Pu-Plant Room Exhaust System

The Pu-plant was maintained at a negative pressure at all times during production and clean up with this system. Each floor exhaust hole had an absolute filter installed just below the floor level, and clean fiberglass prefilters were maintained on top of these absolute filters. These exhaust holes were connected to the exhaust tunnel by transite exhaust duct, that was installed before the concrete floors were installed. Control louvers were installed on each duct just inside the tunnel, to maintain a proper air flow pattern through out the building. This exhaust tunnel is connected to the exhaust fanroom by a 6'x12'x26' riser.

We had to decontaminate most filter housings from the filter seal up to the floor level. We found contamination in the filter housings below the filter seal in:

1. Room 129 - Maximum 1,000 dpm/100 cm^2 direct, 500 dpm/100 cm^2 smear.

2. Room 132 - South filter - 300 to 500 dpm/100 cm^2 direct, 300 dpm/100 cm^2 smear.

   Note: These two filter housings (129 and 132) had a liquid stain where these levels were found.

3. Room 133 - 100 to 1500 dpm/100 cm^2 direct 20 to 100 dpm/100 cm^2 smear.

4. Room 134 - 300 to 500 dmp/100 cm^2 direct 20 to 100 dpm/100 cm^2 smear.

5. Room 138 - 100 to 200 dpm/100 cm^2 direct 20 to 100 dpm/100 cm^2 smear.

6. Room 141 - 100 to 300 dpm/100 cm^2 direct 20 to 100 dpm/100 cm^2 smear.

7. Room 123 - 300 to 500 dpm/100 cm^2 direct 20 to 100 dpm/100 cm^2 smear.

   Note: These filter housings (133, 134, 138, and 123) may have been contaminated while removing filter.

8. Room 116 - 300 to 500 dpm/100 cm^2 direct 300 dpm/100 cm^2 smear. This entire filter housing was extremely oily.

9. Room 124 - 1,000 to 12,000 dpm/100 cm^2 direct - 2,000 to 5,000 dpm/100 cm^2 smear. We removed the steel filter sleeves in this room.

10. Room 127, 128, BO-1 - 1,000 to 2,000 dpm/100 cm^2 direct 500 dpm/100 cm^2 smear. We removed the steel filter housings and all steel duct in these four rooms.

We found contamination in the following transite ducts:

1. Room 124 west duct - North end 500 dpm/100 cm^2 direct.

2. Room 124 east duct - This duct had a moisture stain along the bottom of the duct for its entire run. This stained area 10,000 to 30,000 dpm/100 cm^2 direct and up to 2,000 dpm/100 cm^2 smearable. Non stained area 50 to 5,000 dpm/100 cm^2 direct and up to 1,000 dpm/100 cm^2 smear.

3. Room BO1 duct - Spot levels of 1,000 to 5,000 dpm/100 cm^2 direct and up to 1,000 dpm/100 cm^2 smear.

We spent approximately 8 weeks of extensive decontamination to reduce these levels to release limits. We removed steel sleeves inside these ducts and then sanded the entire length of these ducts. Where the duct was cracked in the bottom we removed a portion of the bottom of these ducts to check the soil below. We removed a small amount of soil from three locations.

The initial survey in the exhaust tunnel and riser were:

1. Walls and ceiling - 300 to 400 dpm/100 cm^2 direct
   100 dpm/100 cm^2 smear.

2. Control louvers - 500 to 2,000 dpm/100 cm^2 direct 500
   dpm/100 cm^2 smear.

3. Floor - 1,000 to 12,000 dpm/100 $cm,^2$ direct 500
   dpm/1000 cm^2 smear.

4. Piping and conduit - 2,000 to 4,00 dpm/100 cm^2 direct
   500 dpm/100 cm^2 smear.

We vacuumed the entire tunnel and removed the control louvers. We shot blasted the entire tunnel and deconed the piping and conduit. Our low energy gamma survey indicated a problem in a crack under room 124 east duct run, and a crack that ran to the tunnel drain pipe. We chiseled out these cracks and removed the drain pipe. We deconed and released the exhaust fans that were associated with this system.

We used a Ludlum 2220 with a Ludlum 43-17 low energy gamma probe to survey all cracks and seams. A Ludlum 2220 with a Ludlum 43-68, 43-4, or 43-27 was used with P-10 gas for all alpha release surveys. All smears were taken on Whatman smear paper and counted in a Hewlett -Packard 5560A (low background) automatic sample counter.

W. A. Rogers

W. A. Rogers

Pu PLANT RELEASE SURVEY PLAN

1. For initial decontamination all surfaces will be scanned with an Eberline PRM-6 with a Radeco alpha scintillation probe. Background will be maintained at less than 100 CPM(200 dpm). All areas greater than twice background will be marked and reading will be taken with a release survey instrument to document contamination levels and random large area smears will be taken.

2. After these initial areas are decontaminated, all floor surfaces and the base of each wall will be completely surveyed with a digital readout release instrument and a Ludlum large area gas proportional alpha detector and random smear samples will be taken. Release instrumentation shall have a minimum detectable level of at least 50 dpm/100 cm^2.

3. All hot spots greater than or equal to 100 dpm/100 cm^2 identified will be decontaminated.

4. A random survey with a release instrument will be taken on the walls and ceiling to try to identify any other problem areas.

5. If no problems are identified, each room will be gridded off into approximately 2 meter on a side square on the walls and floor and five readings will be taken in each grid. Readings shall be taken in the center and at the midpoint from the center to each corner.

6. Each ceiling has closely spaced rafters that will not be easily divided into 2 meter squares. Because of this, we will take readings on the bottom of each rafter at 2 meter intervals and one reading centered on the ceiling between rafters. Readings on each rafter will be staggered one meter.

7. These release readings will be documented on a map that is drawn to approximately scale measurements in meters.

8. Data provided on each map:

    1. Survey block numbers, identifiable on a scale drawings.

        a. room or area name or number.
        b. surface surveyed.
        c. type of measurement and units.

    2. Name of surveyor taking measurements, date of survey, and location.

3. Type, model number, calibration data, sensitivity limit, background, and source response of instruments used in survey.

4. When a block surveyed is below the sensitivity of the instrument, the fact that such a measurement was made should be included as significant data.

9. All release survey smears will be taken on Whatman smear paper and counted in the automatic sample counters. Each smear will cover approximately 100 cm^2.

10. There will be at least 30 survey blocks in each area to be released.

11. Piping and ductwork will be surveyed on all accessable sides at 2 meter intervals. If more than one line is running parallel in a pipe rack, readings shall be staggered at one meter intervals.

12. All readings taken that only cover part of a probe area will be corrected to dpm/100 cm^2.

13. No survey block will measure less than one meter on a side.

14. No survey block will measure more than 3 meters on a side.

15. All portable release survey instruments will be calibrated quarterly and all instruments in use will be source checked daily.

Table I-1. Acceptable surface contamination levels

Nuclides[a]	Average[b,c,f]	Maximum[b,d,f]	Removable[b,e,f]
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm²	15,000 dpm α/100 cm²	1,000 dpm α/100 cm²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm²	300 dpm/100 cm²	20 dpm/100 cm²
Th-nat, Th-232, Sr-90 Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm²	3,000 dpm/100 cm²	200 dpm/100 cm²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and other noted above.	5,000 dpm βγ/100 cm²	15,000 dpm βγ/100 cm²	1,000 dpm βγ/100 cm²

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm².

[e] The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f] The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

Pu-Plant air Exhaust system. Final release surveys

AREA	DIRECT					SMEAR			
	TOTAL DPM	# READINGS	AVG. DPM/100CM²	MAX. READING	MDA DPM/100CM²	TOTAL DPM	# SMEARS	AVG. DPM/100CM²	MAX. READING
Floor exhaust holes									
Pu. Production area	2920	85	34.35	98	19.40	171	85	2.01	9
Lab area	13,072	537	24.34	102	28.81	1059	502	2.11	15
Duct air lock	659	52	12.67	60	24.00	129	52	2.48	9
116	899	36	24.97	84	19.60	45	36	1.25	6
121	4191	215	19.49	90	24.00	402	215	1.87	9
123	6,260	260	24.09	98	33.26	483	260	1.86	15
124	5355	225	23.80	84	28.81	396	226	1.75	9
126	1,516	64	23.69	84	27.44	117	64	1.83	6
Exhaust Ducts									
Lab east	1878	48	39.13	234	28.81	75	40	1.88	9
" middle	660	26	25.38	72	28.81	57	26	2.19	9
" west	2490	45	55.33	120	33.26	81	37	2.19	6
H.P. area	306	7	43.71	132	23.52	21	7	3.00	6
116	180	7	25.71	42	23.52	9	7	1.29	6
121 west	288	26	11.08	48	28.81	42	26	1.62	6
east	690	32	21.56	60	28.81	24	32	0.75	6
123 west	654	37	17.68	48	16.63	42	37	1.14	6
east	654	38	17.21	54	23.52	63	38	1.66	6
124 west	984	27	36.44	138	28.81	90	23	3.91	9
east	3420	80	42.75	185	28.81	153	80	1.91	9
BO-1	3010	56	53.75	168	27.72	126	56	2.25	9
Tunnel - east	6290	205	30.68	96	19.20	378	205	1.84	12
" west	2450	102	24.02	84	19.20	231	102	2.26	9
" riser	3688	134	27.52	92	19.20	213	134	1.59	6
" Conduit	5502	118	46.63	84	57.61	243	118	2.06	9
" Entrance	320	30	10.67	44	15.68	60	30	2.00	9
" Down edges & Trimmer	2807	82	34.23	84	27.44	150	82	1.83	9
TOTALS	71,143	2574	27.64	234		4860	2520	1.93	15

