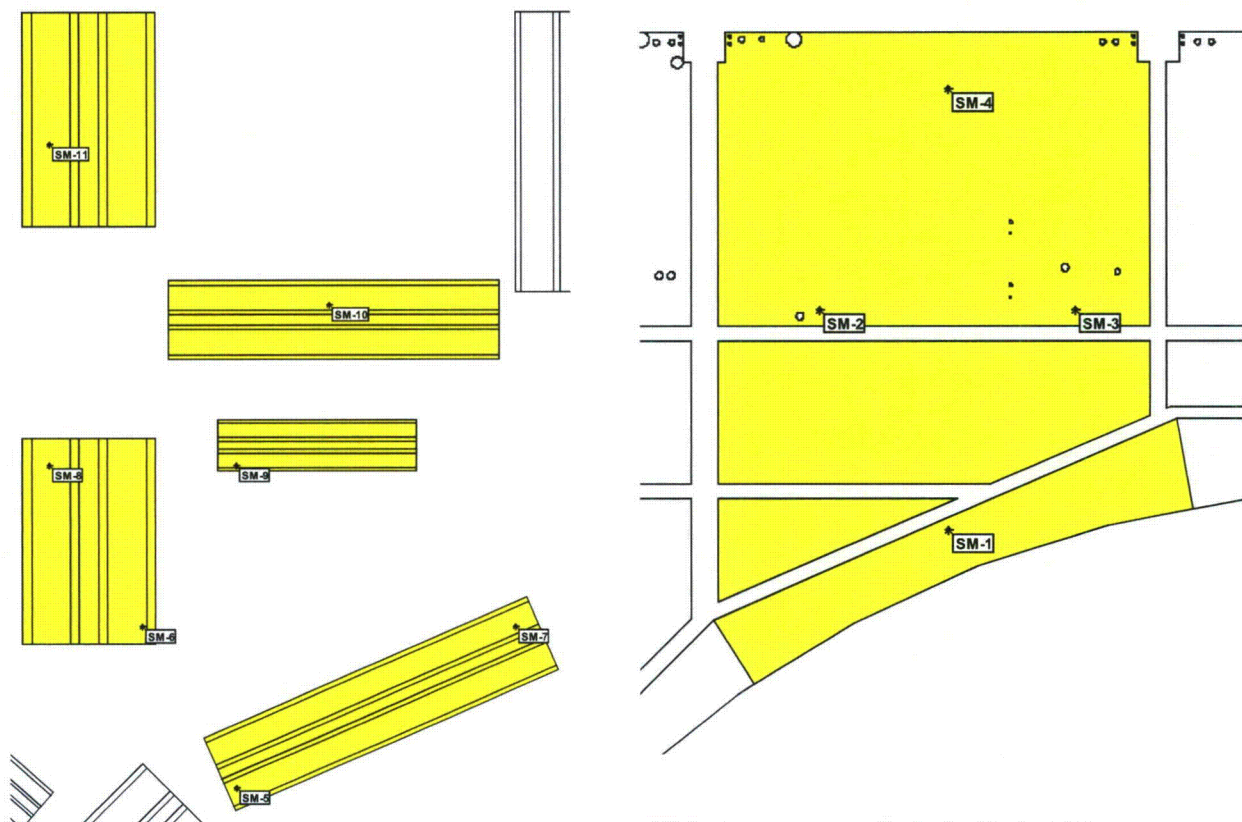
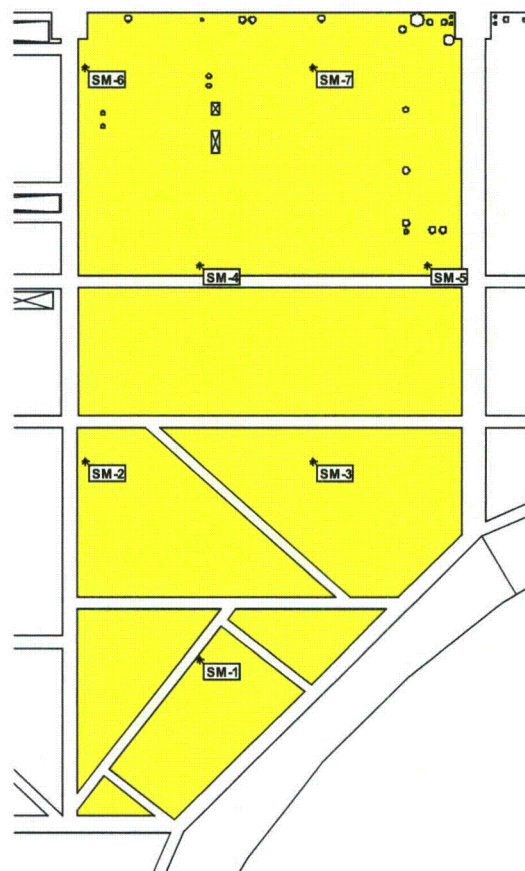
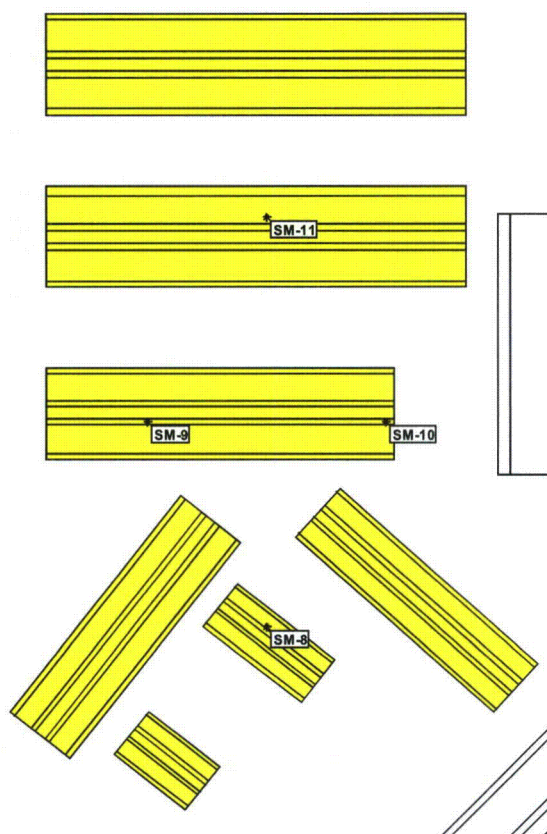


Survey Unit RB-3-30  
RB -15' - RB -15' Ceiling Section #7



RB-3-30 AREA: RB -15' Elevation, Ceiling Section #7 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
3.3	0.6	SM-1	431	Systematic	N/A
1.4	0.2	SM-2	667	Systematic	N/A
4.8	0.2	SM-3	516	Systematic	N/A
3.1	3.2	SM-4	458	Systematic	N/A
6.3	0.2	SM-5	150	Systematic	N/A
3.5	Edge	SM-6	-248	Systematic	N/A
6.1	0.15	SM-7	-124	Systematic	N/A
3.3	0.4	SM-8	-52	Systematic	N/A
3.3	Edge	SM-9	203	Systematic	N/A
3.0	Edge	SM-10	-20	Systematic	N/A
1.5	0.4	SM-11	-281	Systematic	N/A
* Sample points SM-1 through SM-4 are measured from the nearest beam to the West and to the South of the sample point. The X-Y coordinates for SM-5 through SM-11 are measured from the lower left corner of the beam surface on which they lie.					

Survey Unit RB-3-31  
RB -15' - RB -15' Ceiling Section #8

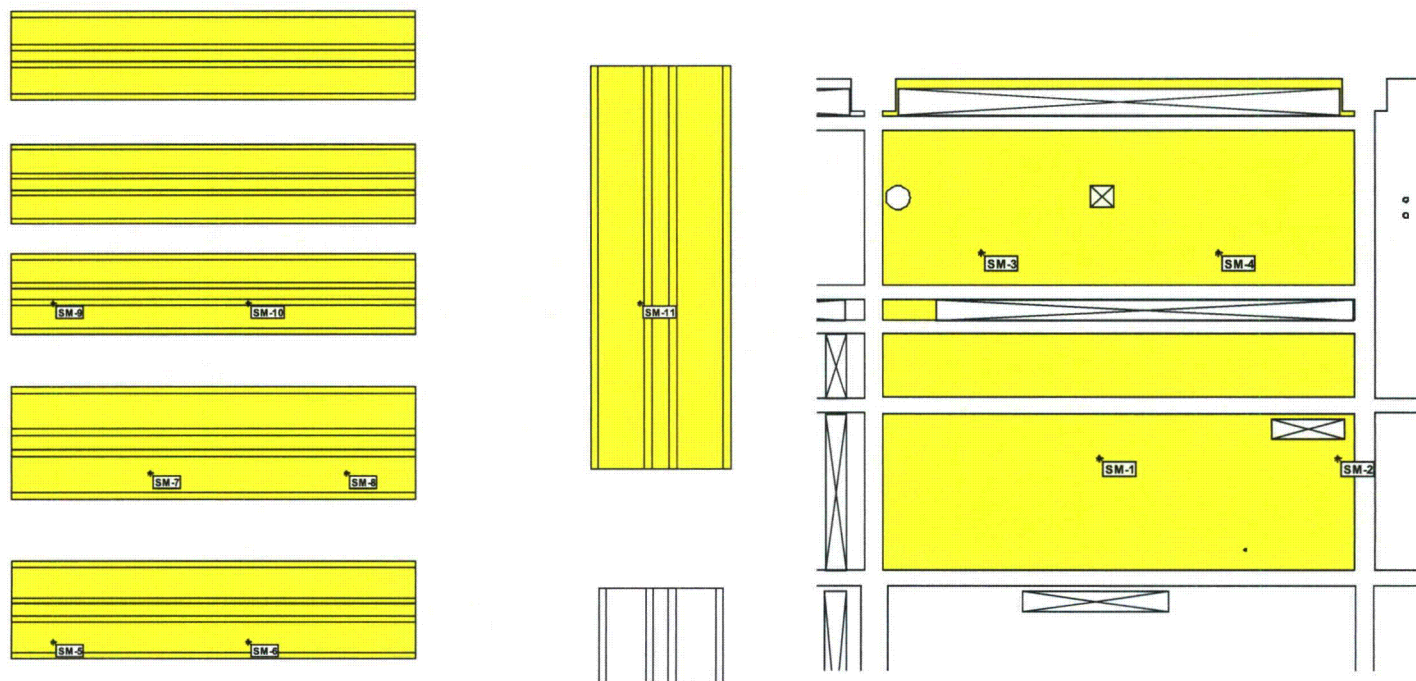


RB-3-31 AREA: RB -15' Elevation, Ceiling Section #8 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
2.1	Edge	SM-1	340	Systematic	N/A
0.1	2.1	SM-2	-52	Systematic	N/A
1.8	2.1	SM-3	346	Systematic	N/A
1.8	0.2	SM-4	353	Systematic	N/A
5.3	0.2	SM-5	627	Systematic	N/A
0.1	3.2	SM-6	0	Systematic	N/A
3.6	3.2	SM-7	320	Systematic	N/A
1.1	Edge	SM-8	65	Systematic	N/A
1.5	Edge	SM-9	-39	Systematic	N/A
4.9	Edge	SM-10	7	Systematic	N/A
3.2	0.1	SM-11	-157	Systematic	N/A

\* Sample points SM-1 through SM-7 are measured from the nearest beam to the West and to the South of the sample point. The X-Y coordinates for SM-8 through SM-11 are measured from the lower left corner of the beam surface on which they lie



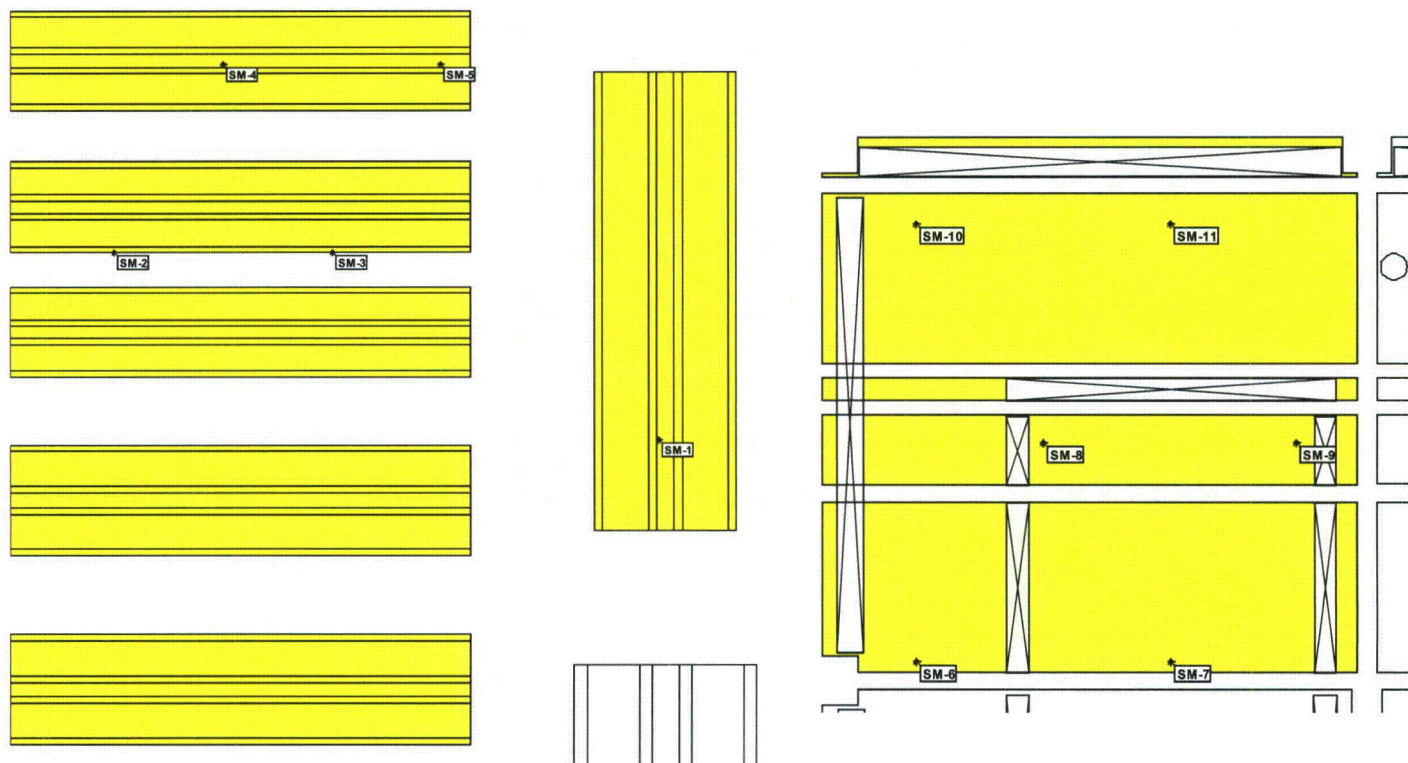
Survey Unit RB-3-32  
RB -15' - RB -15' Ceiling Section #9



RB-3-32 AREA: RB -15' Elevation, Ceiling Section #9 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
2.7	1.4	SM-1	438	Systematic	N/A
5.6	1.4	SM-2	170	Systematic	N/A
1.2	0.4	SM-3	176	Systematic	N/A
4.1	0.4	SM-4	373	Systematic	N/A
5.4	0.3	SM-5	-118	Systematic	N/A
2.5	0.3	SM-6	7	Systematic	N/A
4.0	0.2	SM-7	-150	Systematic	N/A
1.0	0.2	SM-8	-157	Systematic	N/A
5.4	Edge	SM-9	137	Systematic	N/A
2.5	Edge	SM-10	0	Systematic	N/A
2.5	Edge	SM-11	-229	Systematic	N/A

\* Sample points SM-1 through SM-4 are measured from the nearest beam to the West and to the South of the sample point. The X-Y coordinates for SM-5 through SM-11 are measured from the lower left corner of the beam surface on which they lie.

Survey Unit RB-3-33  
RB -15' - RB -15' Ceiling Section #10

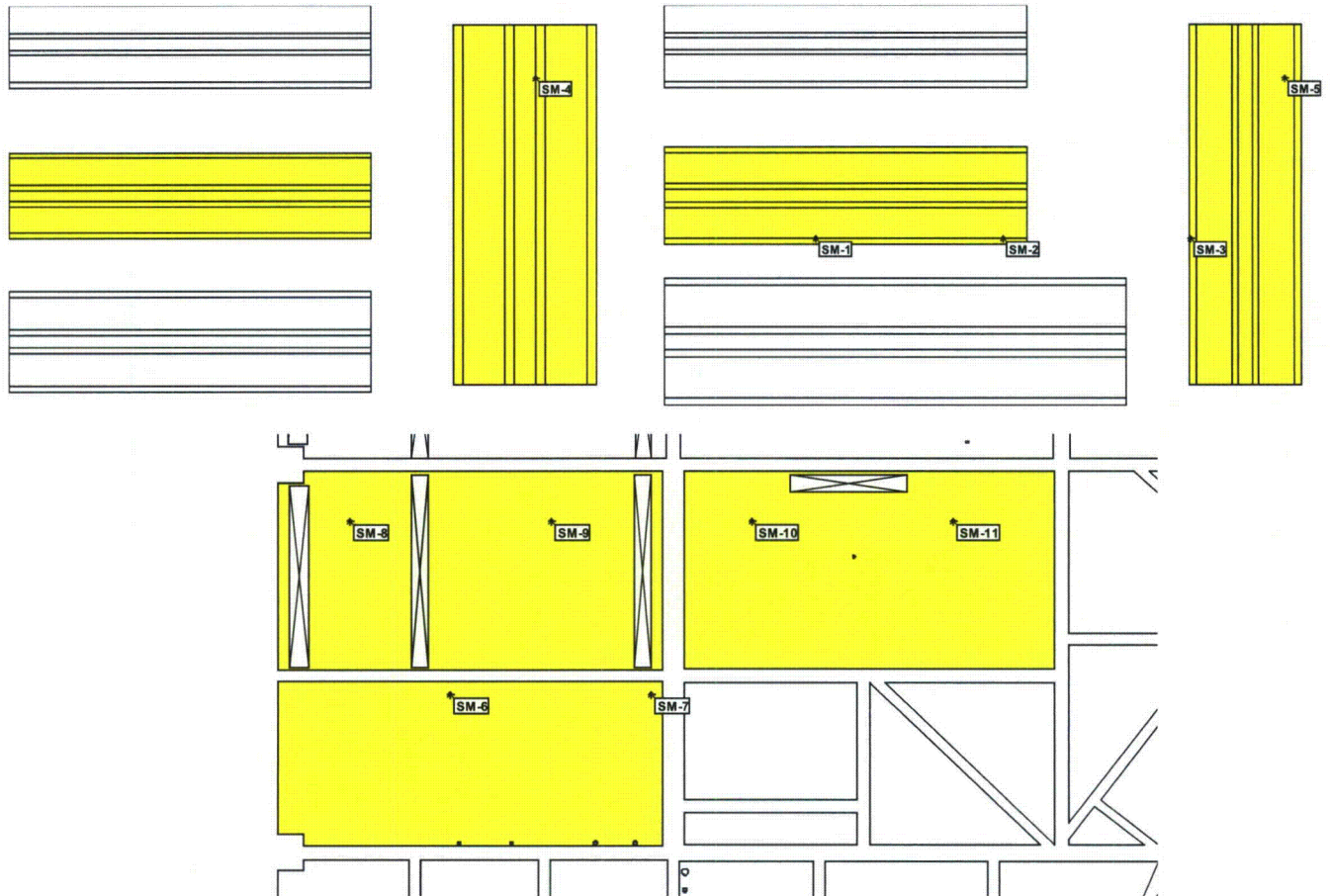


RB-3-33 AREA: RB -15' Elevation, Ceiling Section #10 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.2	Edge	SM-1	52	Systematic	N/A
4.7	Edge	SM-2	144	Systematic	N/A
1.8	Edge	SM-3	7	Systematic	N/A
2.8	Edge	SM-4	-7	Systematic	N/A
5.7	Edge	SM-5	-52	Systematic	N/A
1.1	0.1	SM-6	542	Systematic	N/A
4.0	0.1	SM-7	497	Systematic	N/A
2.5	0.5	SM-8	359	Systematic	N/A
5.4	0.5	SM-9	471	Systematic	N/A
1.1	1.6	SM-10	131	Systematic	N/A
4.0	1.6	SM-11	320	Systematic	N/A

\* Sample points SM-1 through SM-5 are measured from the lower left corner of the beam surface on which they lie. The X-Y coordinates for SM-6 through SM-11 are measured from the nearest beam to the West and to the South of the sample point.



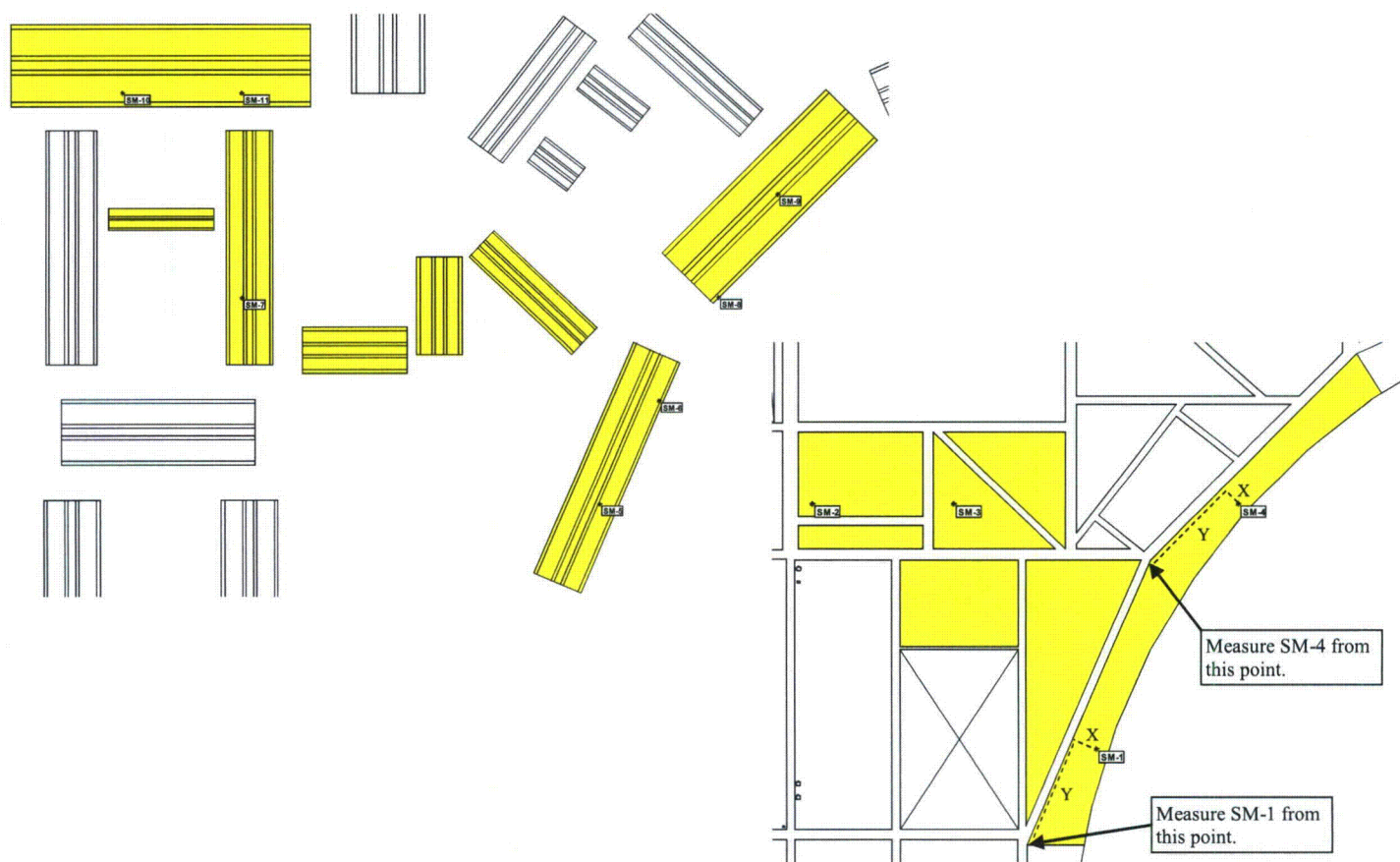
Survey Unit RB-3-34  
RB -15' - RB -15' Ceiling Section #11



RB-3-34 AREA: RB -15' Elevation, Ceiling Section #11 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
3.5	Edge	SM-1	-7	Systematic	N/A
0.4	Edge	SM-2	294	Systematic	N/A
2.5	Edge	SM-3	59	Systematic	N/A
5.2	Edge	SM-4	46	Systematic	N/A
0.9	0.4	SM-5	105	Systematic	N/A
2.7	2.4	SM-6	353	Systematic	N/A
5.8	2.4	SM-7	412	Systematic	N/A
1.1	2.4	SM-8	451	Systematic	N/A
4.3	2.4	SM-9	503	Systematic	N/A
1.1	2.4	SM-10	412	Systematic	N/A
4.2	2.4	SM-11	314	Systematic	N/A

\* Sample points SM-1 through SM-5 are measured from the lower left corner of the beam surface on which they lie nearest. The X-Y coordinates for SM-6 through SM-11 are measured from the beam to the West and to the South of the sample point.

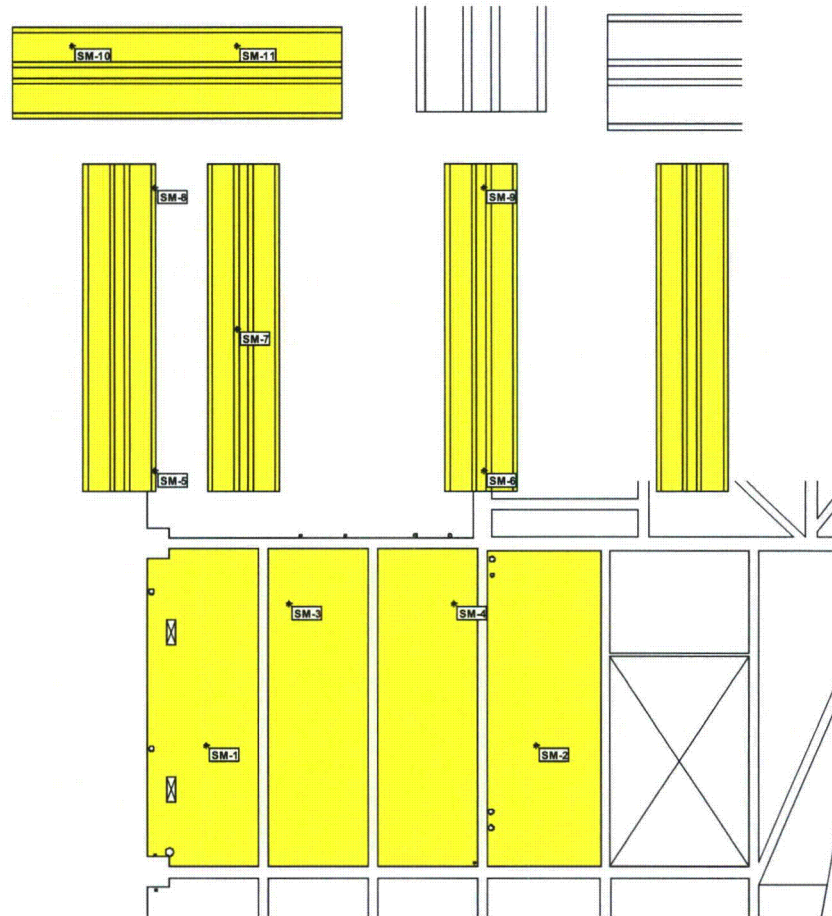
Survey Unit RB-3-35  
RB -15' - RB -15' Ceiling Section #12



RB-3-35					
AREA: RB -15' Elevation, Ceiling Section #12					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.5	2.5	SM-1	412	Systematic	N/A
0.3	0.3	SM-2	497	Systematic	N/A
0.4	1.0	SM-3	477	Systematic	N/A
0.5	2.2	SM-4	78	Systematic	N/A
4.2	Edge	SM-5	359	Systematic	N/A
1.1	Edge	SM-6	-72	Systematic	N/A
1.7	Edge	SM-7	98	Systematic	N/A
5.8	Edge	SM-8	222	Systematic	N/A
2.8	Edge	SM-9	183	Systematic	N/A
4.9	0.4	SM-10	-59	Systematic	N/A
1.8	0.4	SM-11	170	Systematic	N/A
* Sample points SM-1 through SM-4 are measured from the nearest beam to the West and to the South of the sample point, or the point shown on the map. The X-Y coordinates for SM-5 through SM-11 are measured from the lower left corner of the beam surface on which they lie.					



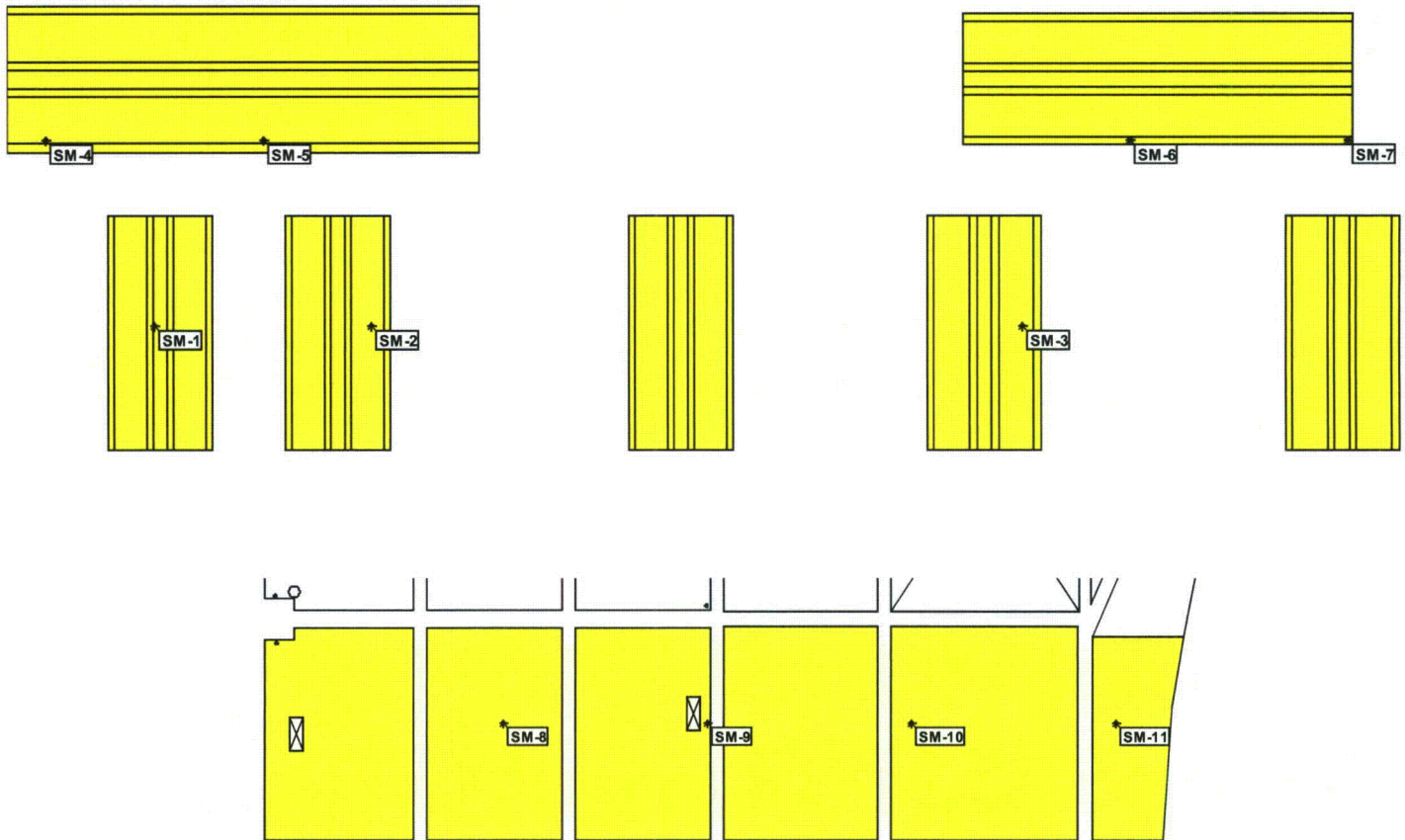
Survey Unit RB-3-36  
RB -15' - RB -15' Ceiling Section #13



RB-3-36 AREA: RB -15' Elevation, Ceiling Section #13 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.1	2.2	SM-1	614	Systematic	N/A
0.9	2.2	SM-2	386	Systematic	N/A
0.4	4.8	SM-3	222	Systematic	N/A
1.4	4.8	SM-4	444	Systematic	N/A
5.7	Edge	SM-5	59	Systematic	N/A
0.4	Edge	SM-6	-111	Systematic	N/A
3.0	Edge	SM-7	144	Systematic	N/A
0.4	Edge	SM-8	46	Systematic	N/A
5.6	edge	SM-9	209	Systematic	N/A
1.1	0.3	SM-10	85	Systematic	N/A
4.1	0.3	SM-11	190	Systematic	N/A

\* Sample points SM-1 through SM-4 are measured from the nearest beam to the West and to the South of the sample point. The X-Y coordinates for SM-5 through SM-11 are measured from the lower left corner of the beam surface on which they lie.

