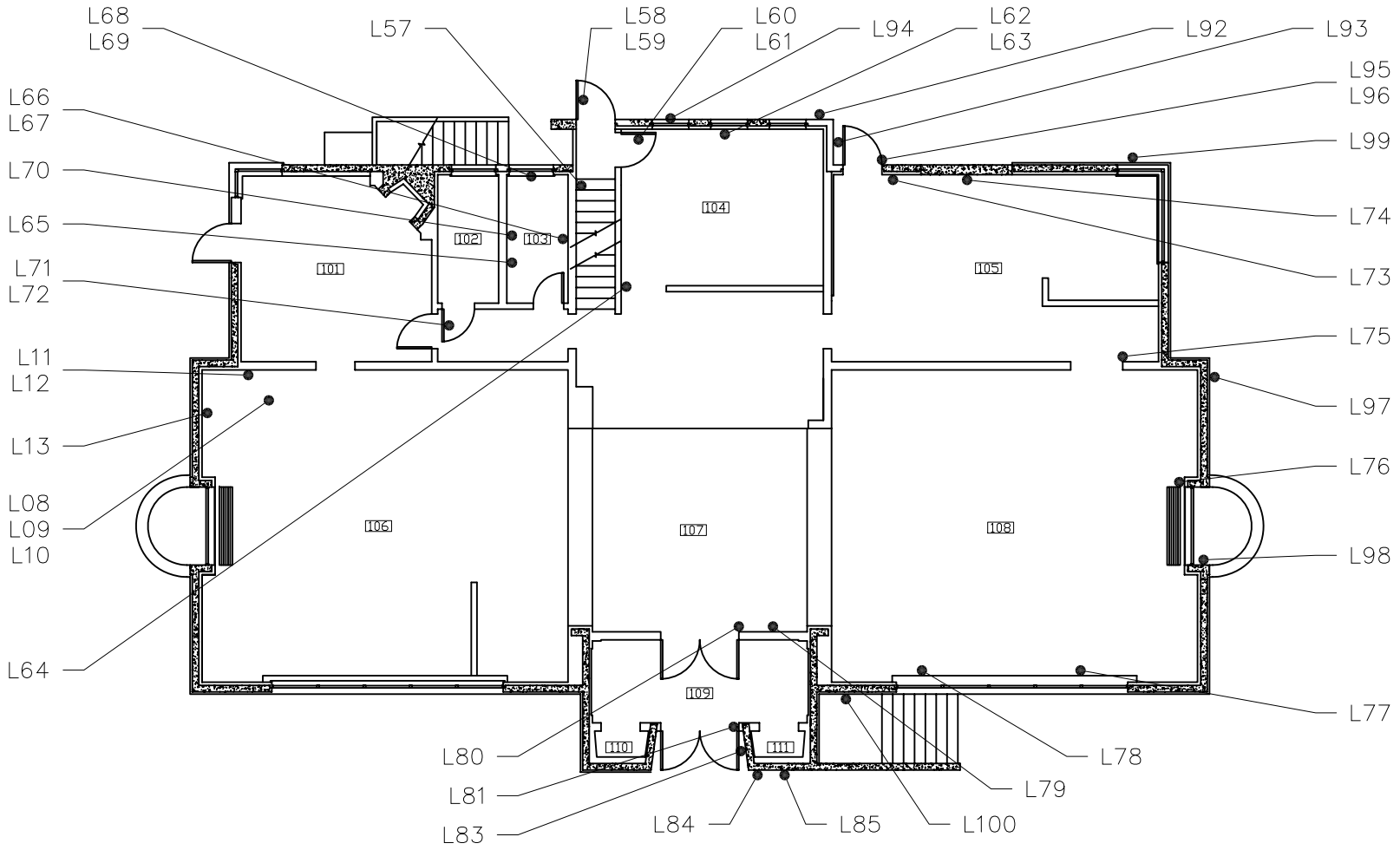
[LXX] LEAD TEST LOCATION

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS.

1 / C-4 BASEMENT NTS

N

CITY & BOROUGH OF JUNEAU	JUNEAU-DOUGLAS CITY MUSEUM JUNEAU, ALASKA LEAD SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENGINEERING, HEALTH & SAFETY CONSULTANTS	DRAWN: CTO CHECK: RAF	DATE: 05/16/2013
			FILE #: 7202-SL	DWG.NO: C-4



LEGEND

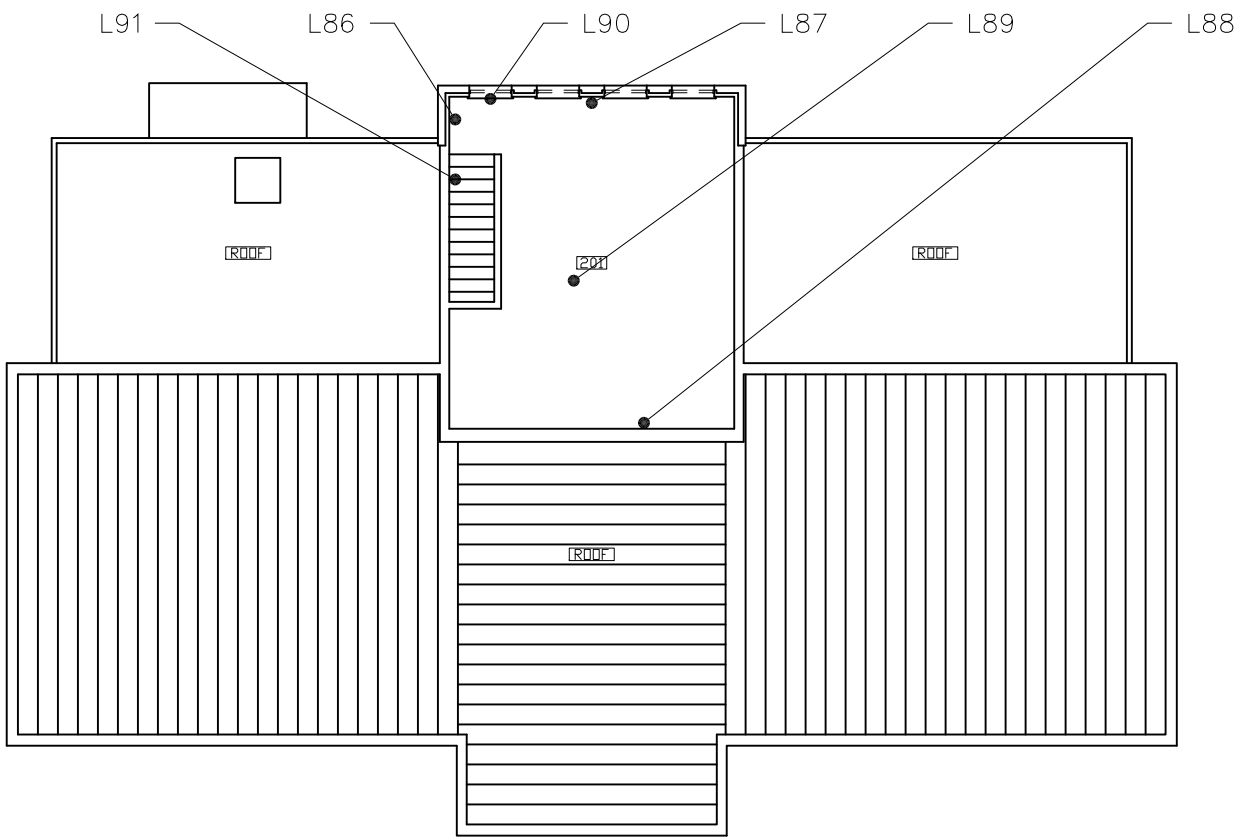
- LXX LEAD TEST LOCATION
- [LXX] LEAD TEST LOCATION

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS.

1 / C-5 FIRST FLOOR
NTS

N

CITY & BOROUGH OF JUNEAU	JUNEAU-DOUGLAS CITY MUSEUM JUNEAU, ALASKA LEAD SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENGINEERING, HEALTH & SAFETY CONSULTANTS	DRAWN: CTO CHECK: RAF DATE: 05/16/2013 FILE #: 7202-SL DWG.NO: C-5



LEGEND

LXX LEAD TEST LOCATION

[LXX] LEAD TEST LOCATION

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS.

1 / C-6 SECOND FLOOR & ROOF
NTS

N

CITY & BOROUGH OF JUNEAU	JUNEAU-DOUGLAS CITY MUSEUM JUNEAU, ALASKA LEAD SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENGINEERING, HEALTH & SAFETY CONSULTANTS	DRAWN: CTO CHECK: RAF	DATE: 05/16/2013
			FILE #: 7202-SL	DWG.NO: C-6

SECTION 01561

AIRBORNE CONTAMINANT CONTROL

PART 1 - GENERAL

1.1 SUMMARY:

A. Related sections:
1. Section 00230 – Hazardous Materials Survey Report
2. Section 02050 – Selective Demolition
3. Section 13280 – Asbestos Removal and Disposal
4. Section 13281 – Lead Removal and Disposal
5. Section 13285 – Chemical Hazards Removal and Disposal

B. Notification of Potential Hazards - Asbestos, lead and other hazardous materials are present in the building that may impact the work of all trades. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Section 00230, Hazardous Materials Survey Report; and Division 13 specifications and drawings for specific requirements for disturbing, removing and disposing of these materials and installing new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.2 DEFINITIONS:

A. “Airborne Contaminants” are those contaminants listed in 29 CFR 1926.55 and 8 AAC 61.1100 that have the potential to become airborne due to various work activities being performed by the Contractor. Additionally, airborne contaminants include those fumes and odors that may be objectionable to personnel in Occupied Areas of the facility even though they are not listed in the reference regulations. Airborne contaminants may be broadly categorized as Pre-Existing or Activity Generated. Contaminant producing activities include, but are not limited to:
1. Demolition, removal, installation and disposal of walls, floors, ceilings, steel, and other architectural or structural materials.
2. Disturbance or removal of existing settled and concealed dusts.
3. Demolition, relocation, installation and disposal of plumbing, mechanical and electrical systems and equipment.
4. Finish operations such as sanding, preparation, painting, and application of special surface coatings.
5. Any construction activity, which can generate aerosols, dust, smoke, or fumes.
6. Temporary heat sources.
7. Other on-site work operations not described above.

B. “Pre-Existing Contaminants” are those contaminants that are present in the facility prior to the start of any work. These contaminants, including asbestos and lead, are assumed to be also present in settled and concealed dust throughout the building in areas not subject to routine cleaning, including the roof

and inside and on top of architectural, mechanical, electrical and structural elements. The dust generally contains several common components including, but not limited to asbestos, cellulose, cotton, fiberglass, lead, silica and other Particulates Not Otherwise Regulated. Representative dusts throughout the facility have been examined by an EPA Certified Building Inspector and determined not to be “asbestos debris” from adjacent ”Asbestos-Containing Building Materials” (ACBM). The inspector also determined that the dusts are unlikely to contain more than one percent (1%) asbestos by weight, and therefore are not an asbestos-containing material (ACM). Reference 40 CFR 763.83. Refer to Section 00230, Hazardous Materials Survey Report. Dust and debris related to adjacent damaged asbestos containing materials are addressed in Section 13280, Asbestos Removal and Disposal.