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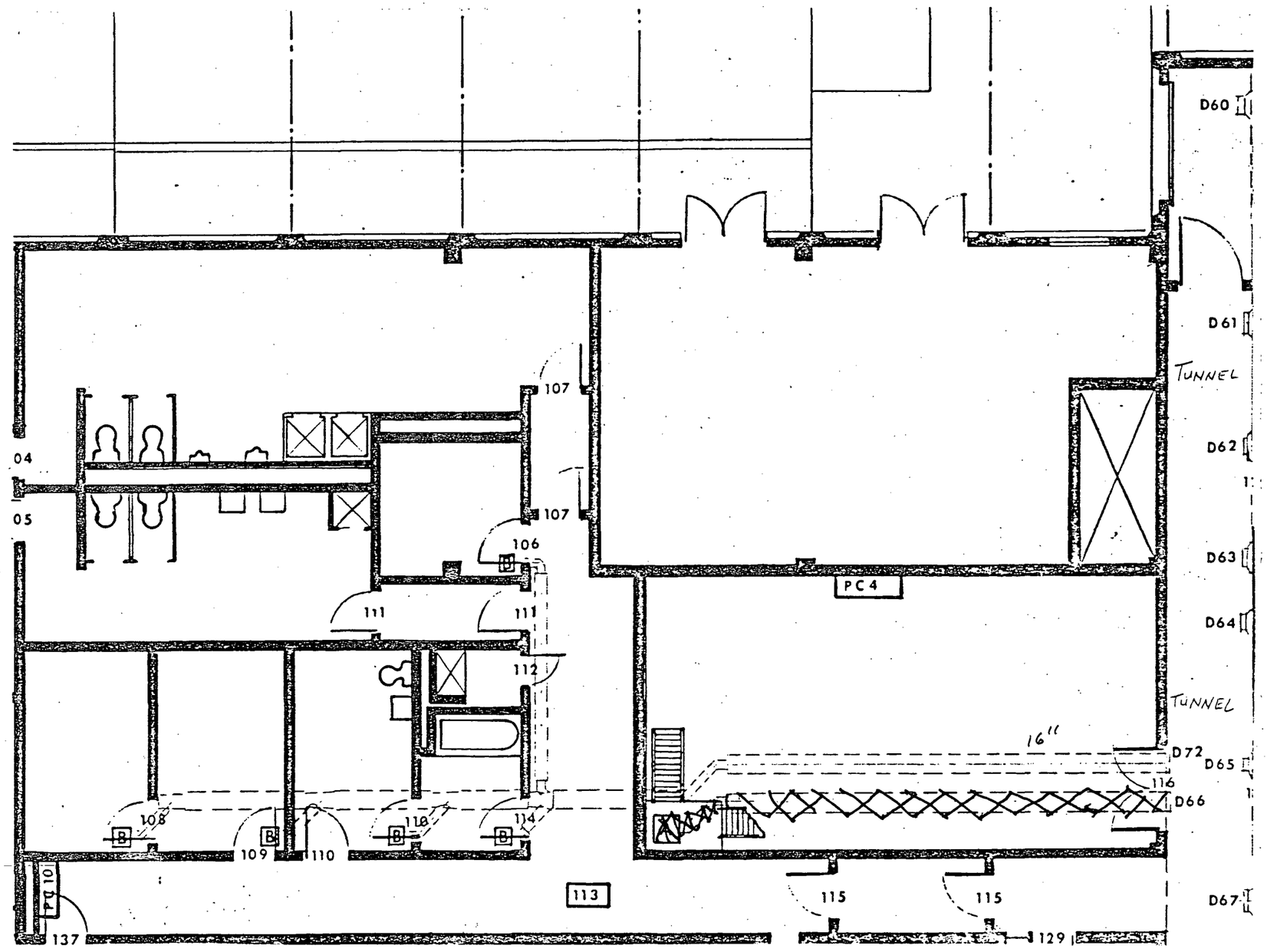
AREA Pu-PLANT H.P. AREA
FLOOR EXHAUST DUCT

TYPE OF SURVEY ∝ DIRECT ∀ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET.
SERIAL NUMBER

COMPLETION DATE
H.P. SIGNATURE
AUTO. SAMPLE COUNTER #:

SURVEY UNITS
DPM/100cm²



W
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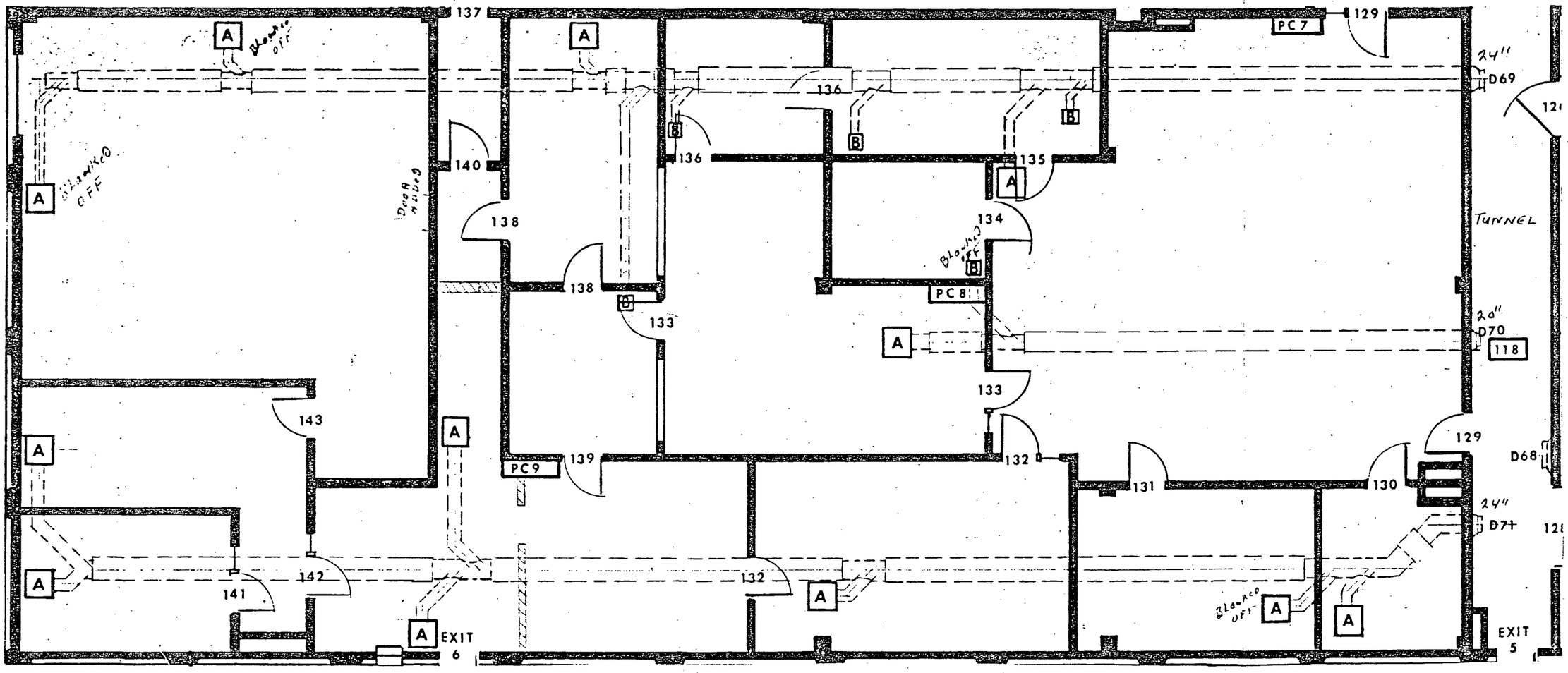
AREA Pu-PLANT LAB AREA
FLOOR EXHAUST DUCTS

TYPE OF SURVEY ∝ DIRECT & SMEAR
TYPE OF INSTRUMENT LUCLUM 2220/DET.
SERIAL NUMBER

COMPLETION DATE
H.P. SIGNATURE
AUTO. SAMPLE COUNTER #:

SURVEY UNITS
DPM/100cm²



S
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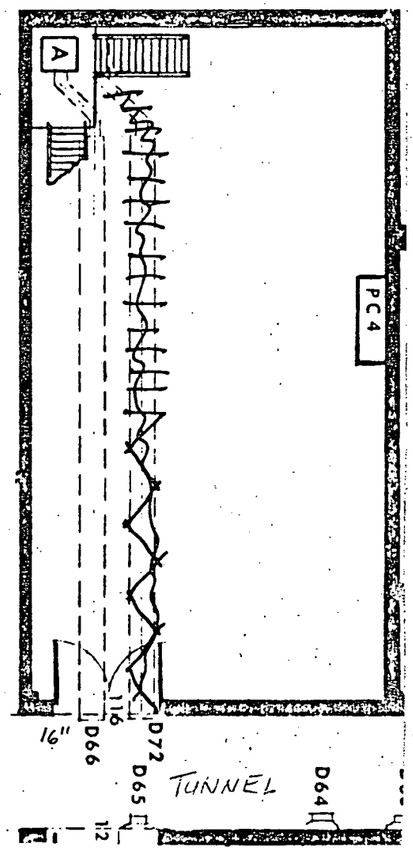
AREA Pu-PLANT Room #116
FLOOR EXHAUST DUCT

TYPE OF SURVEY ∝ DIRECT ∨ SMEAR
TYPE OF INSTRUMENT LUCLUM 2220/GET.
SERIAL NUMBER

COMPLETION DATE
H.P. SIGNATURE
AUTO. SAMPLE COUNTER #:

SURVEY UNITS
DPM/100cm²



AREA Pu-PLANT PRODUCTION AREA
FLOOR EXHAUST DUCTS

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUCLUM 2220/DET.