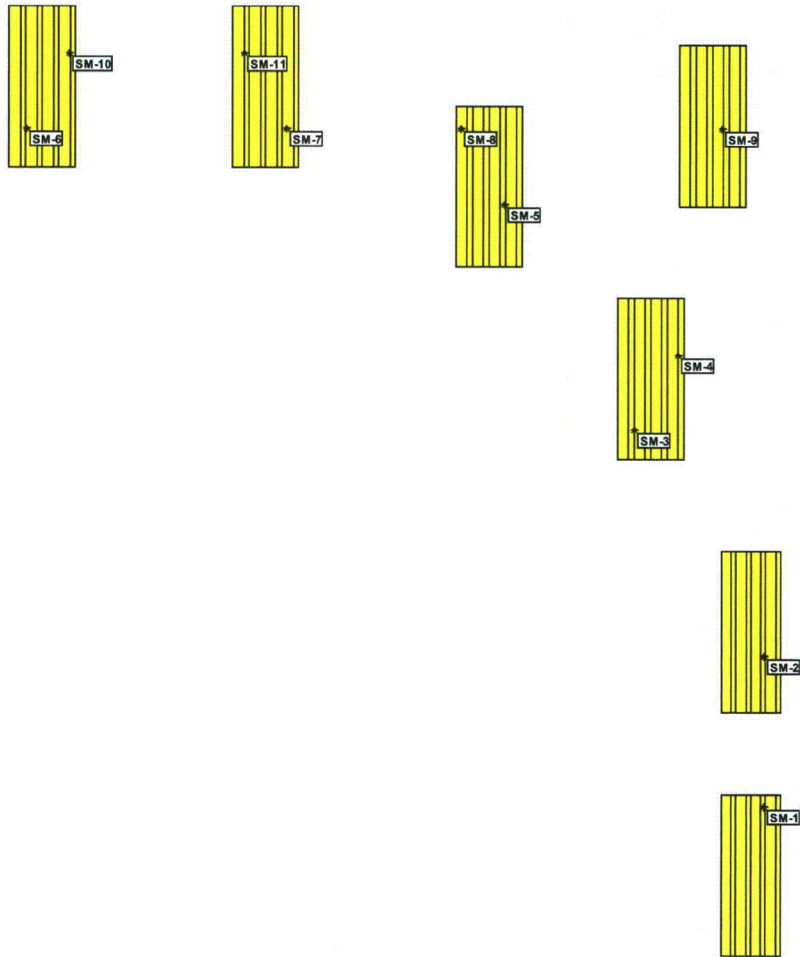
Survey Unit RB-3-37  
RB -15' - RB -15' Ceiling Section #14



RB-3-37 AREA: RB -15' Elevation, Ceiling Section #14 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.6	Edge	SM-1	-163	Systematic	N/A
1.5	0.2	SM-2	222	Systematic	N/A
1.5	0.3	SM-3	144	Systematic	N/A
5.6	Edge	SM-4	-39	Systematic	N/A
2.8	Edge	SM-5	26	Systematic	N/A
2.9	Edge	SM-6	-78	Systematic	N/A
Edge	Edge	SM-7	-59	Systematic	N/A
1.0	1.6	SM-8	327	Systematic	N/A
Edge	1.6	SM-9	52	Systematic	N/A
0.3	1.6	SM-10	438	Systematic	N/A
0.3	1.6	SM-11	-1248	Systematic	N/A
* Sample points SM-1 through SM-7 are measured from the nearest beam to the West and to the South of the sample point. The X-Y coordinates for SM-8 through SM-11 are measured from the lower left corner of the beam surface on which they lie.					



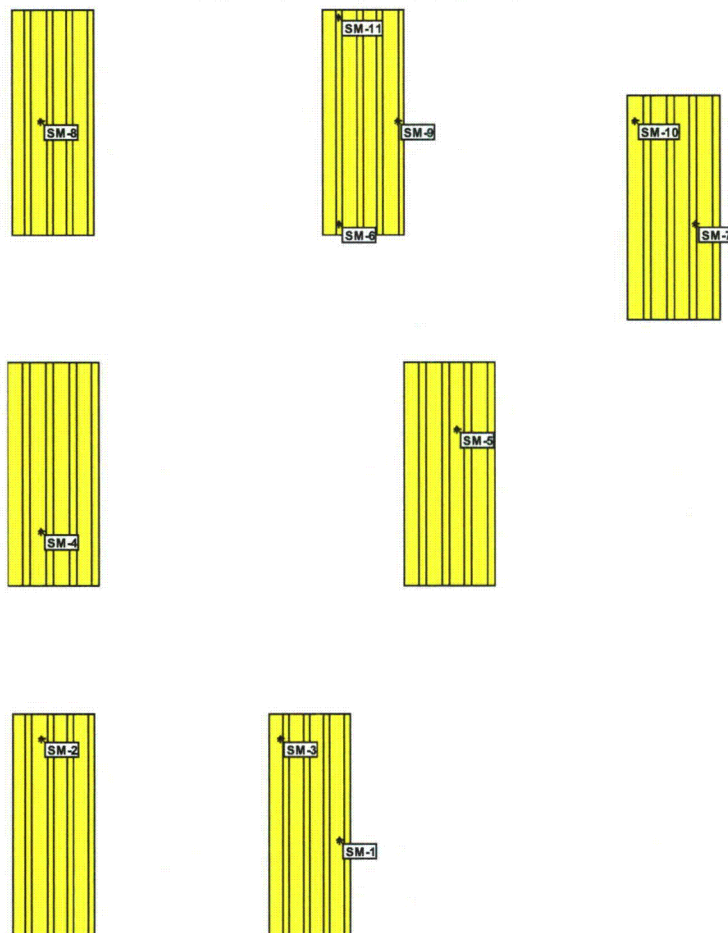
Survey Unit RB-3-38  
RB -15' - RB -15' East Columns



RB-3-38 AREA: RB -15' Elevation, East Columns Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
Edge	4.0	SM-1	182	Systematic	N/A
Edge	1.5	SM-2	15	Systematic	N/A
Edge	0.8	SM-3	117	Systematic	N/A
Edge	2.8	SM-4	139	Systematic	N/A
Edge	1.7	SM-5	-139	Systematic	N/A
Edge	1.0	SM-6	-146	Systematic	N/A
Center	1.0	SM-7	-36	Systematic	N/A
Center	3.8	SM-8	0	Systematic	N/A
Edge	2.1	SM-9	-139	Systematic	N/A
Edge	3.1	SM-10	328	Systematic	N/A
Edge	3.1	SM-11	117	Systematic	N/A

\* Sample measurements are from the lower left corner of the surface on which they lie.

Survey Unit RB-3-39  
RB -15' - West Columns

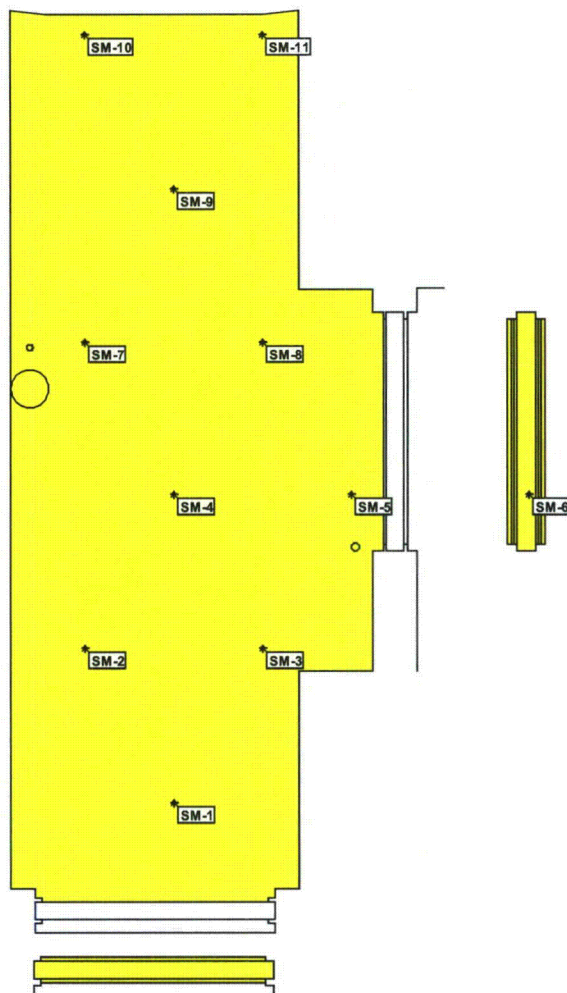


RB-3-39 AREA: RB -15' Elevation, West Columns Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.2	1.9	SM-1	-73	Systematic	N/A
0.2	3.9	SM-2	-51	Systematic	N/A
Edge	3.9	SM-3	350	Systematic	N/A
0.2	1.0	SM-4	-80	Systematic	N/A
Center	3.1	SM-5	190	Systematic	N/A
Edge	0.2	SM-6	168	Systematic	N/A
Edge	1.9	SM-7	226	Systematic	N/A
0.2	2.2	SM-8	-153	Systematic	N/A
Edge	2.2	SM-9	-95	Systematic	N/A
Center	3.9	SM-10	-190	Systematic	N/A
Edge	4.2	SM-11	-80	Systematic	N/A

\* Measurements are taken from the lower left corner of the surface on which they lie.



Survey Unit RB-4-1  
Canal F - Floor



RB-4-1 AREA: Canal F Floor Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
2.1	1.1	SM-1	1087	Systematic	N/A
0.9	3.1	SM-2	680	Systematic	N/A
3.2	3.1	SM-3	380	Systematic	N/A
2.1	5.0	SM-4	413	Systematic	N/A
4.3	5.0	SM-5	647	Systematic	N/A
Center	0.7	SM-6	420	Systematic	N/A
0.9	7.0	SM-7	687	Systematic	N/A
3.2	7.0	SM-8	520	Systematic	N/A
2.1	8.9	SM-9	493	Systematic	N/A
0.9	10.9	SM-10	1047	Systematic	N/A
3.2	10.9	SM-11	767	Systematic	N/A
Sample measurements are taken from the southwest corner of the survey unit, except SM-6, which is measured from the southwest corner of the doorway surface on which it lies.					

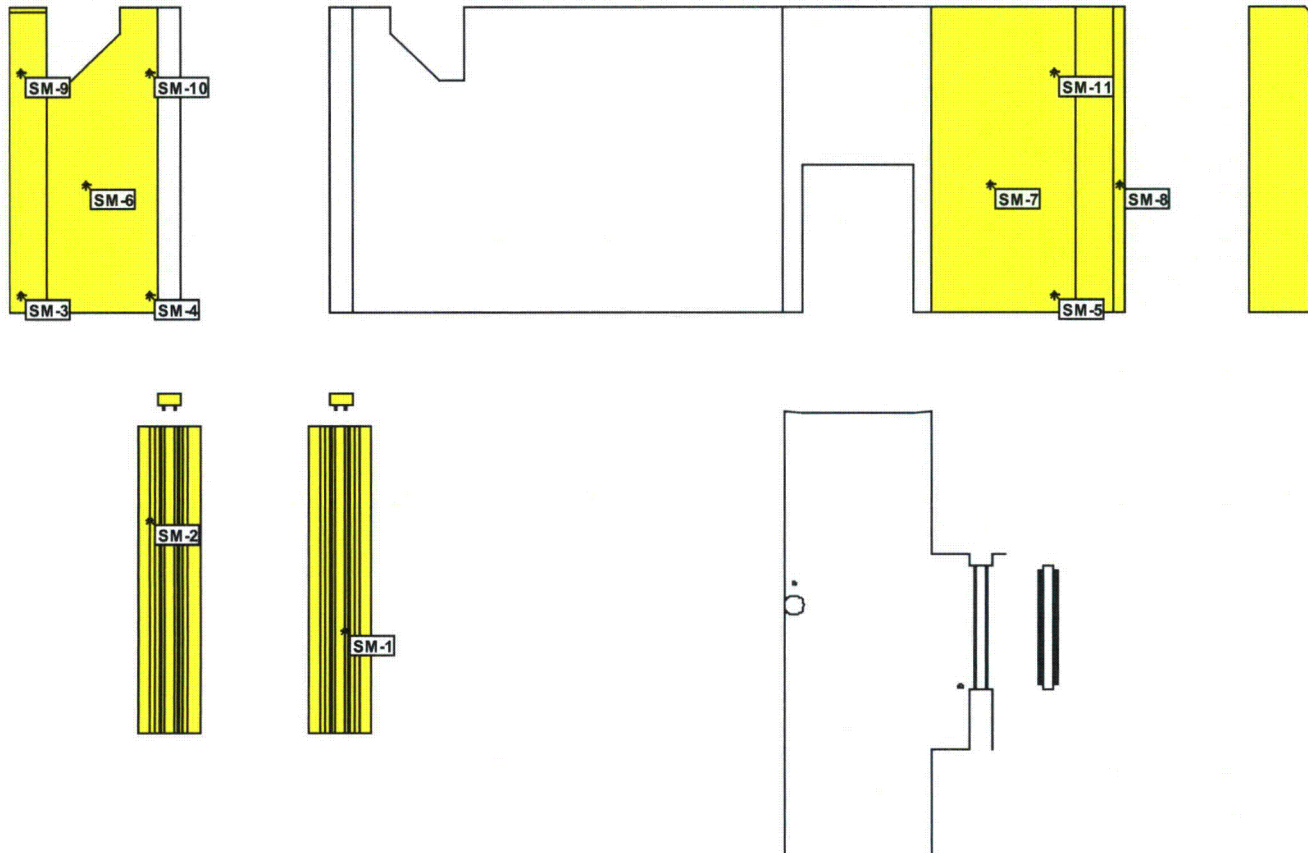
Survey Unit RB-4-2  
Canal F – West and North Walls



RB-4-2 AREA: Canal F – West and North Walls Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.8	0.4	SM-1	657	Systematic	N/A
4.9	0.4	SM-2	685	Systematic	N/A
8.1	0.4	SM-3	378	Systematic	N/A
0.2	3.2	SM-4	797	Systematic	N/A
3.4	3.2	SM-5	119	Systematic	N/A
6.5	3.2	SM-6	643	Systematic	N/A
9.7	3.2	SM-7	434	Systematic	N/A
1.8	5.9	SM-8	336	Systematic	N/A
4.9	5.9	SM-9	573	Systematic	N/A
8.1	5.9	SM-10	580	Systematic	N/A
0.6	5.9	SM-11	748	Systematic	N/A
Sample measurements are taken from the lower left corner of the wall surface on which they rest.					

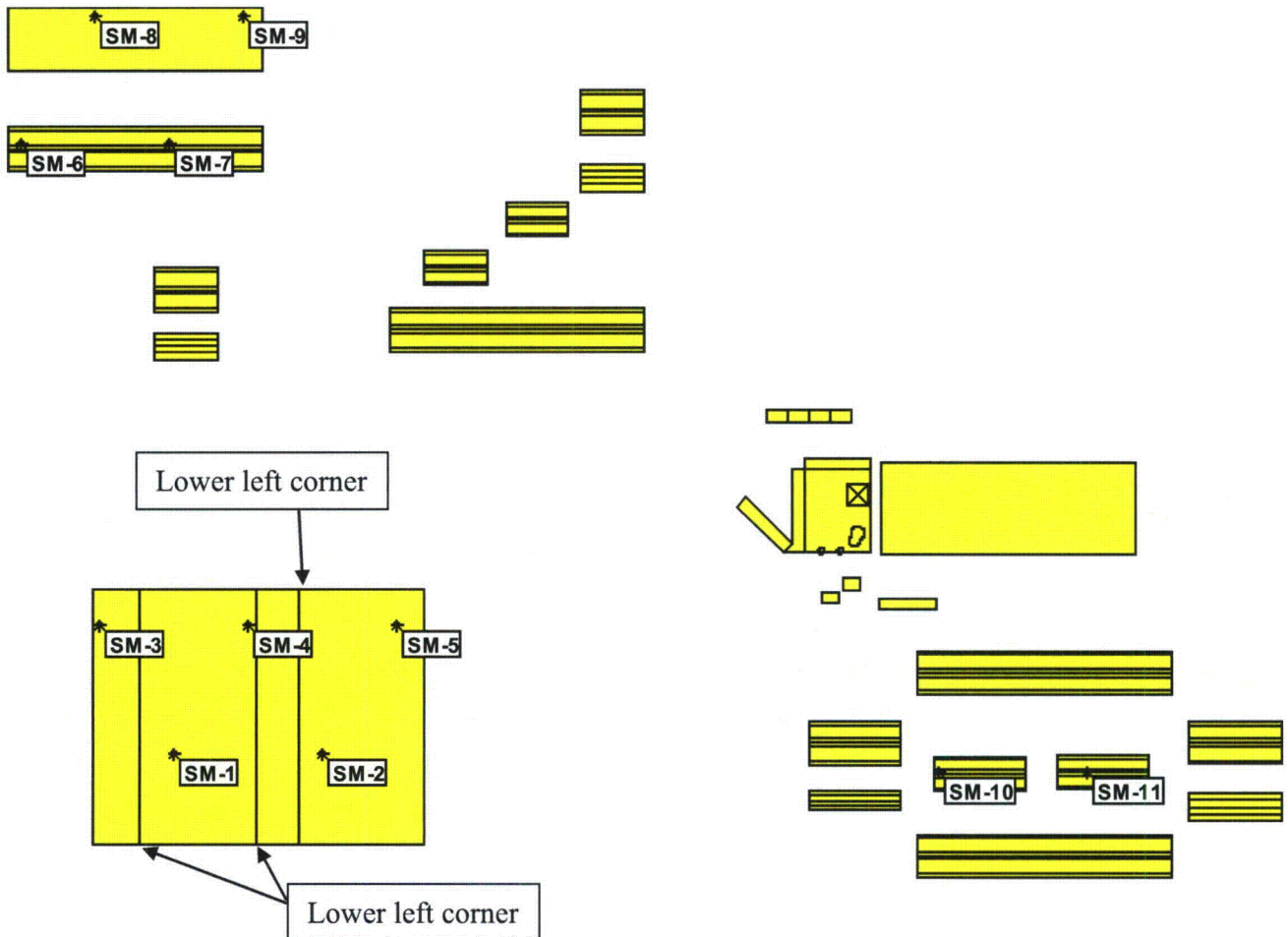


Survey Unit RB-4-3  
Canal F – East Wall and F-J Doorway Sides



RB-4-3					
AREA: Canal F – East Wall and F-J Doorway Sides					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
Edge	2.5	SM-1	259	Systematic	N/A
Edge	5.3	SM-2	273	Systematic	N/A
0.3	0.4	SM-3	776	Systematic	N/A
2.6	0.4	SM-4	650	Systematic	N/A
3.0	0.4	SM-5	755	Systematic	N/A
0.9	3.2	SM-6	420	Systematic	N/A
1.4	3.2	SM-7	413	Systematic	N/A
Center	3.2	SM-8	559	Systematic	N/A
0.3	6.0	SM-9	650	Systematic	N/A
2.6	6.0	SM-10	902	Systematic	N/A
3.0	6.0	SM-11	699	Systematic	N/A
Sample measurements are taken from the lower left corner of the surface on which they rest.					

Survey Unit RB-4-4  
Canal F – Catwalk Underside and Steel

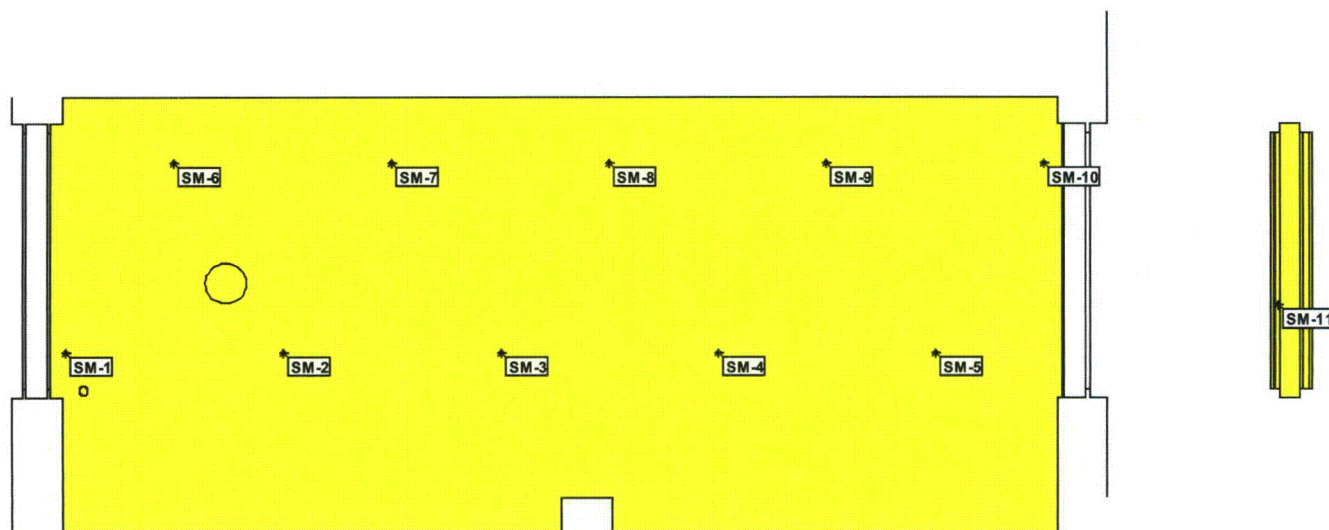


RB-4-4 AREA: Canal F – Catwalk Underside and Steel Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.3	1.2	SM-1	1410	Systematic	N/A
2.4	0.4	SM-2	293	Systematic	N/A
3.2	0.6	SM-3	693	Systematic	N/A
3.2	0.15	SM-4	1180	Systematic	N/A
1.4	1.4	SM-5	833	Systematic	N/A
0.2	Edge	SM-6	87	Systematic	N/A
2.3	Edge	SM-7	133	Systematic	N/A
1.2	Edge	SM-8	73	Systematic	N/A
3.4	Edge	SM-9	200	Systematic	N/A
Edge	Edge	SM-10	-287	Systematic	N/A
0.4	Edge	SM-11	-133	Systematic	N/A

Sample measurements are taken from the lower left corner of the survey unit.

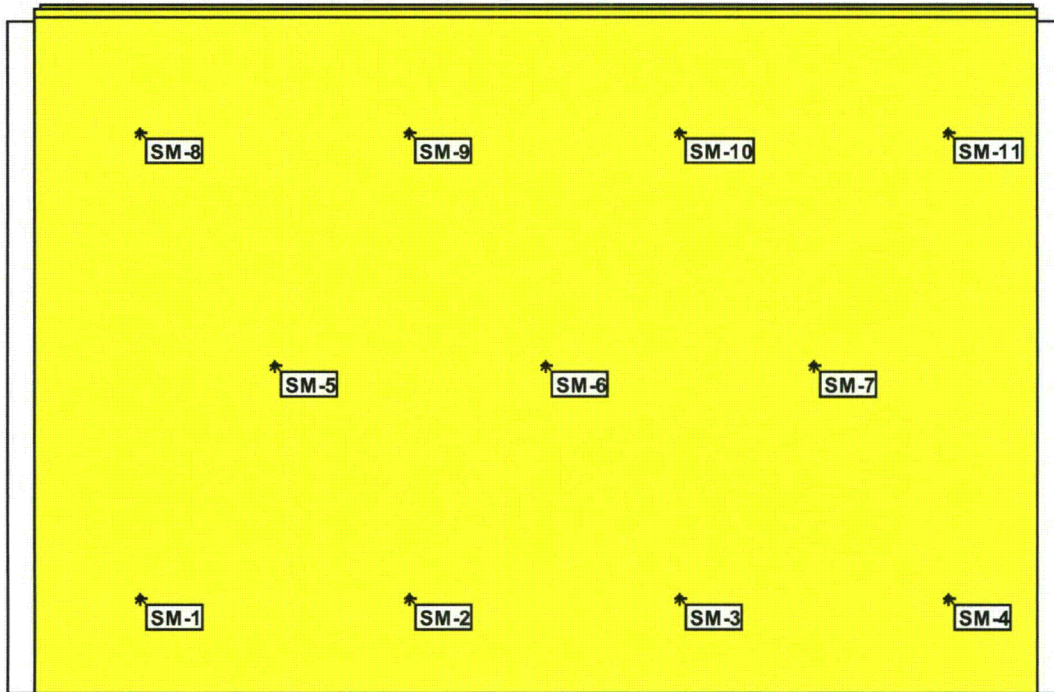


Survey Unit RB-4-5  
Canal G – Floor and G-H Doorway



RB-4-5 AREA: Canal G – Floor and G-H Doorway Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.0	2.0	SM-1	980	Systematic	N/A
2.5	2.0	SM-2	633	Systematic	N/A
4.9	2.0	SM-3	740	Systematic	N/A
7.3	2.0	SM-4	580	Systematic	N/A
9.7	2.0	SM-5	680	Systematic	N/A
1.2	4.1	SM-6	920	Systematic	N/A
3.7	4.1	SM-7	993	Systematic	N/A
6.1	4.1	SM-8	600	Systematic	N/A
8.5	4.1	SM-9	633	Systematic	N/A
10.9	4.1	SM-10	633	Systematic	N/A
Edge	1.0	SM-11	767	Systematic	N/A
Sample measurements are taken from the Southwest corner of the survey unit, except SM-11, which is measured from the south end of the doorway.					

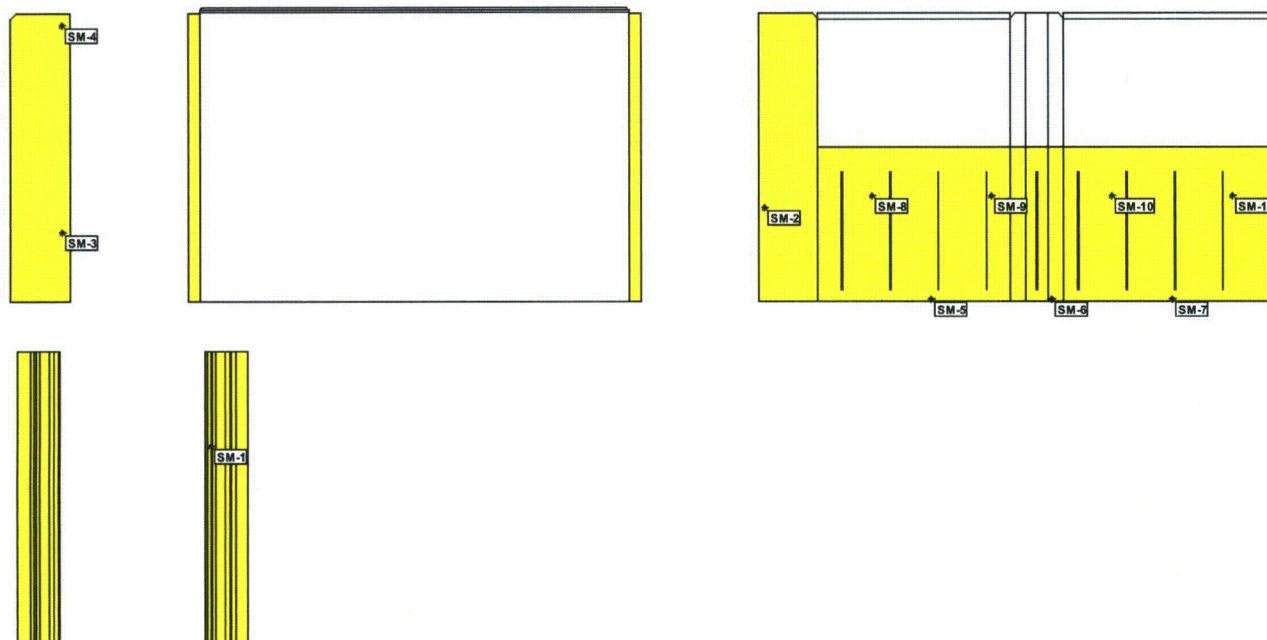
Survey Unit RB-4-6  
Canal G – North Wall



RB-4-6 AREA: Canal G – North Wall Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.2	1.1	SM-1	484	Systematic	N/A
4.1	1.1	SM-2	484	Systematic	N/A
7.1	1.1	SM-3	503	Systematic	N/A
10.1	1.1	SM-4	516	Systematic	N/A
2.6	3.6	SM-5	484	Systematic	N/A
5.6	3.6	SM-6	379	Systematic	N/A
8.6	3.6	SM-7	451	Systematic	N/A
1.2	6.2	SM-8	765	Systematic	N/A
4.1	6.2	SM-9	451	Systematic	N/A
7.1	6.2	SM-10	418	Systematic	N/A
10.1	6.2	SM-11	431	Systematic	N/A
Sample measurements are taken from the lower left corner of the survey unit.					

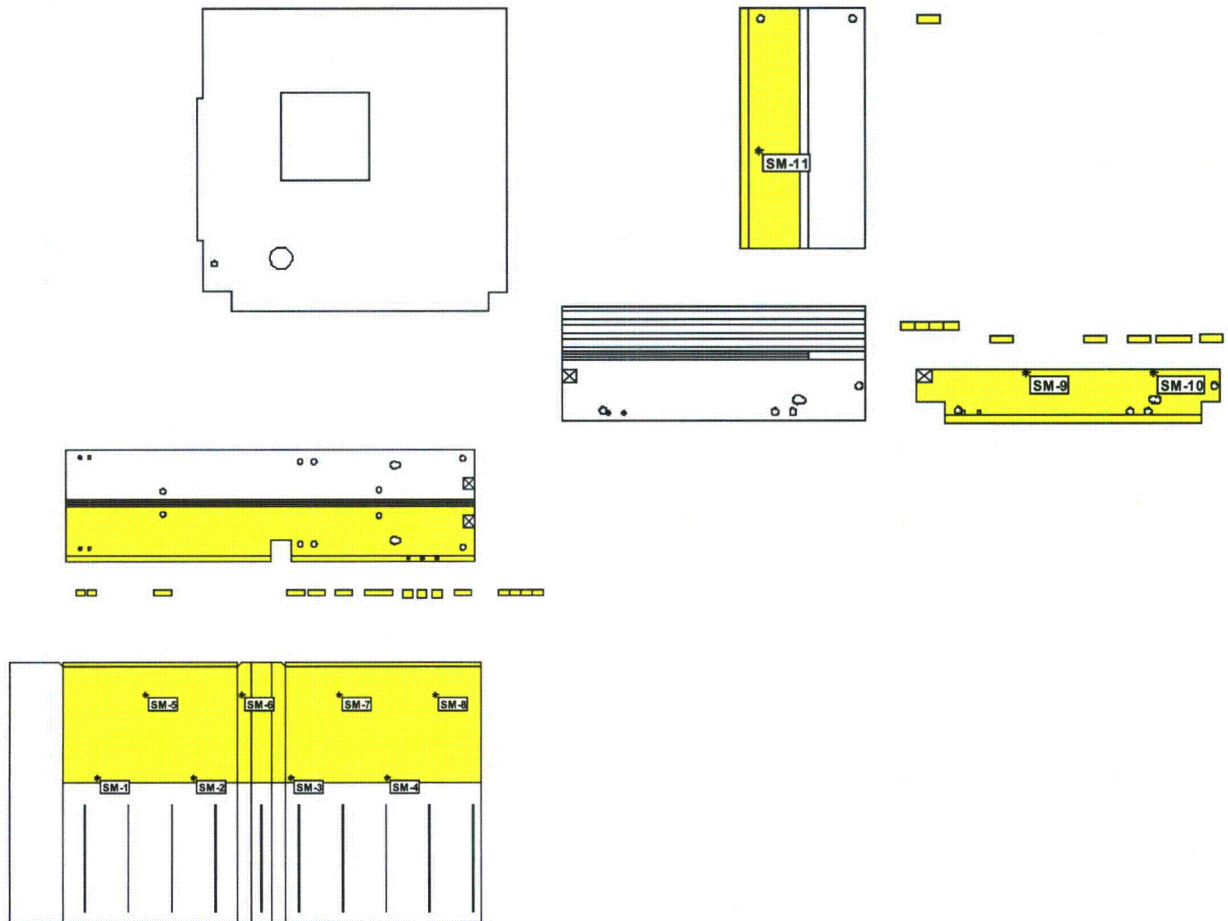


Survey Unit RB-4-7  
Canal G – East and West Walls and Lower 4m of South Wall



RB-4-7					
AREA: Canal G – East and West Walls and Lower 4m of South Wall					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
Edge	5.1	SM-1	111	Systematic	N/A
0.1	2.4	SM-2	490	Systematic	N/A
1.3	1.8	SM-3	451	Systematic	N/A
1.3	7.2	SM-4	209	Systematic	N/A
2.9	0.1	SM-5	529	Systematic	N/A
6.0	0.1	SM-6	765	Systematic	N/A
9.1	0.1	SM-7	948	Systematic	N/A
1.4	2.7	SM-8	216	Systematic	N/A
4.5	2.7	SM-9	333	Systematic	N/A
7.6	2.7	SM-10	745	Systematic	N/A
10.7	2.7	SM-11	386	Systematic	N/A
Sample measurements are taken from the lower left corner of the wall surface on which they lie.					