C. “Activity Generated Contaminants” are those contaminants generated by the various demolition or construction related activities of the Contractor. Examples of typical Activity Generated Contaminants include wood dust (cellulose), cement dust (silica), gypsum dust (particulates not otherwise regulated), paint fumes, and welding fumes. A complete list of regulated air contaminants is available in 29 CFR 1926.55 and 8 AAC 61.1100.

D. “Work Areas”: Areas of demolition, renovation, construction, adjacent staging and storage areas, and passage areas for workers, supplies, and waste. This may include but is not limited to attic spaces, spaces above ceilings, crawl spaces, mechanical and electrical spaces, confined spaces and other spaces not normally accessed or occupied.

E. “Occupied Areas”: Areas as determined by Owner’s Representative and as shown on contract drawings. Typically these include areas adjacent to Work Areas or containment areas, either occupied or used for passage, as well as areas connected to construction area by mechanical system air intake, exhaust, and ductwork. Contaminant control procedures may be relaxed during periods when the building is not occupied as allowed by the Contractor’s approved work plan.

F. “Critical Clean Areas”: Areas inside or outside the Work Area with equipment or occupants that cannot tolerate airborne contamination, and are to be maintained under positive pressure by High-Efficiency, Particulate, Air (HEPA) filtered equipment relative to the surrounding air. These areas will be described or shown in contract documents or drawings.

G. “Contractor” is defined to include all trades and all subcontractors performing work on the work site.

H. “Negative Initial Determination” is a determination made either through air monitoring or other objective data that indicates worker exposure to regulated airborne contaminants are below or expected to be below the regulated limits.

1.3 AIRBORNE CONTAMINANT CONTROL

A. There is no requirement to remove Pre-Existing Contaminants from the facility. The Contractor may remove Pre-Existing Contaminants from his work areas if he determines that to be a more cost effective means of completing the work.

B. The Contractors shall establish and maintain control over the generation and containment of all potential airborne contaminants so that workers, facilities, staff, programs, equipment, and operations are not adversely affected, including adverse affects on air monitoring. Construction activities that disturb existing materials or create airborne contaminants must be conducted in Work Areas specifically constructed, ventilated, and/or equipped to prevent the movement of contaminants into Occupied or Critical Clean Areas.

C. The Contractor shall establish and maintain control over Activity Generated Contaminants within the Work Area to prevent abnormally high levels of airborne contaminants to settle on architectural, mechanical, electrical or structural components within the work areas, or interfere with monitoring conducted for other work. The Contractor shall be required to clean all surfaces within a work area where abnormally high levels of Activity Generated Contaminants are deposited.

D. The Contractor shall ensure that all workers are aware of the Occupied and Critical Clean Areas, the potential air contaminants present and the means and methods established in the work plan to control those contaminants.

E. The Contractor shall ensure workers have the proper protective equipment needed for the job being performed.

1.4 TRAINING

A. The Contractor shall ensure that all workers/trades performing work on the project site are trained in accordance with OSHA standards for hazard communication (29 CFR 1910.1200) and proper protective equipment (29 CFR 1926), as well as engineering controls and work methods required to prevent exposure to regulated air contaminants that might be generated or encountered as a results of their work.

1.5 RESPONSIBILITY:

A. Owner’s Responsibilities
   1. The Owner shall identify in contract documents Occupied Areas and Critical Clean Areas prior to allowing the Contractor to begin work. The Contractor shall be notified of all changes to these areas as work progresses.

B. Contractor’s Responsibilities:
   1. Preparing proposed work plan and procedures for control of airborne contaminants during demolition and construction.
   2. Identifying and implementing specific means and methods of achieving and maintaining control of airborne contaminants.

3. Controlling the generation and spread of airborne contaminants from the Contractor's Work Areas.
4. Cleaning and decontaminating all areas contaminated as the result of their operation. The Owner has the right to review and approve of any and all clean-up and decontamination procedures, chemicals, and processes.
5. Notifying Owner's Representative a minimum of 48 hours prior to starting construction activities that might be expected to produce excess levels of airborne contaminants in Work Area so that precautions may be taken.

1.6 SUBMITTALS:

A. Submittals Required: Submit the following documentation to the Owner for approval. The submittal shall be coordinated with all the Contractor's subcontractors and trades and be submitted as one submittal for all work covered by this section. WORK SHALL NOT PROCEED UNTIL THE SUBMITTAL PACKAGE IS APPROVED, AND THE PRE-CONSTRUCTION MEETING HAS BEEN HELD.
   1. Shop Drawings: Make all shop drawings accurately and to a scale sufficiently large to show all pertinent features of the work. Shop Drawings shall show:
      a. Boundaries of each Work Area, Occupied Areas and Critical Clean Areas.
      b. Location of barriers, negative pressure areas, positive pressure areas, and exhaust fan units (if required).
      c. Locations of windows, louvers, ducts and other penetrations into Occupied Areas and/or Critical Clean Areas that need to be protected from airborne contamination
      d. Disposal Routes.
      e. Locations of contaminant producing operations like painting or sanding which could be moved away from Occupied Areas.
   2. Work Plan: The Work Plan shall be prepared for this specific job in the form of checklists and shall include:
      a. Work area set-up and protection procedures during occupied times.
      b. Work area set-up and protection procedures during periods of limited occupancy (vacation and holidays).
      c. Work procedures to minimize generation of airborne contaminants.
      d. Worker protection procedures.
      e. Daily cleanup procedures and activities.
      f. Procedures to follow if air contaminants enter Occupied or Critical Clean Areas.
      g. Exposure assessment procedures if a "negative initial determination" has not been completed. A record of "negative initial determinations" shall be maintained by the Contractor and be available on the job site for review by the Owner or regulatory agencies.
   3. Material Safety Data Sheets: The Contractor shall identify the location where Material Safety Data Sheets (MSDS) for each chemical proposed to be used or installed will be maintained.

B. Monitoring Results: The Contractor shall submit copies of all air monitoring and testing results to the Owner within 24 hours of receipt of results.

1.7 WORKER PROTECTION:

A. The Contractor shall review the MSDS's for the substances that will be used, data provided by these specifications, proposed means and methods, manufacturers data and other available data to determine the potential for worker exposure.

B. Conduct air monitoring of worker exposures as necessary to show that workers are not being exposed above the permissible exposure limits established by 29 CFR 1926 and 8 AAC 61.1100 (negative initial determination). Not all contaminants or substances will require exposure monitoring.

C. In lieu of worker exposure monitoring, the Contractor may rely on objective data from recognized trade groups, manufacturer or previous exposure monitoring data that establish that worker exposure above the permissible exposure limits is not probable under conditions "closely resembling" the processes, types of materials, control methods, work practices and environmental conditions in the current job.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.1 WORK PRACTICES:

A. General: All construction/demolition work shall be isolated, either by enclosures, and/or work practices and equipment to prevent worker exposures above the permissible exposure limit(s), and prevent the migration of contaminants (dust, fumes, smoke, etc.) into Occupied Areas and Critical Clean Areas of the facility. Exposures to occupants shall be maintained at least 10 times lower than the permissible exposure limit(s) for airborne contaminants. If the Contractor's work practices are not effective in controlling airborne contaminants, as evidenced by dust, fumes, smoke, odors, dust, etc. in Occupied or Critical Clean Areas, the Contractor shall provide a sealed barrier at the perimeter of the work area and exhaust the work area to maintain a negative pressure and/or provide a filtered positive pressure to Critical Clean and Occupied areas to keep airborne contaminants out. Maintain a positive pressure of 0.05 inches of water column relative to the air outside the Critical Clean Areas, with a minimum 100 feet per minute velocity through cracks, openings, etc.

B. Direct exhaust from fume or smoke producing equipment away from building air intakes, windows and other penetrations into Occupied and Critical Clean Areas.

C. The Contractor shall provide "walk-off" mats, at all connections between Work Areas and Occupied Areas, vacuumed or changed daily when there is traffic between the Work Area and the Occupied Areas.

D. Enclosures where used shall be dust tight and withstand air pressure.

E. Prohibited Materials: The use or application of the following materials is prohibited:
   1. All cleaners and aerosol products not submitted and approved by the Owner.
   2. All flammable or chlorinated hydrocarbon solvents, unless approved by the Owner.

F. Any dust or debris tracked outside of Work Areas into Occupied Areas shall be cleaned up immediately. Contractor shall have the necessary manpower and equipment (dust and wet mops, HEPA vacuums, buckets and clean wiping rags) to keep adjacent Occupied Areas clean at all times.

G. Dry Sweeping is prohibited. All vacuums used for cleaning shall be equipped with HEPA filters.

H. Traffic between Work Areas and Occupied Areas shall be kept to a minimum. Keep doors between such areas closed at all times. Transport refuse through Occupied Areas in covered containers.

I. Notify the Owner's Representative immediately of any release of airborne contaminants into Occupied Areas.

3.2 ENFORCEMENT:

A. The Contractor shall periodically inspect Occupied Areas at the perimeter of the work area and Critical Clean Areas to verify that airborne contaminants have not spread into those areas.

B. Failure to properly maintain airborne contaminant control in Work Areas, Occupied or Critical Clean Areas will result in issuance of a written warning. If the problem is not corrected immediately, the Owner will have cause to stop work.

C. Failure of the Contractor to correct deficiencies in controlling airborne contaminants will result in corrective action taken by the Owner and deduction of all costs from the Contract.

3.3 WORK STOPPAGE:

A. The Contractor shall stop work and notify the Owner whenever his work has caused visible dust, smoke, fumes or objectionable odors in Occupied or Critical Clean Areas.

B. When such work stoppage occurs, the area shall be restored to its original condition by the Contractor at no expense to the Owner. The Contractor is responsible for removing dust, fumes and debris that were generated as a result of his work.

3.4 WORK COMPLETION:

A. Provide thorough cleaning of finished surfaces that become exposed to dust or other airborne contaminants. Cleaning of Pre-Existing contaminants is not required.

B. Removal of construction barriers and airborne contaminant control equipment shall be performed in a manner to minimize disturbance of airborne contaminants into occupied spaces. HEPA vacuum and clean all finished surfaces free of dust after the removal of barriers and equipment.

END OF SECTION

SECTION 13280

ASBESTOS REMOVAL AND DISPOSAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work requires the disturbance, demolition, removal, and disposal of the following asbestos-containing materials (ACM) from the Juneau Douglas City Museum HVAC Upgrades Project as shown on the drawings and as specified herein. Bulk samples have been taken of suspect materials in this facility and the results are documented in Section 00230, Hazardous Materials Survey Report:
   1. Aircell" piping insulation on heating and domestic water pipes.
   2. Hard and chalky pipe insulation found at pipe fittings, valves, hangars, and wall penetrations.
   3. Boiler insulation.
   4. Concealed insulation at boiler base and contaminated fire brick, sealants, and gaskets (Assumed asbestos).
   5. Flange gaskets (Assumed asbestos).
   6. Window glazing compounds.
   7. Concealed flat roofing materials.
   8. Mastics used to secure foam board insulation to concrete walls in Basement.