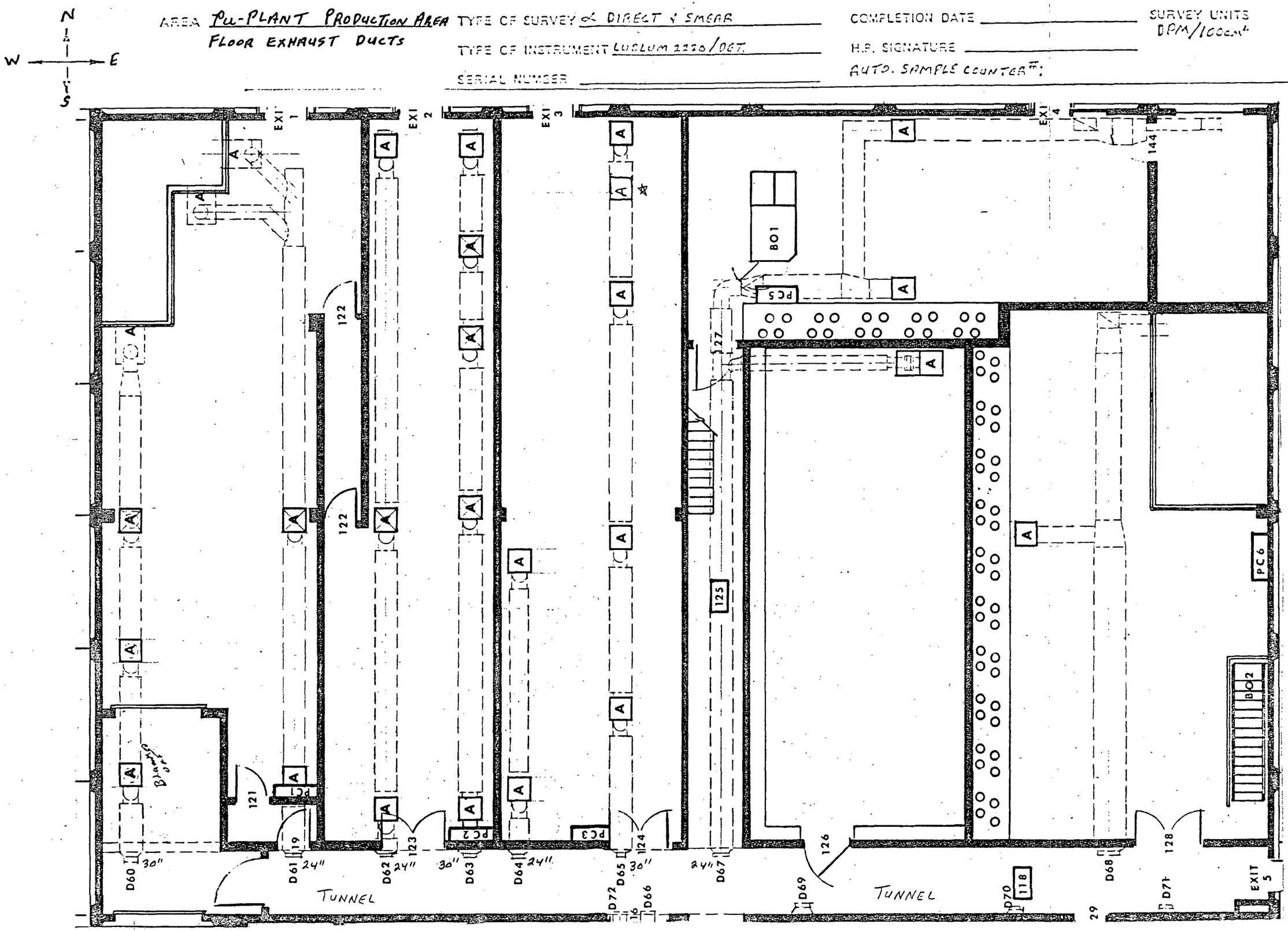
SERIAL NUMBER

COMPLETION DATE

H.P. SIGNATURE

AUTO. SAMPLE COUNTER #:

SURVEY UNITS
DPM/100cm²



AREA Pu-PLANT ROOM # 106
FLOOR EXHAUST HOLE
BEFORE DECON

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4, 43-68
SERIAL NUMBER 50057 (43-68), 52834 (43-4)

COMPLETION DATE
H.P. SIGNATURE W.O. Ayers
AUTO. SAMPLE COUNTER #2: 83600108

SURVEY UNITS DPM/100cm²

N / S / E / W

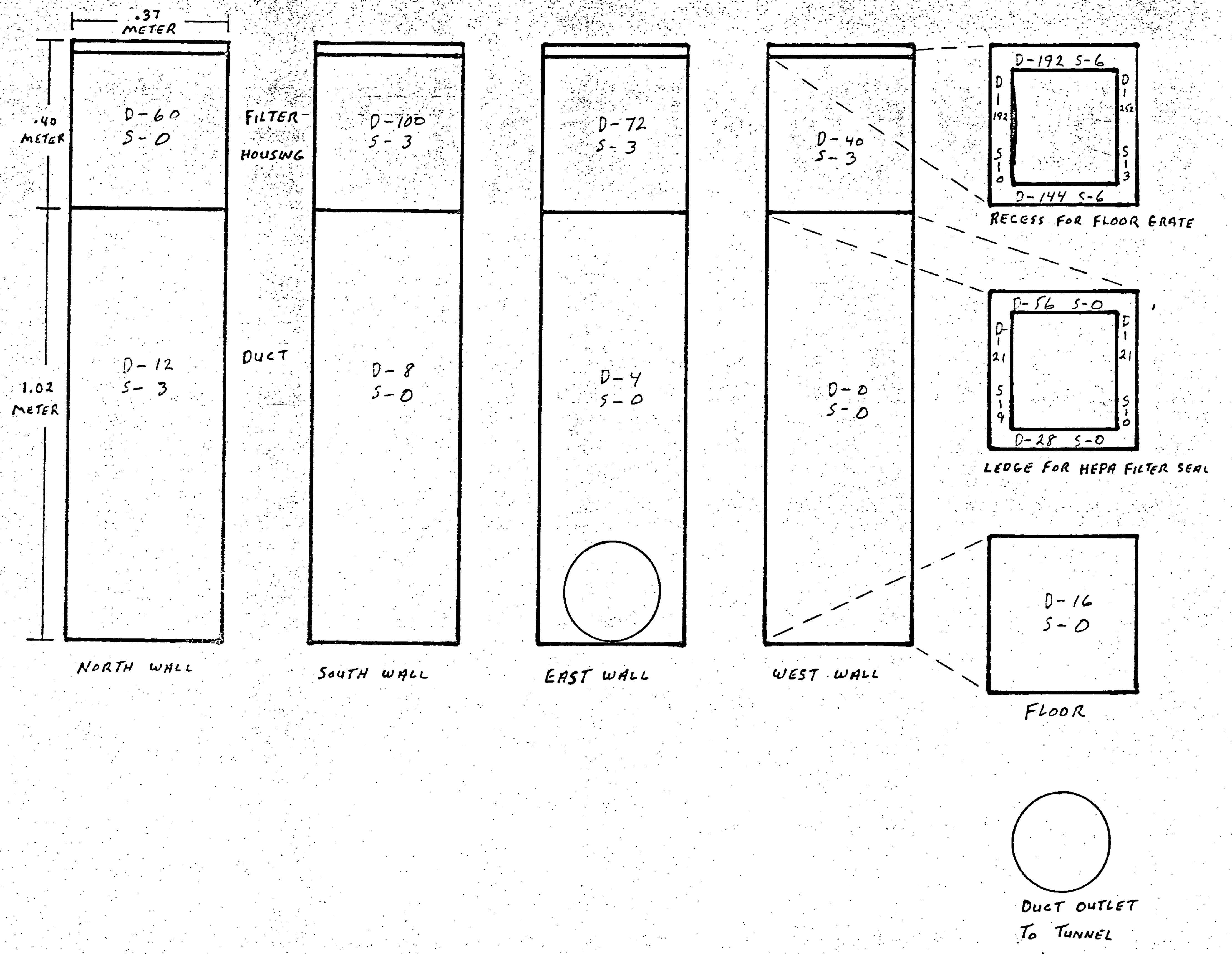
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE RESPONSE C/M	BKGD C/M
50057	3-21-89	218, 214	1
50057	3-21-89	212, 220	2
52834	3-21-89	225, 220	2
52834	3-21-89	229, 222	0
50057	3-27-89	204, 208	2
		ASC #2	
	3-22-89	29	.3



N
W — E
S

AREA Re-PLANT ROOM #106
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY D DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4, 43-68
SERIAL NUMBER 43-4 50064, 43-68 37807

COMPLETION DATE 4-11-89
H.P. SIGNATURE Charles M Thompson
AUTO. SAMPLE COUNTER #: #2 876 00108

SURVEY UNITS
DPM/100cm²
WAR

1cm = .1 METER

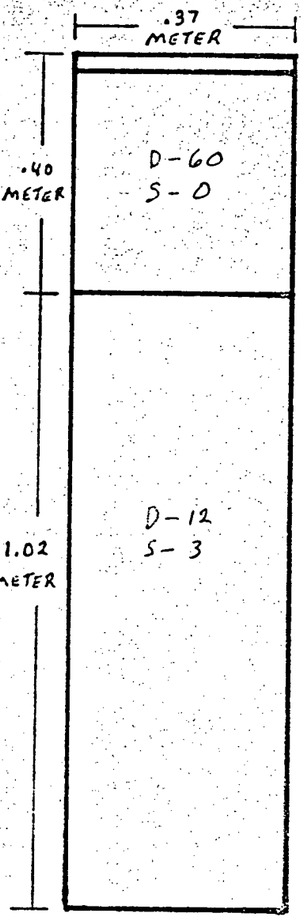
F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