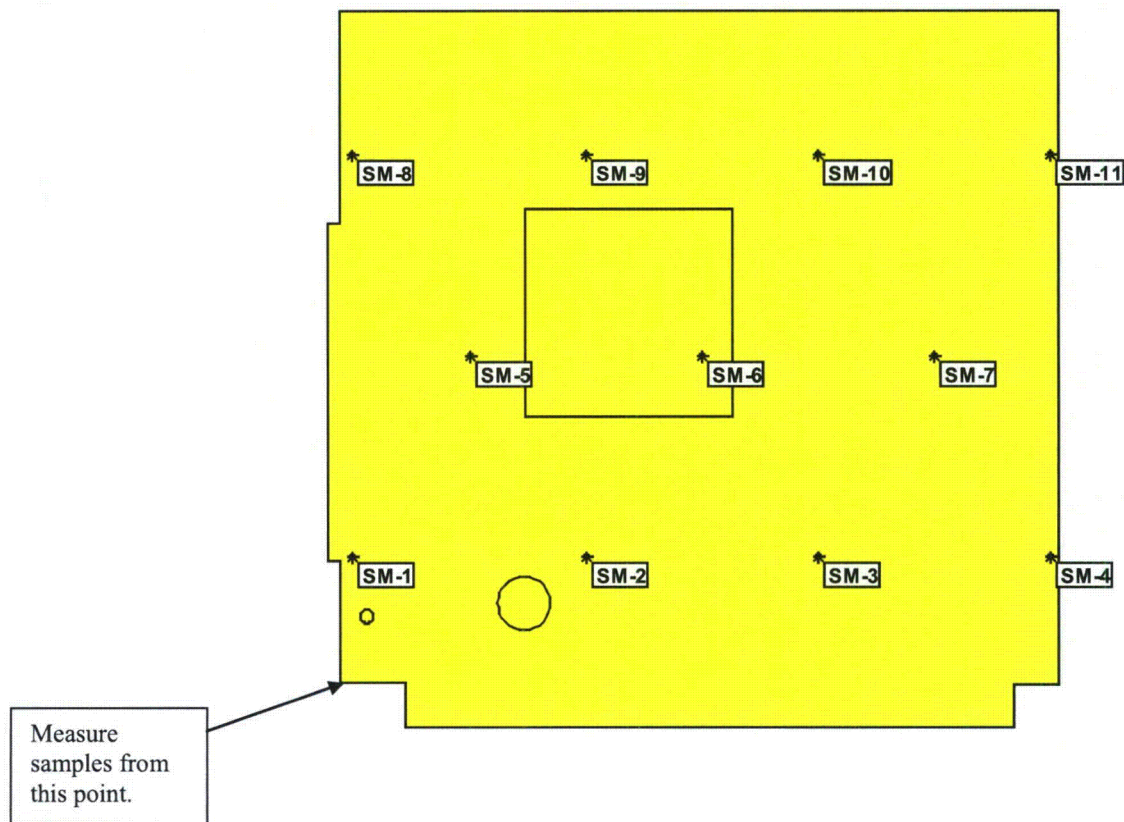
Survey Unit RB-4-8  
Canal G – South Wall above 2m and G and H Ceiling



RB-4-8 AREA: Canal G – South Wall above 2m and G and H Ceiling Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.0	4.1	SM-1	839	Systematic	N/A
3.7	4.1	SM-2	678	Systematic	N/A
6.5	4.1	SM-3	755	Systematic	N/A
9.2	4.1	SM-4	671	Systematic	N/A
2.3	6.5	SM-5	713	Systematic	N/A
5.1	6.5	SM-6	1077	Systematic	N/A
7.8	6.5	SM-7	587	Systematic	N/A
10.6	6.5	SM-8	566	Systematic	N/A
2.3	Edge	SM-9	-28	Systematic	N/A
5.1	Edge	SM-10	287	Systematic	N/A
0.2	2.1	SM-11	552	Systematic	N/A
Sample measurements are taken from the lower left or southwest corner of the surface on which they lie.					

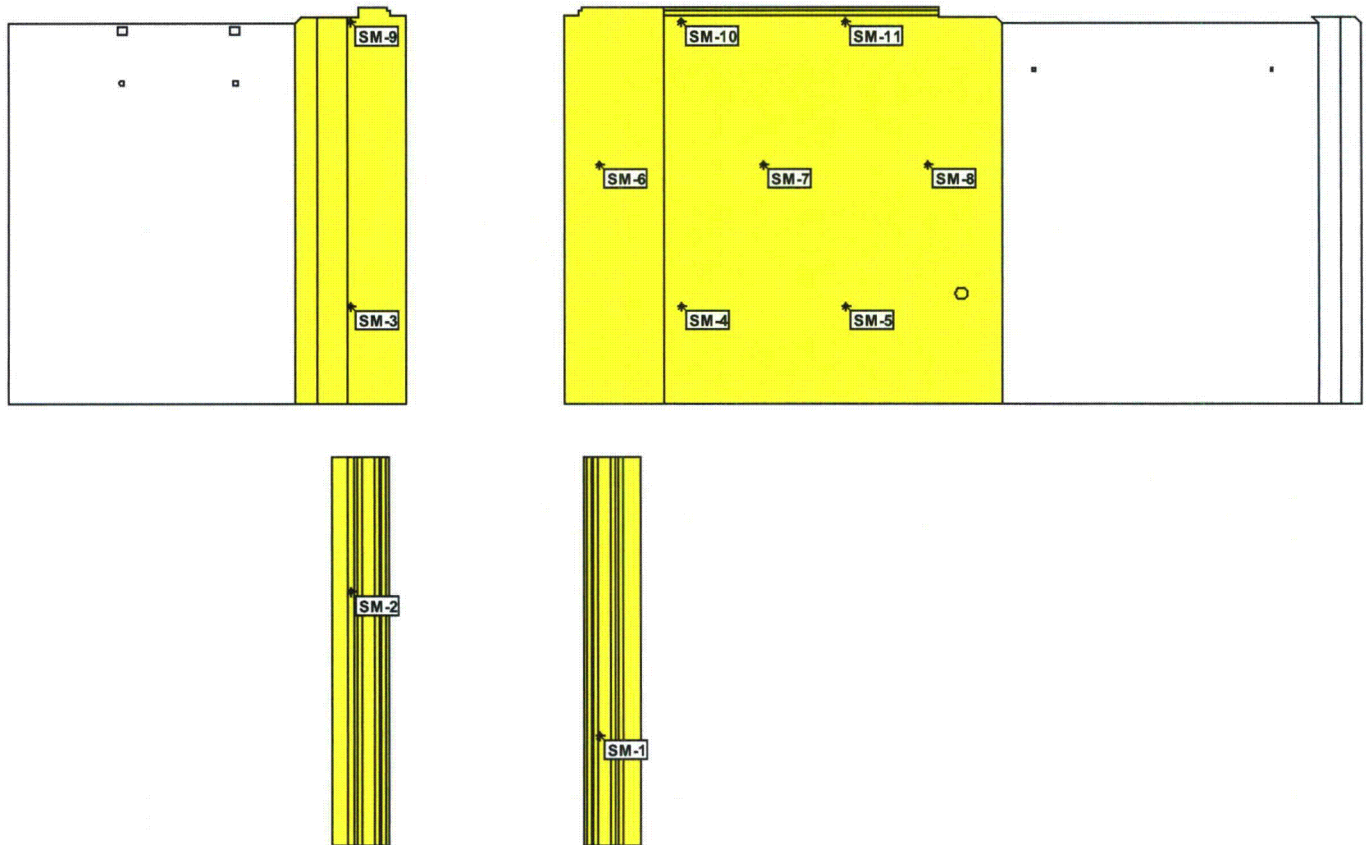


Survey Unit RB-4-9  
Canal H – Floor



RB-4-9 AREA: Canal H – Floor Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.1	1.1	SM-1	887	Systematic	N/A
2.2	1.1	SM-2	613	Systematic	N/A
4.3	1.1	SM-3	700	Systematic	N/A
6.4	1.1	SM-4	560	Systematic	N/A
1.2	3.0	SM-5	767	Systematic	N/A
3.3	3.0	SM-6	1327	Systematic	N/A
5.4	3.0	SM-7	827	Systematic	N/A
0.1	4.8	SM-8	420	Systematic	N/A
2.2	4.8	SM-9	633	Systematic	N/A
4.3	4.8	SM-10	633	Systematic	N/A
6.4	4.8	SM-11	767	Systematic	N/A
Sample measurements are taken from the point shown on the map.					

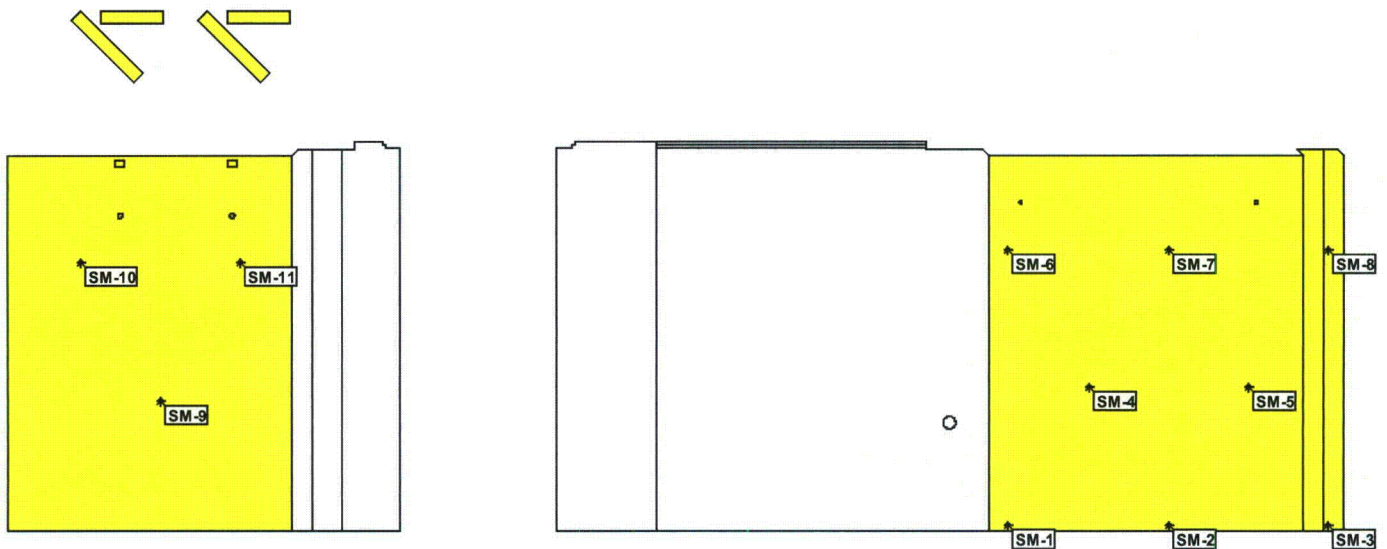
Survey Unit RB-4-10  
Canal H – West and North Walls and G-H Doorway Sides



RB-4-10 AREA: Canal H – West and North Walls and G-H Doorway Sides Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
Edge	2.1	SM-1	-182	Systematic	N/A
Edge	4.9	SM-2	-7	Systematic	N/A
Edge	1.9	SM-3	629	Systematic	N/A
0.3	1.9	SM-4	252	Systematic	N/A
3.5	1.9	SM-5	552	Systematic	N/A
0.7	4.6	SM-6	399	Systematic	N/A
1.9	4.6	SM-7	545	Systematic	N/A
5.1	4.6	SM-8	853	Systematic	N/A
Edge	7.4	SM-9	112	Systematic	N/A
0.3	7.4	SM-10	1090	Systematic	N/A
3.5	7.4	SM-11	476	Systematic	N/A
Sample measurements are taken from the lower left corner of the surface on which they lie.					

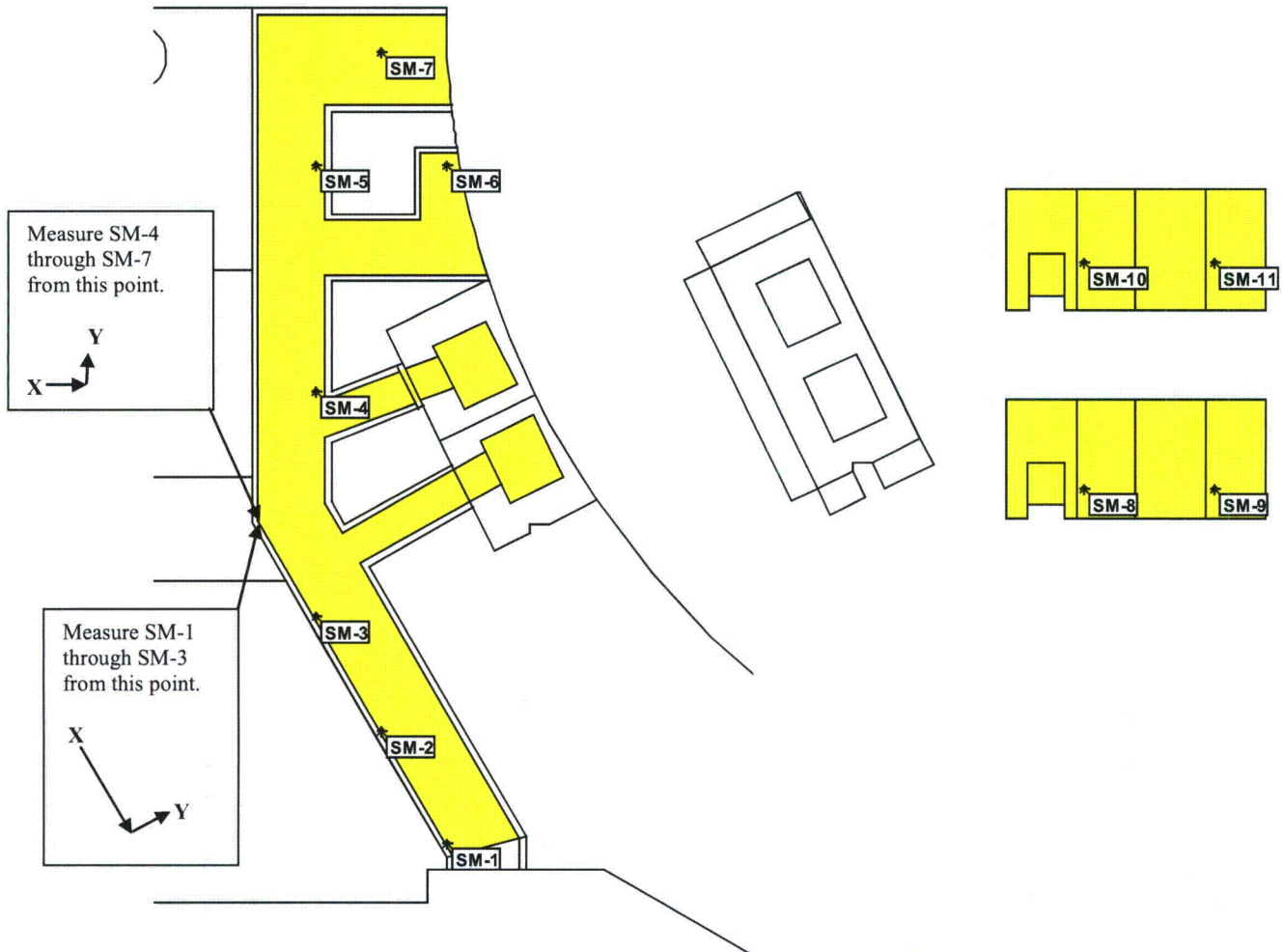


Survey Unit RB-4-11  
Canal H – South and East Walls



RB-4-11 AREA: Canal H – South and East Walls Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.4	0.1	SM-1	734	Systematic	N/A
3.5	0.1	SM-2	315	Systematic	N/A
6.6	0.1	SM-3	615	Systematic	N/A
1.9	2.8	SM-4	762	Systematic	N/A
5.0	2.8	SM-5	462	Systematic	N/A
0.4	5.5	SM-6	601	Systematic	N/A
3.5	5.5	SM-7	350	Systematic	N/A
6.6	5.5	SM-8	636	Systematic	N/A
3.0	2.6	SM-9	483	Systematic	N/A
1.4	5.3	SM-10	608	Systematic	N/A
4.5	5.3	SM-11	678	Systematic	N/A
Sample measurements are taken from the lower left corner of the surface on which they lie.					

**Survey Unit RB-4-12**  
**RB -25' - Trench Floor outside of the PPP Room**

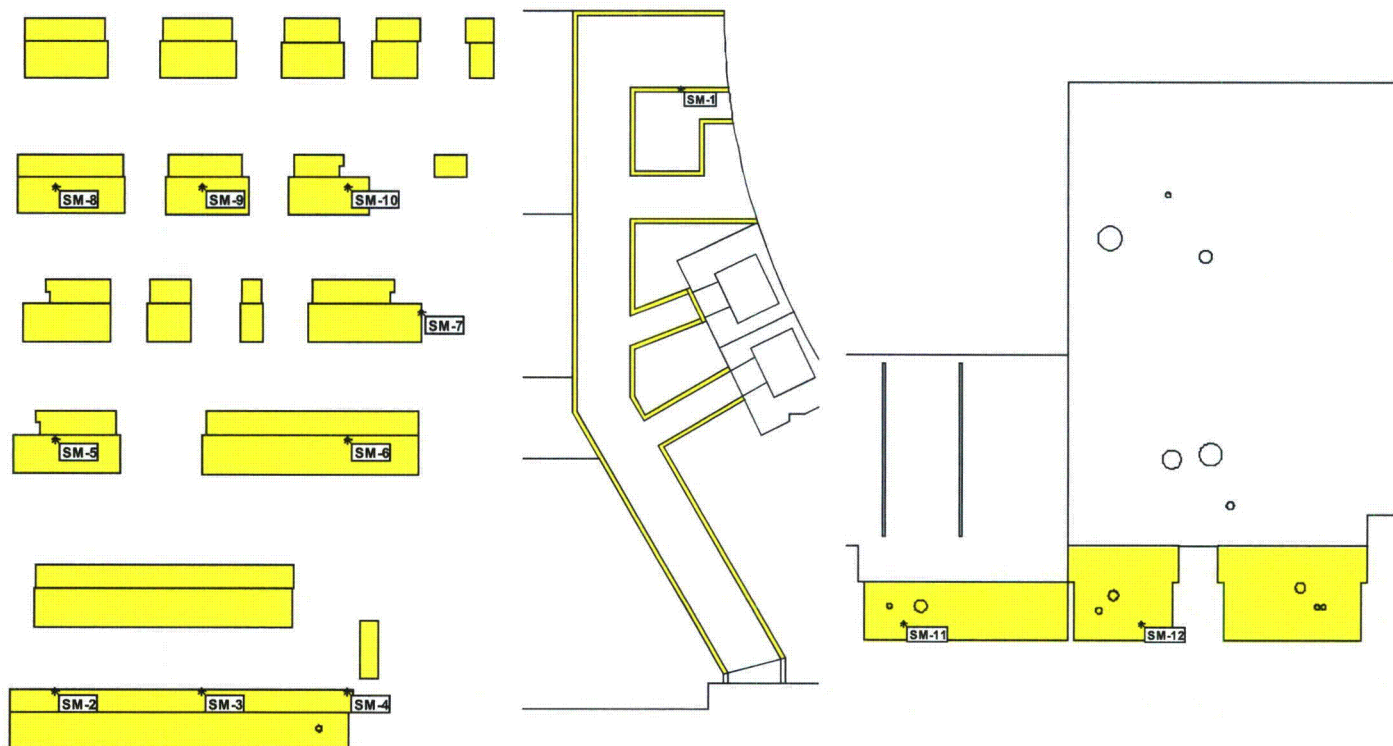


RB-4-12					
AREA: RB -25' Elevation, Trench Floor outside of the PPP Room					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
6.4	0.05	SM-1	916	Systematic	N/A
4.2	0.05	SM-2	490	Systematic	N/A
1.9	0.05	SM-3	650	Systematic	N/A
1.0	2.3	SM-4	517	Systematic	N/A
1.0	6.2	SM-5	1020	Systematic	N/A
3.3	6.2	SM-6	713	Systematic	N/A
2.1	8.1	SM-7	2100	Systematic	N/A
0.1	0.5	SM-8	664	Systematic	N/A
0.1	0.5	SM-9	776	Systematic	N/A
0.1	0.8	SM-10	636	Systematic	N/A
0.1	0.8	SM-11	517	Systematic	N/A

Sample Measurements are taken from the locations shown on the map for the trench bottom, and the lower left corner of the surface on which they lie for the pit sides.

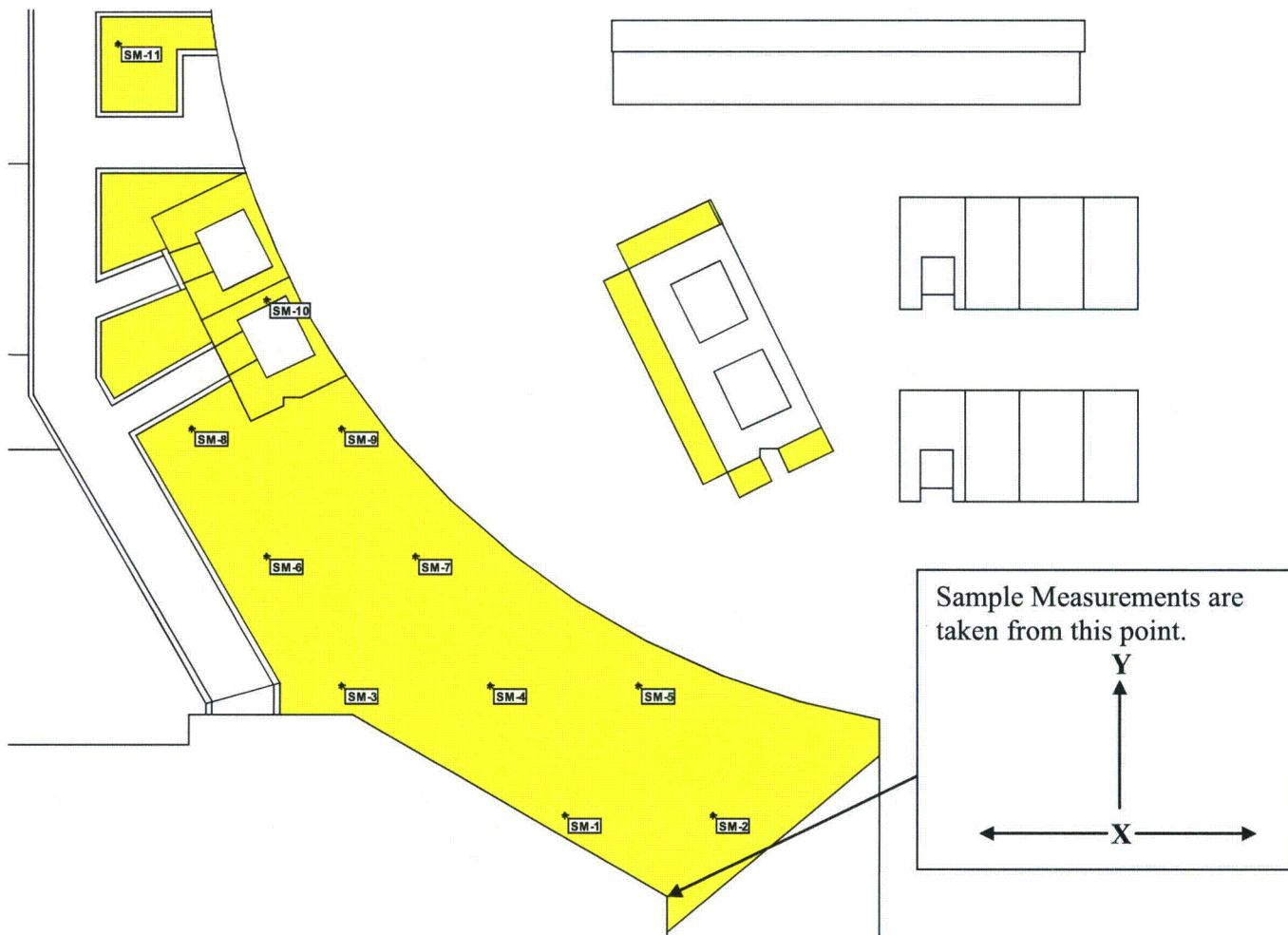


Survey Unit RB-4-13  
RB -25' - Trench Walls outside of the PPP Room



RB-4-13					
AREA: RB -25' Elevation, Trench Walls outside of the PPP Room					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.1	0.05	SM-1	273	Systematic	N/A
1.2	0.5	SM-2	608	Systematic	N/A
5.0	0.5	SM-3	706	Systematic	N/A
8.7	0.5	SM-4	217	Systematic	N/A
1.1	0.9	SM-5	1150	Systematic	N/A
3.8	0.9	SM-6	762	Systematic	N/A
2.8	0.8	SM-7	734	Systematic	N/A
1.0	0.7	SM-8	790	Systematic	N/A
0.9	0.7	SM-9	510	Systematic	N/A
1.6	0.7	SM-10	399	Systematic	N/A
0.6	0.3	SM-11	399	Systematic	N/A
1.1	0.3	SM-12	119	Systematic	N/A
Sample measurements are taken from the lower left corner of the surface on which they lie.					

Survey Unit RB-4-14  
RB -25' - Floor Section #1 – East Floor

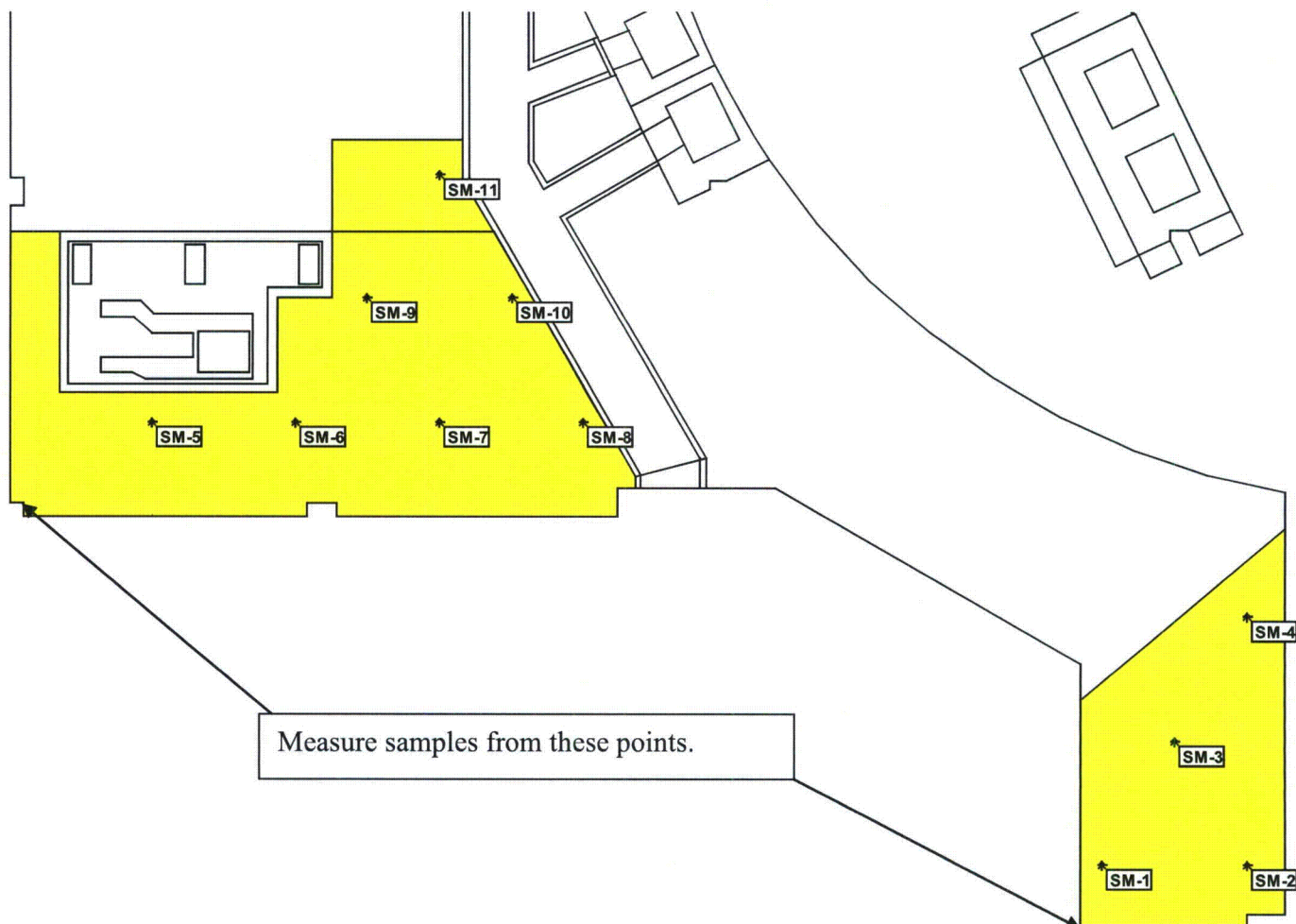


RB-4-14					
AREA: RB -25' Elevation, Floor Section #1 – East Floor					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
-1.9	1.5	SM-1	898	Systematic	N/A
0.9	1.5	SM-2	599	Systematic	N/A
-6.1	4.0	SM-3	854	Systematic	N/A
-3.3	4.0	SM-4	1088	Systematic	N/A
-0.5	4.0	SM-5	876	Systematic	N/A
-7.5	6.4	SM-6	555	Systematic	N/A
-4.7	6.4	SM-7	1051	Systematic	N/A
-8.9	8.8	SM-8	774	Systematic	N/A
-6.1	8.8	SM-9	1190	Systematic	N/A
-7.5	11.2	SM-10	832	Systematic	N/A
-10.3	16.1	SM-11	599	Systematic	N/A

Sample measurements are taken from the location shown on the map.



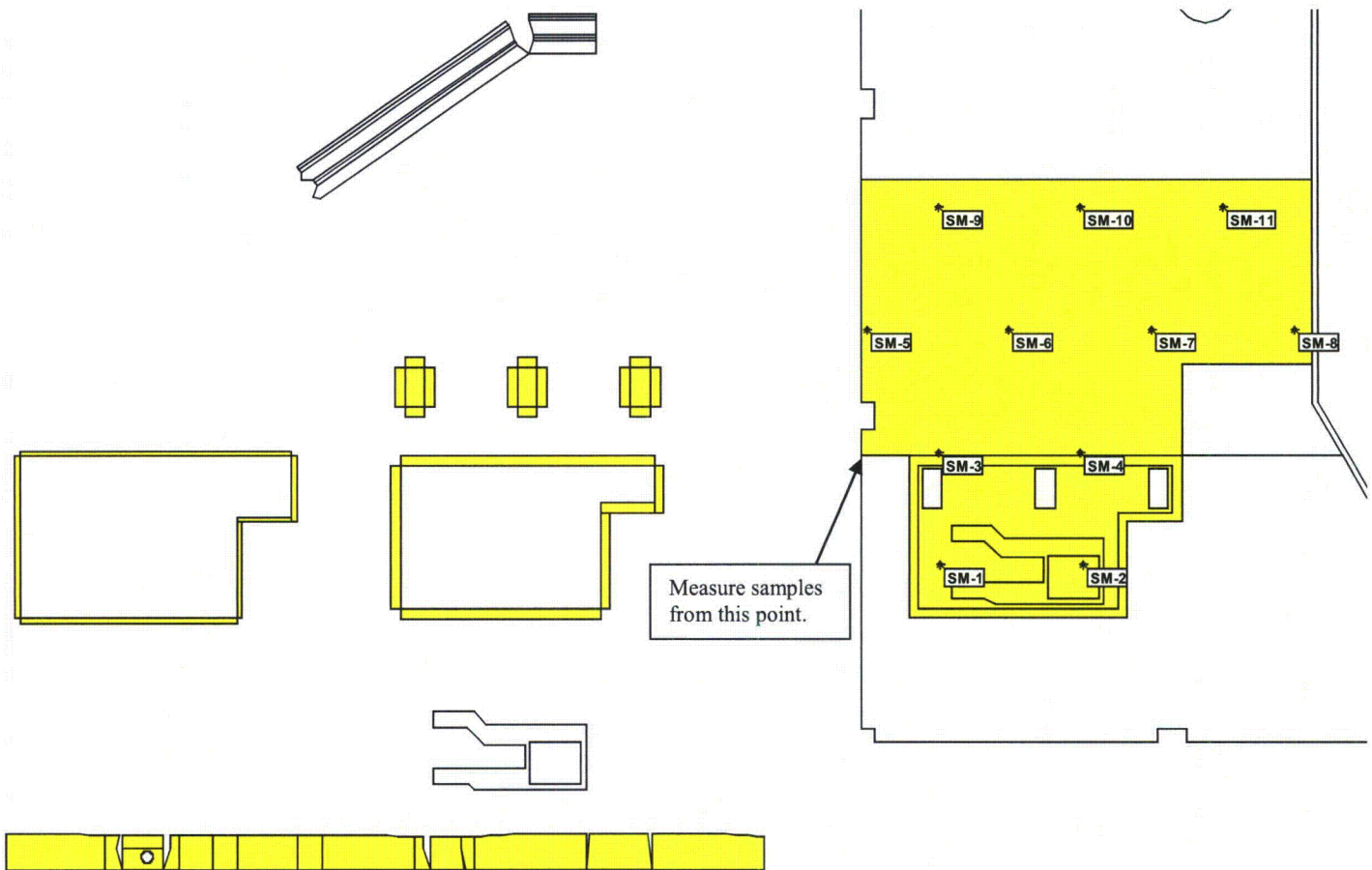
**Survey Unit RB-4-15**  
**RB -25' - Floor Section #2 – SE and South Floor**



<b>RB-4-15</b> <b>AREA: RB -25' Elevation, Floor Section #2 – SE and South Floor</b> <b>Measurement Locations and results</b>					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.4	1.2	SM-1	1029	Systematic	N/A
3.2	1.2	SM-2	920	Systematic	N/A
1.8	3.6	SM-3	876	Systematic	N/A
3.2	6.0	SM-4	934	Systematic	N/A
2.5	1.6	SM-5	613	Systematic	N/A
5.3	1.6	SM-6	701	Systematic	N/A
8.1	1.6	SM-7	927	Systematic	N/A
10.9	1.6	SM-8	803	Systematic	N/A
6.7	4.0	SM-9	562	Systematic	N/A
9.5	4.0	SM-10	219	Systematic	N/A
8.1	6.4	SM-11	949	Systematic	N/A

Sample measurements are taken from the points shown on the map.