B. In addition to the above materials, the following materials are located in other areas of the building, and may require disturbance for auxiliary support, such as removal or installation of electrical, mechanical, or other equipment. Not all ACM is to be removed from these areas, only that required to complete the project work need be removed:
   1. Various colors of 9" x 9" Floor tile.
   2. Black mastic of 9" x 9" Floor tile.
   3. Original wire insulation.
   4. Fire doors (Assumed asbestos).
   5. Black patch tars.
   6. Older sealants at roof perimeter to wooden fascias.

C. Quantities of ACM and hazardous materials shown on drawings are based on a comprehensive survey of the building and take-offs from scale drawings. The hazardous material survey report and quantities provided are considered a baseline for bid purposes. It is the contractor's responsibility to remove and dispose of all ACMs affected by the project from the site in accordance with applicable regulations. The contractor shall immediately notify the owner if other ACM or additional quantities are discovered. Quantities of materials removed shall be documented on a daily basis and shall include all materials removed and locations, in the units used on the drawings. Unit pricing shall be provided in the bid for all identified hazardous material in case additional quantities are discovered.

D. Asbestos, lead and other hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminates, including asbestos and lead, are assumed to be also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Section 00230, Hazardous Materials Survey Report, Section 01561, Airborne Contaminant Control; and Division 13 specifications for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

E. Asbestos-containing materials may have come loose and fallen onto or into, floors, ceilings, walls, chases, wall cavities or mechanical, electrical and structural system components. The Contractor shall immediately notify the Owner if and when they encounter worn, damaged, or deteriorated ACM as evidenced by dust or debris adjacent to ACM materials.

F. Work may be required while employees and visitors are occupying the building. Work during occupied periods involving disturbance of asbestos-containing materials inside the building shall be performed using critical barriers and negative air pressure enclosures. Access to work area from within the building shall be blocked to prevent unauthorized or inadvertent entry by employees and visitors. Access to work area shall be secured by lock when work is not ongoing.

G. All work shall comply with Environmental Protection Agency (EPA) AHERA standard, 40 CFR 763. Clearance sampling is required if the necessary disturbance of asbestos-containing material is not classified as “Small-Scale, Short-Duration” work as defined in 40 CFR 763, and is not required for work that only involves the disturbance of dusts with asbestos. Visual inspections are required for all work disturbing asbestos. Clearance air samples shall include a minimum of five (5) PCM samples from each affected space, taken using aggressive methods as outlined in Appendix A to 40 CFR 763 and analyzed in accordance with 40 CFR 763.90.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00230 Hazardous Materials Survey Report

B. Section 01561 Airborne Contaminant Control

C. Section 13281 Lead Removal and Disposal

D. Section 13285 Chemical Hazards Removal and Disposal

1.3 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.4 of this section.

1.4 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.

A. General Requirements: All work shall be performed in compliance with the International Building, Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code; Uniform Plumbing Code; the National Electrical Code; and the publications listed in this section that are in effect at the time of the bidding of this contract.

B. Title 29 Codes of Federal Regulations (CFR), Department of Labor (USDOL)

Part 1910	General Occupational Safety and Health Standards
Part 1926	Safety and Health Regulations for Construction

C. Title 40 CFR, Environmental Protection Agency (EPA)

Part 61	National Emission Standards for Hazardous Air Pollutants
Part 311	Worker Protection
Part 763	Asbestos

D. Title 49 CFR, Department of Transportation (DOT)

Part 171	General Information, Regulations and Definitions
Part 172	Hazardous Materials Communication and Regulations
Part 173	General Requirements for Shipments and Packaging
Part 177	Carriage by Public Highway
Part 178	Specifications for Packaging
Part 382	Requirements for Drug Testing
Part 383	Commercial Driver’s License Standards

E. State of Alaska Administrative Codes (AAC)

8 AAC 61	Occupational Safety and Health Standards
18 AAC 60	Solid Waste Management

F. State of Alaska Statutes

AS 18.31	Health and Safety - Asbestos
AS 45.50.477	Titles Relating to Industrial Hygiene

G. Public Law 101-637
Asbestos School Hazard Abatement Reauthorization Act

H. Federal Standards

313D	Material Safety Data Sheets

I. American National Standard Institute (ANSI)

Z9.2	Local Exhaust Systems
Z87.1	Eye and Face Protection
Z88.2	Practices for Respiratory Protection

J. American Society for Testing and Materials (ASTM)

D-4397	Polyethylene Sheeting

K. International Code Institute
International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Codes Current Standards

L. National Fire Protection Association (NFPA)
NFPA 701 Fire Tests for Flame Resistant Textiles and Films

M. National Institute of Occupational Safety and Health (NIOSH)
Manual of Analytical Methods, Current Edition

N. Underwriters Laboratories (UL)
UL 586 High-Efficiency, Particulate, Air (HEPA) Filter Units

1.5 QUALITY ASSURANCE

A. On-site Observation:
1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner, the Owner's Representative or representatives of State or Federal agencies may make unannounced visits to the site during the work. The contractor shall make available two complete sets of clean, protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Air Monitoring: Air monitoring during the work shall be performed as follows:
1. The Contractor shall hire Independent Testing Laboratories to collect and evaluate all air samples that are the responsibility of the Contractor. The Contractor shall direct its laboratories, in writing, to release air monitoring data, and all other pertinent data and records, to the Owner. A copy of this written direction shall be submitted to the Owner along with the information required by Paragraph 1.13 of this Specification.
2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne asbestos fibers as required by this specification and all applicable regulations.

3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.
4. The Owner may perform air monitoring inside the building, inside the work areas, and on the Contractor's employees while asbestos work is underway and at any time during the work.
5. Final inspection and clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory. The Independent Testing Laboratory may not be hired by the Abatement Subcontractor to perform final visual inspections and clearance air monitoring.
6. The Contractor shall have its Independent Testing Laboratories archive all air samples until the successful completion of the project.

C. Additional Sampling of Suspect Materials:
1. The Contractor and all Subcontractors shall be vigilant during demolition and construction in the event additional suspect asbestos or hazardous materials are encountered. If suspect asbestos or hazardous materials not previously identified are encountered, the contractor shall stop work that may be affected by this material and immediately notify the Owner. The Owner or the Owner's Representative will provide recommendations and additional testing if necessary.
2. The Contractor and all Subcontractors shall notify the Owner prior to any bulk sampling of suspect asbestos-containing material or other hazardous materials to allow the Owner or Owner's Representative to be present during such sampling.

1.6 PROTECTION OF EXISTING WORK TO REMAIN: Perform asbestos removal in the project work areas without contamination of adjacent work or the facility.

1.7 MEDICAL REQUIREMENTS

A. Institute and maintain a medical surveillance program for employees in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134.

B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting asbestos or hazardous materials.

1.8 TRAINING: Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 763, and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of asbestos.

1.9 PERMITS AND NOTIFICATIONS: Secure necessary permits for asbestos removal, hauling, and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD COMMUNICATION PROGRAM: Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

A. The Contractor shall submit the following documentation to the Owner for review, approval or rejection. Work shall not begin until submittals are approved.
1. Shop drawings.
2. Work plan.
3. Liability insurance policy and performance bond.
4. Schedule.
5. Testing laboratory and laboratory personnel.
6. Disposal site designations and disposal authorizations.
7. Waste transporter designation.
8. Notifications and certifications.
9. “Competent Person” designation and experience.
10. Request for substitutions.

B. Shop drawings shall show:
1. Boundaries of each regulated work area.
2. Location and construction of decontamination areas.
3. Location of temporary site storage facilities.
4. Location of air monitoring stations, both in and outside of the work area.
5. Emergency egress route(s).
6. Location of negative pressure exhaust systems, if required.

C. The work plan shall include procedures for:
1. Work area setup and protection.
2. Worker protection and decontamination.
3. Initial exposure assessment procedures.
4. Asbestos removal procedures.
5. Waste load-out, transport, and disposal procedures.
6. Air monitoring procedures.
a. Air monitoring procedures shall include the number of daily samples and the target volumes of each type of sample.
b. Clearance air monitoring procedures and protocols for each work area.
7. Determination by the Certified Project Designer of the estimated quantities of ACM and PACM to be removed, and determination of clearance requirements for each different type or phase of work.
8. Emergency procedures.
9. The Work Plan shall be prepared and signed by an Environmental Protection Agency (EPA) Certified Project Designer.

D. Insurance Policy and Bond: Submit copies of the Contractor’s or Subcontractor’s insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.

E. Schedule: Submit construction schedule by work area.

F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed independent testing laboratories, and the names and certifications of the industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
   1. The Independent Testing Laboratories shall be acceptable to Owner.
   2. The laboratories shall be proficient in the National Institute of Occupational Safety and Health (NIOSH) Proficiency in Analytical Testing (PAT) program and shall be accredited by the National Institute of Science and Technology (NIST) under their National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis and airborne asbestos fibers as appropriate. NVLAP accreditation for bulk asbestos analysis may be waived if the microscopists are listed in the American Industrial Hygiene Association (AIHA) Asbestos Analyst Registry (AAR).
   3. Provide a current list of their microscopists who have participated in the latest PAT and NVLAP programs and provide the names of microscopists and evidence that they have completed the NIOSH 582 course or equivalent. Provide latest AAR report of performance for microscopists.
   4. Provide name(s) and resume(s) of proposed on-site industrial hygiene technician(s) showing academic degrees and Alaska Abatement Certificate(s).

G. Disposal Site: Submit the name and location of the proposed Alaska Department of Environmental Conservation/ U.S. Environmental Protection Agency (DEC/EPA) permitted disposal site. Submit authorization to dispose of asbestos waste by the proposed disposal site operator.

H. Waste Transporter: Submit the name and address of the proposed waste transporter.

I. Representations: Submit a signed statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.

J. Notifications and Certificates:
   1. Submit a copy of the written "Notification of Demolition and Renovation" to the Environmental Protection Agency. (If required by NESHAP).
   2. Submit a State of Alaska Department of Labor (ADOL) approved copy of the written ADOL notification of proposed workers.
   3. Submit a copy of Project Designer's current certification.

K. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of his/her previous projects. Certify by signed statement that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.4 above.

L. Substitutions: Submit requests for substitutions of materials, equipment and methods.

M. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:
1. Updated schedules.
2. Change in Competent Person.
3. ADOL approval for additional workers.
4. Changes to work plan.
5. Revisions to the EPA notification.

1.14 TEST REPORTS: Contractor shall submit periodic test reports, daily logs, monitoring results as specified herein Submit two (2) copies of the following information within twenty-four (24) hours after the end of a shift:

A. Initial Exposure Assessment(s): Submit the results of the Contractor's initial exposure assessment(s).

B. Daily Air Monitoring: Submit daily, all results of Contractor's air monitoring (submit no later than 24 hours after the end of the shift). Submittal shall consist of negative air pressure recordings, visual inspection report, field data sheets, and the analytical laboratory's results.

C. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of asbestos-containing materials removed including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.