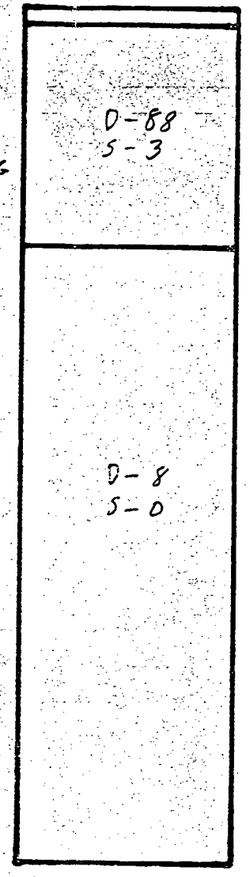
MDA = 19.40
DPM/100cm²
FIXED

SOURCE #: 6816 VALUE: 1078 DPM

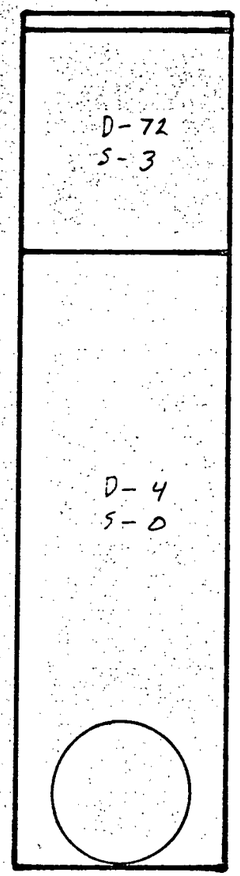
	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EKCO C/M
50064	4-10-89	279,280	1
37807	4-10-89	259,250	3
		ASC #2	
	4-11-89	30	.1



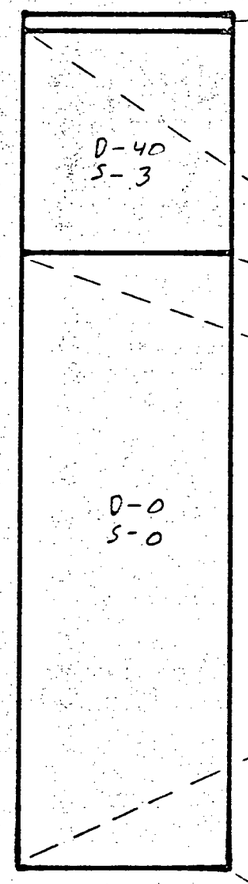
NORTH WALL



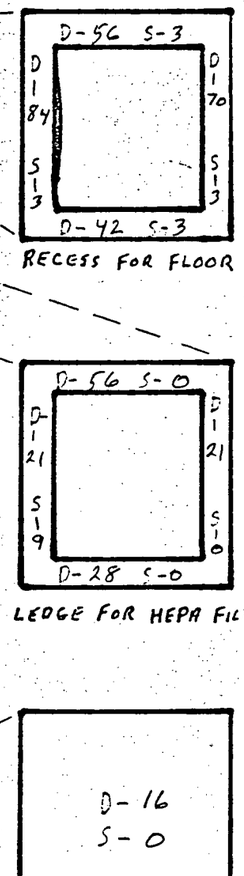
SOUTH WALL



EAST WALL

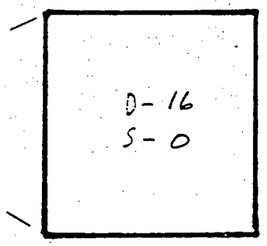


WEST WALL



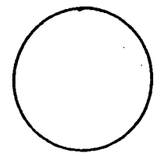
RECESS FOR FLOOR GRATE

LEDGE FOR HEPA FILTER SEAL



FLOOR

	DIRECT	SMEAR
TOTAL DPM	678	33
#READINGS	17	17
AVG. DPM/100cm²	39.88	1.94
MAX DPM/100cm²	88	9


DUCT OUTLET
TO TUNNEL

N
W — E
S

AREA Pu-PLANT ROOM # 108
FLOOR EXHAUST HOLE
BEFORE DECON

TYPE OF SURVEY D DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 + 43-68
SERIAL NUMBER 43-68: 50057 ; 43-4: 52834

COMPLETION DATE
H.P. SIGNATURE W.A. Rogers
AUTO. SAMPLE COUNTER #: #2 83600108

SURVEY UNITS DPM/100cm²

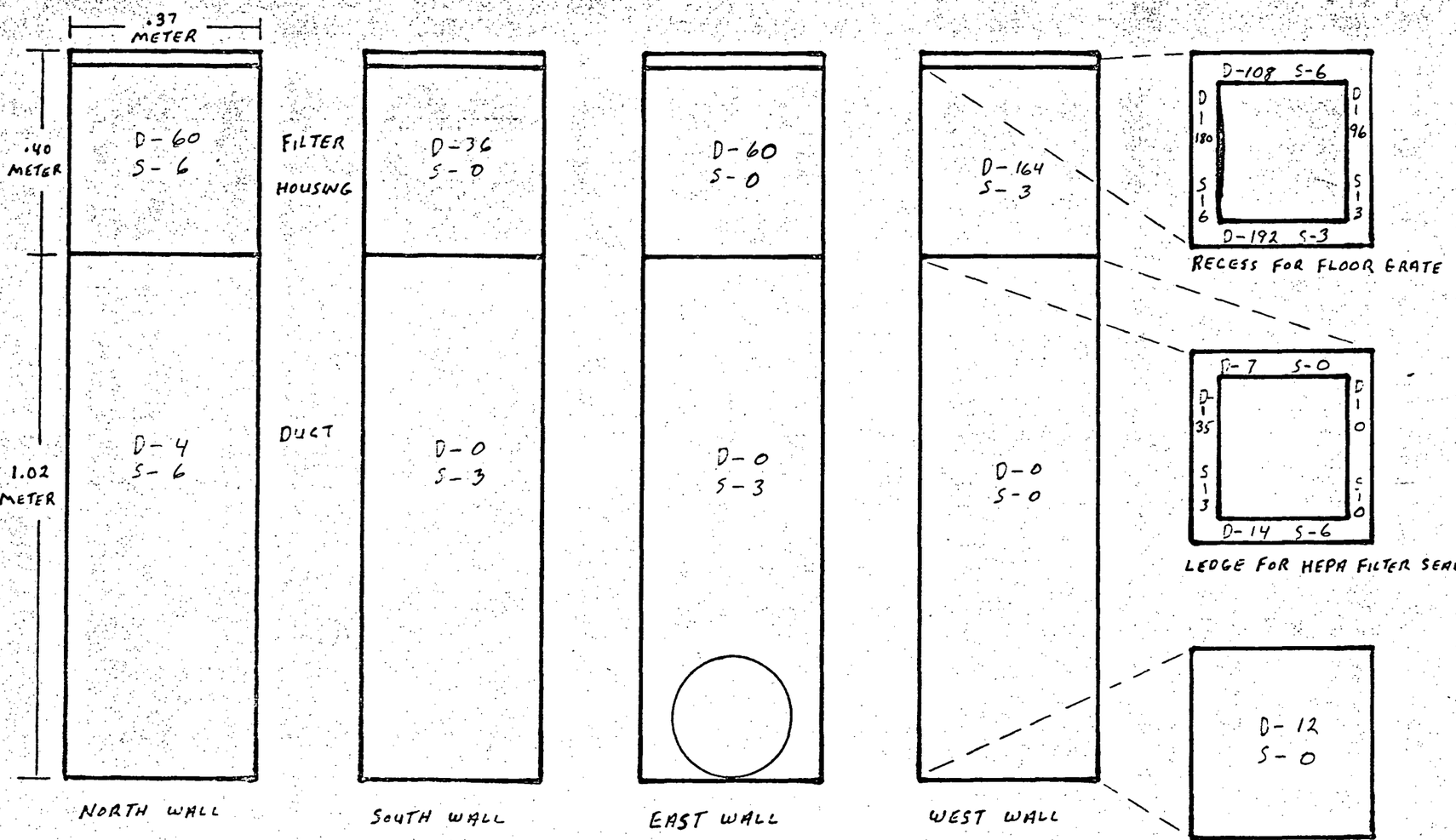
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EKCO F/M
50057	3-21-89	218,214	1
50057	3-21-89	212,220	2
52834	3-21-89	225,220	2
52834	3-21-89	229,222	0
50057	3-27-89	204,208	2
		ASC #2	
	3-22-89	29	3