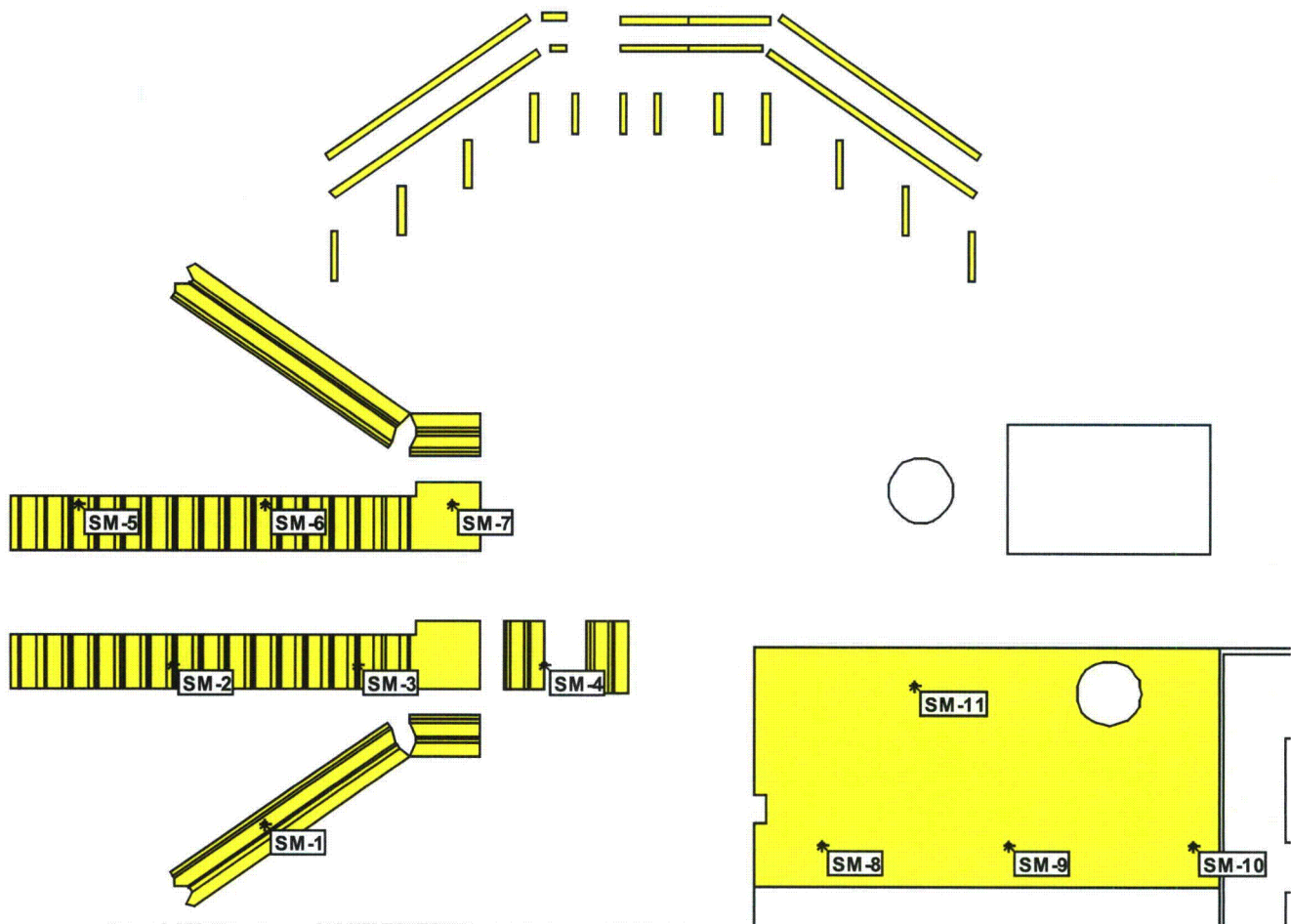
Survey Unit RB-4-16  
RB -25' - Floor Section #3 – Center Floor and Pad



RB-4-16					
AREA: RB -25' Elevation, Floor Section #3 – Center Floor and Pad					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.5	-2.1	SM-1	620	Systematic	N/A
4.3	-2.1	SM-2	1204	Systematic	N/A
1.5	0.1	SM-3	482	Systematic	N/A
4.3	0.1	SM-4	628	Systematic	N/A
0.1	2.5	SM-5	774	Systematic	N/A
2.9	2.5	SM-6	839	Systematic	N/A
5.7	2.5	SM-7	869	Systematic	N/A
8.4	2.5	SM-8	759	Systematic	N/A
1.5	4.9	SM-9	701	Systematic	N/A
4.3	4.9	SM-10	759	Systematic	N/A
7.0	4.9	SM-11	606	Systematic	N/A
Sample Measurements are taken from the point shown on the map.					



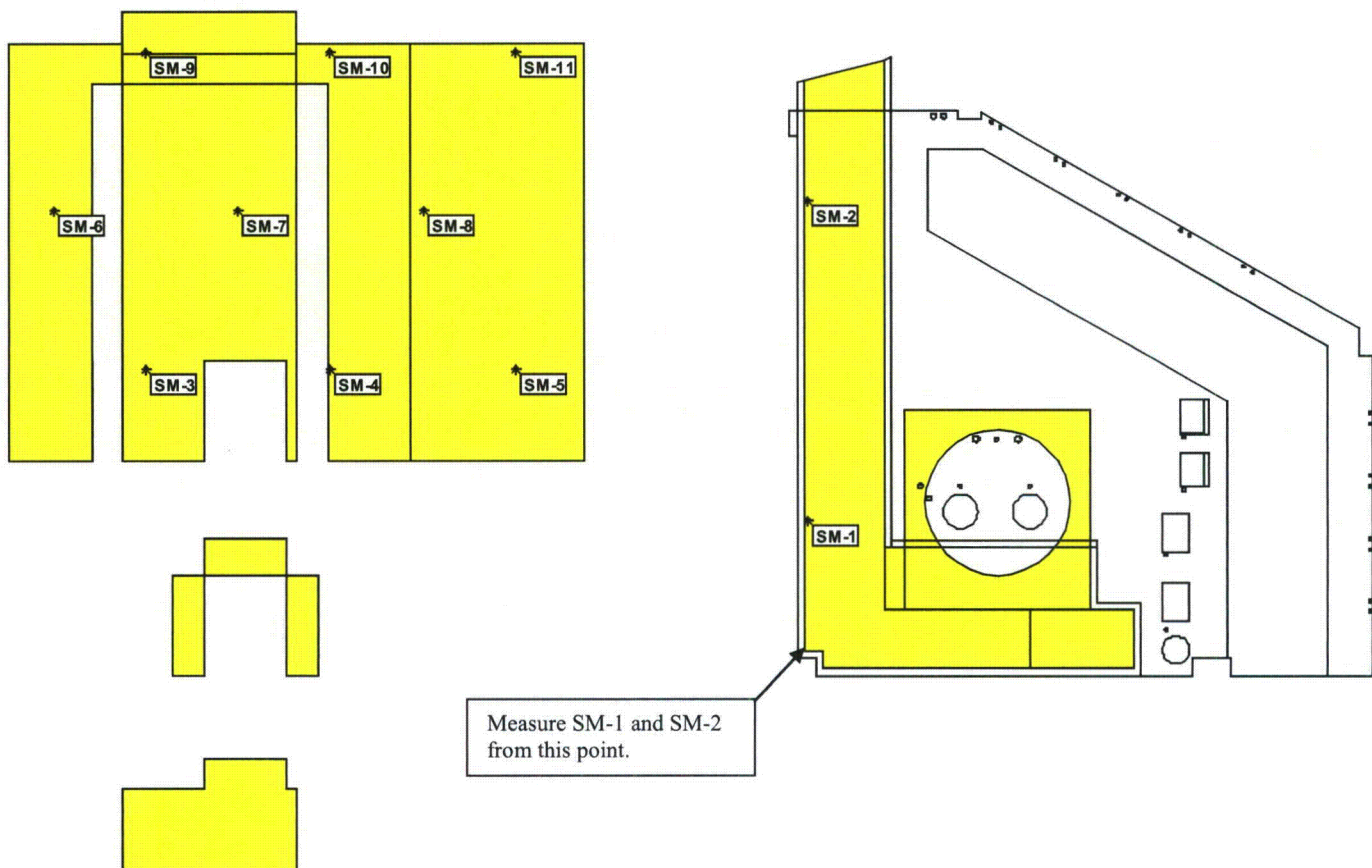
Survey Unit RB-4-17  
RB -25' - Floor Section #4 – North Floor and Stairway



RB-4-17					
AREA: RB -25' Elevation, Floor Section #4 – North Floor and Stairway					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.8	0.1	SM-1	102	Systematic	N/A
0.5	0.1	SM-2	124	Systematic	N/A
0.5	center	SM-3	-161	Systematic	N/A
0.5	edge	SM-4	102	Systematic	N/A
0.2	0.1	SM-5	496	Systematic	N/A
0.2	0.2	SM-6	985	Systematic	N/A
0.4	0.6	SM-7	745	Systematic	N/A
1.3	0.8	SM-8	891	Systematic	N/A
4.8	0.8	SM-9	336	Systematic	N/A
8.3	0.8	SM-10	1022	Systematic	N/A
3.1	3.8	SM-11	825	Systematic	N/A

Measurements for SM-1 through SM-7 are taken from the lower left corner of the surface on which they lie, measurements for SM-8 through SM-11 are taken from the southwest corner of the survey unit.

Survey Unit RB-4-18  
RB -25' - PPP Room Trench and Pipe Chase

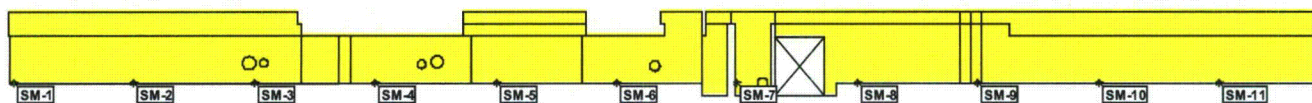
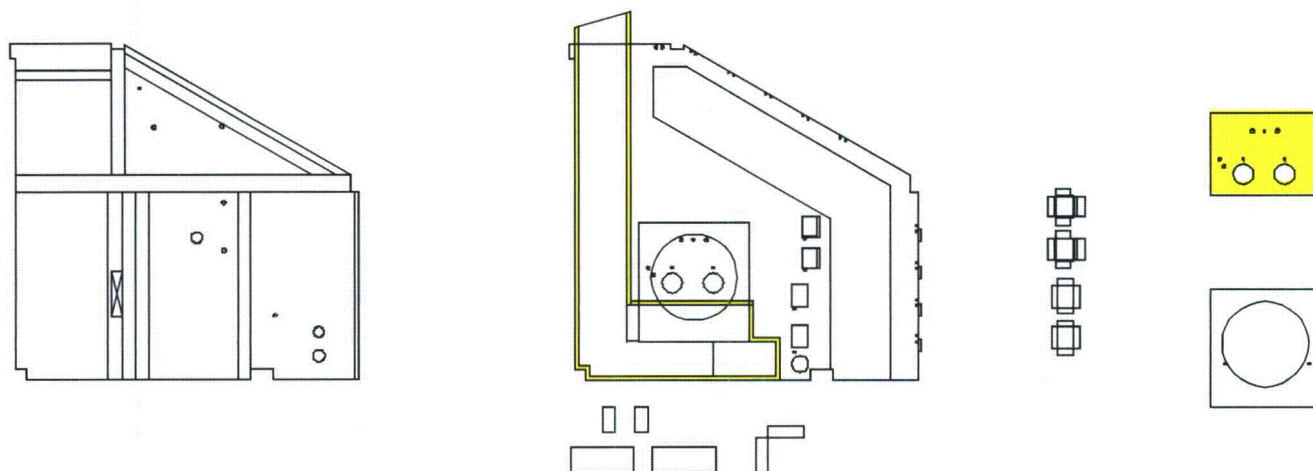


RB-4-18 AREA: RB -25' Elevation, PPP Room Trench and Pipe Chase Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
Edge	1.9	SM-1	1160	Systematic	N/A
Edge	6.6	SM-2	3920	Systematic	N/A
0.3	1.4	SM-3	908	Systematic	N/A
0.1	1.4	SM-4	789	Systematic	N/A
1.5	1.4	SM-5	1200	Systematic	N/A
0.6	3.7	SM-6	845	Systematic	N/A
1.7	3.7	SM-7	817	Systematic	N/A
0.2	3.7	SM-8	930	Systematic	N/A
0.3	Edge	SM-9	521	Systematic	N/A
0.5	6.0	SM-10	606	Systematic	N/A
1.6	6.0	SM-11	507	Systematic	N/A

Sample measurements for SM-1 and SM-2 are taken from the point shown on the map. Measurements for SM-3 through SM-11 are taken from the lower left corner of the surface on which they lie.

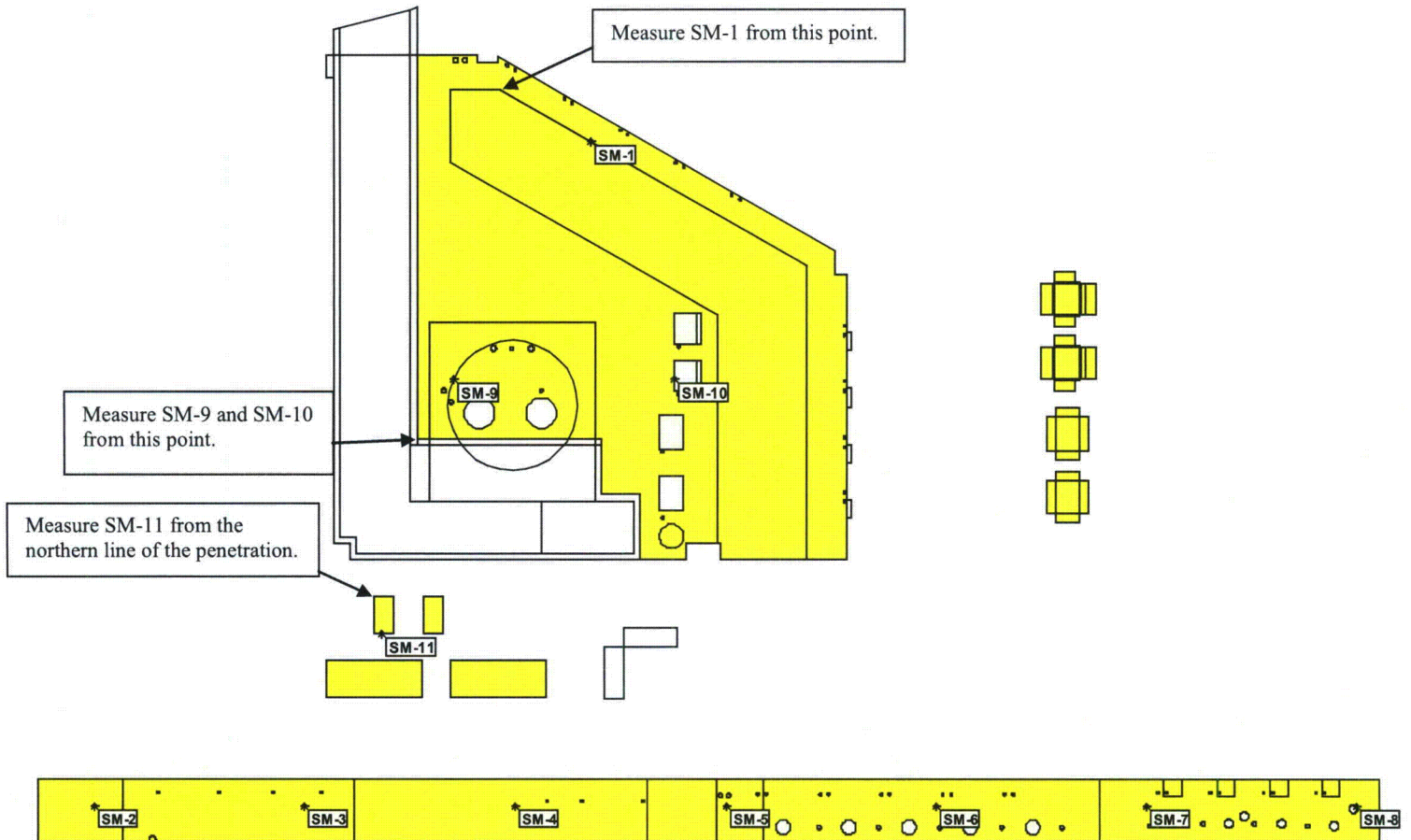


**Survey Unit RB-4-19**  
**RB -25' - PPP Room Trench Walls**



<b>RB-4-19</b> <b>AREA: RB -25' Elevation, PPP Room Trench Walls</b> <b>Measurement Locations and results</b>					
<b>X Co-ord (m)</b>	<b>Y Co-ord (m)</b>	<b>Location /</b>		<b>Type</b>	<b>Notes</b>
0.1	bottom edge	SM-1	1944	Systematic	N/A
3.1		SM-2	3387	Systematic	N/A
6.1		SM-3	2563	Systematic	N/A
0.6		SM-4	1915	Systematic	N/A
0.6		SM-5	975	Systematic	N/A
0.8		SM-6	1873	Systematic	N/A
Edge		SM-7	563	Systematic	N/A
0.8		SM-8	2993	Systematic	N/A
0.15		SM-9	3211	Systematic	N/A
2.9		SM-10	3408	Systematic	N/A
5.9	↓	SM-11	5458	Systematic	N/A
Sample measurements are taken from the lower left corner of the surface on which they lie.					

Survey Unit RB-4-20  
RB -25' - PPP Room Floor and Pump Services Trench



RB-4-20					
AREA: RB -25' Elevation, PPP Room Floor and Pump Services Trench					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.7	edge	SM-1	797	Systematic	N/A
1.0	0.7	SM-2	580	Systematic	N/A
3.2	0.7	SM-3	783	Systematic	N/A
2.8	0.7	SM-4	629	Systematic	N/A
0.15	0.7	SM-5	776	Systematic	N/A
3.0	0.7	SM-6	1250	Systematic	N/A
0.8	0.7	SM-7	524	Systematic	N/A
4.4	0.7	SM-8	1310	Systematic	N/A
0.6	1.0	SM-9	1300	Systematic	N/A
4.2	1.0	SM-10	1200	Systematic	N/A
0.1	Bottom edge	SM-11	1420	Systematic	N/A
Sample measurements for SM-2 through SM-8 are taken from the lower left corner of the surface on which they lie. Measurements for SM-1 and SM-9 through SM-11 are taken from the point shown on the map.					

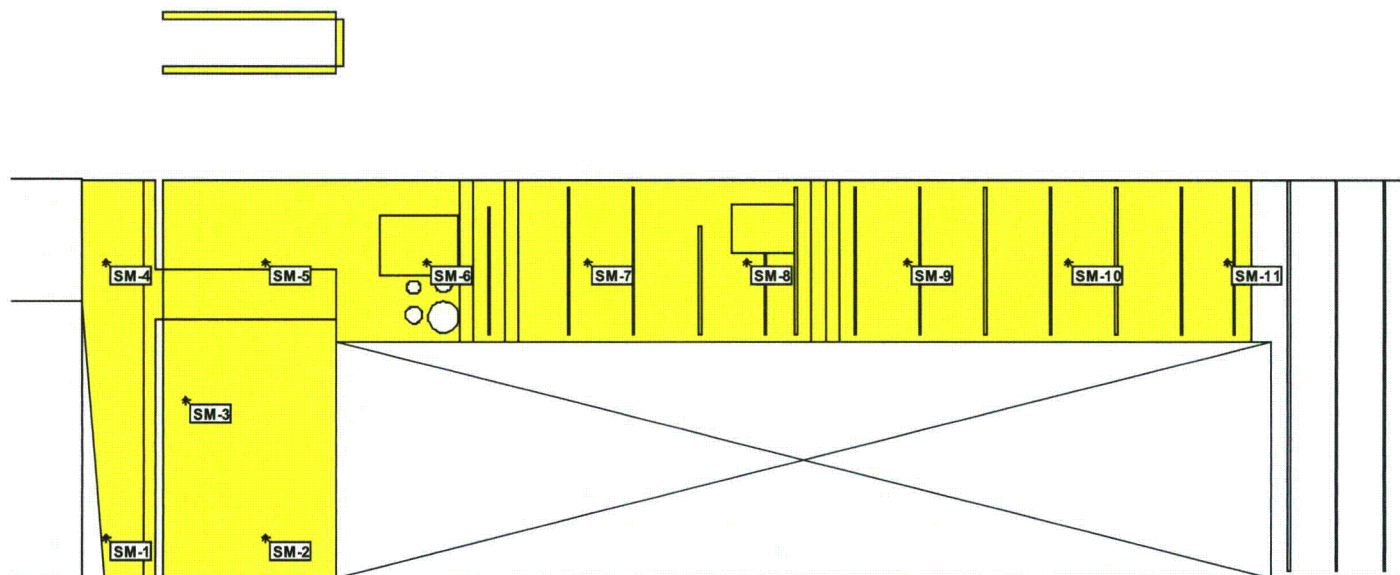


Survey Unit RB-4-21  
RB -25' - Wall Section #1



RB-4-21 AREA: RB -25' Elevation, Wall Section #1 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.3	1.8	SM-1	469	Systematic	N/A
1.7	1.8	SM-2	622	Systematic	N/A
4.3	1.8	SM-3	552	Systematic	N/A
6.9	1.8	SM-4	497	Systematic	N/A
0.4	4.0	SM-5	538	Systematic	N/A
3.0	4.0	SM-6	301	Systematic	N/A
5.6	4.0	SM-7	336	Systematic	N/A
0.3	6.3	SM-8	587	Systematic	N/A
1.7	6.3	SM-9	287	Systematic	N/A
4.3	6.3	SM-10	483	Systematic	N/A
6.9	6.3	SM-11	531	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

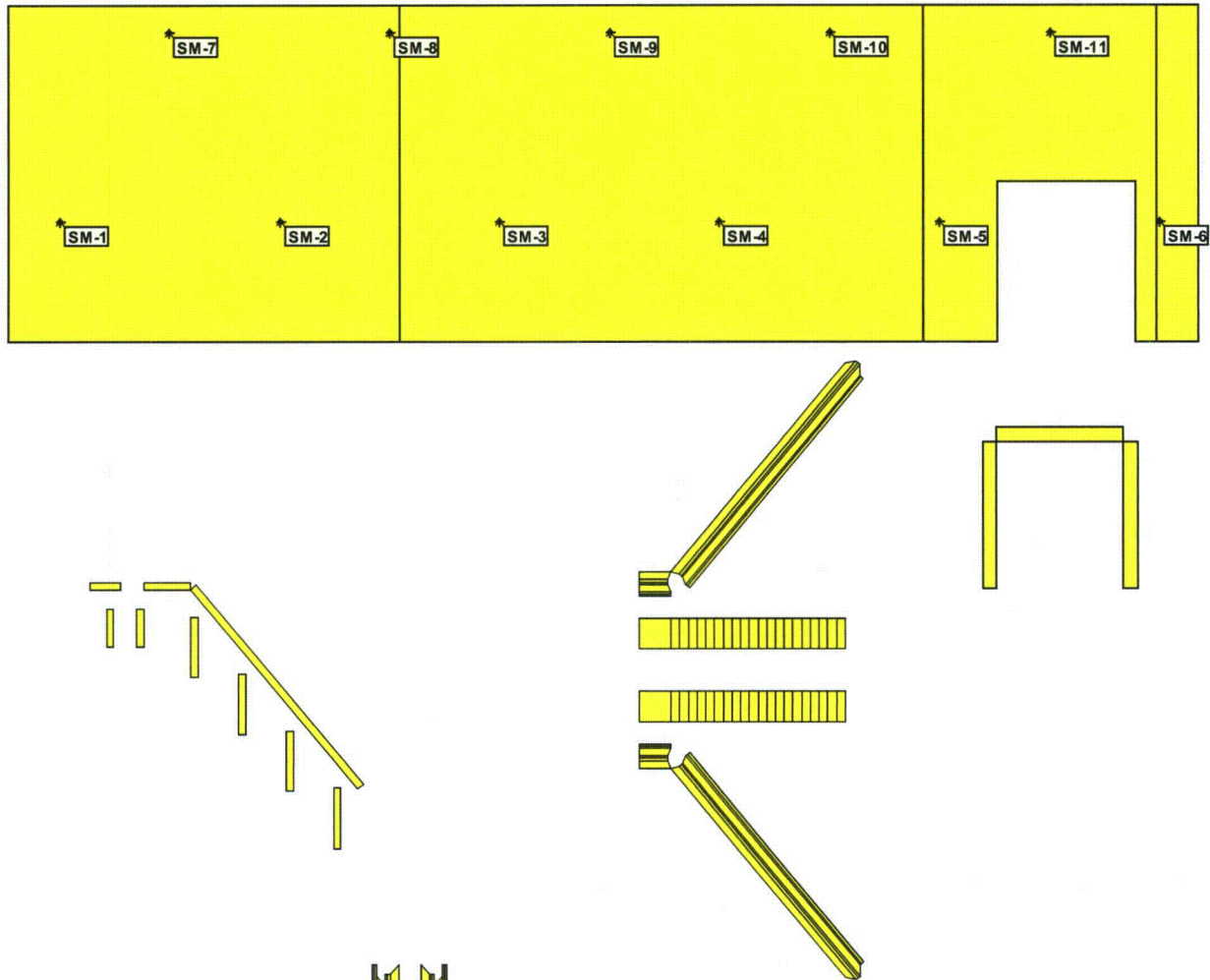
Survey Unit RB-4-22  
RB -25' - Wall Section #2



RB-4-22 AREA: RB -25' Elevation, Wall Section #2 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0	0.7	SM-1	406	Systematic	N/A
1.9	0.7	SM-2	517	Systematic	N/A
0.4	3.3	SM-3	720	Systematic	N/A
0	5.9	SM-4	483	Systematic	N/A
1.9	0.2	SM-5	622	Systematic	N/A
4.9	1.5	SM-6	217	Systematic	N/A
1.3	1.5	SM-7	706	Systematic	N/A
4.3	1.5	SM-8	720	Systematic	N/A
1.2	1.5	SM-9	503	Systematic	N/A
4.2	1.5	SM-10	231	Systematic	N/A
7.2	1.5	SM-11	126	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

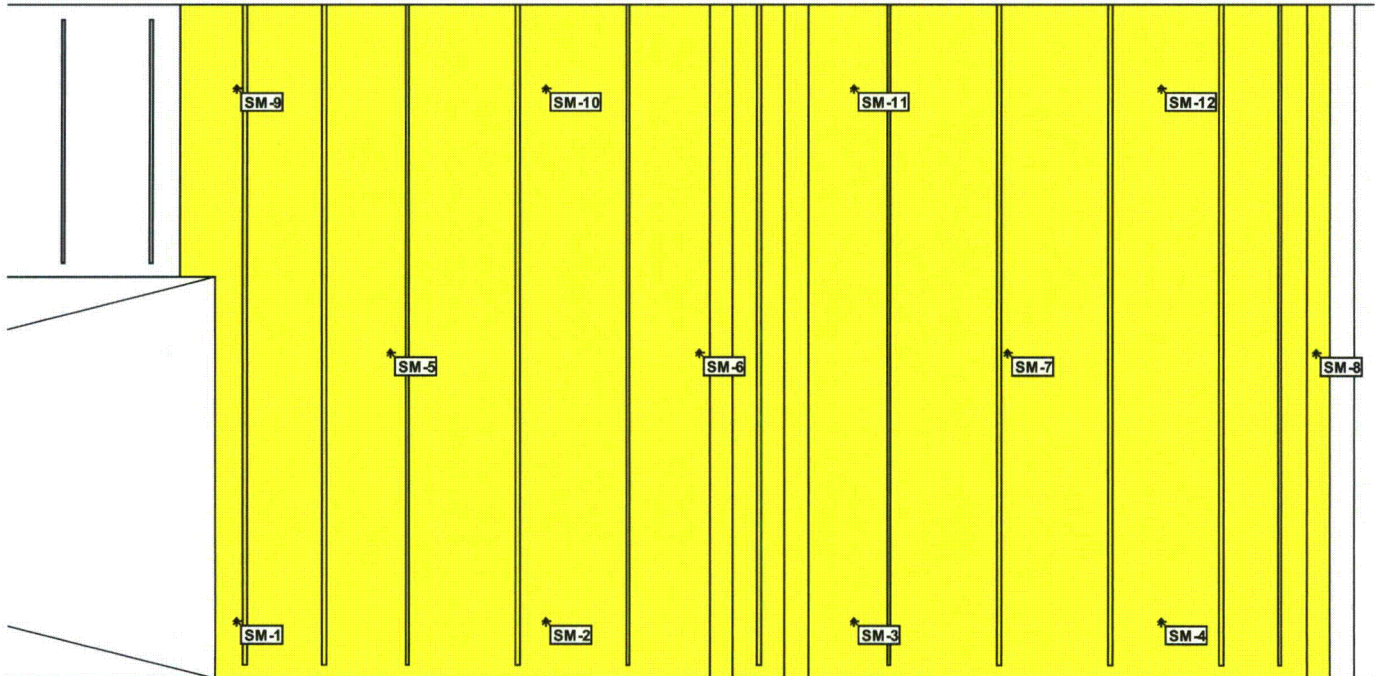


Survey Unit RB-4-23  
RB -25' - Wall Section #3



RB-4-23 AREA: RB -25' Elevation, Wall Section #3 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.7	1.6	SM-1	434	Systematic	N/A
3.5	1.6	SM-2	308	Systematic	N/A
1.3	1.6	SM-3	853	Systematic	N/A
4.2	1.6	SM-4	601	Systematic	N/A
0.2	1.6	SM-5	7	Systematic	N/A
0.1	1.6	SM-6	434	Systematic	N/A
2.1	4.1	SM-7	98	Systematic	N/A
5.0	4.1	SM-8	888	Systematic	N/A
2.8	4.1	SM-9	490	Systematic	N/A
5.6	4.1	SM-10	538	Systematic	N/A
1.7	4.1	SM-11	476	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

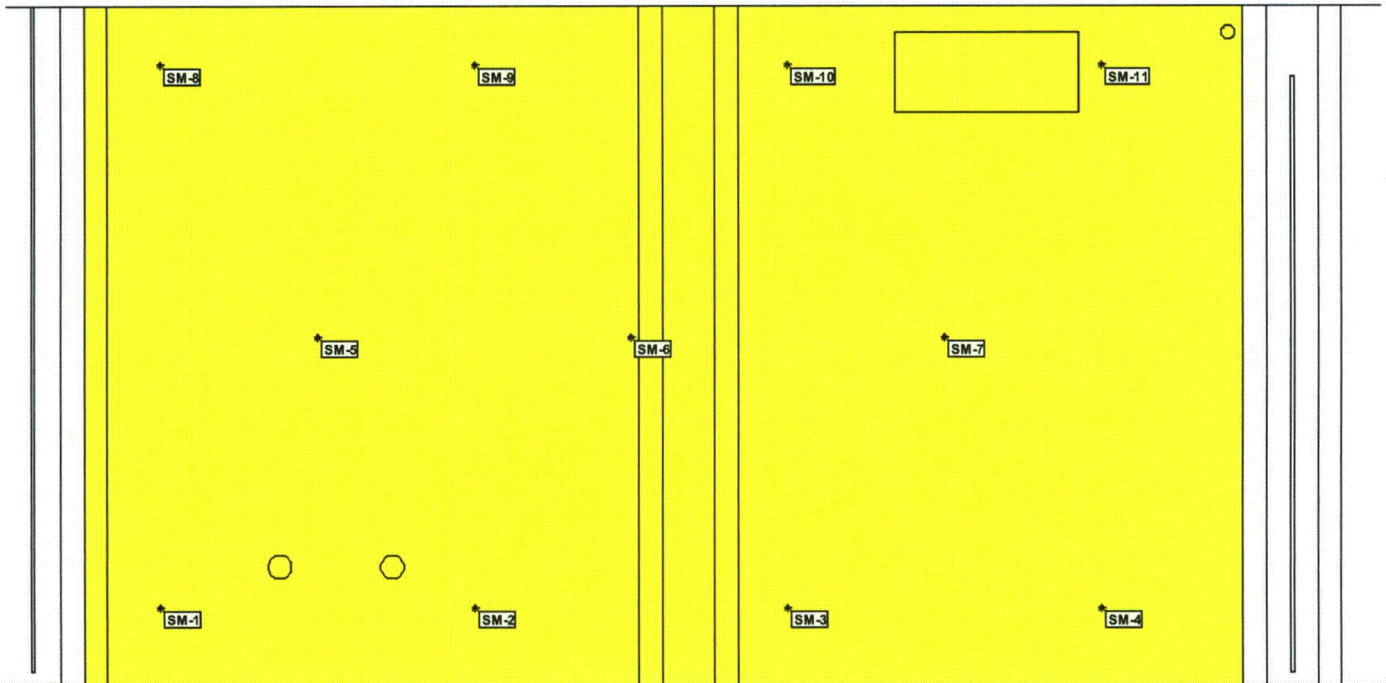
Survey Unit RB-4-24  
RB -25' - Wall Section #4