D. Clearance Air Monitoring: Submit draft results of Contractor's clearance air monitoring for each work area for Owner's review and approval prior to releasing the work area to unprotected workers. FAX or electronic submittals are acceptable. Submittal shall include the following:
1. A signed and dated copy of the final visual inspection report (completed prior to clearance air monitoring) certifying that all dust and debris have been removed from the work area and that all ACM to be removed as required by the contract, were removed.
2. Documentation that clearance air sample collection complied with 40 CFR 763, contract specifications and the approved work plan.
3. Drawings of the work area with sampling locations clearly marked. Work area drawings shall be clearly identified as to their location within the facility.
4. Field data sheets for sampling including: sample locations, calibration device serial number, initial and final pump calibration readings, pump time on and off, initial and final sampling flow rate, pump type and serial number, and sample cassette identification.
5. Laboratory results, signed and dated by the analyst.
6. Data sheets and visual inspection sheets shall be signed and dated by the Industrial Hygiene Technician performing the work.

1.15 PROJECT COMPLIANCE DOCUMENTS: Prepare and submit the following records of compliance with hazardous materials regulations following each work area clearance. Submittals may contain segregated submittals for more than one (1) work area.

Submittal shall be received by Owner within four (4) weeks following work area clearance. Compliance documents shall be signed and dated and shall include as a minimum:

A. Waste transport records (40 CFR 61, Figure 4).

B. Disposal site receipts.

C. Contractor's "Start" and Finish" dates for the work area(s).

D. Daily logs, including regulated area sign in sheets, materials summary, etc (if not previously submitted).

E. Final work area inspection report(s) and inspector certifications (if not previously submitted).

F. Final, signed, clean copies of all air sampling field data sheets, location drawings, and air monitoring log, including all clearance data.

G. Final, signed, clear, legible copies of all analytical laboratory air monitoring test results, including all clearance data, and current laboratory certifications (if changed from previously submitted).

H. Copies of Asbestos Worker Training certificates for workers performing work on this project and all approved Alaska DOL notifications for those workers, and any revisions to the EPA notification(s).

1.16 SANITARY FACILITIES: Provide adequate toilet and hygiene facilities.

1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.

1.18 ON-SITE DOCUMENTATION: The Contractor shall maintain on the job site, copies of the following data for safety procedures, equipment, and supplies used for the work.

A. Equipment: Show the model, style, capacity and the operation and maintenance procedures for the following, as applicable:
   1. High-Efficiency, Particulate, Air (HEPA) Filtration units.
   2. HEPA Vacuum cleaners.
   3. Pressure differential recording equipment.
   4. Heat stress monitoring equipment.

B. Material Safety Data Sheets (MSDS): Each encapsulant, surfactant, solvent, detergent, and other material proposed to be used shall have an MSDS.

C. Respiratory Protection Plan: The Contractor's and/or Subcontractor's written respirator program.

PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT: Provide personal protective clothing as approved and selected by the IH.

A. Respirators: Provide personally issued and marked respirators approved by the National Institute of Occupational Safety and Health (NIOSH). Provide sufficient replacements for respirators with disposable canisters. Use respirators equipped with dual cartridges whenever both asbestos hazards and other respiratory hazards exist in the work area.

B. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges may be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.

C. Whole Body Protection: Provide approved disposable fire retardant, full body coveralls and hoods fabricated from nonwoven fabric, gloves, eye protection, and hard-hats, and other protective clothing as required to meet applicable safety regulations to personnel potentially exposed to asbestos above the permissible exposure limits (PELs). Wear this protection properly. Full facepiece respirators shall meet the requirements of ANSI Z87.1.

D. Provide protective personal equipment and clothing at no cost to the workers.

2.2 DECONTAMINATION UNIT

A. Provide a temporary three-stage decontamination unit, attached in a leak-tight manner to each negative pressure work area. Decontamination units shall consist of a clean room equipped with separate lockers for each worker, a shower room, and an equipment locker room equipped with separate lockers for each worker.

B. Shower specifications: Locate flow and temperature controls within the shower where adjustable by the user. Hot water service may be secured from the building hot water system if available, but only with back-flow protection installed by the Contractor at the point of connection, and with prior notification and approval by the Owner. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40-gallon electric hot water heater with a minimum recovery rate of 20 gallons per minute. Water from the shower room shall not be allowed to wet the floor in the clean room.

2.3 WASTE WATER FILTERS: Provide Water Filtration Units with filters of adequate capacity to treat decontamination water and shower flows. Water filtration unit effluent shall contain less than 7,000,000 asbestos fibers per liter prior to discharge to sanitary sewer or storm drains.

2.4 DANGER SIGNS AND TAPE: Post danger signs and tape signs to demarcate areas where asbestos waste is temporarily stored, and, in areas not accessible to the public, where asbestos-containing materials are left in place. Signs and labels shall be in accordance with applicable regulations and codes. The signs posted at work area

entrances, exits, decontamination areas, emergency egress, and waste disposal areas shall comply with 29 CFR 1926.1101 and the International Fire Code.

2.5 WARNING LABELS: Affix warning labels to all components or containers containing asbestos wastes. Conform labeling to 29 CFR 1926.1101 and 49 CFR 172.

2.6 HEPA FILTRATION UNITS: (if required) shall conform to ANSI Z9.2, and HEPA filters shall be UL-586 labeled.

2.7 PRESSURE DIFFERENTIAL MONITORING EQUIPMENT: Provide continuous monitoring of the pressure differential with an automatic recording instrument for each negative pressure enclosure. Locate the instrument in a clean area where personnel have access to it without respiratory protection. The instrument shall be fitted with an alarm should the negative pressure drop below -0.02 inches of water column relative to the air outside containment.

2.8 CHEMICALS

A. Adhesives: Adhesives shall be capable of sealing joints of adjacent sheets of polyethylene to finished or unfinished surfaces and of adhering under both dry and wet conditions.

B. Mastic Removal Solvents: Mastic removal solvents shall not contain halogenated compounds or compounds with flashpoints less than 60° C (140° F). Solvents shall be compatible with replacement materials.

C. Sealants and Encapsulants: Penetrating and bridging encapsulants for asbestos applications. Tint “Lock-Down” encapsulants used in non-finished areas for identification in a color that will not obscure residual asbestos. Encapsulants shall be compatible with replacement materials.

D. Surfactant: Use a surfactant specifically designed to effectively wet asbestos. Mix and apply the surfactant as recommended by the manufacturer.

2.9 MATERIALS

A. Disposal Containers: Use disposal containers to receive, retain, and dispose of asbestos-containing or contaminated materials. Label leak tight containers in accordance with the applicable regulations. Non-leak tight containers are not acceptable. Plastic bags shall be a minimum 6-mil polyethylene, pre-printed with approved warning labels. Plastic wrap shall be 6-mil polyethylene sheets, securely wrapped and taped. Disposal containers shall be labeled with “ASBESTOS NA 2212,” Contractor’s name and location, and a Class 9 label.

B. Glove Bags: The glove bags shall be a minimum of 6-mil polyethylene or polyvinylchloride plastic, and specially designed for removal of asbestos-containing materials, with two inward projecting long sleeves and rubber gloves, one inward projecting water wand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste.

C. Plastic Sheet: A minimum 6-mil thick flame resistant polyethylene (in accordance with NFPA 701) shall be used unless otherwise specified.

D. Tape: Tape shall be capable of sealing joints of adjacent sheets of polyethylene, for attachment of polyethylene sheets to finished or unfinished surfaces and of adhering under both dry and wet conditions.

2.10 OTHER MATERIALS: The Contractor shall provide standard commercial quality of all other materials as required to prepare and complete the work.

2.11 TOOLS AND EQUIPMENT

A. The Contractor shall provide tools and equipment as required to prepare and complete the work. Tools and equipment shall meet all applicable safety regulations.

B. Transportation equipment shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. All trucks or vans used to transport asbestos shall be enclosed and all containers sealed leaktight. Truck drivers shall have a commercial driver's license with hazardous material endorsement.

PART 3 - EXECUTION

3.1 WORK AREAS

A. Regulated Work Areas: Establish regulated work areas in compliance with 29 CFR 1926.1101.

B. Decontamination Area: Install decontamination areas in compliance with 29 CFR 1926.1101. Decontamination area shall meet fire-exiting requirements of the International Fire Code. Showers shall be provided with hot water and water filtration units.

C. Negative Pressure Enclosure System: Construct Negative Pressure Enclosure Systems as required by 29 CFR 1926.1101, these specifications, and approved work plan. Signage shall conform to the International Fire Code and 29 CFR 1926.1101. Exhausts from HEPA Filtration Units shall terminate outside of the building.

D. Notify applicable Fire Marshal as required by the International Fire Code.

3.2 PERSONNEL PROTECTION PROCEDURES

A. Contractor's Competent Person shall strictly enforce personal protection procedures as required by the approved work plan and all applicable regulations.

B. Post the decontamination, safety, and work procedures to be followed by workers.

C. Provide continuous on-site supervision by the approved Competent Person.

D. Maintain a daily log of all workers and visitors entering regulated work areas. Log shall contain the name of each individual, his or her organization, accurate time of entering and leaving, and purpose of visit.

3.3 ASBESTOS REMOVAL PROCEDURES: Remove asbestos in accordance with the Contractor's Approved Work Plan, applicable regulations and this specification. The Owner shall be notified 24-hours in advance of any asbestos disturbance taking place outside of a Negative Pressure Enclosure System.

3.4 AIR MONITORING

A. Perform personal, work area, and environmental monitoring for airborne asbestos fibers by industrial hygiene technicians who are employees of (one of) the Contractor's Independent Testing Laboratories.

B. Conduct air monitoring in accordance with 29 CFR 1926.1101, current EPA guidance, and as specified herein. Calibrate all sampling pumps on-site with a calibrated transfer standard before and after each sample. Built-in rotameters on pumps are not acceptable for calibration. Additional samples beyond the minimum numbers shown below may be necessary if samples are overloaded or require shorter sampling periods to achieve readable samples, due to size of the work force, or due to more than one 8-hour work shifts.

C. Conduct daily work area and environmental air monitoring per shift as follows:
1. Three (3) air samples within the work area.
2. One (1) air sample located outside the entrance to the work area.
3. One (1) air sample located at the exhaust(s) of the HEPA filtration unit(s) (if more than one unit is used, the sampling may be rotated between units, however, each unit must be sampled at least once every three days).
4. Three (3) air samples located in adjacent occupied areas.
5. Two (2) waste load-out samples for the full duration of the operation, one taken inside the wash-down station and one taken on the clean side of the wash-down station, in addition to the daily work area and environmental samples. (No samples are necessary if no load-out operation is performed).

D. Clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory subcontractor. The Independent Testing Laboratory may not be hired by the Abatement Subcontractor to perform visual inspections and clearance air monitoring. Owner approval is required before a work area is released to unprotected workers. The Contractor is responsible for all costs associated with clearance and scheduling of visual inspection and clearance air monitoring. The maximum acceptable level of airborne asbestos fibers for work area clearance is as published in 40 CFR 763 for PCM analysis. A minimum of five aggressive clearance samples are required for each work area, regardless of the type of analysis. PCM analysis shall be used unless Transmission Electron Microscopy (TEM) analysis is required by 40 CFR 763 due to quantities of materials removed. The Contractor has the option, at its expense and at no cost to the Owner, of re-cleaning the work area and repeating the clearance air monitoring procedures or of having failed phase contrast microscopy (PCM)

sample media sent to his/her NVLAP accredited laboratory for TEM analysis by NIOSH Method 7402.