AREA Fu-PLANT ROOM # 108

FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 & 43-68

SERIAL NUMBER 43-4: 50064, 43-68: 37807

COMPLETION DATE 4-11-89

H.P. SIGNATURE Claude M Thompson

AUTO. SAMPLE COUNTER #: #2 83600108

SURVEY UNITS DPM/100cm² WGK

N
W — E
S

1cm = .1 METER

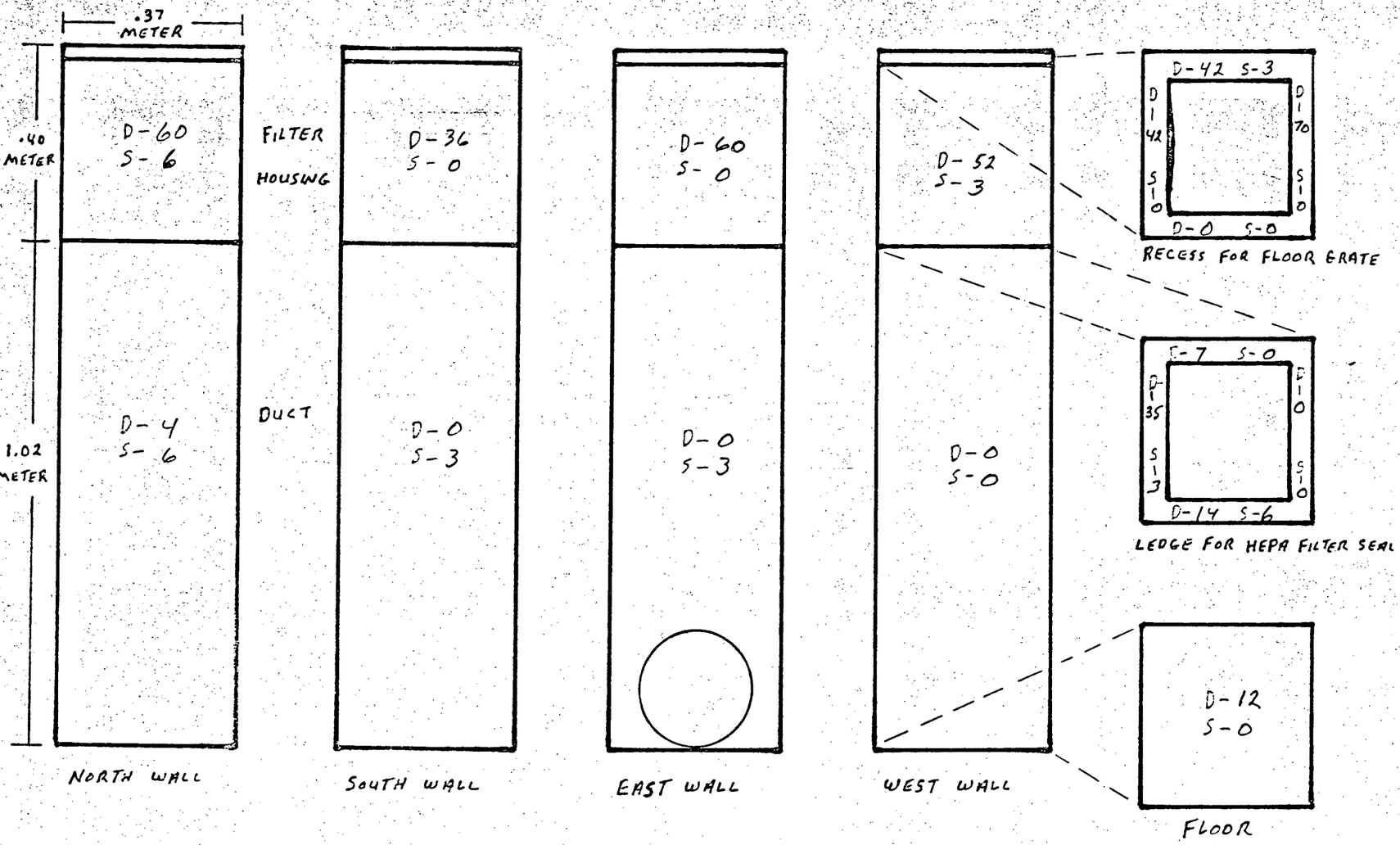
F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

MDA = 19.40 DPM/100cm²
FIXED

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EKCO C/M
50064	4-10-89	279,280	1
37807	4-10-89	259,250	3
		ASC #2	
	4-11-89	30	.1



	DIRECT	SMEAR
TOTAL DPM	434	33
# READINGS	17	17
AVG. DPM/100cm²	25.53	1.94
MAX DPM/100cm²	70	6

AREA Fu-PLANT ROOM # 109

FLOOR EXHAUST HOLE

BEFORE DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4, 43-68

SERIAL NUMBER 43-68 50057, 43-4 52834

COMPLETION DATE

H.P. SIGNATURE W.a. Rogers

AUTO. SAMPLS COUNTER #: #2 83600108

SURVEY UNITS DPM/100cm² W.a.R.

N
W — E
S

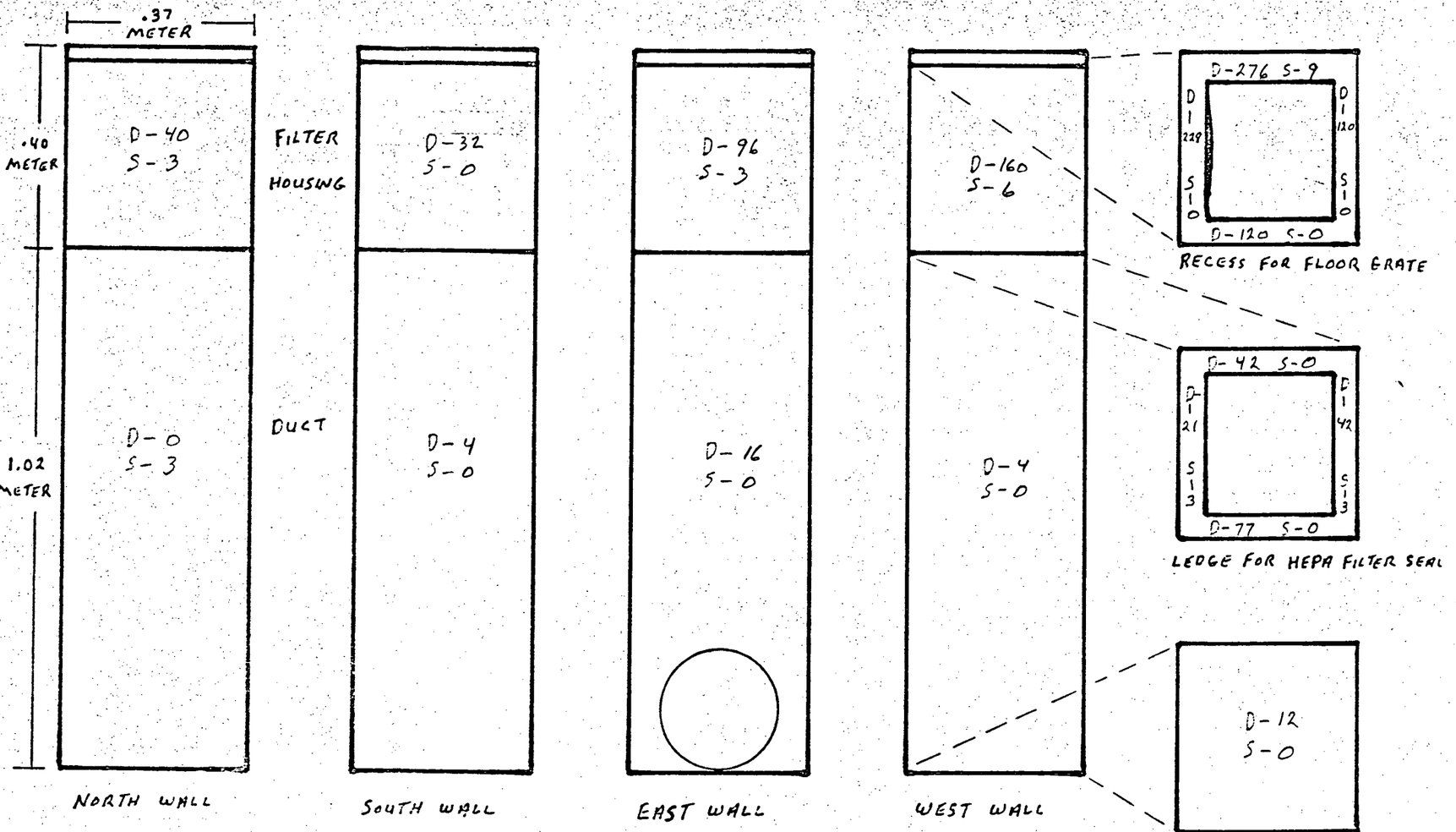
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
50057	3-21-89	218,214	1
50057	3-21-89	212,220	2
52834	3-21-89	225,220	2
52834	3-21-89	229,222	0
50057	3-27-89	204,208	2
		ASC #2	
	3-22-89	29	.3



AREA: Su-FLRNT ROOM #109
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY: DIRECT & SMEAR
TYPE OF INSTRUMENT: LUDLUM 2220 / DET. 43-4, 43-68
SERIAL NUMBER: 50064, 37807

COMPLETION DATE: 4-11-89
H.P. SIGNATURE: Claude M Thompson
AUTO. SAMPLE COUNTER #: #2 83600108