RB-4-24 RB -25' Elevation, Wall Section #4 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.2	0.6	SM-1	500	Systematic	N/A
3.6	0.6	SM-2	869	Systematic	N/A
7.0	0.6	SM-3	1082	Systematic	N/A
10.5	0.6	SM-4	434	Systematic	N/A
1.9	3.6	SM-5	680	Systematic	N/A
5.3	3.6	SM-6	967	Systematic	N/A
8.8	3.6	SM-7	492	Systematic	N/A
12.2	3.6	SM-8	631	Systematic	N/A
0.2	6.5	SM-9	689	Systematic	N/A
3.6	6.5	SM-10	246	Systematic	N/A
7.0	6.5	SM-11	541	Systematic	N/A
10.5	6.5	SM-12	410	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

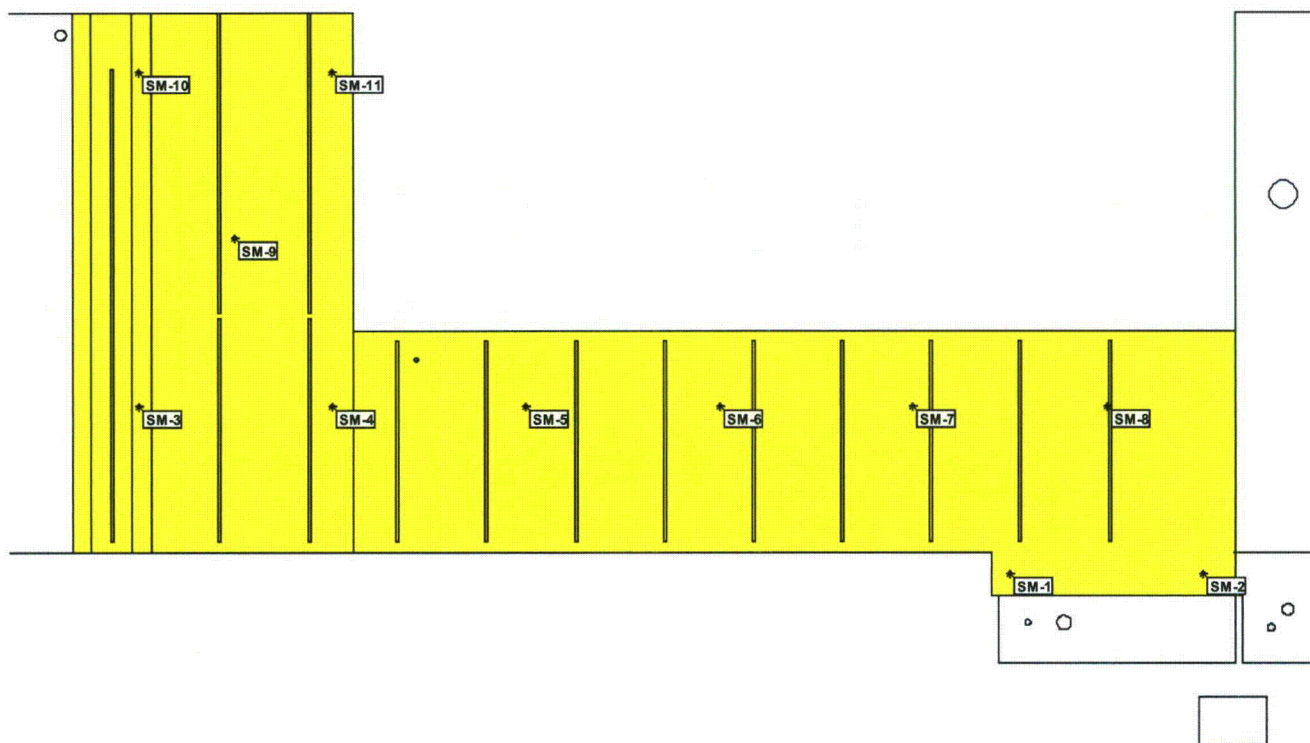


Survey Unit RB-4-25  
RB -25' - Wall Section #5



RB-4-25 AREA: RB -25' Elevation, Wall Section #5 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.6	0.9	SM-1	434	Systematic	N/A
4.0	0.9	SM-2	769	Systematic	N/A
7.4	0.9	SM-3	867	Systematic	N/A
10.9	0.9	SM-4	420	Systematic	N/A
2.3	3.8	SM-5	448	Systematic	N/A
5.7	3.8	SM-6	245	Systematic	N/A
9.1	3.8	SM-7	615	Systematic	N/A
0.6	6.8	SM-8	888	Systematic	N/A
4.0	6.8	SM-9	573	Systematic	N/A
7.4	6.8	SM-10	273	Systematic	N/A
10.9	6.8	SM-11	594	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

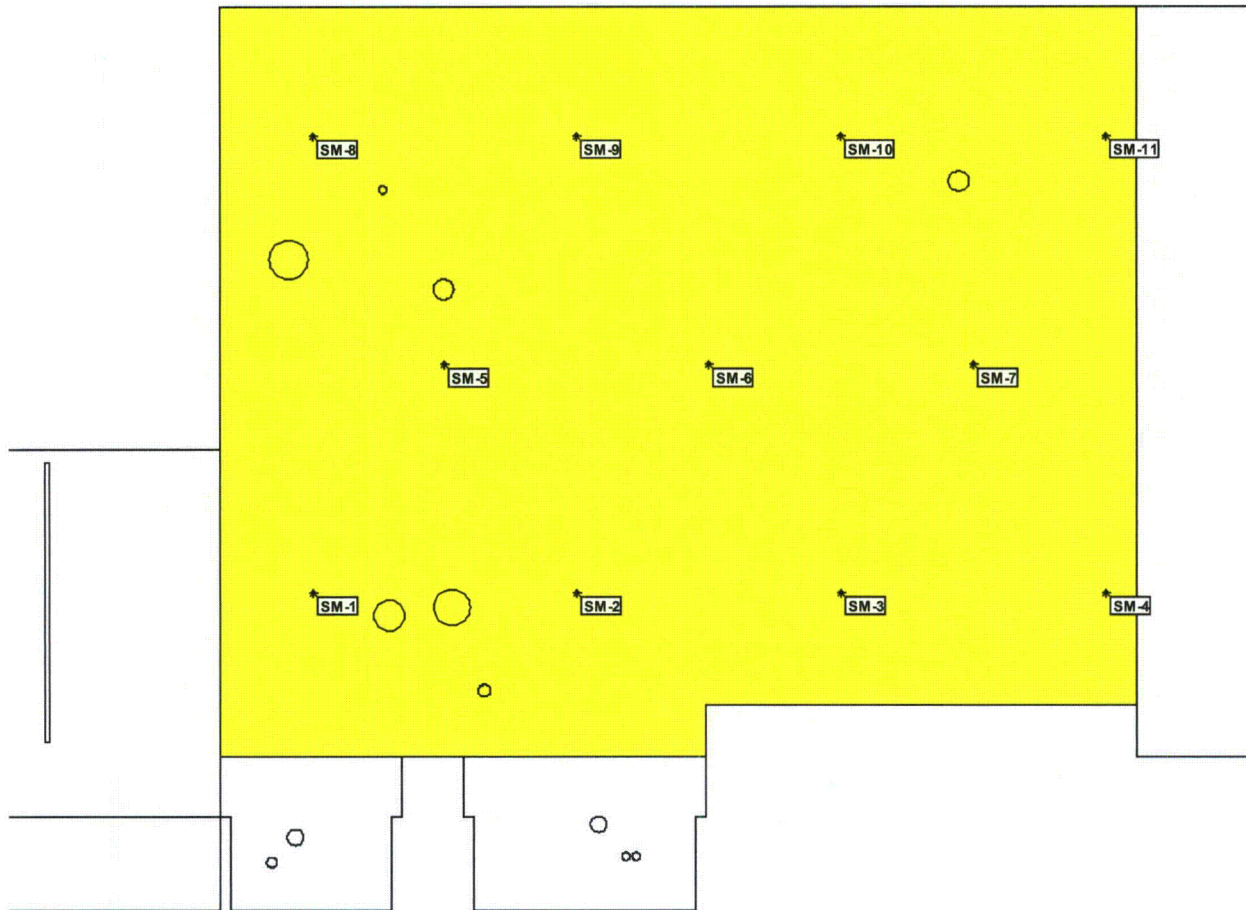
**Survey Unit RB-4-26**  
**RB -25' - Wall Section #6**



<b>RB-4-26</b> <b>AREA: RB -25' Elevation, Wall Section #6</b> <b>Measurement Locations and results</b>					
<b>X Co-ord (m)</b>	<b>Y Co-ord (m)</b>	<b>Location / dpm/100-cm<sup>2</sup></b>		<b>Type</b>	<b>Notes</b>
11.8	-0.3	SM-1	473	Systematic	N/A
14.5	-0.3	SM-2	820	Systematic	N/A
0.1	2.0	SM-3	426	Systematic	N/A
2.5	2.0	SM-4	369	Systematic	N/A
2.4	2.0	SM-5	344	Systematic	N/A
5.0	2.0	SM-6	295	Systematic	N/A
7.7	2.0	SM-7	393	Systematic	N/A
10.4	2.0	SM-8	407	Systematic	N/A
1.2	4.3	SM-9	197	Systematic	N/A
0.1	6.6	SM-10	516	Systematic	N/A
2.5	6.6	SM-11	598	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

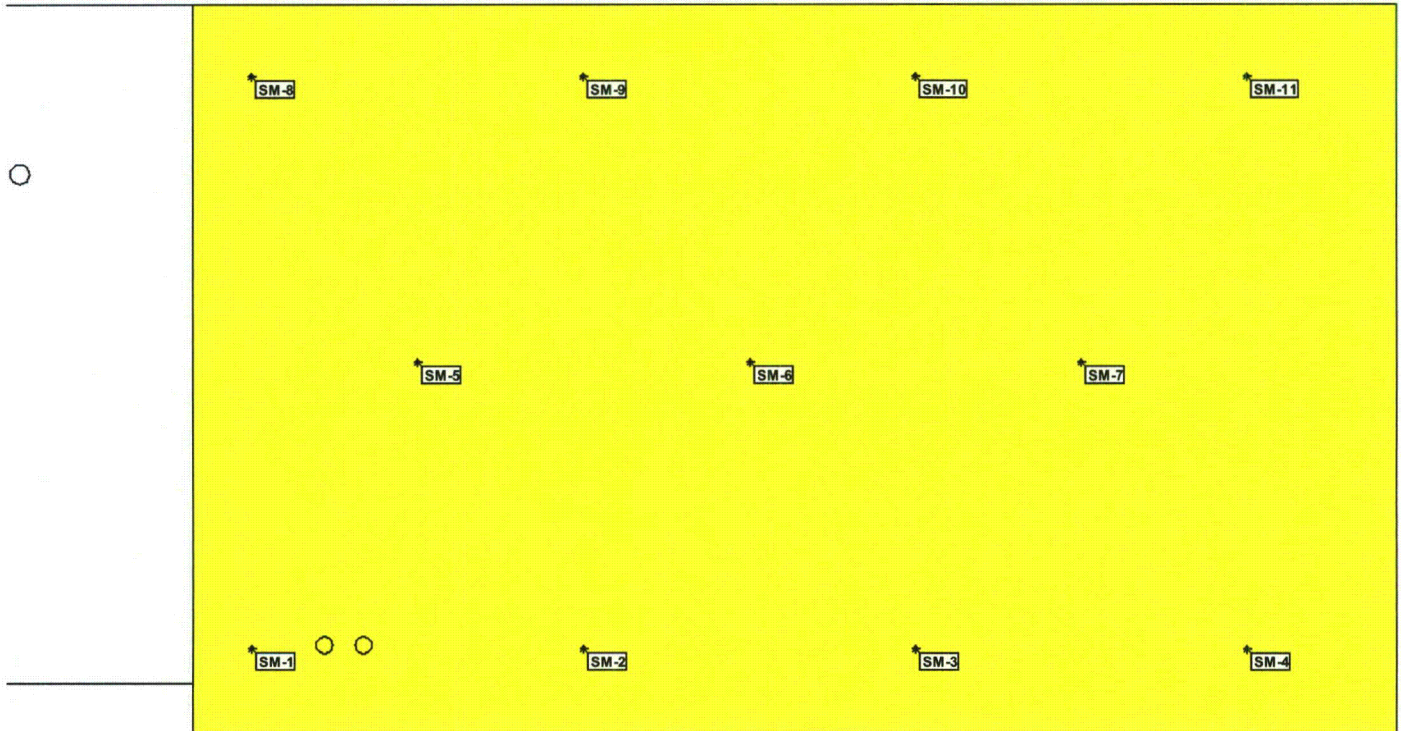


Survey Unit RB-4-27  
RB -25' - Wall Section #7



RB-4-27 AREA: RB -25' Elevation, Wall Section #7 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.9	1.6	SM-1	113	Systematic	N/A
3.5	1.6	SM-2	98	Systematic	N/A
6.1	1.6	SM-3	119	Systematic	N/A
8.8	1.6	SM-4	140	Systematic	N/A
2.2	3.9	SM-5	207	Systematic	N/A
4.8	3.9	SM-6	-217	Systematic	N/A
7.4	3.9	SM-7	-77	Systematic	N/A
0.9	6.2	SM-8	-167	Systematic	N/A
3.5	6.2	SM-9	-133	Systematic	N/A
6.1	6.2	SM-10	-28	Systematic	N/A
8.8	6.2	SM-11	-224	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

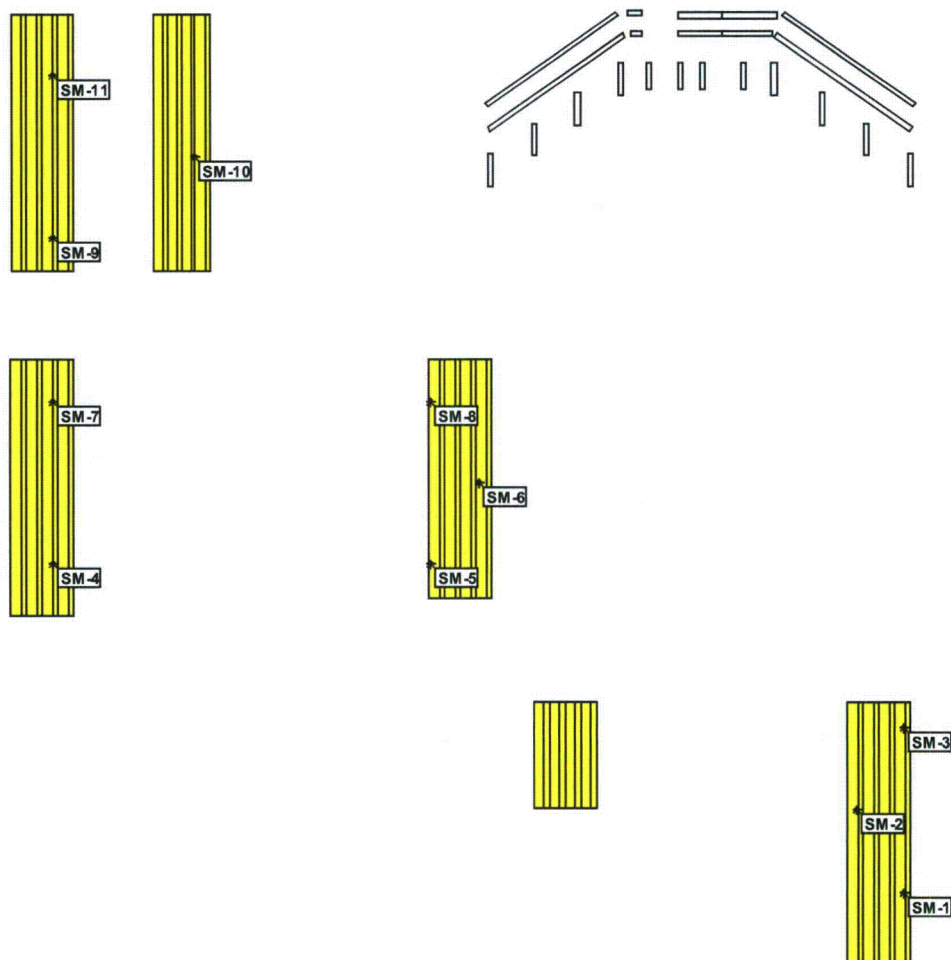
Survey Unit RB-4-28  
RB -25' - Wall Section #8



RB-4-28 AREA: RB -25' Elevation, Wall Section #8 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.6	0.9	SM-1	-173	Systematic	N/A
4.0	0.9	SM-2	-33	Systematic	N/A
7.4	0.9	SM-3	-253	Systematic	N/A
10.7	0.9	SM-4	-47	Systematic	N/A
2.3	3.8	SM-5	133	Systematic	N/A
5.7	3.8	SM-6	-180	Systematic	N/A
9.1	3.8	SM-7	167	Systematic	N/A
0.6	6.7	SM-8	-87	Systematic	N/A
4.0	6.7	SM-9	140	Systematic	N/A
7.4	6.7	SM-10	-80	Systematic	N/A
10.7	6.7	SM-11	-220	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

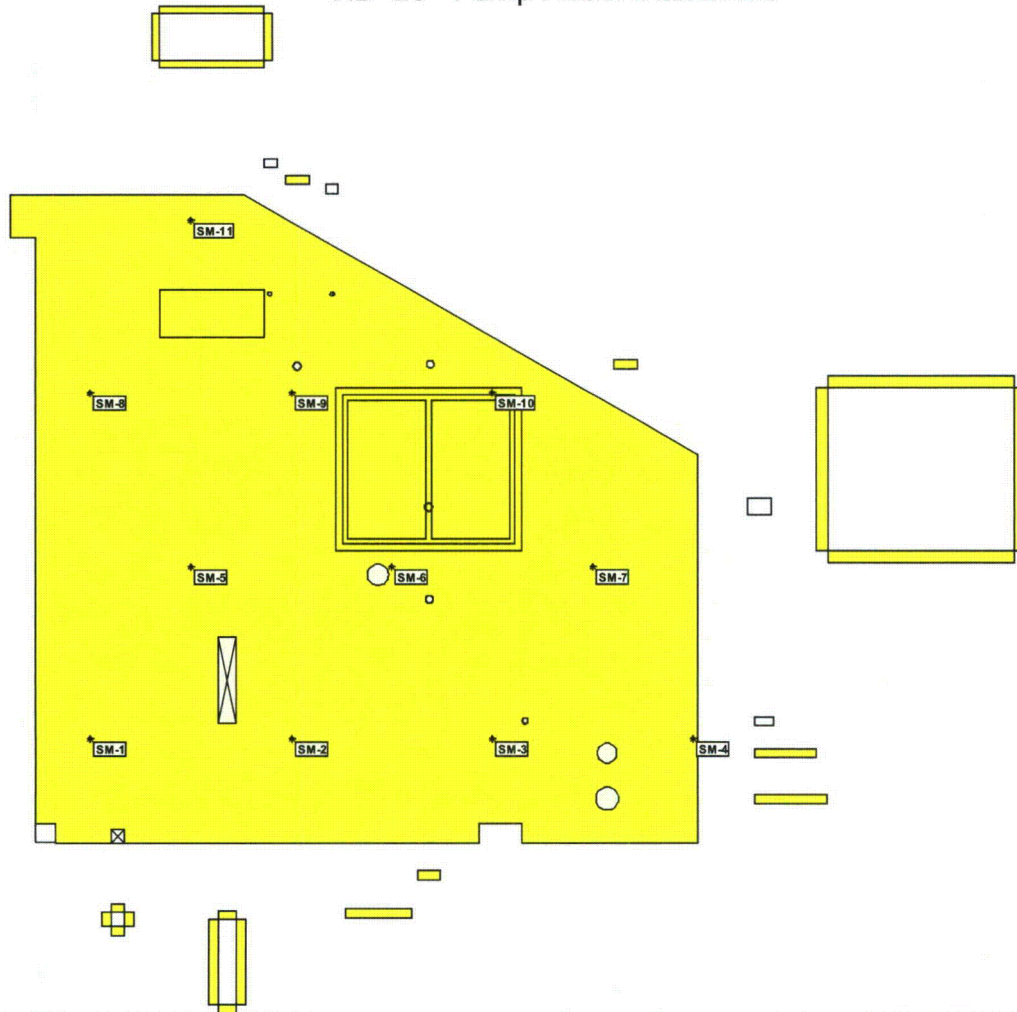


Survey Unit RB-4-29  
RB -25' - Columns



RB-4-29 AREA: RB -25' Elevation, Columns Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
Edge	2.0	SM-1	-119	Systematic	N/A
Edge	4.3	SM-2	266	Systematic	N/A
Edge	6.7	SM-3	-294	Systematic	N/A
Edge	1.5	SM-4	-91	Systematic	N/A
0.1	1.0	SM-5	-98	Systematic	N/A
0.1	3.4	SM-6	42	Systematic	N/A
Edge	6.2	SM-7	-175	Systematic	N/A
0.1	5.7	SM-8	-238	Systematic	N/A
Edge	1.0	SM-9	63	Systematic	N/A
Center	3.3	SM-10	-67	Systematic	N/A
Edge	5.7	SM-11	287	Systematic	N/A
* All sample measurements are taken from the lower left corner of the surface on which they rest.					

Survey Unit RB-4-30  
RB -25' -Pump Room Mezzanine

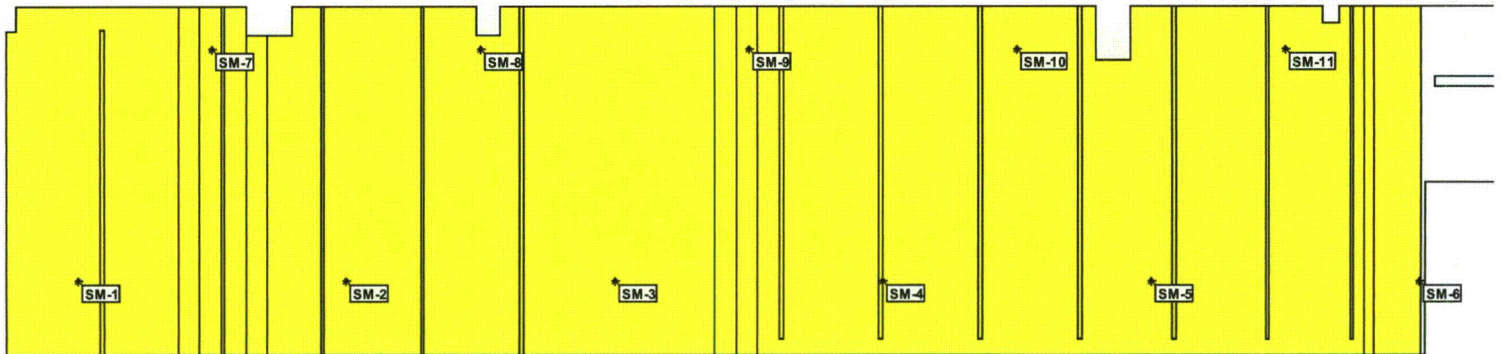


RB-4-30 AREA: RB -25' Elevation, Pump Room Mezzanine Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.7	1.4	SM-1	573	Systematic	N/A
3.4	1.4	SM-2	587	Systematic	N/A
6.0	1.4	SM-3	678	Systematic	N/A
8.6	1.4	SM-4	1042	Systematic	N/A
2.0	3.6	SM-5	615	Systematic	N/A
4.7	3.6	SM-6	490	Systematic	N/A
7.3	3.6	SM-7	462	Systematic	N/A
0.7	5.9	SM-8	510	Systematic	N/A
3.4	5.9	SM-9	490	Systematic	N/A
6.0	5.9	SM-10	657	Systematic	N/A
2.0	8.2	SM-11	769	Systematic	N/A

\* Sample measurements are taken from the southwest corner of the survey unit.

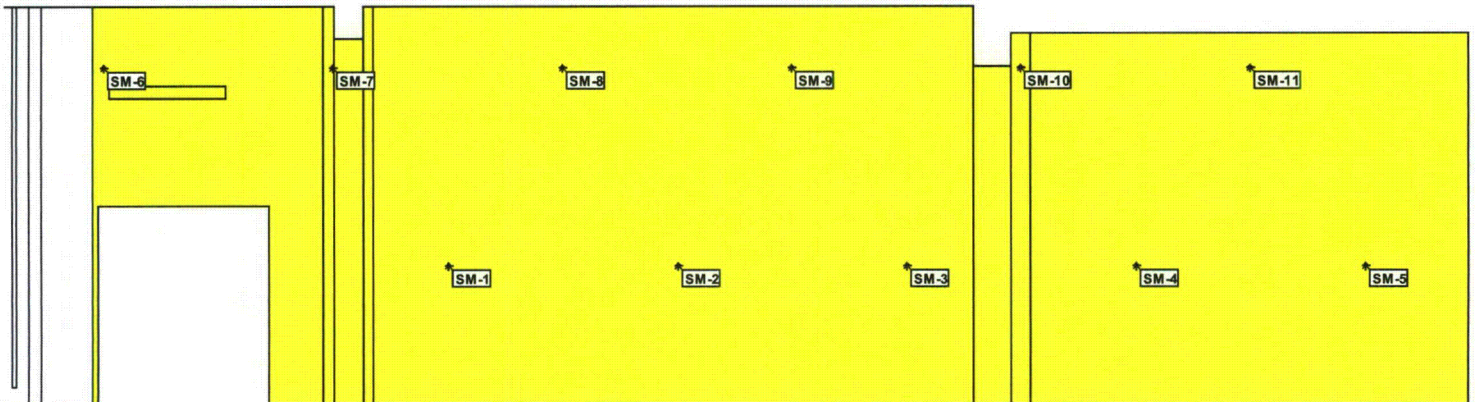


Survey Unit RB-4-31  
RB -25' - Pump Room South and West Walls



RB-4-31 AREA: RB -25' Elevation, Pump Room South and West Walls Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.9	0.9	SM-1	640	Systematic	N/A
4.2	0.9	SM-2	1079	Systematic	N/A
7.5	0.9	SM-3	683	Systematic	N/A
1.5	0.9	SM-4	669	Systematic	N/A
4.8	0.9	SM-5	878	Systematic	N/A
0.5	0.9	SM-6	345	Systematic	N/A
2.5	3.8	SM-7	1094	Systematic	N/A
5.8	3.8	SM-8	511	Systematic	N/A
0.15	3.8	SM-9	619	Systematic	N/A
3.2	3.8	SM-10	676	Systematic	N/A
6.5	3.8	SM-11	561	Systematic	N/A
* Sample measurements are taken from the lower left corner of the surface on which they lie.					

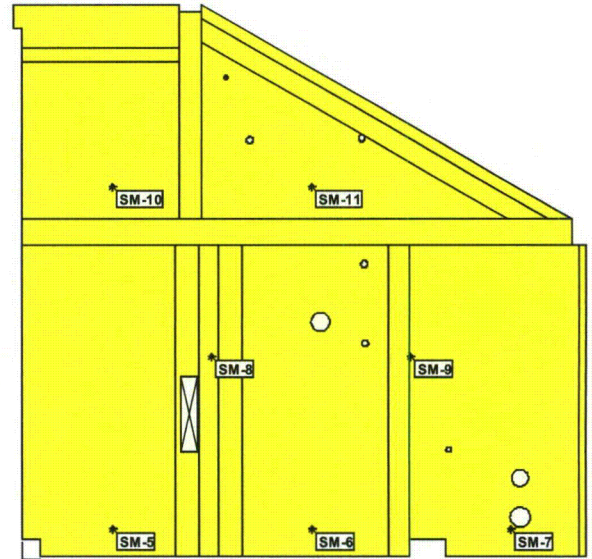
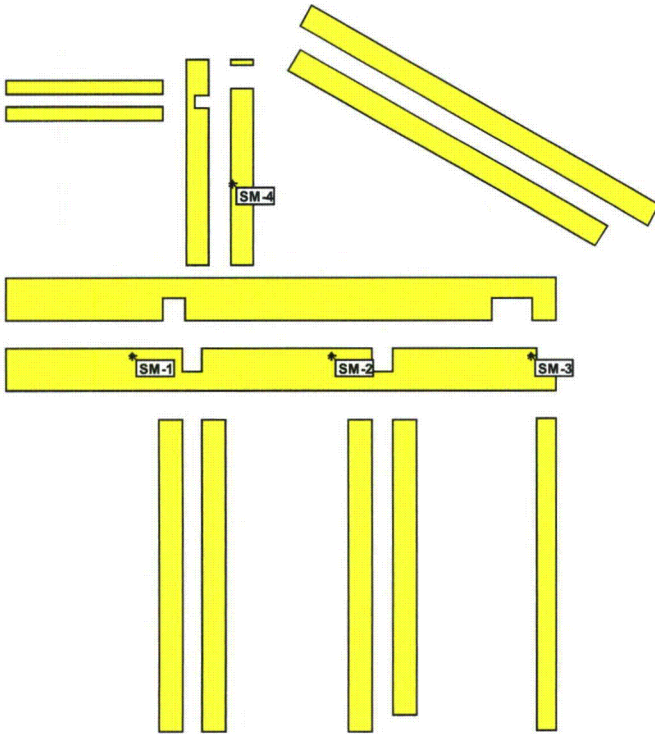
Survey Unit RB-4-32  
RB -25' - Pump Room North, Northeast and East Walls



RB-4-32 RB -25' Elevation, Pump Room North, Northeast and East Walls Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.8	1.5	SM-1	691	Systematic	N/A
3.3	1.5	SM-2	374	Systematic	N/A
5.7	1.5	SM-3	223	Systematic	N/A
1.1	1.5	SM-4	259	Systematic	N/A
3.6	1.5	SM-5	719	Systematic	N/A
0.1	3.6	SM-6	-36	Systematic	N/A
Edge	3.6	SM-7	482	Systematic	N/A
2.0	3.6	SM-8	173	Systematic	N/A
4.5	3.6	SM-9	417	Systematic	N/A
0.1	3.6	SM-10	453	Systematic	N/A
2.3	3.6	SM-11	453	Systematic	N/A
* Sample measurements are taken from the lower left corner of the surface on which they lie.					