E. Conduct personal air monitoring in accordance with 29 CFR 1926.1101 and as specified herein.
   1. Take personnel samples (excluding excursion samples) at least twice per eight-hour work shift at the rate of one sample for every six people performing that task in the same work area. Persons performing separate tasks or in separate work areas shall be sampled separately.
   2. Collect and analyze excursion samples as required by 29 CFR 1926.1101.
   3. Continuously monitor all workers disturbing asbestos outside of a Negative-Pressure Enclosure System if that work is conducted indoors.

F. Daily personnel monitoring may be discontinued only after the Contractor's Independent Testing Laboratory certifies in writing that a Negative Exposure Assessment has been obtained and the Owner has reviewed and approved the negative exposure assessment data.

G. Submit air monitoring results to the Owner as specified in Paragraphs 1.14 and 1.15.

3.5 DISPOSAL

A. Dispose of asbestos wastes in an EPA/DEC permitted asbestos landfill.

B. Comply with current waste disposal, handling, labeling, storage, and transportation requirements of the waste disposal facility, U.S. Department of Transportation, and EPA regulations.

C. Workers handling waste shall wear protective clothing and canister type respirators.

D. Drivers of the waste transport vehicles need not wear respirators while enroute.

E. Workers shall wear respirators when handling asbestos material at the disposal site.

3.6 CLEANING OF WORK AREA

A. Remove all asbestos material and debris upon completion of asbestos repair or removal within a work area. Wet clean or HEPA vacuum all surfaces within the work area.

B. Notify the Owner and the Independent Testing Laboratory that asbestos work has been completed and the work area is ready for visual inspection. Include in the visual inspection report a statement that all asbestos in the work area has been removed, repaired and/or encapsulated as required by the contract, and that all debris has been removed.

C. All required demolition (ACM and non-ACM) shall be completed in each work area prior to clearance air monitoring. Exceptions may be made with prior approval of the Owner.

D. A lockdown encapsulant shall be applied to all surfaces within the abatement areas prior to performing clearance air monitoring.

3.7 CLEARANCE AIR MONITORING

A. The Contractor and its Independent Testing Laboratory shall conduct and document a visual inspection to verify that all asbestos in the work area has been removed, repaired and/or encapsulated as required by the contract, and that all debris has been removed.

B. Final clearance air monitoring tests shall not be performed until all areas and materials within the work area are fully clean and dry.

C. Final clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory in accordance with all applicable regulations and the Contractor's approved work plan after passing the visual inspection. The clearance criteria shall include a minimum of five clearance samples using "aggressive methods" collected and analyzed in accordance with 40 CFR 763. PCM analysis is allowed, unless TEM analysis is specifically required due to the quantities of asbestos removed.

D. If the final clearance air monitoring results show that the work area has failed to meet the clearance criteria, the Independent Testing Laboratory shall notify the Owner and the Contractor. The Contractor shall reclean the work area and request the Independent Testing Laboratory to conduct a follow-up inspection to be followed by another set of clearance air monitoring samples. All work specified in this paragraph shall be done at no additional expense to the Owner.

E. If the clearance air monitoring results meet the clearance criteria of 40 CFR 763 and the specifications for the work and the Owner has reviewed and accepted the clearance results as required by 1.14 D, then the HEPA filtration units may be deactivated (if applicable) and all seals, barriers, barricades, and decontamination areas shall be dismantled and removed and the work area released to unprotected workers.

F. Submit the final work area inspection report, clearance air monitoring field data sheets and the laboratory air monitoring report to the Owner as specified in Paragraph 1.15.

3.8 SUBSTANTIAL COMPLETION

A. After the work area barriers and temporary construction and equipment have been removed, the Contractor shall inspect the work area to verify that no asbestos debris, contaminated water, or other residue remains. Any remaining residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.

B. The Contractor shall certify that the work area has been cleaned of all asbestos in compliance with the contract, and that there is no unrepaired damage to walls, ceilings, doors, surfaces, equipment or finishes other than that called for by the scope of work.

C. Costs of restoration of damaged finishes shall be borne by the Contractor.

END OF SECTION

SECTION 13281

LEAD REMOVAL AND DISPOSAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work may require the disturbance (including cleanup of existing loose paint), demolition, or removal, and disposal of lead painted and/or lead-containing materials related to the Juneau Douglas City Museum HVAC Upgrades Project as shown on the drawings and as specified herein. Items to be disturbed may include, but are not limited to:
   1. Painted interior and exterior surfaces.
   2. Painted windows, doors and frames.
   3. Painted mechanical and electrical equipment.
   4. Lead-containing dust in and on architectural, structural, mechanical, and electrical components.
   5. Lead in pipe solder at copper pipe fittings.

B. In addition to the above materials, the following materials are located in other areas of the building, and may require disturbance for auxiliary support, such as electrical and mechanical equipment and installation of equipment. Not all lead-containing materials are to be removed from these areas, only that required to complete the project work need be removed:
   1. Lead caulking in bell and spigot pipe joints.
   2. Painted structural and miscellaneous steel.
   3. Lead-acid batteries for exit and emergency lights, and other equipment.
   4. Lead in glazing of ceramic bathroom fixtures and wall tile.

C. This building was constructed prior to 1978 and representative components affected by this project have been tested for lead-based paint. The building is not classified as a child occupied facility and therefore most requirements of 40 CFR 745 do not apply.

D. The work includes all air monitoring, dust sampling, waste testing and disposal as specified herein. Materials listed are not necessarily hazardous waste or hazardous to handle. Lead-containing paints or materials identified for demolition and disposal shall be tested by the Toxicity Characteristics Leaching Procedure (TCLP) to determine if they are hazardous waste prior to disposal. Metal waste shall be recycled where practical.

E. Asbestos, lead and other hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminates, including asbestos and lead, are assumed to be also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Section 00230, Hazardous Materials Survey Report, Section 01561, Airborne Contaminant Control; and Division 13 specifications for specific information concerning disturbing, removing and disposing of these materials

and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00230 Hazardous Materials Survey Report

B. Section 01561 Airborne Contaminant Control

C. Section 13280 Asbestos Removal and Disposal

D. Section 13285 Chemical Hazards Removal and Disposal

1.3 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.4 of this section.

1.4 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.

A. General Requirements: All work shall be performed in compliance with the International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code; Uniform Plumbing Code; the National Electrical Code; and the publications listed in this section that are in effect at the time of the bidding of this contract.

B. Title 29 Code of Federal Regulations (CFR), Department of Labor (USDOL)
Part 1910 General Occupational Safety and Health Standards
Part 1926 Safety and Health Regulations for Construction

C. Title 40 CFR, Environmental Protection Agency (EPA)
Part 260 Hazardous Waste Management System: General
Part 261 Identification and Listing of Hazardous Wastes
Part 262 Standards Applicable to Generators of Hazardous Waste
Part 263 Standards Applicable to Transporters of Hazardous Waste
Part 270 Hazardous Waste Permit Program
Part 273 Standards for Universal Waste Management
Part 311 Worker Protection
Part 745 Lead Based Paint Poisoning Prevention in Certain Residential Structures

D. Title 49 CFR, Department of Transportation (DOT)
Part 171 General Information, Regulations and Definitions
Part 172 Hazardous Materials Communication and Regulations
Part 173 General Requirements for Shipments and Packaging
Part 176 Carriage by Vessel
Part 177 Carriage by Public Highway
Part 178 Specifications for Packaging
Part 382 Requirements for Drug Testing
Part 383 Commercial Driver's License Standards

E. Alaska Administrative Codes (AAC)

8 AAC 61	Occupational Safety and Health Standards
18 AAC 60	Solid Waste Management
18 AAC 62	Hazardous Waste Management
18 AAC 70	Water Quality Standards
18 AAC 75	Oil and Hazardous Substances Pollution Control

F. Alaska Statues (AS)

AS 45.50.477	Titles Relating to Industrial Hygiene

G. Municipality of Anchorage

AMC 26.50.060	Specific Discharge Limitations

H. Federal Standards

313D	Material Safety Data Sheets

I. American National Standards Institute (ANSI)

Z9.2	Local Exhaust Systems
Z87.1	Eye and Face Protection
Z88.2	Practices for Respiratory Protection

J. American Society For Testing and Materials (ASTM)

D 4397	Polyethylene Sheeting
E 1728	Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination
E 1792	Specification for Wipe Sampling Materials for Lead in Surface Dust

K. International Code Institute

International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code	Current Standards

L. National Fire Protection Association (NFPA)

NFPA 701	Fire Tests for Flame Resistant Textiles and Films

M. National Institute of Occupational Safety and Health (NIOSH)
Manual of Analytical Methods, Current Edition

N. Underwriters Laboratories (UL)

UL 586	High-Efficiency, Particulate, Air (HEPA) Filter Units

1.5 QUALITY ASSURANCE

A. On-site Observation:

1. The safety and protection of the Contractor's employees, Subcontractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner, the Owner's Representative, or representatives of State or Federal agencies may make unannounced visits to the site during the work. The Contractor shall make available two complete sets of clean,

protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.

3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Monitoring and Testing: Monitoring and testing during the work shall be performed as follows:
1. The Contractor shall hire Independent Testing Laboratories to collect and evaluate all air, dust, bulk, and toxicity characteristic leaching procedure (TCLP) samples that are the responsibility of the Contractor. The Contractor shall direct its laboratories, in writing, to release monitoring and testing data, and all other pertinent data and records, to the Owner.
2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne contaminants as required by this specification and all applicable regulations.
3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.
4. The Owner may perform monitoring and testing inside the building, inside the work areas, and on the Contractor's employees while work is underway and at any time during the work.
5. Final inspection and clearance testing shall be conducted by the Contractor.
6. The Contractor shall have its Independent Testing Laboratories archive all samples until the successful completion of the project.

C. Additional Sampling of Suspect Materials:
1. The Contractor and all Subcontractors shall be vigilant during demolition and construction in the event additional suspect lead or hazardous materials are encountered. If suspect lead or hazardous materials not previously identified are encountered, the contractor shall stop work that may be affected by this material and immediately notify the Owner. The Owner or the Owner's Representative will provide recommendations and additional testing if necessary.
2. The Contractor and all Subcontractors shall notify the Owner prior to any bulk sampling of suspect lead-containing material or other hazardous materials to allow the Owner or Owner's Representative to be present during such sampling.

1.6 PROTECTION OF EXISTING WORK TO REMAIN: Perform lead removal in the project work areas without damage or contamination of adjacent work or the facility.

1.7 MEDICAL REQUIREMENTS

A. Institute and maintain a surveillance program in accordance with 29 CFR 1926.62 and 29 CFR 1910.134.

B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.

1.8 TRAINING: Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 311, 40 CFR 745 and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of lead-containing materials.