SURVEY UNITS: DPM/100cm²
WGR

N
W — E
S

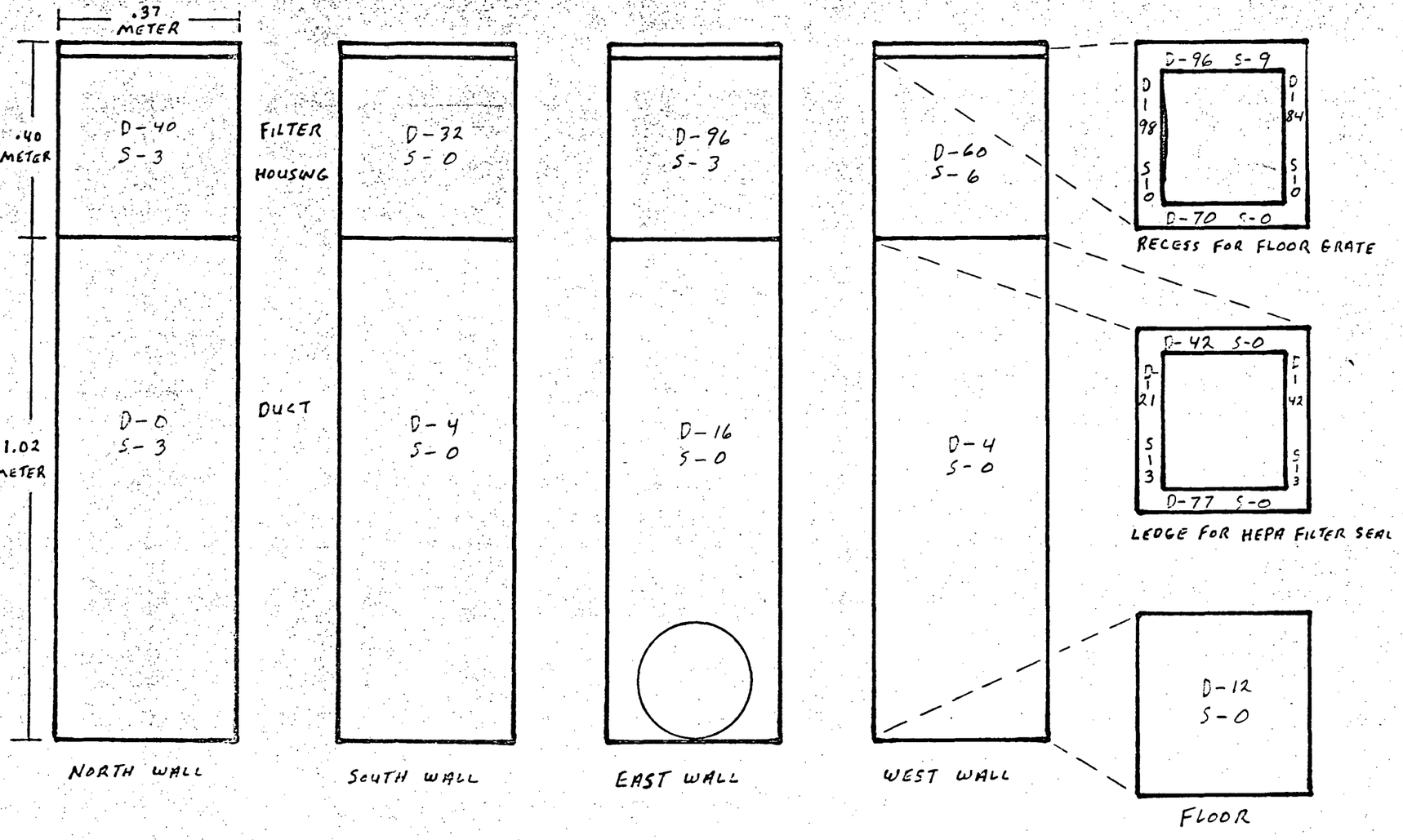
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR
MDA = 19.40 DPM/100cm²
FIXED

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EKCO C/M
50064	4-10-89	279,280	1
37807	4-10-89	259,250	3
		ASC #2	
	4-11-89	30	.1



	DIRECT	SMEAR
TOTAL DPM	794	30
#READINGS	17	17
AVG. DPM/100cm²	46.71	1.76
MAX DPM/100cm²	98	9

DUCT OUTLET
TO TUNNEL

AREA: Pu-PLANT ROOM # 110 — TYPE OF SURVEY: ✓ DIRECT + SMEAR — COMPLETION DATE: _____ — SURVEY UNITS: DPM/100cm²

FLOOR EXHAUST HOLE
BEFORE DECON

TYPE OF INSTRUMENT: LUDLUM 2220/GCT 43-4, 43-68 — H.P. SIGNATURE: W.O. Rogers

SERIAL NUMBER: 43-68 50057, 43-4 52834 — AUTO. SAMPLE COUNTER #: #2 83600108

N
W — E
S

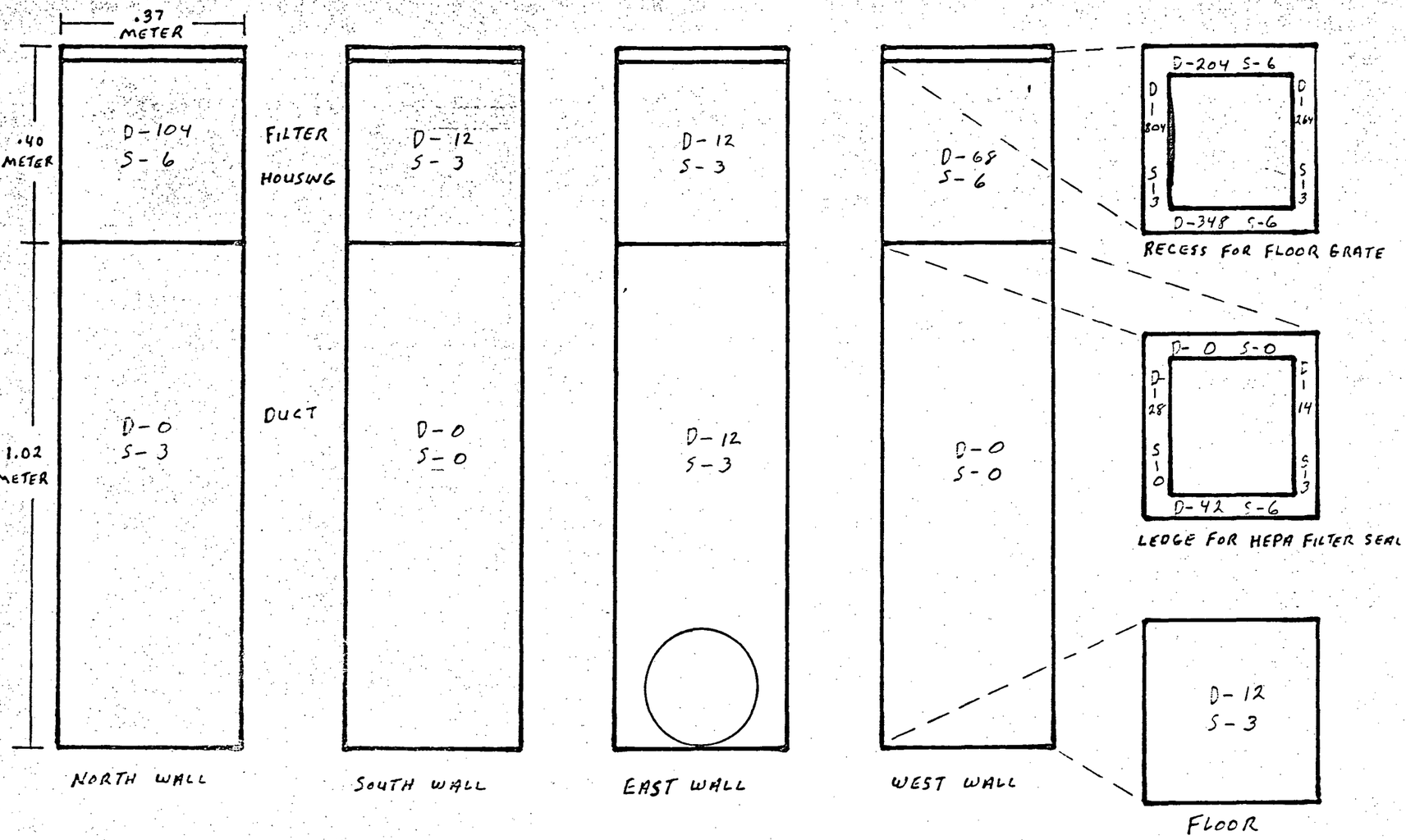
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EKCO C/M
50057	3-21-89	218,214	1
50057	3-21-89	212,220	2
52834	3-21-89	225,220	2
52834	3-21-89	229,222	0
50057	3-27-89	204,208	2
		ASC #2	
	3-22-89	29	.3



AREA Pu-PLANT ROOM # 110
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/CST 43-4, 43-68
SERIAL NUMBER 43-4 43-68 50064, 37807

COMPLETION DATE 4-11-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: #2 83600108

SURVEY UNITS DPM/100cm²
WGR

1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

MDA = 19.40 DPM/100cm² FIXED

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50064	4-10-89	279,280	1
37807	4-10-89	259,250	3
		ASC #2	
	4-11-89	30	.1