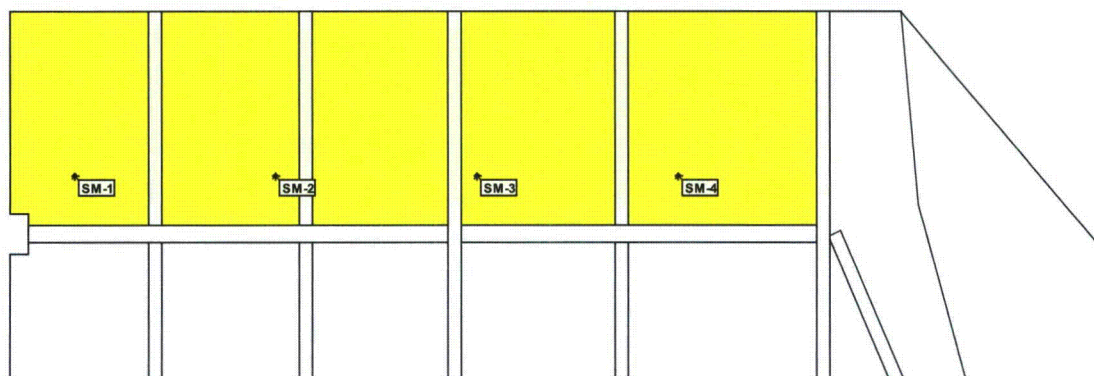
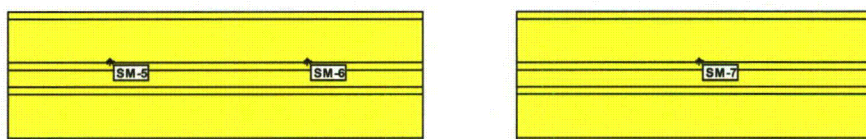
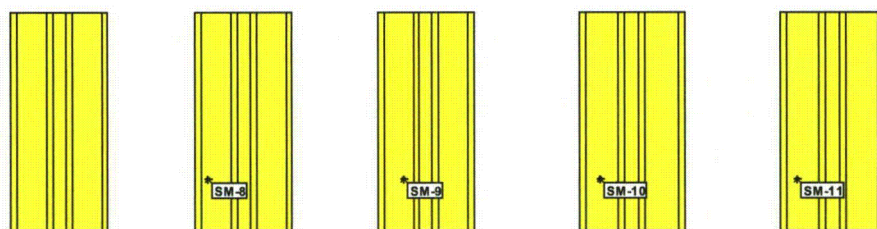


Survey Unit RB-4-33  
RB -25' - Pump Room Ceiling



RB-4-33 AREA: RB -25' Elevation, Pump Room Ceiling Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
1.9	Edge	SM-1	1036	Systematic	N/A
4.9	Edge	SM-2	604	Systematic	N/A
7.9	Edge	SM-3	662	Systematic	N/A
1.3	Edge	SM-4	554	Systematic	N/A
1.4	0.5	SM-5	561	Systematic	N/A
4.3	0.5	SM-6	755	Systematic	N/A
7.3	0.5	SM-7	878	Systematic	N/A
2.8	3.1	SM-8	417	Systematic	N/A
5.8	3.1	SM-9	683	Systematic	N/A
1.4	5.7	SM-10	489	Systematic	N/A
4.3	5.7	SM-11	1144	Systematic	N/A
* Sample measurements for SM-1 through SM-4 are taken from the lower left corner of the surface on which they lie. Measurements for SM-5 through SM-11 are taken from the southwest corner of the ceiling.					

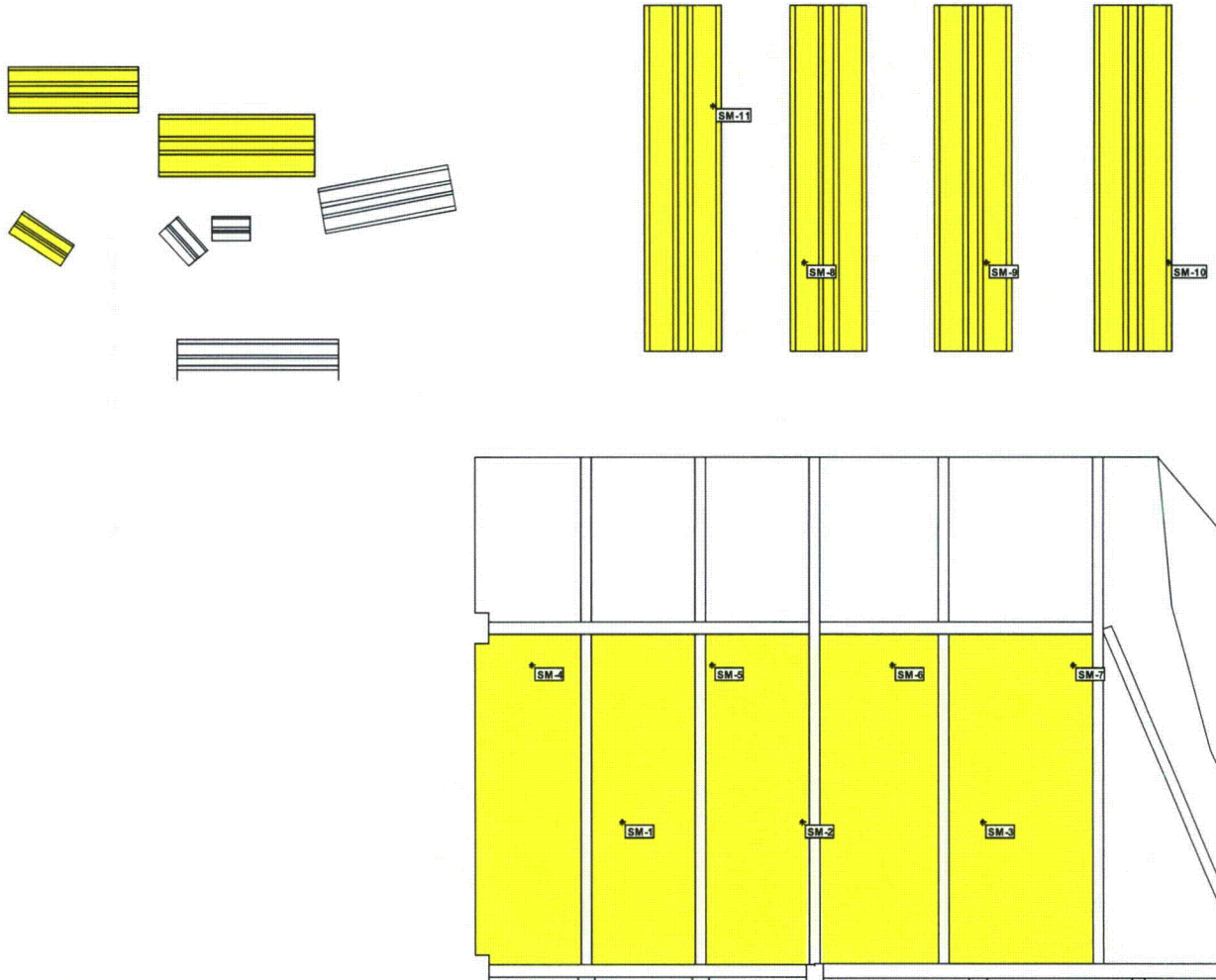
**Survey Unit RB-4-34**  
**RB -25' - Ceiling Section #1**



<b>RB-4-34</b> <b>AREA: RB -25' Elevation, Ceiling Section #1</b> <b>Measurement Locations and results</b>					
<b>X Co-ord (m)</b>	<b>Y Co-ord (m)</b>	<b>Location / dpm/100-cm<sup>2</sup></b>		<b>Type</b>	<b>Notes</b>
0.9	0.7	SM-1	344	Systematic	N/A
1.5	0.7	SM-2	441	Systematic	N/A
0.2	0.7	SM-3	552	Systematic	N/A
0.7	0.7	SM-4	533	Systematic	N/A
1.4	Edge	SM-5	49	Systematic	N/A
4.2	Edge	SM-6	210	Systematic	N/A
2.5	Edge	SM-7	-240	Systematic	N/A
0.7	0.3	SM-8	-49	Systematic	N/A
0.7	0.1	SM-9	-105	Systematic	N/A
0.7	0.2	SM-10	373	Systematic	N/A
0.7	0.3	SM-11	227	Systematic	N/A
* Sample measurements are taken from the southwest corner or the lower left corner of the surface on which they lie.					



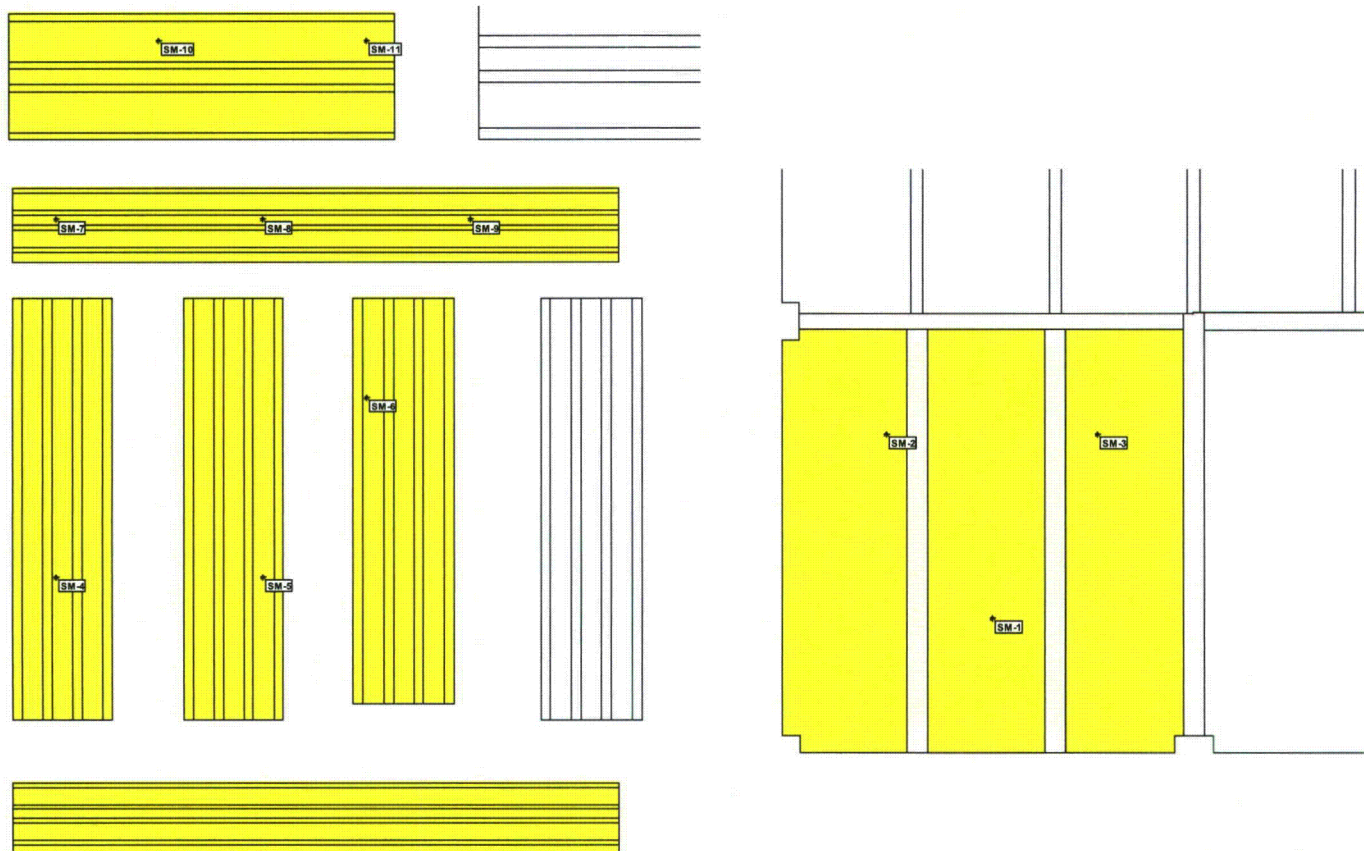
Survey Unit RB-4-35  
RB -25' - Ceiling Section #2



RB-4-35					
AREA: RB -25' Elevation, Ceiling Section #2					
Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.5	2.5	SM-1	336	Systematic	N/A
1.7	2.5	SM-2	329	Systematic	N/A
0.6	2.5	SM-3	566	Systematic	N/A
1.0	5.3	SM-4	441	Systematic	N/A
0.1	5.3	SM-5	315	Systematic	N/A
1.3	5.3	SM-6	657	Systematic	N/A
2.2	5.3	SM-7	706	Systematic	N/A
1.6	0.2	SM-8	14	Systematic	N/A
4.5	Edge	SM-9	-77	Systematic	N/A
4.5	Edge	SM-10	175	Systematic	N/A
1.7	0.3	SM-11	315	Systematic	N/A

\* Sample measurements are taken from the lower left corner or the southwest corner of the surface on which they lie.

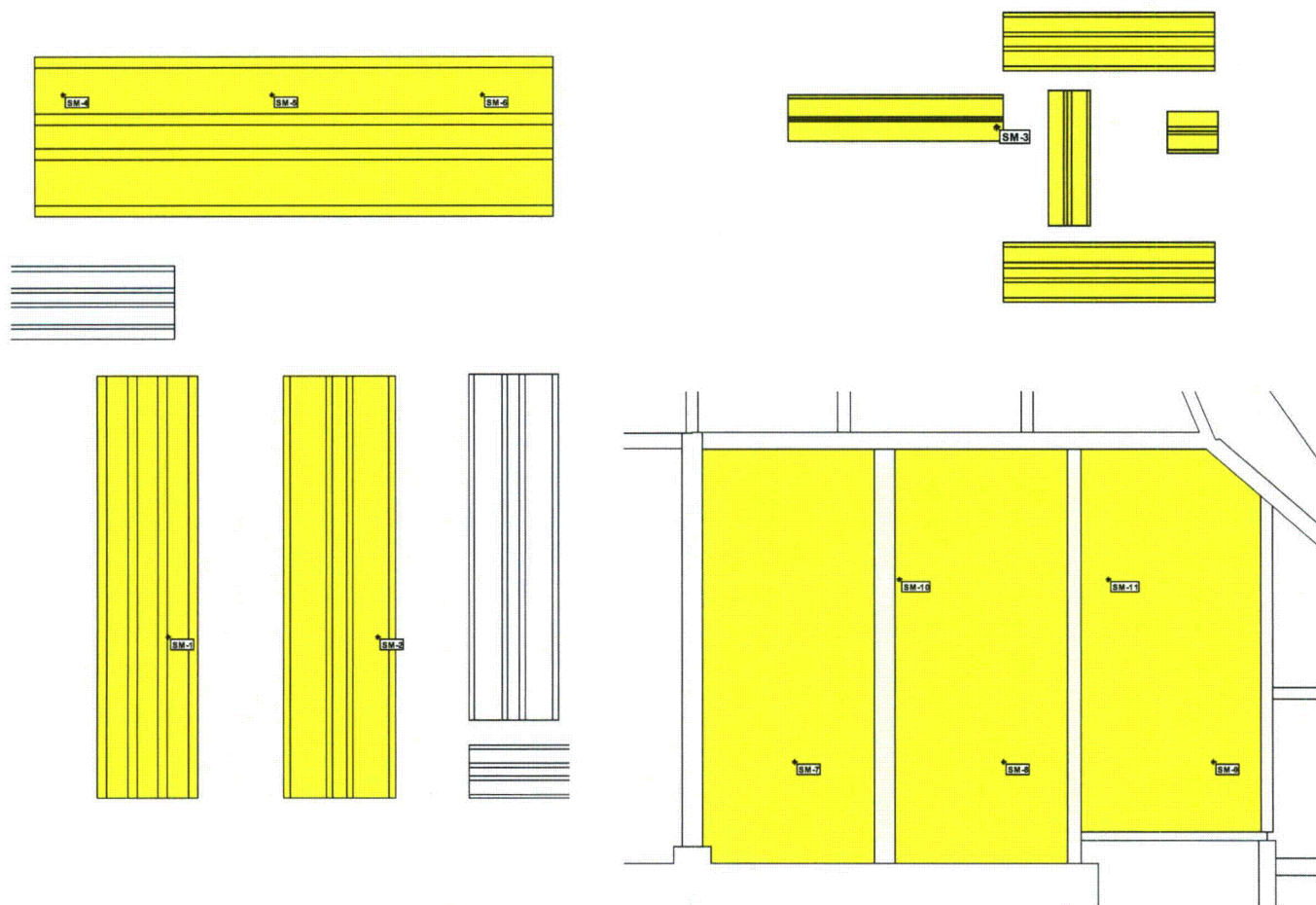
**Survey Unit RB-4-36**  
**RB -25' - Ceiling Section #3**



<b>RB-4-36</b> <b>AREA: RB -25' Elevation, Ceiling Section #3</b> <b>Measurement Locations and results</b>					
<b>X Co-ord (m)</b>	<b>Y Co-ord (m)</b>	<b>Location / dpm/100-cm<sup>2</sup></b>		<b>Type</b>	<b>Notes</b>
0.9	2.0	SM-1	441	Systematic	N/A
1.5	4.7	SM-2	622	Systematic	N/A
0.5	4.7	SM-3	448	Systematic	N/A
Edge	2.2	SM-4	21	Systematic	N/A
4.2	0.1	SM-5	35	Systematic	N/A
4.6	Edge	SM-6	14	Systematic	N/A
0.6	Centered	SM-7	126	Systematic	N/A
3.7	Centered	SM-8	7	Systematic	N/A
6.9	Centered	SM-9	182	Systematic	N/A
2.3	0.3	SM-10	-259	Systematic	N/A
5.4	0.3	SM-11	161	Systematic	N/A
* Sample measurements are taken from the lower left corner or the southwest corner of the surface on which they lie.					

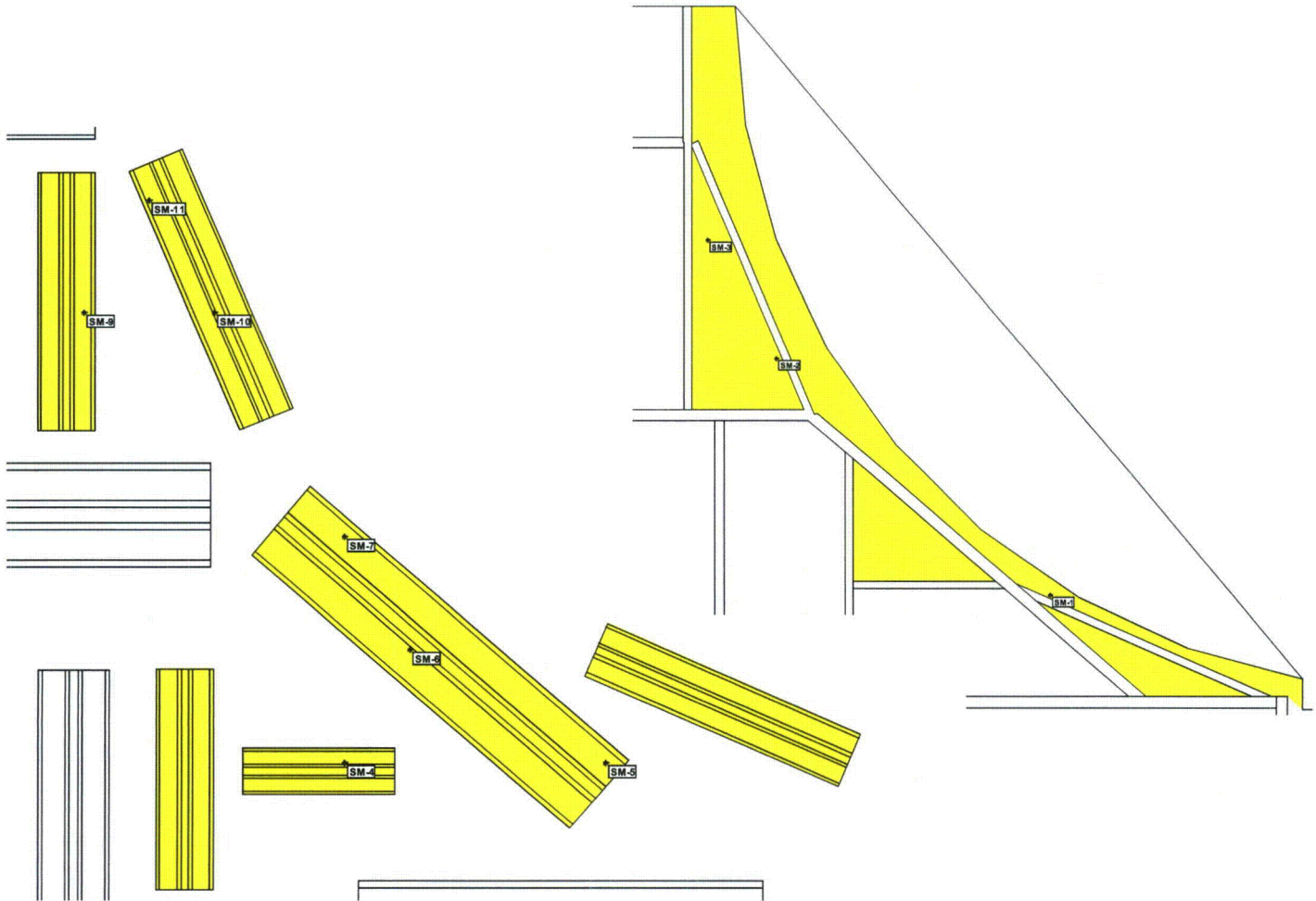


Survey Unit RB-4-37  
RB -25' - Ceiling Section #4



RB-4-37 AREA: RB -25' Elevation, Ceiling Section #4 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
3.9	Edge	SM-1	-14	Systematic	N/A
3.9	0.4	SM-2	-175	Systematic	N/A
0.1	Edge	SM-3	-28	Systematic	N/A
0.4	0.3	SM-4	-133	Systematic	N/A
3.5	0.3	SM-5	35	Systematic	N/A
6.7	0.3	SM-6	0	Systematic	N/A
1.4	1.6	SM-7	615	Systematic	N/A
1.6	1.6	SM-8	357	Systematic	N/A
2.0	1.1	SM-9	448	Systematic	N/A
0.1	4.2	SM-10	357	Systematic	N/A
0.4	3.8	SM-11	469	Systematic	N/A
* Sample measurements are taken from the lower left corner or the southwest corner of the surface on which they lie.					

Survey Unit RB-4-38  
RB -25' - Ceiling Section #5

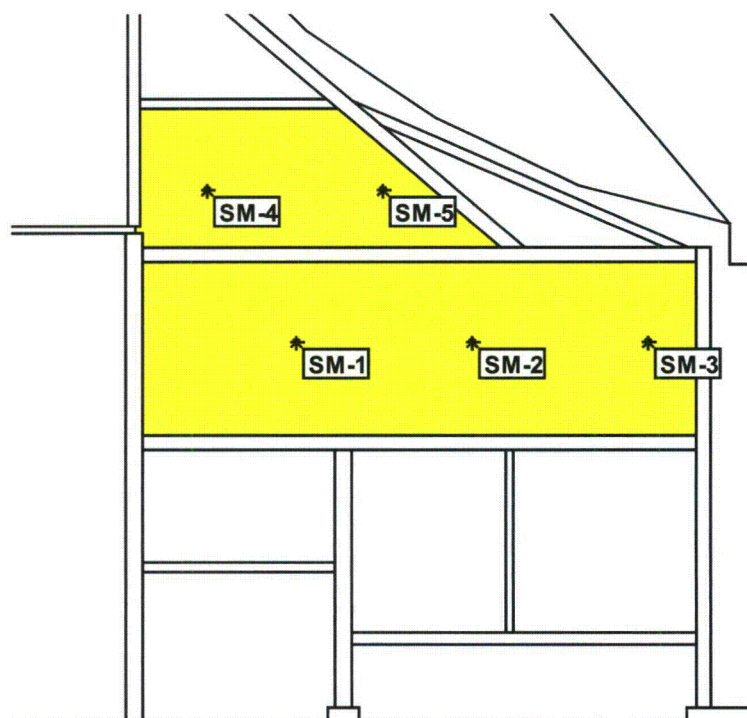
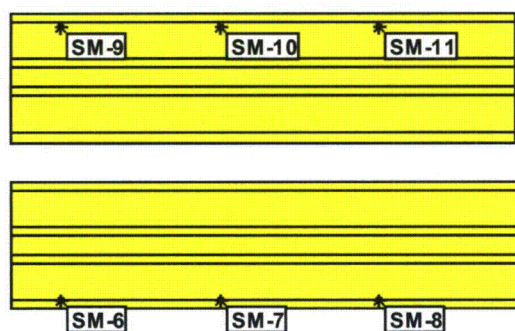


RB-4-38 AREA: RB -25' Elevation, Ceiling Section #5 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.8	0.1	SM-1	615	Systematic	N/A
1.8	1.1	SM-2	210	Systematic	N/A
0.4	3.8	SM-3	559	Systematic	N/A
2.4	Edge	SM-4	93	Systematic	N/A
9.3	0.4	SM-5	63	Systematic	N/A
5.6	Edge	SM-6	245	Systematic	N/A
1.4	0.4	SM-7	-70	Systematic	N/A
2.2	Edge	SM-8	245	Systematic	N/A
3.3	0.2	SM-9	21	Systematic	N/A
2.8	Edge	SM-10	238	Systematic	N/A
5.8	0.3	SM-11	-49	Systematic	N/A

\* Sample measurements are taken from the lower left or the southwest corner of the surface on which they lie, except SM-1, which is measured from the point shown on the map.

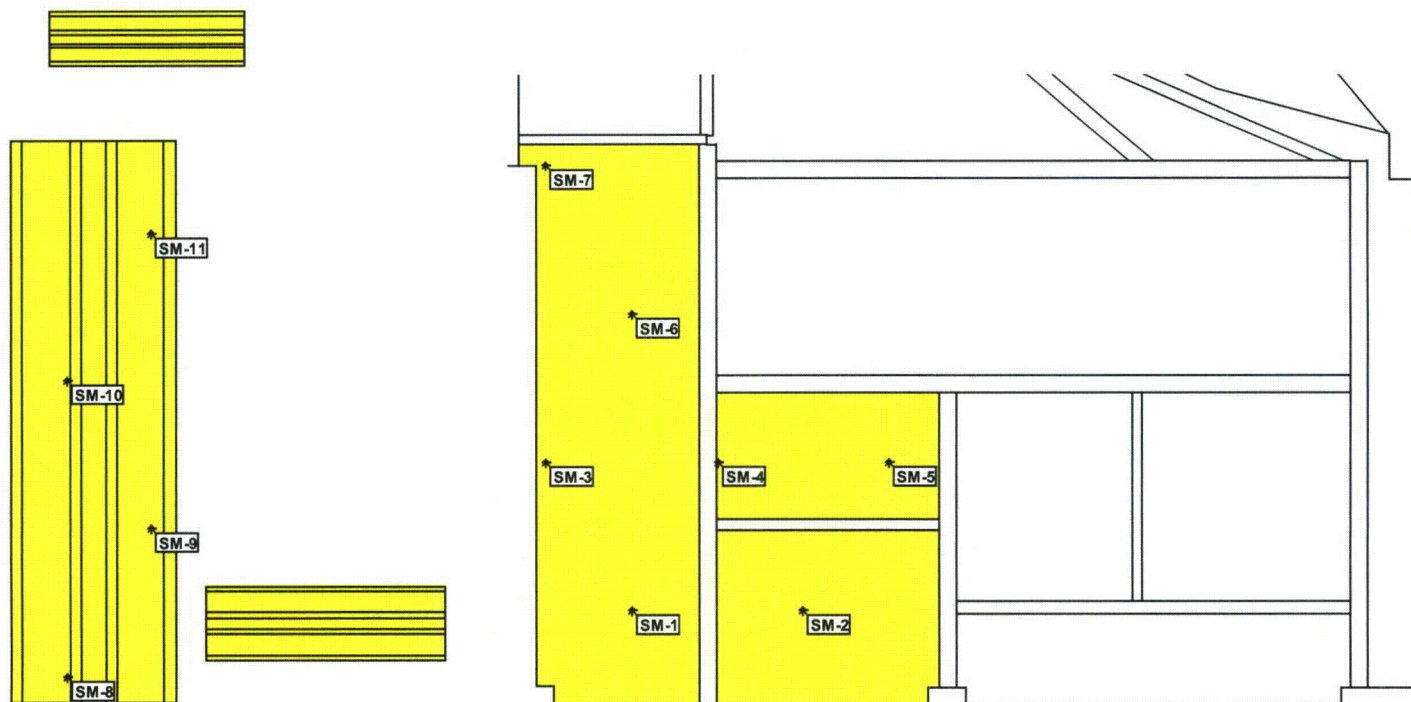


**Survey Unit RB-4-39**  
**RB -25' - Ceiling Section #6**



<b>RB-4-39</b> <b>AREA: RB -25' Elevation, Ceiling Section #6</b> <b>Measurement Locations and results</b>					
<b>X Co-ord (m)</b>	<b>Y Co-ord (m)</b>	<b>Location /</b> <b>dpm/100-cm<sup>2</sup></b>		<b>Type</b>	<b>Notes</b>
2.6	1.5	SM-1	545	Systematic	N/A
5.6	1.5	SM-2	448	Systematic	N/A
8.6	1.5	SM-3	671	Systematic	N/A
1.2	1.0	SM-4	573	Systematic	N/A
4.2	1.0	SM-5	510	Systematic	N/A
2.7	Edge	SM-6	42	Systematic	N/A
5.7	Edge	SM-7	84	Systematic	N/A
8.7	Edge	SM-8	21	Systematic	N/A
1.0	Edge	SM-9	35	Systematic	N/A
3.9	Edge	SM-10	-70	Systematic	N/A
6.9	Edge	SM-11	161	Systematic	N/A
* Sample measurements are taken from the lower left or southwest corner of the surface on which they lie.					

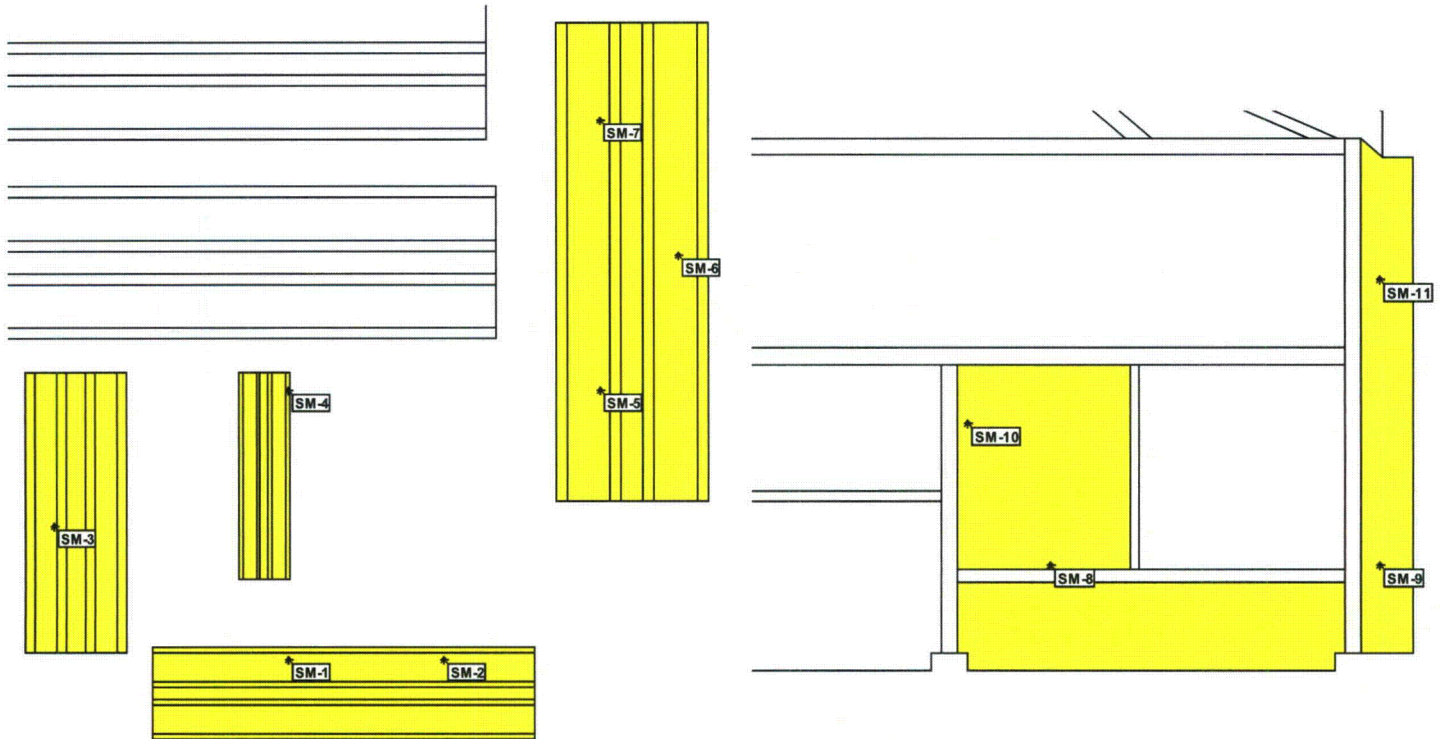
**Survey Unit RB-4-40**  
**RB -25' - Ceiling Section #7**



<b>RB-4-40</b> <b>AREA: RB -25' Elevation, Ceiling Section #7</b> <b>Measurement Locations and results</b>					
<b>X Co-ord (m)</b>	<b>Y Co-ord (m)</b>	<b>Location / dpm/100-cm<sup>2</sup></b>		<b>Type</b>	<b>Notes</b>
1.4	1.4	SM-1	643	Systematic	N/A
1.3	1.4	SM-2	266	Systematic	N/A
0.3	3.6	SM-3	643	Systematic	N/A
Edge	3.6	SM-4	413	Systematic	N/A
2.6	3.6	SM-5	706	Systematic	N/A
1.4	5.8	SM-6	853	Systematic	N/A
0.2	8.0	SM-7	657	Systematic	N/A
0.4	Edge	SM-8	-28	Systematic	N/A
1.4	0.5	SM-9	203	Systematic	N/A
4.8	Edge	SM-10	-42	Systematic	N/A
5.8	0.5	SM-11	70	Systematic	N/A
* Sample measurements are taken from the lower left or southwest corner of the surface on which they lie.					