1.9 PERMITS, IDENTIFICATION NUMBERS AND NOTIFICATIONS: Secure necessary permits for hazardous material removal, storage, transport and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD COMMUNICATION PROGRAM: Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

A. Submit the following documentation to the Owner for review, approval or rejection. Work shall not begin until submittals are approved.
1. Shop drawings.
2. Work plan.
3. Liability insurance policy and performance bond.
4. Schedule.
5. Independent testing laboratory and laboratory personnel.
6. Disposal site designations.
7. Waste transporter designations.
8. Representations.
9. "Competent Person" designation and experience.
10. Request for substitutions.

B. Shop drawings shall show:
1. Boundaries of each lead work area, if required.
2. Location and construction of decontamination stations, if required.
3. Location of temporary site storage facilities.
4. Location of air monitoring stations, both in and outside of the work area.
5. Emergency egress route(s).
6. Location of negative pressure exhaust systems, if required.

C. The work plan shall include procedures for:
   1. Work area set-up and protection.
   2. Worker protection and decontamination.
   3. Initial exposure determination(s).
   4. Lead removal procedures.
   5. Waste testing, transport, and disposal procedures.
   6. Monitoring and testing procedures (Sampling and Analysis Plan).
   7. Spill clean-up emergency procedures.

D. Insurance Policy and Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.

E. Schedule: Submit construction schedule by work area.

F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed independent testing laboratories, and the names and certifications of the industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
   1. The Independent Testing Laboratories shall be acceptable to Owner.
   2. Submit evidence that the laboratory is currently judged proficient in lead analysis, as determined by the Environmental Lead Proficiency Analytical Testing (ELPAT) Program, of the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP) for lead in paint chip, soil, and dust wipe samples.
   3. Submit evidence that the laboratory is currently certified by OSHA to perform blood lead analysis.
   4. Submit evidence that the laboratory has demonstrated proficiency as determined by ELPAT or ELLAP performance for NIOSH Method 7082 and/or NIOSH Method 7105 analytical method for the determination of lead in air.
   5. Submit evidence that the laboratory has demonstrated proficiency in performing analyses according to Method 1311 TCLP, corresponding to the current version of Test Methods for Evaluating Solid Wastes (Chemical Physical Methods), SW-846. Evidence may include successful participation in a recognized inter-laboratory quality control program such as a laboratory certified by the California Health and Welfare Agency, Department of Health Services, or a more informal inter-laboratory quality control program.
   6. Submit evidence that the laboratory is currently accredited by the American Industrial Hygiene Association (AIHA).
   7. Submit the name, address, telephone number, and résumé of the Contractor's Industrial Hygienist (IH) who prepared the Sampling and Analysis Plan and will oversee the on-site monitoring, visual inspections and clearance testing. Submit the names, addresses, and résumés of industrial hygiene technicians who may assist the IH for on-site tasks.

Submit documentation that the IH has all the qualifications for the assigned duties as required by the Contractor's liability insurance policy.

8. Submit copies of the Contractor's letter to each of the independent testing laboratories, directing each to release all the results for this project to the Owner, as these results become available and as specified herein.

G. Disposal Site: Submit the name and location of the proposed Environmental Protection Agency (EPA) permitted disposal site.

H. Waste Transporter: Submit the name and address of the proposed waste transporter.

I. Representations: Submit statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.

J. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of his/her previous projects. Certify that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.4 above.

K. Substitutions: Submit requests for substitutions of materials, equipment and methods.

L. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:
1. Updated schedules for lead removal.
2. Change in Competent Person.
3. Changes to work plan.

1.14 TEST REPORTS: Submit the following documentation produced during the work as soon as received:

A. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of lead-containing materials removed, including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.

B. Monitoring and testing data sheets and laboratory reports.

1.15 PROJECT COMPLIANCE DOCUMENTS: Submit the following documents to the Owner with application for final payment:

A. Contractor's actual project "Start and Finish" dates.

B. Waste testing results per Paragraph 3.5 (A).

C. Waste Shipment Records (Manifest EPA form 8700-22) if required.

D. Clearance sampling and soil sampling data sheets (if required) and laboratory reports.

E. Disposal site receipts.

F. Final clearance submittals as outlined in 3.7 (if required).

G. Evidence that each employee who was engaged in lead disturbance/removal work or who was exposed to lead completed training on lead covering the requirements of 29 CFR 1926.62.

1.16 SANITARY FACILITIES: Provide adequate toilet and hygiene facilities.

1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.

1.18 ON-SITE DOCUMENTATION: Maintain on the job site, copies of the following data for safety procedures, equipment, and supplies used for the work.

A. Equipment: Show the model, style, capacity and the operation and maintenance procedures for the following, as applicable:
1. High-Efficiency, Particulate, Air (HEPA) Filtration units.
2. HEPA Vacuum cleaners.
3. Pressure differential recording equipment.
4. Heat stress monitoring equipment.

B. Material Safety Data Sheets (MSDSs): Maintain MSDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.

C. Respiratory Protection Plan: The Contractor's written respirator program.

PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT: Provide personal protective clothing as approved and selected by the IH.

A. Respirators: Provide personally issued and marked respirators approved by the National Institute of Occupational Safety and Health (NIOSH). Provide sufficient replacements for respirators with disposable canisters. Use respirators equipped with dual cartridges whenever both lead hazards and other respiratory hazards exist in the work area.

B. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges may be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.

C. Whole Body Protection: Provide approved aprons, gloves, eye protection, and hard-hats, and other protective clothing as required to meet applicable safety regulations to personnel potentially exposed to lead dust or fumes above the

permissible exposure limit (PEL). Wear this protection properly. Full facepiece respirators shall meet the requirements of ANSI Z87.1.

D. Provide protective personal equipment and clothing at no cost to the workers.

2.2 DECONTAMINATION UNIT

A. Provide a temporary three-stage decontamination unit, attached in a leak-tight manner to each Contained Work Area. Decontamination units shall consist of a clean room equipped with separate lockers for each worker, a shower room, and an equipment locker room equipped with separate lockers for each worker.

B. Shower specifications: Locate flow and temperature controls within the shower and be adjustable by the user. Hot water service may be secured from the building hot water system if available, but only with back-flow protection installed by the Contractor at the point of connection, and with prior notification and approval by the Owner. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40 gallon electric hot water heater with a minimum recovery rate of 20 gallons per hour. Water from the shower room shall not be allowed to wet the floor in the clean room.

2.3 WASTE WATER FILTERS: Install the waste water filters in a series of stages with the final filtration stage sufficient to meet discharge standard of 18 AAC 70 and/or any local sewage system discharge limit for lead. Size the waste water pump for 1.25 times the shower head flow-rate. Dispose all filters as lead contaminated waste.

2.4 WARNING SIGNS AND TAPE: Post warning signs and tape at the boundaries and entrances to lead disturbance and removal work areas. Signs required by other statutes, regulations, or ordinances may be posted in addition to, or in combination with, this warning sign. Conform warning signs and tape to the requirements of 29 CFR 1926.62.

2.5 WARNING LABELS: Affix warning labels to all hazardous waste disposal containers as described in the Contractor's approved Solid Waste Disposal Plan. Conform labeling to 29 CFR 1926.62 and 49 CFR 100-199.

2.6 NEGATIVE PRESSURE EXHAUST SYSTEM: Use the negative pressure exhaust systems to exhaust each contained work area where the PEL will or is expected to be exceeded. Operate the negative pressure exhaust system continuously (24 hours a day) during lead work. Select the negative pressure exhaust system equipment to provide a minimum of 4 air changes per hour under load within the work area. The negative pressure exhaust system shall have a minimum of two stages of pre-filtration ahead of the HEPA filter: The HEPA filter shall bear the UL-586 label. In no case shall the building ventilation system be used as the local exhaust for the contained work area. Terminate the exhaust outside of the building. The exhaust ventilation system equipment shall be equipped with lock-out protection to prevent operation without a HEPA filter properly installed. The exhaust system equipment shall be equipped with the following instrumentation: a static pressure gauge with low flow alarm, an elapsed time indicator, automatic shutdown capability in the event of a major rupture in the HEPA filter or blocked air discharge and an automatic re-start when power is restored after a power failure.

2.7 PRESSURE DIFFERENTIAL MONITORING EQUIPMENT: Provide continuous monitoring of the pressure differential with an automatic recording instrument for each contained work area. Locate the instrument in a clean area where personnel have access to it without respiratory protection. The instrument shall be fitted with an alarm should the negative pressure drop below -0.02 inches of water column relative to the air outside containment.

2.8 TOOLS: Vacuum cleaners shall be equipped with HEPA filters. Use only approved power tools to remove lead-containing material. Do not use open-flame and electric element heat-gun type tools with temperatures in excess of 700° F to remove lead-containing material. Remove all residual lead contamination from reusable tools being removed from lead disturbance or removal work areas. Electrical tools and equipment shall be UL listed.

2.9 AIR MONITORING EQUIPMENT: The Contractor's IH shall select the air monitoring equipment to be used for the evaluation of airborne lead.

2.10 EXPENDABLE SUPPLIES: Provide flame resistant 6-mil thick polyethylene sheet plastic shall be provided in widths necessary to minimize seams.

2.11 MATERIAL SAFETY DATA SHEETS (MSDSs): Provide MSDSs for all chemical materials brought onto the work-site.

2.12 OTHER ITEMS: Provide other items, such as consumable materials, disposable and/or reusable cleaning equipment and hand tools, or miscellaneous construction equipment and materials, in sufficient quantity as necessary to fulfill and complete the requirements of the contract. Electrical equipment and supplies shall be UL listed.

2.13 ENCAPSULANTS: Encapsulants shall contain no toxic or hazardous substances. Encapsulants shall be compatible with the products to which they are applied and be compatible with replacement products.

PART 3 - EXECUTION

3.1 WORK AREAS

A. Lead Control Areas: A control area, structure or containment where lead-containing or contaminated materials are being disturbed. Critical barriers and/or physical boundaries shall be employed to isolate the lead control area and to prevent migration of lead contamination and unauthorized entry of personnel.

B. Contained Lead Work Area Requirements: Construct contained lead work areas as described in the Contractor's approved work plan. A contained lead work area is required whenever airborne lead levels cannot be maintained below the OSHA action level at the boundary of a lead work area.

C. Building Ventilation System: Shut down and isolate by air-tight seals all building ventilation systems supplying air into or returning air from a lead control area or contained lead work area.

D. Building Electrical Systems: Verify that the electrical service is deactivated, disconnected and locked out where necessary for wet washing and/or removal. Provide temporary electrical service, equipped with ground fault protection, where needed.

3.2 PERSONNEL PROTECTION PROCEDURES

A. Initial Determination: An initial determination is required in the absence of acceptable prior exposure data in accordance with 29 CFR 1926.62. Establish an initial lead work area for each material to be disturbed and each disturbance procedure if required. Isolate these lead work areas from the rest of the building. Personnel working in these areas shall wear respiratory protection and personal protective equipment as directed by the IH. Perform personal and work area air monitoring as directed by the IH. Operational decontamination facilities shall be available. Work performed shall be representative of the work to be done during the remainder of the project.

B. Respirator Evaluation: Upgrading, downgrading, or not requiring respirators shall be recommended by the Contractor's IH based on the measured airborne lead-containing dust concentrations. Immediately implement recommendations to upgrade the respiratory protection shall be implemented immediately, followed by notification to the Owner. NOTE: Submit recommendations in writing to downgrade respirator type or not require respirators to the Owner for review and written approval prior to implementation.