	DIRECT	SMEAR
TOTAL DPM	500	54
# READINGS	17	17
AVG DPM/100cm²	29.41	3.18
MAX DPM/100cm²	98	6

AREA: Pu-PLANT ROOM # 114
FLOOR EXHAUST HOLE
BEFORE DECON

TYPE OF SURVEY: ✓ DIRECT + SMEAR

TYPE OF INSTRUMENT: LUCIUM 2220 / GET 43-4, 43-68

SERIAL NUMBER: 43-68 50057, 43-4 52834

COMPLETION DATE: _____

H.P. SIGNATURE: W.A. Ryan

AUTO. SAMPLE COUNTER #: 1 #2 83600108

SURVEY UNITS: DPM/100cm²

N
W — E
S

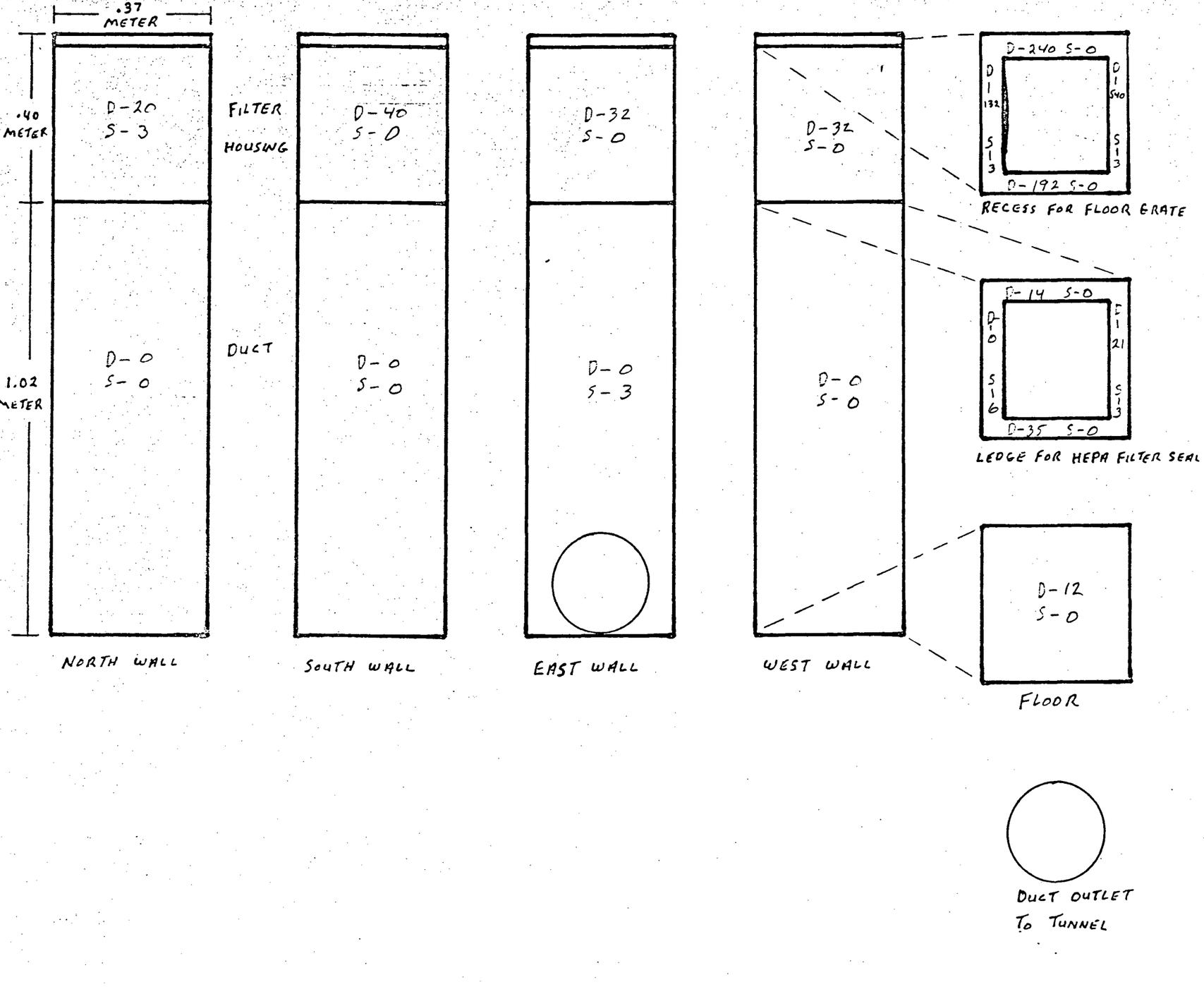
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50057	3-21-89	218,214	1
50057	3-21-89	212,220	2
52834	3-21-89	225,220	2
52834	3-21-89	292,222	0
50057	3-27-89	204,208	2
		Hsc #2	
	3-22-89	29	.3



AREA Pu-PLANT ROOM # 114
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY α DIRECT & SMEAR
TYPE OF INSTRUMENT Ludlum 2220/DST 43-4, 43-68
SERIAL NUMBER 43-4 50064, 43-68 37807

COMPLETION DATE 4-11-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #2: 83600108

SURVEY UNITS DPM/100cm²
WAR

N / W — E / S

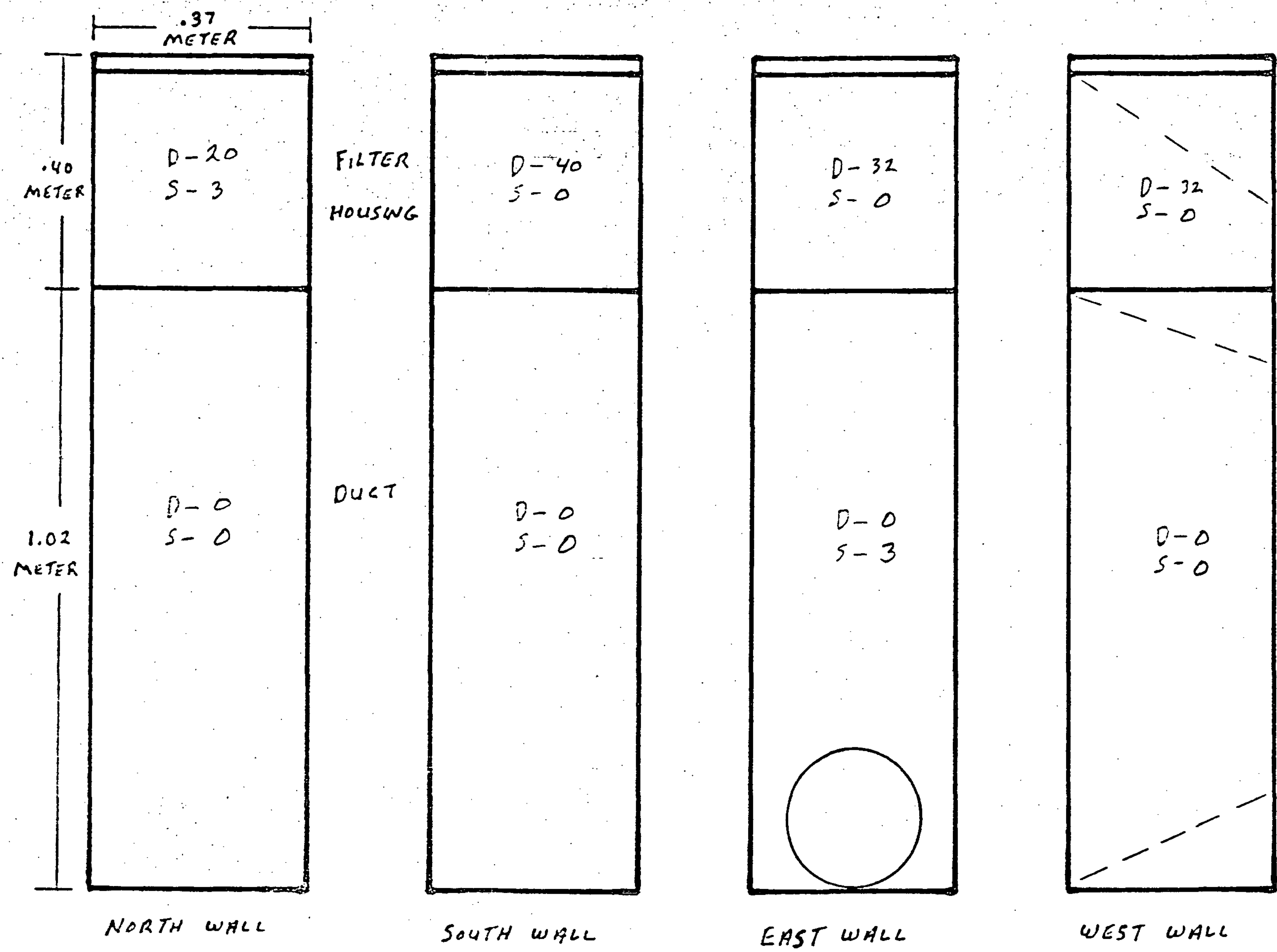
1cm = .1 METER

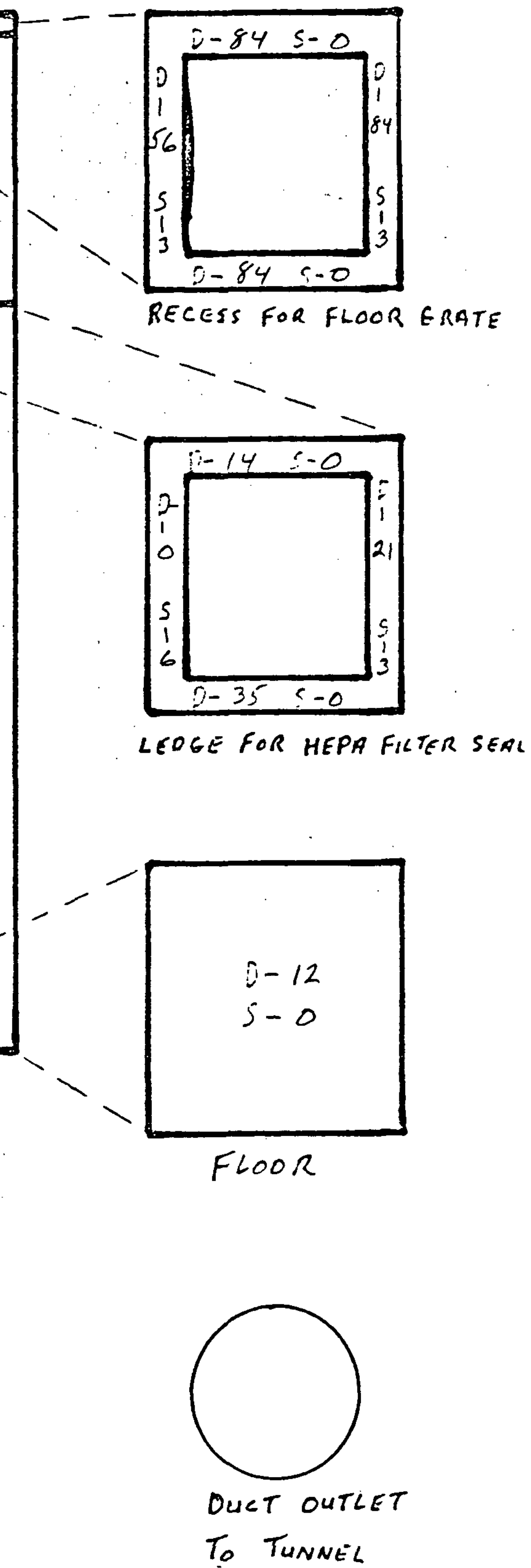
F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR
MDA = 19.40 DPM/100cm² FIXED

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50064	4-10-89	279, 280	1
37807	4-10-89	259, 250	3
		ASC #2	
	4-11-89	30	.1