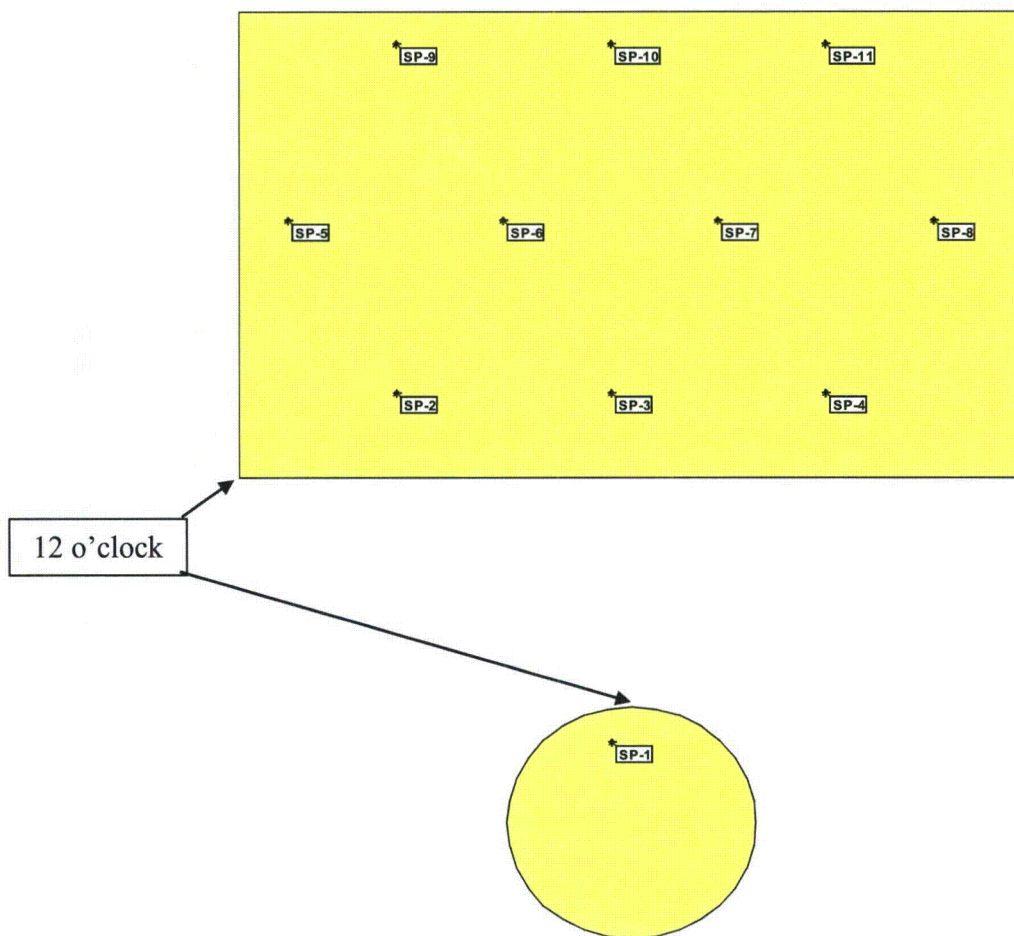


Survey Unit RB-4-41  
RB -25' - Ceiling Section #8



RB-4-41 AREA: RB -25' Elevation, Ceiling Section #8 Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
2.2	0.3	SM-1	105	Systematic	N/A
4.6	0.3	SM-2	133	Systematic	N/A
2.0	Edge	SM-3	-531	Systematic	N/A
0.3	Edge	SM-4	748	Systematic	N/A
1.8	0.2	SM-5	-28	Systematic	N/A
3.7	0.4	SM-6	-147	Systematic	N/A
6.1	0.2	SM-7	-210	Systematic	N/A
1.4	0.1	SM-8	140	Systematic	N/A
0.3	1.4	SM-9	350	Systematic	N/A
0.2	2.2	SM-10	503	Systematic	N/A
0.3	5.6	SM-11	280	Systematic	N/A
* Sample measurements are taken from the lower left corner of the surface on which they lie.					

Survey Unit RB-4-42  
RB -25' Elevation, Cold Sump

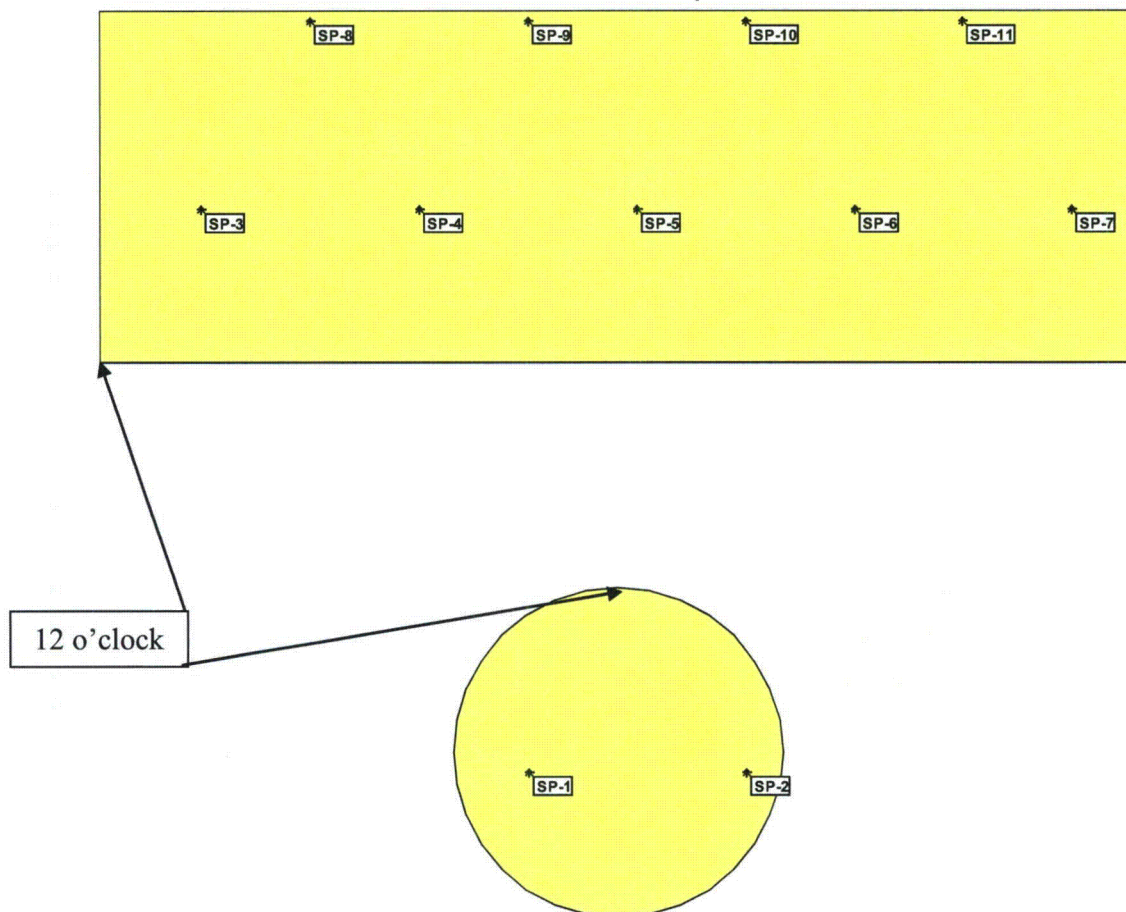


<b>RB-4-42</b> <b>AREA: RB -25' Elevation, Cold Sump</b> <b>Measurement Locations and results</b>					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.1 west of 12 o'clock	0.2 south of 12 o'clock	SM-1	N/A	Systematic	Not acquired see release record body
0.8	0.4	SM-2	541	Systematic	N/A
1.8	0.4	SM-3	516	Systematic	N/A
2.9	0.4	SM-4	410	Systematic	N/A
0.2	1.3	SM-5	377	Systematic	N/A
1.3	1.3	SM-6	205	Systematic	N/A
2.3	1.3	SM-7	123	Systematic	N/A
3.4	1.3	SM-8	262	Systematic	N/A
0.8	2.3	SM-9	238	Systematic	N/A
1.8	2.3	SM-10	508	Systematic	N/A
2.9	2.3	SM-11	66	Systematic	N/A

Lower left corner of sump is due north (12 o'clock), for SM locations 2 thru 11 the X coordinate is measured clockwise from 12 o'clock and the Y co-ordinate is measured up from the sump bottom.

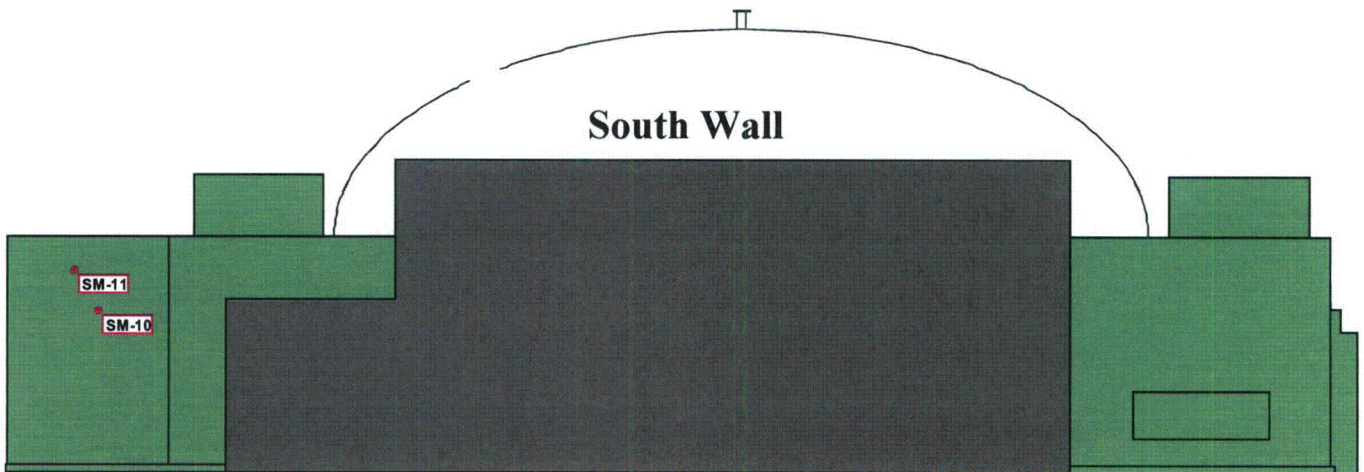
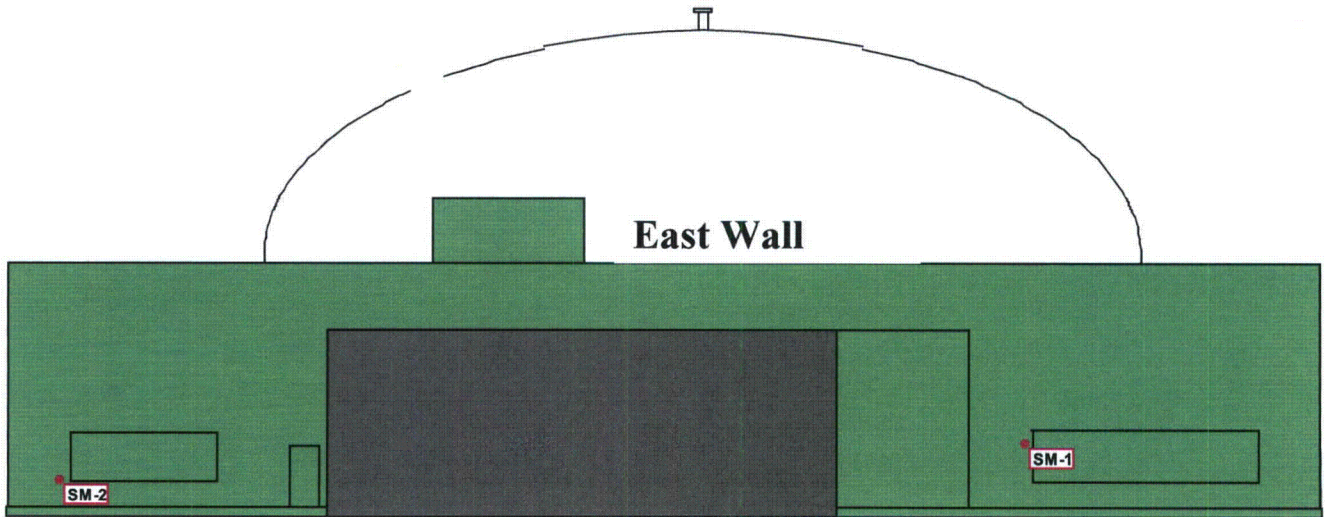
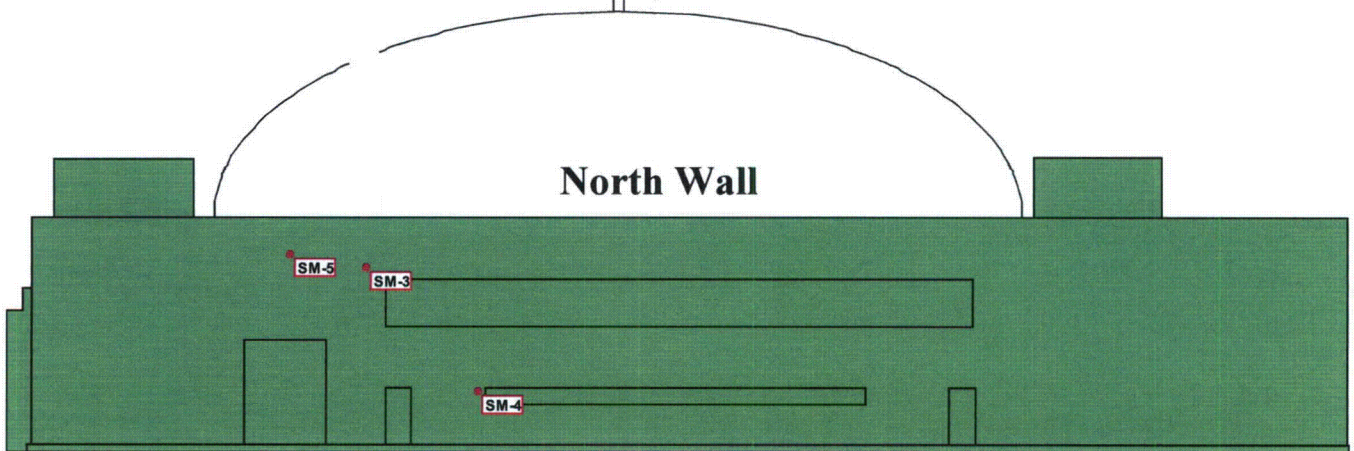


Survey Unit RB-4-43  
RB -25' - PPP Sump



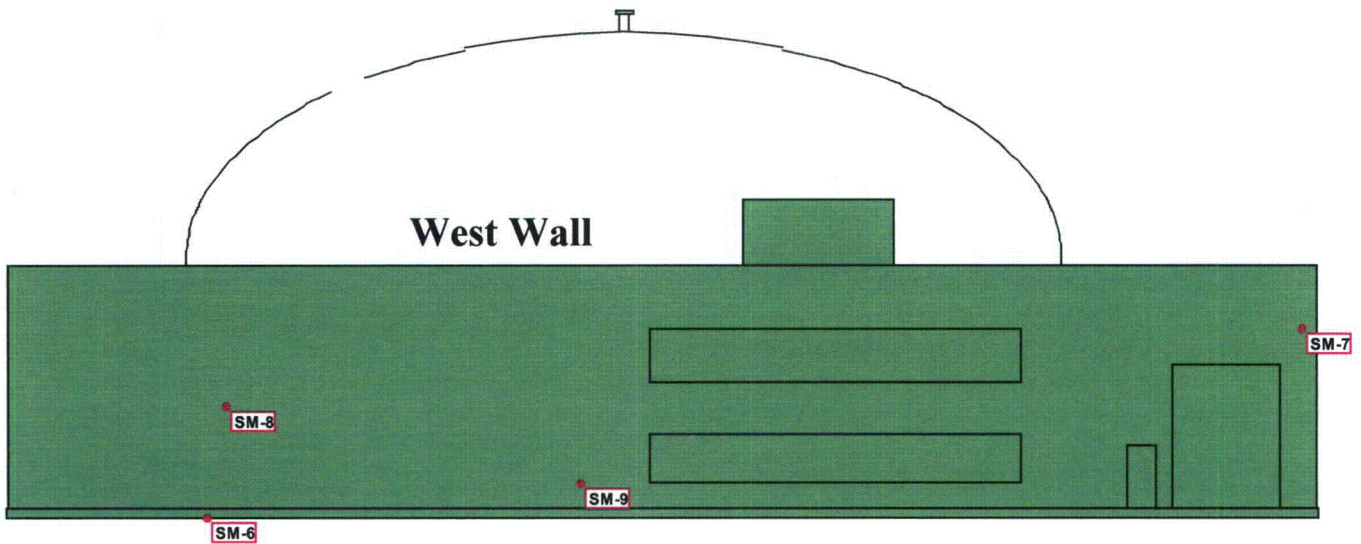
RB-4-43 AREA: RB -25' Elevation, PPP Sump Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
0.6 west of 12 o'clock	1.2 south of 12 o'clock	SM-1	2434	Systematic	N/A
0.8 east of 12 o'clock	1.2 south of 12 o'clock	SM-2	1727	Systematic	N/A
0.7	0.9	SM-3	2538	Systematic	N/A
2.1	0.9	SM-4	1664	Systematic	N/A
3.5	0.9	SM-5	1706	Systematic	N/A
4.9	0.9	SM-6	1573	Systematic	N/A
6.3	0.9	SM-7	1699	Systematic	N/A
1.4	2.2	SM-8	1084	Systematic	N/A
2.8	2.2	SM-9	1587	Systematic	N/A
4.2	2.2	SM-10	1944	Systematic	N/A
5.6	2.2	SM-11	1273	Systematic	N/A
* Lower left corner of sump is due north (12 o'clock), for SM locations 3 thru 11 the X coordinate is measured clockwise from 12 o'clock and the Y co-ordinate is measured up from the sump bottom.					

Survey Unit RB-5-1  
RB Exterior Walls  
Page 1 of 2



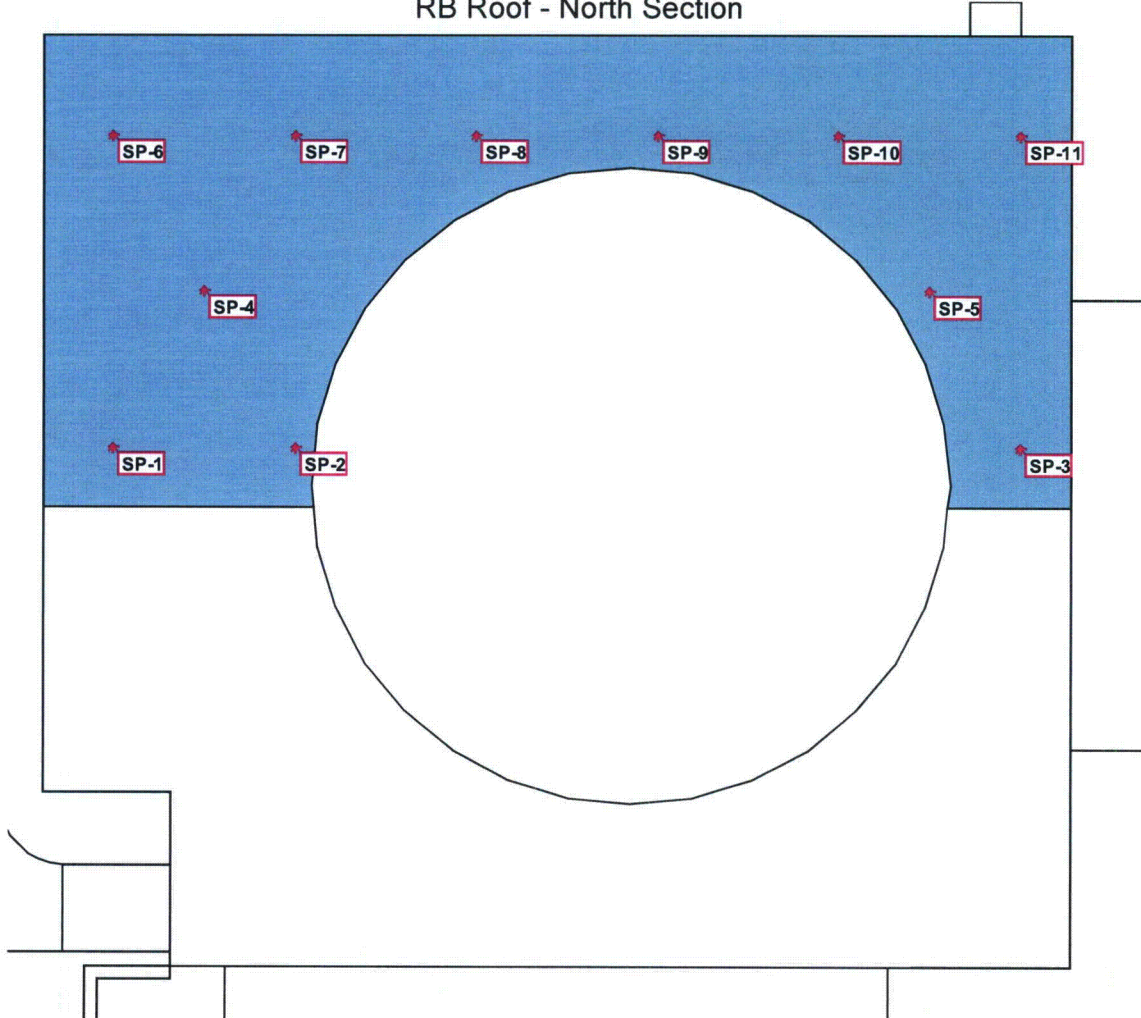


Survey Unit RB-5-1  
RB Exterior Walls  
Page 2 of 2



RB-5-1 AREA: Reactor Building – Exterior Walls Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
6.6	2.3	SM-1	340	Systematic	N/A
1.8	1.0	SM-2	-231	Systematic	N/A
12.6	6.6	SM-3	150	Systematic	N/A
16.9	2.0	SM-4	-54	Systematic	N/A
9.8	7.2	SM-5	95	Systematic	N/A
7.0	Edge	SM-6	-102	Systematic	N/A
45.1	6.2	SM-7	565	Systematic	N/A
7.7	3.6	SM-8	-136	Systematic	N/A
19.9	0.9	SM-9	184	Systematic	N/A
3.4	5.7	SM-10	265	Systematic	N/A
2.6	7.3	SM-11	129	Systematic	N/A
* Sample measurements are from the lower left corner of the wall surface on which they rest.					

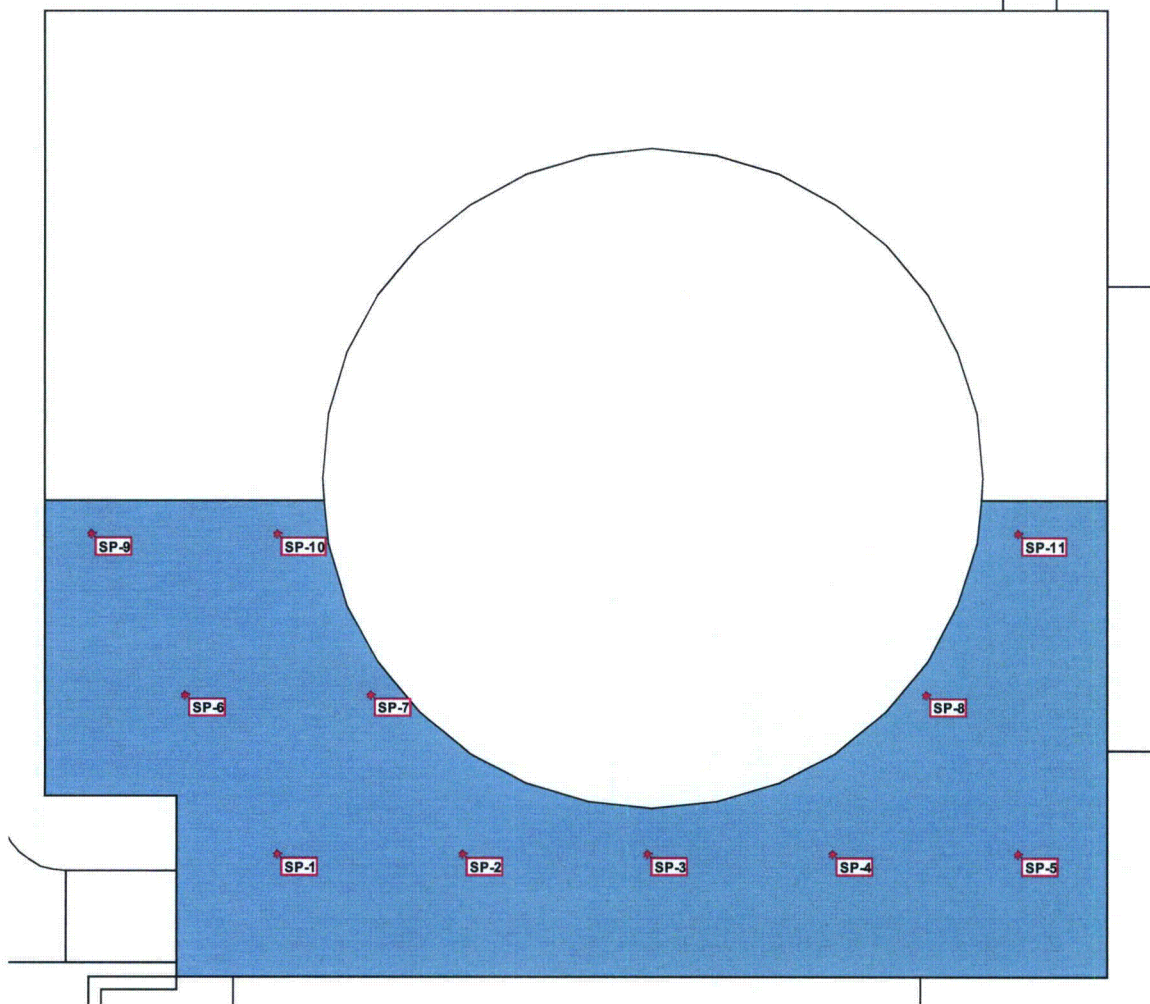
Survey Unit RB-5-2  
RB Roof - North Section



RB-5-2 AREA: Reactor Building Roof – North Section Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
11	-66	SM-1	378	Systematic	N/A
40	-66	SM-2	1547	Systematic	N/A
155	-66	SM-3	2149	Systematic	N/A
25	-41	SM-4	649	Systematic	N/A
140	-41	SM-5	2345	Systematic	N/A
11	-16	SM-6	176	Systematic	N/A
40	-16	SM-7	1284	Systematic	N/A
68	-16	SM-8	757	Systematic	N/A
97	-16	SM-9	1872	Systematic	N/A
126	-16	SM-10	439	Systematic	N/A
155	-16	SM-11	1946	Systematic	N/A
* Sample measurements are from the Northwest corner of the survey unit.					



Survey Unit RB-5-3  
RB Roof - South Section



RB-5-3 AREA: Reactor Building Roof – South Section Measurement Locations and results					
X Co-ord (m)	Y Co-ord (m)	Location / dpm/100-cm <sup>2</sup>		Type	Notes
15	19	SM-1	601	Systematic	N/A
44	19	SM-2	750	Systematic	N/A
72	19	SM-3	872	Systematic	N/A
100	19	SM-4	372	Systematic	N/A
129	19	SM-5	210	Systematic	N/A
1	43	SM-6	685	Systematic	N/A
30	43	SM-7	791	Systematic	N/A
115	43	SM-8	284	Systematic	N/A
-13	68	SM-9	1115	Systematic	N/A
15	68	SM-10	601	Systematic	N/A
129	68	SM-11	514	Systematic	N/A

\* Sample measurements are from the Southwest corner of the survey unit.

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## **Attachment 12**

### **Reactor Building**

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#### **Appendix C**

##### **QC Measurements**



Survey Unit	Measurement ID	Net Activity <sup>(1) (2)</sup> (dpm/100-cm <sup>2</sup> )	QC Replicate <sup>(2)</sup> (dpm/100-cm <sup>2</sup> )	RPD (%) <sup>(3)</sup>
RB-4-42	SM-11	66	210	104.3
RB-1-20	SM-5	67	343	134.6
RB-3-38	SM-3	117	-35	370.7
RB-4-28	SM-5	133	58	78.5
RB-3-38	SM-4	139	0	200.0
RB-3-1	SM-9	146	21	149.7
RB-4-28	SM-7	167	230	31.7
RB-5-1	SM-9	184	41	127.1
RB-3-7	SM-6	252	347	31.7
RB-1-40	SM-1	263	777	98.8
RB-1-40	SM-4	263	236	10.8
RB-3-16	SM-10	263	107	84.3
RB-1-20	SM-2	315	357	12.5
RB-1-40	SM-6	336	338	0.6
RB-3-23	SM-9	353	613	53.8
RB-3-29	SM-12	425	527	21.4
RB-4-34	SM-2	441	346	24.1
RB-1-9	SM-8	444	777	54.5
RB-3-34	SM-8	451	446	1.1
RB-3-6	SM-6	462	733	45.4
RB-1-24	SM-5	477	419	12.9
RB-3-33	SM-7	497	853	52.7
RB-4-21	SM-4	497	540	8.3
RB-1-22	SM-1	503	203	85.0
RB-3-34	SM-9	503	655	26.3
RB-4-22	SM-9	503	373	29.7
RB-4-42	SM-10	508	273	60.2
RB-3-4	SM-11	510	693	30.4
RB-1-7	SM-2	516	642	21.8
RB-3-27	SM-2	529	127	122.6
RB-3-33	SM-6	542	259	70.7
RB-1-20	SM-7	544	351	43.1
RB-1-8	SM-1	549	405	30.2
RB-4-34	SM-3	552	477	14.6
RB-2-2	SM-2	555	927	50.2
RB-4-15	SM-9	562	697	21.4
RB-1-36	SM-5	582	662	12.9
RB-1-24	SM-7	604	622	2.9
RB-3-18	SM-5	606	20	187.2
RB-3-18	SM-4	613	113	137.7

Survey Unit	Measurement ID	Net Activity <sup>(1) (2)</sup> (dpm/100-cm <sup>2</sup> )	QC Replicate <sup>(2)</sup> (dpm/100-cm <sup>2</sup> )	RPD (%) <sup>(3)</sup>
RB-3-19	SM-1	613	527	15.1
RB-4-15	SM-5	613	474	25.6
RB-1-36	SM-1	614	574	6.7
RB-4-21	SM-2	622	576	7.7
RB-2-1	SM-9	628	967	42.5
RB-4-10	SM-3	629	380	49.4
RB-1-20	SM-11	631	587	7.2
RB-3-29	SM-11	634	787	21.5
RB-1-9	SM-4	647	622	3.9
RB-4-33	SM-3	662	643	2.9
RB-1-20	SM-10	678	392	53.5
RB-4-5	SM-5	680	529	25.0
RB-4-22	SM-7	706	620	13.0
RB-4-40	SM-5	706	633	10.9
RB-4-11	SM-1	734	633	14.8
RB-4-5	SM-3	740	484	41.8
RB-1-22	SM-6	752	480	44.2
RB-4-33	SM-6	755	308	84.1
RB-1-24	SM-3	758	439	53.3
RB-3-29	SM-7	765	633	18.9
RB-3-19	SM-9	768	647	17.1
RB-3-23	SM-5	797	933	15.7
RB-1-9	SM-5	824	432	62.4
RB-1-7	SM-7	830	311	91.0
RB-4-8	SM-1	839	207	120.8
RB-3-5	SM-2	846	860	1.6
RB-4-40	SM-6	853	587	36.9
RB-4-24	SM-2	869	447	64.1
RB-1-22	SM-3	913	770	17.0
RB-4-15	SM-7	927	730	23.8
RB-4-15	SM-11	949	1007	5.9
RB-4-5	SM-1	980	850	14.2
RB-1-36	SM-10	987	291	108.9
RB-3-5	SM-10	993	613	47.3
RB-4-5	SM-7	993	706	33.8
RB-1-8	SM-9	1,039	439	81.2
RB-1-7	SM-3	1,092	358	101.2
RB-4-20	SM-11	1,420	-438	378.4
RB-5-2	SM-3	2,149	597	113.0
RB-5-2	SM-5	2,345	523	127.1
RB-4-43	SM-1	2,434	2,013	18.9



Survey Unit	Measurement ID	Net Activity <sup>(1) (2)</sup> (dpm/100-cm <sup>2</sup> )	QC Replicate <sup>(2)</sup> (dpm/100-cm <sup>2</sup> )	RPD (%) <sup>(3)</sup>
RB-4-18	SM-2	3,920	3,460	12.5
RB-4-18	IM-9	8,470	9,140	7.6
RB-4-42	IM-1	9,000	10,292	13.4
RB-3-4	IM-1	19,100	18,420	3.6
RB-4-18	IM-12	22,500	24,300	7.7
RB-4-18	IM-11	22,800	24,000	5.1
RB-4-3	IM-3	30,800	29,000	6.0
RB-4-3	IM-2	37,500	42,600	12.7
RB-3-13	IM-2	45,000	47,100	4.6

## Appendix C Notes:

1. The table entries are sorted by Net Activity in increasing order.
2. Repeat replicate QC measurements performed where RPD criterion not met are not included.
3. Relative Percent Difference (RPD) is calculated as:

$$RPD = \left| \frac{(Original - Replicate)}{(Original + Replicate)/2} \right|$$

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**Appendix D**

**Evaluation of Revised DCGLs**



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Addendum 2 – Calculation of Revised Equivalent Screening Level DCGL for ALARA Evaluation

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## 1.0 Introduction

As part of an NRC inspection at the PBRF Decommissioning Project in July 2011, radiological surveys and records review were performed by the NRC independent verification contractor, ORISE. The ORISE review included a review of gross beta activity DCGL values used by the PBRF to evaluate FSS measurements for compliance with the 25 mrem/y release criterion. The gross beta activity DCGL values and the radionuclide mixtures used to calculate them are published in a PBRF Technical Basis Document, PBRF-TBD-07-001 [PBRF 2007].