C. Decontamination Procedures: Worker and material decontamination procedures shall be as described in the Contractor’s approved work plan. Worker decontamination shall be as directed by the Contractor’s competent person.

D. Work Stoppage: Stop work if the IH, the Owner, or a representative of a regulatory agency determines that the work is not in compliance with the Contractor's approved work plan, these specifications, or applicable laws and regulations. The Contractor shall stop work and notify the Owner whenever the measured concentrations of lead outside the lead control area equal or exceed 30 $\mu g/m^3$ for airborne lead or 200 $\mu g/ft^2$ for lead dust on surfaces that would normally be accessible by building occupants. When such work stoppage occurs, the cause of the contamination shall be corrected and the damaged or contaminated area shall be restored to its original decontaminated condition by the Contractor at no expense to the Owner. The Contractor is responsible for removing dusts and debris that were generated as a result of his work.

E. The Contractor shall adhere to all applicable regulations regarding entry into confined spaces.

3.3 LEAD DISTURBANCE AND REMOVAL PROCEDURES:

A. General: Perform lead disturbance or removal work in accordance with the Contractors approved work plan, applicable regulations and this specification.

B. Pre-Cleaning: Removal of existing loose paint chips is included in the scope of work. Pre-clean surfaces by HEPA vacuum and wet washing/wiping prior to the establishment of a work area.

3.4 MONITORING AND TESTING: Conduct daily sampling in accordance with the Contractor's accepted Sampling and Analysis Plan and this specification. The Owner may conduct air monitoring in the Contractor's work areas and on the Contractor's employees.

A. Perform environmental air monitoring outside the lead work area for each lead work area without a negative initial determination. Include at least one sample immediately outside the entrance to the lead work area.

B. Perform dust wipe sampling for each lead work area without a negative initial determination. Include at least one sample immediately outside the entrance to the work area daily.

C. Take personnel samples in accordance with 29 CFR 1926.62. Personal samples for an employee will include a minimum of two samples per 8 hour shift. Employees will be monitored at the rate of at least one employee for every eight people performing each task in each work area. Persons performing separate tasks or in separate lead work areas shall be sampled separately.

D. Reduction of monitoring: For each operation for which the Negative Initial Determination established workers' exposure will be below the action level, the Contractor's IH may petition the Owner's Representative to recommend that the monitoring as required above be reduced for the specific task or operation.

3.5 DISPOSAL

A. Sampling of Waste Materials: The Contractor shall test waste materials according to 40 CFR 261 and the disposal site's permit to determine if they are hazardous waste and to dispose of them accordingly. Collect, package and transport to an EPA approved Hazardous Waste Disposal Site all bulk debris, loose paint chips, fines, dust from HEPA filters and vacuum bags, unfiltered waste water, water filter cartridges, disposable personal protective equipment (including respirator filters, poly, and tape) which do not have TCLP test results that classify the material as non-hazardous for lead. Lead-acid batteries and other batteries are classified by the EPA as Universal Wastes. The EPA encourages that all Universal Wastes be recycled in accordance with 40 CFR 273, or in the case of lead-acid batteries, in accordance with 40 CFR 266, subpart G.

B. Hazardous Waste Disposal: Dispose of hazardous project wastes as required by 40 CFR 260 and the Contractor's approved work plan.

C. Construction (Non-Hazardous) Waste Disposal: Dispose of solid (non-hazardous) waste in a permitted waste facility, in accordance with applicable federal, state, and local laws and regulations. Burning of waste is prohibited.

D. Salvageable Materials: The Contractor may salvage metallic lead, lead-acid batteries and other materials to keep such materials from entering the project waste stream. Sell or transfer salvage with a document of exempt status as provided by 40 CFR 261.

E. Waste Storage: Temporarily store solid wastes as described in the approved work plan.

3.6 FINAL CLEANING AND VISUAL INSPECTION: Perform a final cleaning and visual inspection of each lead control area prior to release to unprotected workers in accordance with the Contractor's approved work plan. Clean the lead control area by vacuuming with a HEPA filtered vacuum cleaner, wet mopping or wet wiping. Do not dry sweep or use pressurized air to clean up the area. A final visual inspection report shall be provided verifying that all lead disturbance required by the contract has been completed and that all visible dust and debris subject to disturbance by the planned work under this contract have been removed and the area HEPA vacuumed, wet mopped or wet wiped.

3.7 WORK AREA CLEARANCE TESTING: Work area clearance testing by the Contractor is required for each lead control area where the lead action level has been exceeded. Clearance testing shall be performed only after a visual inspection report by the IH Technician has documented that the work area is clean and that all lead disturbance required by the contract has been completed. Clearance testing shall include the following:

A. A visual inspection report by the Contractor's IH Technician verifying that all lead disturbance required by the contract has been completed and that all visible dust and debris subject to disturbance by the planned work under this contract have been removed and the area HEPA vacuumed, wet mopped or wet wiped.

B. Three (3) lead wipe and/or lead soil sample results from within the lead control area per the Contractor's approved work plan and in accordance with NIOSH method 9100. Clearance levels shall be 200 $\mu g/ft^2$ for wipes or 500 ppm in soil.

C. The Owner may conduct concurrent clearance testing.

D. Work area barriers or containments shall not be removed until clearance testing results are reviewed and approved by the Owner.

3.8 SUBSTANTIAL COMPLETION

A. After the work area barriers and temporary construction and equipment have been removed, the Contractor shall inspect the work area to verify that no lead debris, contaminated water, or other residue remains. Any remaining residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.

B. The Contractor shall certify that the work area has been cleaned of all lead in compliance with the contract, and that there is no unrepaired damage to walls, ceilings, doors or surfaces or finishes other than that called for by the scope of work.

C. Costs of restoration of damaged finishes shall be borne by the Contractor.

END OF SECTION

SECTION 13285

CHEMICAL HAZARDS REMOVAL AND DISPOSAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK: The work includes proper removal and disposal of electrical equipment and chemical hazards related to the Juneau Douglas City Museum HVAC Upgrades Project as shown on the drawings and as specified herein. Items to be removed or disturbed may include, but are not limited to:

A. Mercury and mercury compounds in electrical equipment and light fixtures, switches, etc.

B. PCB containing ballasts and light fixture components contaminated with PCB-containing oil.

C. Electrical equipment and building components containing or contaminated with PCB-containing oil. Note: Where the ballasts have previously been replaced, fixtures and all components may be contaminated with PCB-Containing Oils, and shall either be decontaminated or disposed of as PCB contaminated equipment.

D. Ozone Depleting Substances (ODS) in refrigeration equipment.

E. Asbestos, lead and other hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are assumed to be also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Section 00230, Hazardous Materials Survey Report; Section 01561, Airborne Contaminant Control; and Division 13 specifications for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00230 Hazardous Materials Survey Report

B. Section 01561 Airborne Contaminant Control

C. Section 13280 Asbestos Removal and Disposal

D. Section 13281 Lead Removal and Disposal

1.3 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.4 of this Section.

1.4 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.

A. General Requirements: All work shall be performed in compliance with the International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code; Uniform Plumbing Code; the National Electrical Code; and the publications listed in this section that are in effect at the time of the bidding of this contract.

B. Title 10 Code of Federal Regulations (CFR), Nuclear Regulatory Commission
Part 20 Standard for Protection Against Radiation

C. Title 29 CFR, Department of Labor (USDOL)
Part 1910 General Occupational Safety and Health Standards
Part 1926 Safety and Health Regulations for Construction

D. Title 40 CFR, Environmental Protection Agency (EPA)
Part 61 National Emission Standards for Hazardous Air Pollutants
Part 260 Hazardous Waste Management System: General
Part 261 Identification and Listing of Hazardous Waste
Part 262 Standards Applicable to Generators of Hazardous Waste
Part 263 Standards Applicable to Transporters of Hazardous Waste
Part 270 The Hazardous Waste Permit Program
Part 273 Standards for Universal Waste Management
Part 311 Worker Protection
Part 761 Polychlorinated Biphenyls (PCBs)

E. Title 49 CFR, Department of Transportation (DOT)
Part 171 General Information, Regulations and Definitions
Part 172 Hazardous Materials Communication and Regulations
Part 173 General Requirements for Shipments and Packaging
Part 177 Carriage by Public Highway
Part 178 Specifications for Packagings
Part 382 Requirements for Drug Testing
Part 383 Commercial Driver's License Standards

F. State of Alaska Administrative Codes (AAC)
8 AAC 61 Occupational Safety and Health Standards
18 AAC 60 Solid Waste Management
18 AAC 62 Hazardous Wastes
18 AAC 75 Oil and Hazardous Substances Pollution Control

G. State of Alaska Statutes (AS)
AS 45.50.477 Titles Relating to Industrial Hygiene

H. Federal Standards
313D Material Safety Data Sheets

I. American National Standard Institute (ANSI)
Z9.2 Local Exhaust Systems
Z87.1 Eye and Face Protection

Z88.2 Practices for Respiratory Protection
C78.LL 1256 Procedures for Fluorescent Lamp Sample Preparation and Toxicity Characteristic Leaching Procedure.

J. American Society for Testing and Materials (ASTM)
D-4397 Polyethylene Sheeting

K. International Code Institute
International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code Current IC Standards

L. National Fire Protection Association (NFPA)
NFPA 701 Fire Tests for Flame Resistant Textiles and Films

M. National Institute of Occupational Safety and Health (NIOSH)
Manual of Analytical Methods, Current Edition

1.5 QUALITY ASSURANCE

A. On-site Observation:
1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner, the Owner's Representative, or representatives of State or Federal agencies may make unannounced visits to the site during the work. The contractor shall make available two complete sets of clean protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Monitoring and Testing: Monitoring and testing during the work shall be performed as follows:
1. The Contractor shall hire Independent Testing Laboratories to collect and evaluate all air, bulk, and toxicity characteristic leaching procedure (TCLP) samples, which are the responsibility of the Contractor. The Contractor shall direct its laboratories, in writing, to release monitoring and testing data, and all other pertinent data and records, to the Owner.

2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne contaminants as required by specification 01561 and all applicable regulations.
3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.
4. The Owner may perform monitoring and testing inside the building, inside the work areas, and on the Contractor's employees while work is underway and at any time during the work.
5. The Contractor shall have its Independent Testing Laboratories archive all samples until the successful completion of the project.
6. Final inspection and clearance testing shall be conducted by the Contractor.

1.6 PROTECTION OF EXISTING WORK TO REMAIN: Perform hazardous material removal work without damage or contamination of adjacent work or the site.

1.7 MEDICAL REQUIREMENTS

A. Institute and maintain a medical surveillance program in accordance with 29 CFR 1910.134.

B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.

1.8 TRAINING: Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 311, and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of hazardous materials.

1.9 PERMITS AND NOTIFICATIONS: Secure necessary permits for hazardous material removal, storage, transport and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD COMMUNICATION PROGRAM: Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

A. Approval: Submit the following documentation to the Owner for review, approval, or rejection. Work shall not begin until submittals are approved.
1. Shop drawings.
2. Hazardous material removal work plan.
3. Liability insurance policy and performance bond.
4. Schedule.

5. Independent testing laboratories.
6. Disposal site designations.
7. Waste Transporter Designations.
8. Notifications and certifications.
9. Competent Person Designation Notifications and Certifications.
10. Request for Substitutions.

B. Shop drawings shall show:
1. Boundaries of all hazardous material removal areas.
2. Location and construction of decontamination stations, if required.
3. Location of temporary site storage facilities.
4. Location of air monitoring stations, if required.
5. Emergency egress route(s).

C. The work plan shall include procedures for:
1. Work area set-up and protection.
2. Worker protection and decontamination.
3. Ballast removal procedures.
4. Mercury-containing lamp removal and packaging procedures.
5. Mercury-containing material removal procedures.
6. Monitoring and testing procedures (Sampling and Analysis Plan).
7. Radioactive materials removal and tracking procedures.
8. Waste handling, packaging, labeling, and manifesting procedures.

D. Insurance Policy and Performance Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.

E. Schedule: Submit construction schedule by work area.

F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed independent testing laboratories, and the names and certifications of industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
1. The Independent Testing Laboratories shall be acceptable to the Owner.
2. Evidence that a laboratory has demonstrated proficiency in performing analyses according to Method 1311 TCLP, corresponding to the current version of Test Methods for Evaluating Solid Wastes (Chemical Physical Methods), SW-846. Evidence may include successful participation in a recognized inter-laboratory quality control program such as a laboratory certified by the California Health and Welfare Agency, Department of Health Services, or a more informal inter-laboratory quality control program.
3. Submit the name, address, telephone number, and résumé of the Industrial Hygienist (IH) who prepared the Sampling and Analysis Plan and will oversee the on-site monitoring. Submit the names, addresses, and résumés of industrial hygiene technicians who may assist the IH for

on-site tasks. The Contractor shall submit documentation that the IH has all the qualifications for the assigned duties as required by the Contractor's liability insurance policy.

4. Submit copies of the Contractor's letters to the independent testing laboratories, directing each to release all the results for this project to the Owner, as these results become available and as specified herein.

G. Disposal Site: Submit the name and location of the proposed Alaska Department of Environmental Conservation (DEC) or U.S. Environmental Protection Agency (EPA) permitted disposal sites.

H. Waste Transporter: Submit the name, address and EPA Hazardous Waste Transporter identification number for the proposed waste transporters.

I. Certifications, Permits, and Notifications: Obtain and submit copies of EPA Hazardous Waste Generator identification number for the purpose of accumulating hazardous waste in accordance with 40 CFR 262. Submit copies of refrigerant recovery technician’s EPA certification and company name when refrigeration systems are being demolished or deactivated. If the site does not have an EPA ID number for hazardous wastes, the contractor will need to assist the Owner in obtaining the EPA ID number, but the Owner will be available to sign the application documents and shipment records prepared by the contractor.

J. Representations: Submit statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.

K. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of his/her previous projects. Certify that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.4 above.

L. Substitutions: Submit requests for substitutions of materials, equipment and methods.

M. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:

1. Updated schedules for hazardous material removal.
2. Change in competent person.
3. Changes to work plan.

1.14 TEST REPORTS: Submit the following documentation produced during the work as received:

A. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of chemical hazards removed including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.

B. Monitoring and testing data sheets and laboratory reports.

1.15 PROJECT COMPLIANCE DOCUMENTS: Submit the following documents with the application for final payment.

A. Daily sign-in sheets.

B. Contractor's actual "start and finish" project dates.

C. All hazardous waste shipping manifests.

D. Disposal site receipts, including manufacturer name and serial numbers from each radioactive exit sign (if removed).

E. All final laboratory results.

F. Submit legible copies of the each Worker’s Hazardous Waste Operations and Emergency Response (HAZWOPR) cards and/or a copy of the refresher training certificate to show that all workers have received their initial training or an eight-hour refresher course within the past year.

1.16 SANITARY FACILITIES: Provide adequate toilet and hygiene facilities.

1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.

1.18 ON-SITE DOCUMENTATION: Maintain on-site manufacturer's data for all equipment and supplies proposed to be used for the work.

A. Equipment: Show the model, style, operations, and maintenance for the following, as applicable:
1. Respirators, PAPR and canister types.
2. Decontamination facilities.
3. Specialized hazards handling equipment.

B. Expendable supplies: Maintain the manufacturer’s safety data, and use the data for the following supplies:
1. Coveralls and headgear.
2. Boots, aprons, and gloves.
3. Disposal containers.
4. Solvents and degreasers.

C. Material Safety Data Sheets (MSDS): Maintain on-site Material Safety Data Sheets for each chemical and other material proposed to be used.

D. Respirator Program: The Contractor's written respirator program.

PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT: Provide personal protective clothing as approved and selected by the IH.

A. Respirators: Provide personally issued and marked respirators approved by the National Institute of Occupational Safety and Health (NIOSH). Provide sufficient replacements for respirators with disposable canisters.

B. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges may be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.

C. Whole Body Protection: Provide approved aprons, gloves, goggles, face shields, and hard-hats, and other protective clothing as required to meet applicable safety regulations to all workers engaged in hazardous materials removal. Full facepiece respirators shall meet the requirements of ANSI Z87.1.

D. Provide protective personal equipment and clothing at no cost to the workers.

2.2 DECONTAMINATION UNIT: Provide a decontamination station in accordance with the Contractor's accepted work plan and applicable regulations.

2.3 WARNING SIGNS AND TAPE: Post warning signs and tape at the boundaries and entrances to chemical hazards removal areas. Signs required by other statutes, regulations, or ordinances may be posted in addition to, or in combination with, this warning sign.

2.4 WARNING LABELS: Affix warning labels to all hazardous waste disposal containers as described in the Contractor's approved Solid Waste Disposal Plan. Conform labeling to 49 CFR 100-199.

2.5 SPECIALIZED EQUIPMENT: Lamp crushers and other specialized equipment to consolidate, reduce or treat hazardous materials are classified as RCRA treatment and the EPA specifically prohibits the use of Drum Top Crushers for management of fluorescent lamps as universal waste unless an equivalency determination is made by the state.

2.6 EXPENDABLE SUPPLIES: Provide flame resistant 6-mil thick polyethylene sheet plastic in widths necessary to minimize seams.

2.7 MATERIAL SAFETY DATA SHEETS (MSDSs): Provide MSDSs for all chemical materials brought onto the work-site.

2.8 OTHER ITEMS: Provide other items, such as consumable materials, disposable and/or reusable cleaning equipment and hand tools, or miscellaneous construction equipment and materials, in sufficient quantity as necessary to fulfill and complete the requirements of the contract. Electrical equipment and supplies shall be UL listed.

2.9 ENCAPSULANTS: Encapsulants shall contain no toxic or hazardous substances. Encapsulants shall be compatible with the products to which they are applied and be compatible with any replacement products.

PART 3 - EXECUTION

3.1 WORK AREAS

A. Electrical Power: Verify that the electrical power to the equipment being removed is deactivated, disconnected, and locked-out.

B. Loaded Disposal Drums: The Contractor shall provide handling equipment to move disposal drums loaded with hazardous wastes.

3.2 PERSONNEL PROTECTION PROCEDURES

A. All personnel entering the work area shall sign the daily log and put on clean protective clothing.

B. Basic protective clothing shall consist of aprons, gloves, goggles, face shields, and hard hats--with the addition of approved full body coveralls, bib-type aprons, and respirators as conditions warrant.

C. Make available a contaminated material disposal drum, 6-mil. plastic wrapping and tape, or appropriate bagging materials for leaking ballasts and/or oil-contaminated components.

D. Decontamination Procedures: All personnel handling or removing hazardous materials will comply with the decontamination procedures as described in the approved work plan.

3.3 HAZARDOUS MATERIAL REMOVAL PROCEDURES: Remove hazardous materials in accordance with the Contractor's approved work plan, applicable regulations, and this specification.

A. Perform PCB related work in accordance with 40 CFR 761, 8 AAC 61, 18 AAC 60 and 18 AAC 62.

B. Perform mercury-containing lamps storage and transport in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 and 8 AAC.

C. Perform removal of ozone depleting substances in accordance with 40 CFR 82, 8 AAC 61, 18 AAC 60, and 18 AAC 62.

3.4 MONITORING AND TESTING: Conduct daily sampling in accordance with the Contractor's accepted Sampling and Analysis Plan and this Specification. The Owner may conduct air monitoring in the Contractor’s work areas and on the Contractor’s employees.

A. Personal, work area, and environmental monitoring for airborne contaminants shall be performed by industrial hygiene technicians who are employees of (one of) the Contractor's Independent Testing Laboratories.

B. Perform air monitoring in accordance with 29 CFR 1926, current EPA guidance, and as specified herein. Calibrate all sampling pumps on-site with a calibrated transfer standard before and after each sample. Built-in rotameters on pumps are not acceptable for calibration.

C. Monitor for all airborne contaminants listed in 29 CFR 1926.55 and 8 AAC 61.1100, which are produced by the Contractor's operations.

D. Contractor shall test waste materials as required by 40 CFR 261, the disposal site's permit, and it’s approved work plan. If performed, TCLP testing of fluorescent lamps shall comply with ANSI/NEMA Standard Procedure for Fluorescent Lamp Sample Preparation and Toxicity Characteristic Leaching Procedure, C78.LL 1256-2003 or latest version.

3.5 DISPOSAL

A. Dispose of hazardous wastes in an EPA permitted hazardous waste disposal site as required by 40 CFR 260 and 40 CFR 761, the Contractor's approved plan, and the disposal site operator.

B. Comply with current waste disposal, handling, labeling, storage, and transportation requirements of the waste disposal facility, U.S. Department of Transportation, and EPA regulations.

C. Fluorescent, mercury vapor, metal halide and high pressure sodium lamps are classified by the EPA as hazardous mercury waste under the Universal Waste Rule under 40 CFR 273. Mercury and mercury-containing products are considered hazardous waste unless TCLP testing of the waste for mercury confirms the mercury content to be less than the EPA criteria of 0.2 mg/l.

D. Dispose of radioactive materials and equipment in accordance with the manufacturer's recommendations, the disposal site's requirements and 10 CFR 20, Subpart K. Provide list of manufacturer name and serial numbers for all removed radioactive exit signs to owner.

E. Refrigerants in refrigeration and cooling systems in the building contain ODS components that must be recovered and recycled or disposed of in accordance with 40 CFR 82. Personnel decommissioning or removing ODS refrigerants shall hold appropriate EPA training and certificate for handling and recovering these materials.

F. Heating systems containing glycol shall be drained and all glycol collected in appropriate waste containers for recycling or disposal. Glycol shall be tested for heavy metals using the Toxicity Characteristics Leaching Procedure (TCLP). Glycol that failed the TCLP shall be packaged for disposal as hazardous waste.

3.6 CLEANING OF WORK AREA

A. Remove all hazardous materials and debris within a work area. Wet clean all work area surfaces.

B. Notify the Owner that hazardous materials removal has been completed and the work area is ready for visual inspection. Include a statement that all hazardous materials and debris in the work area have been removed as required by the contract.

END OF SECTION