The ORISE report, issued in October 2011, identified an error in the gross activity DCGL used for the -15 ft. elevation (Area 20) of the Reactor Building, 35,296 dpm/100-cm<sup>2</sup>. The ORISE report determined that this value did not correctly account for the use of beta surface activity measurements as surrogates in areas such as the Reactor Building -15 ft. elevation where the radionuclide mixture reported in TBD-07-001 included alpha emitting U-234 [ORISE 2011].

In subsequent discussions with the NRC, it was agreed that NASA would re-evaluate the method used to calculate DCGLs, with particular attention given to areas where uranium was included in the radionuclide mixture. This evaluation would also include a review of the basis for determining that uranium was present in the radionuclide mixtures. The results of this re-evaluation, including revised radionuclide mixtures and revised gross activity DCGLs for the PBRF structures, are published in a new technical basis document, [PBRF 2012a]. In what follows, effects of the revised gross activity DCGLs on the FSS of the Reactor Building (RB) are evaluated. The following topics are addressed:

- The effect of revised DCGLs on the survey design calculation of the number of measurements, "N".
- Instrument sensitivities and scan survey action levels relative to the revised DCGLs.
- Evaluation of FSS systematic measurement results against the revised DCGLs to ensure that the RB survey units satisfy the 25 mrem/y criterion.
- Investigative static measurements are reviewed to determine if Elevated Measurement Comparison (EMC) and Elevated Measurement Test (EMT) results are changed as a result of reduced DCGLs.

The next section, Section 2.0, contains a summary of the revised gross activity DCGLs. In Section 3.0, an evaluation to determine if the number of systematic measurements, N, is changed as a result of the revised DCGLs is described. Section 4.0 summarizes an evaluation of instrument sensitivities and scan survey action levels to ensure that FSS Plan requirements for action levels relative to DCGLs are satisfied. In Section 5.0, the FSS systematic total surface beta measurement results are evaluated to demonstrate that the RB survey units meet the 25 mrem/y criterion, considering the revised DCGLs. Static investigative measurement results are compared to the revised DCGLs in Section 6.0. Addendum 1 provides the Visual Sample Plan output screens for design calculations using the revised DCGLs and Addendum 2 presents the EXCEL template used in the revised ALARA evaluation.



## 2.0 Revised DCGLs

The revised gross beta activity DCGLs for RB structural areas are compared to the original DCGLs in Table 1. It is seen that there are only five DCGL values used in the 13 RB designs. In the discussions which follow, Designs 43, 59, 60A, 61A, 66, 69B and 70A will be examined to determine if the revised DCGLs affect the design calculations.

**Table 1, DCGLs for the RB Structures – Comparison of Revised and Original Values**

Survey Design	Location	TBD-07-001 Table 5-3 DCGL <sub>GB</sub>	Revised DCGL <sub>GB</sub>	% change
		(dpm/100-cm <sup>2</sup> )		
43	Canals F, G, H RB-4-1 thru RB-4-11	31,711	30,734	-3.1
59	Area 11 Mezzanine RB-2-1 & RB-2-2	29,060	28,040	-3.5
60A	-25 ft. Fl. & Trenches RB-4-12 thru RB-4-20	14,600	14,382	-1.5
60B	-25 ft. Walls & Ceiling RB-4-21 thru RB-4-41	14,600	14,382	-1.5
61A	-15 ft. Floor, RB-3-3 thru RB-3-14 & RB 3-23	35,296	40,500	14.7
61B	-15 ft. Walls & Ceiling RB-3-15 thru RB-3-22 & RB3-24 thru ERB-3-39	35,296	40,500	14.7
61C	-15 ft. E. Stairway resurvey, RB-3-13	35,296	40,500	14.7
65	0 ft. upper walls & ceil. RB-1-17 thru RB-1-21, RB-1-28 thru RB-1-30 & RB-1-37 thru RB-1-42	29,060	28,040	-3.5
66	0 ft. Fl. & L.W. RB-1-1 thru RB-1-16, RB-1-22 thru RB-1-27, RB-1-31 thru RB-1-42	29,060	28,040	-3.5
69A	Exterior Walls, RB-5-1 (Default)	27,166	23,146	-14.8
69B	Roof, RB-5-2, RB-5-3 (Default)	27,166	23,146	-14.8
70A	Cold Sump -15 ft. RB-3-1	35,296	40,500	14.7
70C	-25 ft. Cold Sump & PPP Rm. Sump RB-4-42, RB-4-43	14,600	14,382	-1.5

## 3.0 Survey Design Calculations with Revised DCGLs

To determine if the revised DCGLs would result in significant additional FSS measurements, the number of measurements was recalculated for the seven RB survey designs which have distinct design parameters. The revised DCGLs were input into VSP. The principal design parameters and the VSP input parameter values are shown in Table 2. The table lists the original design parameters for Designs 43, 59, 60A, 61A, 66, 69B and 70A. The table rows immediately below the original design parameters show the design parameters associated with the revised DCGLs. Comparing the original and revised design parameter values, it is seen that the LBGR/DCGL ratio is preserved as is the value of  $\sigma$ , except where  $\sigma$  was assumed to be a fixed percentage of the DCGL (20%). The LBGR did change somewhat, because of the change in DCGL values, but the FSS Plan guidance to maintain the relative shift ( $\Delta/\sigma$ ) between one and three was accomplished in all but Design 61A

where the value of  $\Delta/\sigma$  changed from 3.0 to 3.4. Figures 1 through 7 in Addendum 1 are images of the VSP design output screens for the re-calculation of N. They show the values of  $\alpha$ , the Type I error probability,  $\beta$ , the Type II error probability (these are unchanged),  $\Delta$ , the DCGL and  $\sigma$ , the estimated standard deviation.

Table 2 shows that the calculated number of measurements for all the designs is unchanged. This attests to the conservative assumptions used in the original design calculations.

**Table 2, RB Survey Design Recalculation Summary**

Design No.	Area	DCGL <sub>w</sub> <sup>(1)</sup>	LBGR <sup>(1)</sup>	$\frac{LBGR}{DCGL_w}$	$\Delta$ <sup>(1)</sup>	$\sigma$ <sup>(1)</sup>	$\Delta/\sigma$	N
43	Canals F, G, H <sup>(2)</sup>	27,271	24,166	0.89	3,105	1,035	3.0	11
	Canals F, G, H, Revised <sup>(2)</sup>	26,431	23,422	0.89	3,009	1,035	2.9	11
59	Area 11 Mezzanine <sup>(3)</sup>	26,154	25,077	0.96	359	359	3.0	15
	Area 11 Mezzanine, Revised <sup>(3)</sup>	25,236	24,197	0.96	359	359	2.9	15
60A	-25 ft. Floor & Trenches <sup>(2)</sup>	12,556	6,278	0.5	6,278	2,260	2.8	11
	-25 ft. Floor & Trenches, Revised <sup>(2)</sup>	12,369	6,184	0.5	6,184	2,260	2.7	11
61A	-15 Floor <sup>(2)</sup>	30,355	26,758	0.88	3,597	1,199	3.0	11
	-15 Floor, Revised <sup>(2)</sup>	34,830	30,703	0.88	4,127	1,199	3.4	11
66	0 ft. Floor & Lower Walls <sup>(3)</sup>	26,154	13,077	0.5	13,077	5,230	2.5	11
	0 ft. Floor & Lower Walls, Revised <sup>(3)</sup>	25,236	12,618	0.5	12,618	5,230	2.4	11
69B	Exterior Roof <sup>(3)</sup>	24,449	12,225	0.5	12,224	4,890	2.5	11
	Exterior Roof, Revised <sup>(3)(4)</sup>	20,831	10,416	0.5	10,415	4,166	2.5	11
70A	Cold Sump, -15 ft. <sup>(3)</sup>	31,766	15,883	0.5	15,883	6,353	2.5	11
	Cold Sump, -15 ft., Revised <sup>(3)(4)</sup>	36,450	18,225	0.5	18,225	7,290	2.5	11

Table 2 Notes:

1. Units are dpm/100-cm<sup>2</sup>.
2. The DCGL<sub>w</sub> values are obtained by adjusting the DCGLs published in TBD-07-001 and TBD-11-002 (revised DCGLs) to account for dose contributions from insignificant radionuclides (2.5 mrem) and embedded piping (1.0 mrem).
3. The DCGL<sub>w</sub> values are obtained by adjusting the DCGLs published in TBD-07-001 and TBD-11-002 (revised DCGLs) to account for dose contributions from insignificant radionuclides (2.5 mrem). No adjustment is made for embedded piping.
4. The standard deviations for the revised 69B and 70A designs are changed to maintain the original assumption that  $\sigma = 20\%$  of the DCGL.



## 4.0 Instrument Sensitivities and Action Levels

Sensitivities of instruments used in the FSS of the RB are reviewed to ensure that they were sufficient to meet FSS Plan requirements in view of the revised DCGLs. As described in Section 4.1 of the main body of this report, the FSS Plan requirement for Class 1 survey units is that when an observed scan count rate is greater than a value equivalent to the  $DCGL_{EMC}$ , an investigation is required. For Class 2 and 3 survey units, an investigation is required whenever a scan count rate is observed that is greater than a value equivalent to the  $DCGL_W$ . Alternatively, if the scan MDC is greater than the  $DCGL_W$ , an observed scan count rate greater than the scan MDC requires an investigation.

In the original survey designs and instructions for Class 1 survey units, scan investigation levels were set below the DCGL. This provided a conservative margin below the requirement that the investigation level be set at the  $DCGL_{EMC}$ . The investigation levels used in the FSS of the RB are compared to  $DCGL_{EMC}$  values associated with the revised DCGLs to determine if the FSS Plan requirement is satisfied in retrospect. Table 3 lists the revised  $DCGL_{EMC}$  values for the designs where the revised  $DCGL_W$ s are decreased from the original values.

**Table 3, Revised  $DCGL_{EMC}$  Values for RB Class 1 Survey Units**

Design No.	Reactor Building Area	Revised $DCGL_W$ (dpm/100-cm <sup>2</sup> )	Area of Largest SU (m <sup>2</sup> )	$A_{EMC}$ (m <sup>2</sup> ) <sup>(1)</sup>	Area Factor <sup>(2)</sup>	Revised $DCGL_{EMC}$ (dpm/100-cm <sup>2</sup> ) <sup>(3)</sup>
43	Canals F, G & H	26,431	97.8	8.9	2.2	58,148
60A/60B	-25 ft. Floor, Trenches, Walls & Ceiling	12,369	94.2	8.6	2.2	27,212
66	0 ft. Floor & Lower Walls	25,236	97	8.8	2.2	55,519

Table 3 Notes:

1. Calculated as  $A_{EMC} = 100/N$  where 100 m<sup>2</sup> is a conservative-representative value of the Class 1 RB survey unit areas.
2. The Area Factor for  $A_{EMC} = 9.1$  is 2.2. It is obtained by interpolation from FSS Plan Table 3-5, Building Reuse Area Factors (Structures).
3. The revised  $DCGL_{EMC}$  is obtained as revised  $DCGL \times 2.2$ .

Next, the investigation levels established in survey designs for the instrument models used in the RB FSS of Class 1 survey units are compared to the Revised  $DCGL_{EMC}$ s for those survey designs where the revised DCGLs are decreased from the original TBD-07-001 values. Table 4 shows the LMI model 44-116 detector information. The LMI 44-9 detector information is shown in Table 5. The tables show that in all cases instrument scan sensitivities are sufficient to meet the investigation level requirement for Class 1 areas; the detectors are capable of detecting contamination levels at or below the  $DCGL_{EMC}$  for the revised DCGLs.

**Table 4, LMI 44-116 Detector Scan Sensitivity and Investigation Levels for Original and Revised DCGLs – Class 1 Areas**

Design No.	Reactor Building Area	Scan MDC	SR Scan Investigation Level <sup>(1)</sup>	Scan count rate = DCGL <sup>(2)</sup>	Scan count rate = revised DCGL <sup>(2)</sup>	Scan count rate = revised DCGL <sub>EMC</sub> <sup>(2)</sup>	Investigation Level < Revised DCGL	Investigation Level < Revised DCGL <sub>EMC</sub>
		(dpm/100-cm <sup>2</sup> )	(gcpm)	(ncpm)				
43	Canals F, G & H	2587 <sup>(3)</sup>	3188 <sup>(3)</sup>	3188 <sup>(3)</sup>	3089	6797	No	Yes
60A/60B	-25 ft. Floor, Trenches, Walls & Ceiling	2892 <sup>(4)</sup>	1400 <sup>(5)</sup>	1468 <sup>(4)</sup>	1446	3181	No	Yes
66	0 ft. Floor & Lower Walls	2892 <sup>(6)</sup>	3057 <sup>(7)</sup>	3057 <sup>(6)</sup>	2950	6489	No	Yes

Table 4 Notes:

1. The scan investigation level for the 44-116 is in units of gcpm.
2. Action levels corresponding to DCGLs are in ncpm. Typical 44-116 background count rates are 200 to 250 cpm.
3. From Design 43, Table 5 and SR-316 Instructions. These values are for detector-to-surface distance  $\leq \frac{1}{2}$  in. & scan speed of 15.2 cm/sec.
4. From Design 60A, Table 5. These values are for detector-to-surface distance  $\leq \frac{1}{2}$  in. & scan speed of 15.2 cm/sec.
5. From SR-306, survey instructions.
6. From Design 66, Table 4. These values are for detector-to-surface distance  $\leq \frac{1}{2}$  in. & scan speed of 15.2 cm/sec.
7. From SR-327, survey instructions.

**Table 5, LMI 44-9 Detector Scan Sensitivity and Investigation Levels for Original and Revised DCGLs – Class 1 Areas**

Design No.	Reactor Building Area	Scan MDC	SR Scan Investigation Level	Scan count rate = DCGL <sup>(1)</sup>	Scan count rate = revised DCGL <sup>(1)</sup>	Scan count rate = revised DCGL <sub>EMC</sub> <sup>(1)</sup>	Investigation Level < Revised DCGL	Investigation Level < Revised DCGL <sub>EMC</sub>
		(dpm/100-cm <sup>2</sup> )	(ncpm)					
43	Canals F, G & H	11268 <sup>(2)</sup>	409 <sup>(2)</sup>	409 <sup>(2)</sup>	450	991	Yes	Yes
60A/60B	-25 ft. Floor, Trenches, Walls & Ceiling	10025 <sup>(3)</sup>	200 <sup>(4)</sup>	212 <sup>(3)</sup>	211	464	Yes	Yes
66	0 ft. Floor & Lower Walls	11268 <sup>(5)</sup>	392 <sup>(6)</sup>	392 <sup>(5)</sup>	430	946	Yes	Yes

Table 5 Notes:

1. Action levels corresponding to DCGLs are in ncpm. Typical 44-9 background count rates are 50 to 100 cpm.
2. From Design 43, Table 5 and SR-316 Instructions. These values are for detector-to-surface distance on contact & scan speed of 4.4 cm/sec.
3. From Design 60A, Table 5. These values are for detector-to-surface distance on contact & scan speed of 4.4 cm/sec.
4. From SR-306, survey instructions.
5. From Design 66, Table 4. These values are for detector-to-surface distance on contact & scan speed of 4.4 cm/sec.
6. From SR-327, survey instructions.

To evaluate the effect of revised-reduced DCGLs on the Class 2 and Class 3 survey units in the FSS of the RB, the scan survey data was reviewed to determine the measurement capabilities of the detectors actually used in the surveys. Table 6 summarizes the results. It shows that in the actual surveys of the Class 2 survey units and the single Class 3 survey unit, scan sensitivities were well below the DCGL (the revised DCGL<sub>w</sub> for these survey units is 25,236 dpm/100-cm<sup>2</sup>, with adjustment for deselected radionuclides). In these surveys, conservative action levels were used which corresponded to observed scan conditions; rough and fractured surfaces with detector-to-surface effective distance greater than the distance assumed under optimal conditions. Also, in calculating the total surface activity equivalent to the action level, the detector background count rate is subtracted; in contrast with normal practice in the FSS.

**Table 6, LMI 44-116 Action Levels and Scan Capabilities for Class 2 and 3 Survey Units**

Survey Unit	Action Level used in Survey (AL, gcpm) <sup>(1)</sup>	Detector Background (bkg, cpm)	Detector Efficiency (E <sub>i</sub> ) <sup>(2)</sup>	Efficiency Correction Factor (E <sub>c</sub> ) <sup>(3)</sup>	Total Surface Activity Equivalent to Action Level (TSA, dpm/100-cm <sup>2</sup> ) <sup>(4)</sup>
RB-1-17	1400	162	0.359	0.3966	17,390
RB-1-18	1500	194	0.359	0.3966	18,345
RB-1-19	1000	163	0.359	0.3966	11,757
RB-1-20	1000	173	0.364	0.3966	11,457
RB-1-21	1000	220	0.302	0.3966	13,025
RB-1-28	1000	185	0.364	0.3966	11,291
RB-1-29	200 <sup>(5)</sup>	33	0.145	1.0	19,195
RB-1-30	1000	204	0.362	0.3966	11,089
RB-1-43	1000	182	0.359	0.3966	11,490
RB-2-1	1500	182	0.333	0.5427	14,586
RB-2-2	3000 <sup>(6)</sup>	807	0.401	1.0	10,938
RB-5-2	1300	256	0.346	0.668	8,761
RB-5-3	1000	244	0.349	0.688	6,290
RB-5-1 <sup>(7)</sup>	600	190	0.359	0.5427	4,209

Table 6 Notes:

1. Scan action levels applied by technicians to the survey.
2. These are the actual efficiencies reported for the detectors used in the survey. A generic surface efficiency, E<sub>s</sub> = 0.5 is also applied.
3. This is an additional efficiency correction factor used to account for the reduced efficiency due to the increased effective detector-to-surface distance (44-116 detector). An E<sub>s</sub> of 0.8349 corresponds to 0.5 in. distance; an E<sub>s</sub> of 0.688 corresponds to 1.0 in distance; an E<sub>s</sub> corresponds to 1.5 in distance and an E<sub>s</sub> of 0.3966 corresponds to 2.0 in.
4. The Total surface beta activity equivalent to the action level is calculated as: 
$$TSA = \frac{AL - bkg}{E_i * 0.5 * E_c}$$
5. A 44-9 detector was used.
6. A 43-37 detector was used.
7. Class 3 survey unit.



## 5.0 Comparison of Investigative Measurements with Revised DCGLs

The Investigative static measurements are summarized in Table 13 of the Reactor Building FSS Report. In Table 7 below, the investigative static measurement results are compared to the revised DCGLs.

**Table 7, Comparison of RB Investigative Static Measurements to Revised DCGLs**

Survey Unit	Measurement ID	Size of Elevated Area (cm <sup>2</sup> )	Static Measurement (dpm/100-cm <sup>2</sup> )	Original DCGL <sub>w</sub>	Revised DCGL <sub>w</sub>	Meas. > Orig. DCGL <sub>w</sub>	Meas. > Rev. DCGL <sub>w</sub>
RB-3-4	IM-1	100	19,100	30355	34830	No	No
RB-3-13	IM-1	100	33,700	30355	34830	Yes	No
RB-3-13	IM-2	100	45,000	30355	34830	Yes	Yes
RB-4-3	IM-1	100	15,060	27271	26431	No	No
RB-4-3	IM-2	100	37,500	27271	26431	Yes	Yes
RB-4-3	IM-3	100	14,600	27271	26431	No	No
RB-4-4	IM-1	1000	22,800	27271	26431	No	No
RB-4-4	IM-2	700	19,200	27271	26431	No	No
RB-4-12	IM-1	100	20,200	12556	12369	Yes	Yes
RB-4-12	IM-2	100	41,100	12556	12369	Yes	Yes
RB-4-12	IM-3	100	16,600	12556	12369	Yes	Yes
RB-4-13	IM-1	100	9,250	12556	12369	No	No
RB-4-13	IM-2	100	10,100	12556	12369	No	No
RB-4-18	IM-1	100	7,460	12556	12369	No	No
RB-4-18	IM-2	100	13,600	12556	12369	Yes	Yes
RB-4-18	IM-3	100	10,400	12556	12369	No	No
RB-4-18	IM-4	100	10,900	12556	12369	No	No
RB-4-18	IM-5	100	11,700	12556	12369	No	No
RB-4-18	IM-6	100	10,200	12556	12369	No	No
RB-4-18	IM-7	100	4,920	12556	12369	No	No
RB-4-18	IM-8	100	12,000	12556	12369	No	No
RB-4-18	IM-9	100	8,470	12556	12369	No	No
RB-4-18	IM-10	200	7,800	12556	12369	No	No
RB-4-18	IM-11	100	22,800	12556	12369	Yes	Yes
RB-4-18	IM-12	1550	22,500	12556	12369	Yes	Yes
RB-4-19	IM-1	100	23,523	12556	12369	Yes	Yes
RB-4-20	IM-1	100	11,500	12556	12369	No	No
RB-4-20	IM-2	100	14,400	12556	12369	Yes	Yes
RB-4-20	IM-3	100	12,800	12556	12369	Yes	Yes
RB-4-20	IM-4	100	5,850	12556	12369	No	No
RB-4-20	IM-5	100	7,990	12556	12369	No	No

Inspection of Table 7 reveals that as expected, in all cases where the revised DCGL is decreased and the investigative measurement exceeded the original DCGL, it exceeded the revised DCGL as well. The EMC and EMT are re-calculated to ensure that the results are unchanged. The results of these calculations are shown in Table 8. Comparison of Table 8 results with Table 14 in the main report shows that in all cases where the  $DCGL_W$  is reduced, the investigative measurements are still well below the  $DCGL_{EMC}$  values. The table shows that the calculated EMT unity values are all increased (except for the RB-13 measurements), but only slightly. The highest unity value is only 25% of unity. The Table 8 results show that the impacts of the revised DCGLs on the EMC and EMT are very small and do not change any conclusions from the original tests; all are still satisfactory.

Table 8, Revised EMC and EMC Calculations

Survey Unit	Measurement ID	Size of Elevated Area (cm <sup>2</sup> )	Measured Activity	DCGL <sub>w</sub>	Calculated DCGL <sub>EMC</sub>	Average Activity in SU	EMT Unit Value
RB-3-13	IM-1/EMA-1	100	33,700	34,830 <sup>(1)</sup>	1.400E+06	4.835E+02	0.069
RB-3-13	IM-2/EMA-2	100	45,000	34,830 <sup>(1)</sup>	1.400E+06	4.835E+02	0.069
RB-4-3	IM-2/EMA-1	100	37,500	26,431	1.063E+06	5.778E+02	0.057
RB-4-12	IM-1/EMA-1	100	20,200	12,369	4.972E+05	8.181E+02	0.218
RB-4-12	IM-2/EMA-2	100	41,100	12,369	4.972E+05	8.181E+02	0.218
RB-4-12	IM-3/EMA-3	100	16,600	12,369	4.972E+05	8.181E+02	0.218
RB-4-18	IM-2/EMA-1	100	13,600	12,369	4.972E+05	1.109E+03	0.201
RB-4-18	IM-11/EMA-2	100	22,800	12,369	4.972E+05	1.109E+03	0.201
RB-4-18	IM-12/EMA-2	1550	22,500	12,369	4.972E+05	1.109E+03	0.201
RB-4-19	IM-1/EMA-1	100	23,523	12,369	4.972E+05	2.572E+03	0.250
RB-4-20	IM-2/EMA-1	100	14,400	12,369	4.972E+05	9.608E+02	0.129
RB-4-20	IM-3/EMA-2	100	12,800	12,369	4.972E+05	9.608E+02	0.129

Table 8 Note:

1. The  $DCGL_W$  for the RB-3-13 measurements represents an increase and thus will have no impact on the conclusions of the EMC and EMT. The results are included for completeness.

## 6.0 Evaluation of FSS Results to Ensure the Dose Criterion is met

Results of the systematic fixed survey measurements from each survey unit are reviewed to ensure that they satisfy the 25 mrem/y criterion, considering the revised DCGLs. To this end, the results of fixed measurements and tests, reported in Table 12 of the main body of this report are examined. Table 12 shows that the maximum individual measurement, 5,458 dpm/100-cm<sup>2</sup> (in survey unit RB-4-19) is well below the applicable revised  $DCGL_W$ , 12,369 dpm/100-cm<sup>2</sup>. The maximum of the survey unit averages, 2,572 dpm/100-cm<sup>2</sup> (also in survey unit RB-4-19) is also well below the applicable revised  $DCGL_W$ , 12,369 dpm/100-cm<sup>2</sup>.

The ALARA evaluation in Section 5.6 of the main report is also reviewed to examine the effect of revised DCGLs. Table 18 in the main report shows the screening level DCGL values and the PBRF

radionuclide activity fractions used in the ALARA evaluation (RB -25 ft. PPP Room mixture). Replacing the Table 18 activity fractions with the revised activity fractions developed in the TBD-11-002 for the radionuclide mixture results in a change in the screening level equivalent gross activity DCGL from 2,355 to 8,378 dpm/100-cm<sup>2</sup>. The details of this calculation are shown in Addendum 2. This change is primarily due to the removal of U-234 and U-235 from the mixture. The average of the RB systematic total surface beta activity measurements ( $451 \pm 480$ , with an upper 95<sup>th</sup> % confidence limit of 476 dpm/100-cm<sup>2</sup>) is well below the revised equivalent screening level DCGL. The conclusion that the ALARA requirement is satisfied is unchanged by the revised DCGLs.



## Addendum 1 – VSP Design Screens

Figure 1, VSP Screen for Design 43, Survey Unit RB-4-1

The screenshot shows a software window titled "True Mean or Median vs. Action Level" with a close button (X) in the top right corner. The window contains several tabs: "MARSSIM Sign Test", "Sample Placement", "Costs", "Data Analysis", and "Analytes". The "MARSSIM Sign Test" tab is active.

Below the tabs, there is a red instruction: "For Help, highlight an item and press F1".

The "Choose:" section has two radio buttons:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

Below the radio buttons, it states: "You have chosen as a baseline to assume the site is 'Dirty'"

The "Analyte:" section is enclosed in a box and contains the following fields:

- False Rejection Rate (Alpha):  %
- False Acceptance Rate (Beta):  %
- Width of Gray Region (Delta):
- Action Level (DCGLw):
- Estimated Standard Deviation:

Below the box, there is a button labeled "MQO".

Below the "MQO" button, it says: "Minimum Number of Samples for Analyte 1: 9".

At the bottom of the window, there is a calculation: "Minimum Number of Samples in Survey Unit: 9 +  % = 11".

The bottom of the window has four buttons: "OK", "Cancel", "Apply", and "Help".



Figure 2, VSP Screen for Design 59, Survey Unit RB-2-1

True Mean or Median vs. Action Level

MARSSIM Sign Test | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

You have chosen as a baseline to assume the site is "Dirty"

Analyte:

False Rejection Rate (Alpha):	5.0	%
False Acceptance Rate (Beta):	10.0	%
Width of Gray Region (Delta):	1039	
Action Level (DCGLw):	25236	
Estimated Standard Deviation:	359	

MQO

Minimum Number of Samples for Analyte 1: 9

Minimum Number of Samples in Survey Unit: 9 + 60 % = 15

OK Cancel Apply Help



Figure 3, VSP Design Screen for Design 60A, Survey Unit RB-4-12

True Mean or Median vs. Action Level

MARSSIM Sign Test | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

You have chosen as a baseline to assume the site is "Dirty"

Analyte:

False Rejection Rate (Alpha):	5.0	%
False Acceptance Rate (Beta):	10.0	%
Width of Gray Region (Delta):	6184	
Action Level (DCGLw):	12369	
Estimated Standard Deviation:	2260	

MQO

Minimum Number of Samples for Analyte 1: 9

Minimum Number of Samples in Survey Unit: 9 + 20% = 11

OK Cancel Apply Help



Figure 4, VSP Design Screen for Design 61A, Survey Unit RB-3-14

True Mean or Median vs. Action Level

MARSSIM Sign Test | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

You have chosen as a baseline to assume the site is "Dirty"

Analyte:

False Rejection Rate (Alpha):	5.0	%
False Acceptance Rate (Beta):	10.0	%
Width of Gray Region (Delta):	4127	
Action Level (DCGLw):	34830	
Estimated Standard Deviation:	1199	

MQO

Minimum Number of Samples for Analyte 1: 9

Minimum Number of Samples in Survey Unit: 9 + 20 % = 11

OK Cancel Apply Help



Figure 5, VSP Design Screen for Design 66, Survey Unit RB-1-1

True Mean or Median vs. Action Level

MARSSIM Sign Test | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

You have chosen as a baseline to assume the site is "Dirty"

Analyte:

False Rejection Rate (Alpha):	5.0	%
False Acceptance Rate (Beta):	10.0	%
Width of Gray Region (Delta):	12618	
Action Level (DCGLw):	25236	
Estimated Standard Deviation:	5230	

MQO

Minimum Number of Samples for Analyte 1: 9

Minimum Number of Samples in Survey Unit: 9 + 20 % = 11

OK Cancel Apply Help



Figure 6, VSP Design Screen for Design 69B, Survey Unit RB-5-3

True Mean or Median vs. Action Level

MARSSIM Sign Test | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

You have chosen as a baseline to assume the site is "Dirty"

Analyte:

False Rejection Rate (Alpha):	5.0	%
False Acceptance Rate (Beta):	10.0	%
Width of Gray Region (Delta):	10416	
Action Level (DCGLw):	20831	
Estimated Standard Deviation:	4166	

MQO

Minimum Number of Samples for Analyte 1: 9

Minimum Number of Samples in Survey Unit: 9 + 20% = 11

OK Cancel Apply Help



Figure 7, VSP Design Screen for Design 70A, Survey Unit RB-3-1

True Mean or Median vs. Action Level

MARSSIM Sign Test | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:

- ☒ True Mean or Median  $\geq$  Action Level (Assume Site is Dirty)
- ☐ True Mean or Median  $\leq$  Action Level (Assume Site is Clean)

You have chosen as a baseline to assume the site is "Dirty"

Analyte:

False Rejection Rate (Alpha):	5.0	%
False Acceptance Rate (Beta):	10.0	%
Width of Gray Region (Delta):	18225	
Action Level (DCGLw):	36450	
Estimated Standard Deviation:	7290	

MQO

Minimum Number of Samples for Analyte 1: 9

Minimum Number of Samples in Survey Unit: 9 + 20% = 11

OK Cancel Apply Help



## Addendum 2 – Calculation of Revised Equivalent Screening Level DCGL for ALARA Evaluation

The EXCEL template used to calculate screening level equivalent gross activity DCGLs for the ALARA evaluation described in Section 5.6 of the main body of this report is shown below. The individual radionuclide screening level DCGLs shown in the range B4:I4 are the NRC screening level DCGLs shown in Table 12 of the main body of this report. The template uses the surrogate and gross beta activity DCGL equations from Section 3.6 of the PBRF FSS Plan. These equations are implemented in the cell formulas in the range L8:M9. Example cell formulas are shown for cells L8 and M8. The template calculates screening level equivalent DCGLs for the original and revised radionuclide mixtures.

	A	B	C	D	E	F	G	H	I	K	L	M	
1													
2		Screening Level DCGLs (dpm/100-cm <sup>2</sup> )											
3		H-3	Co-60	Sr-90	I-129	Cs-137	Eu-154	U-234	U-235				
4		1.20E+08	7,100	8,700	35,000	28,000	12,000	91	98				
5													
6		Description	Activity Fractions							Detectable Activity Fraction	Screening Level DCGL <sub>sur</sub>	Screening Level DCGL <sub>GB</sub>	
7			H-3	Co-60	Sr-90	I-129	Cs-137	Eu-154	U-234		U-235	(dpm/100-cm <sup>2</sup> )	
8		-25 ft. PPP Rm. Mix.	0.0729	0.5389	0.2222	0	0.1205	0.0171	0.0242	0.0042	0.8987	385	2161
9		Revised -25 ft. PPP Rm. Mix	0.075	0.555	0.229	0	0.124	0.018			0.9251	27996	8378
10													
11													
12		Example Cell Formulas											
13		Cell	Formula							Comment			
14		K8	=(C8+D8+F8+G8)/SUM(B8:I8)							Detectable Activity Fraction			
15		L8	=1/(((1/\$F\$4)+((B8/F8)/\$B\$4)+((E8/F8)/\$E\$4)+((H8/F8)/\$H\$4)+((I8/F8)/\$I\$4))							Surrogate DCGL Calculation			
16		M8	=K8/((F8/L8)+(C8/\$C\$4)+(D8/\$D\$4)+(G8/\$G\$4))							Gross Activity DCGL Calculation			