	DIRECT	SMEAR
TOTAL DPM	514	21
# READINGS	17	17
AVG. DPM/100cm²	30.24	1.24
MAX DPM/100cm²	84	6

AREA Pu-FLINT LAG ROOM #129
FLOOR EXHAUST HOLE
BEFORE DECON
READINGS > 100 DPM/100cm²

TYPE OF SURVEY α DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/CET. 43-4 43-65
SERIAL NUMBER 50068, 37800

COMPLETION DATE 8-12-88
H.P. SIGNATURE [signature]
AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm² WGR

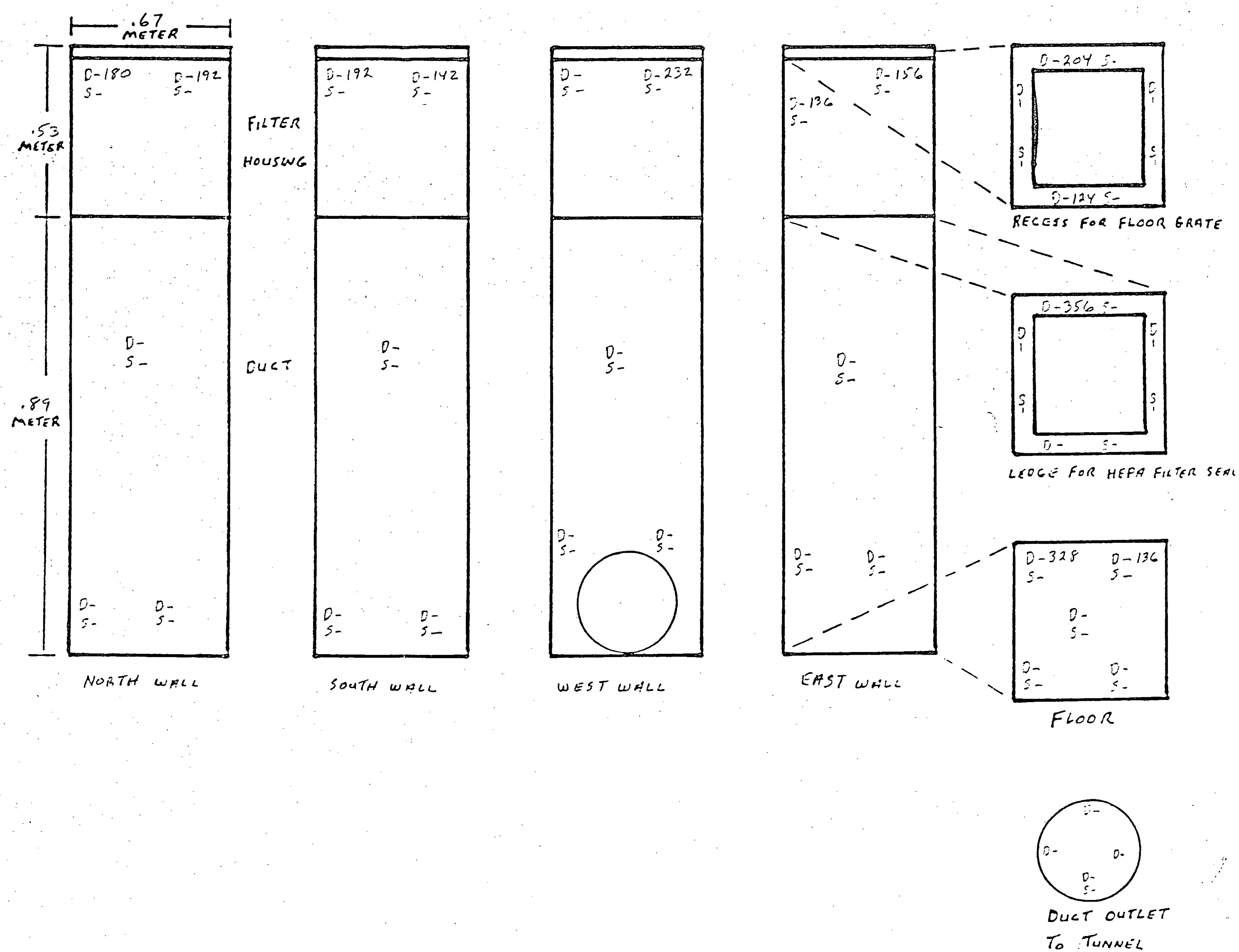
N / W — E / S

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE RESPONSE c/m	BKGD c/m
8-12-89	200-198	3
"	272-222	4



N
W E
S

AREA Pu-PLANT ROOM # 129 LAB
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY ∝ DIRECT ∨ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / EBERLINE PRS-2 DET. 43-68 / 43-4
SERIAL NUMBER 50068, 370 (43-68, 43-4)

COMPLETION DATE 8-24-88
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: #1 83600115

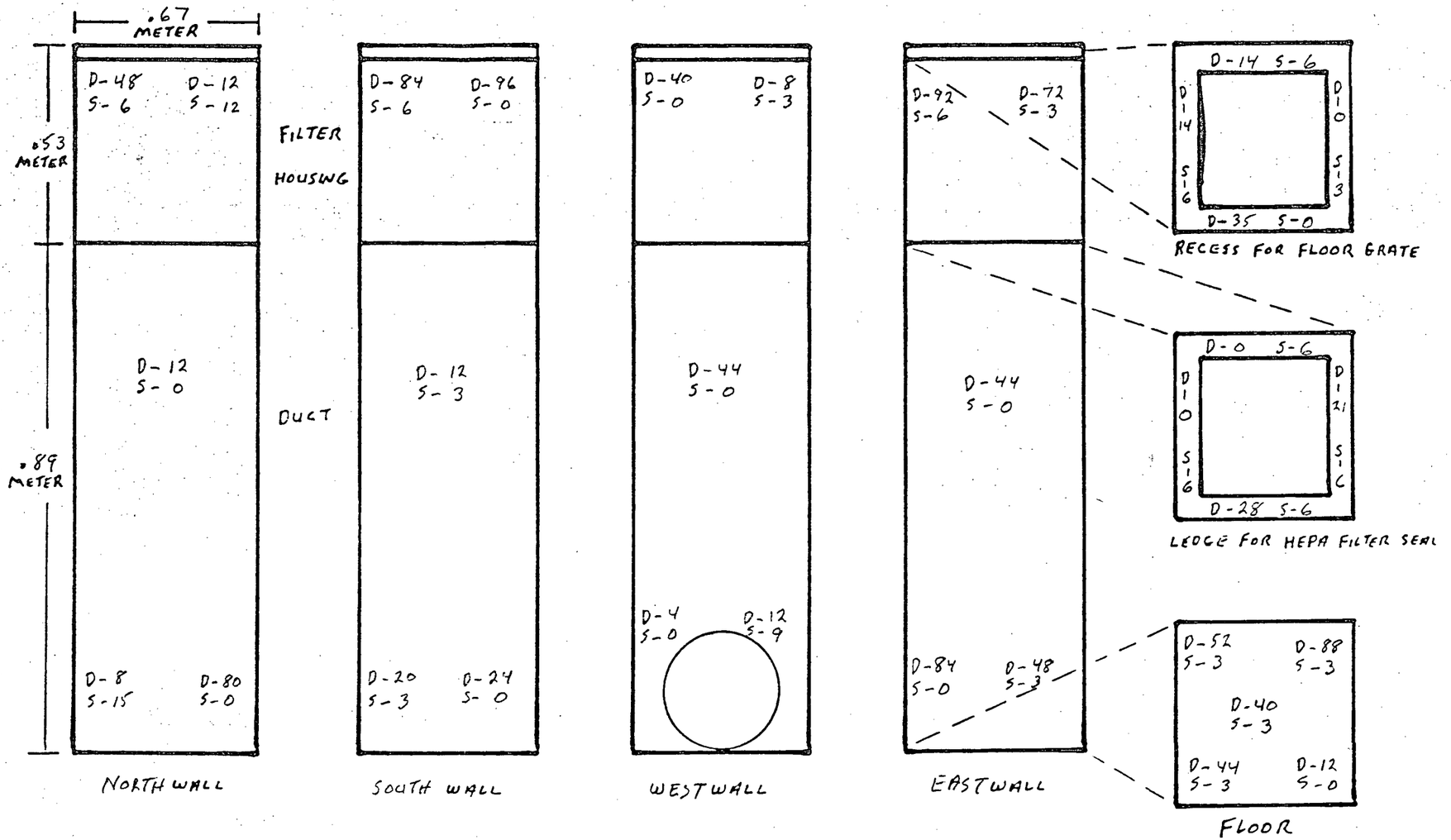
SURVEY UNITS
DPM/100cm² WALL

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR
MDA = 28.81 DPM/100 cm² FIXED

SOURCE #: 6868 VALUE: 1055 DPM

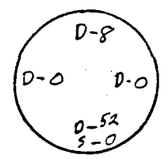
	INSTRUMENT		
	DATE	SOURCE CPM RESPONSE	BKGD CPM
370	8-22-88	269,258	3
370	8-22-88	268,254	3
50068	8-22-88	303,302	1
50068	8-22-88	334,782	1
		ASC #1	
	8-24-88	34	.3



ALL LAB FLOOR EXHAUST HOLES

	DIRECT	SMEAR
TOTAL DPM	13,072	1,059
# READINGS	537	502
AVG. DPM/100cm²	24.34	2.11
MAX. DPM/100cm²	102	15

MDA = 28.81 DPM/100cm² FIXED



DUCT OUTLET TO TUNNEL

N
W — E
S

AREA Pu-Plant LAB ROOM # 130
FLOOR EXHAUST HOLE
BEFORE DECON
READING >100 DPM/100cm² SERIAL NUMBER 370

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT ~~LUCIUM 2220/ GET 43-4~~ PS-2 43-4

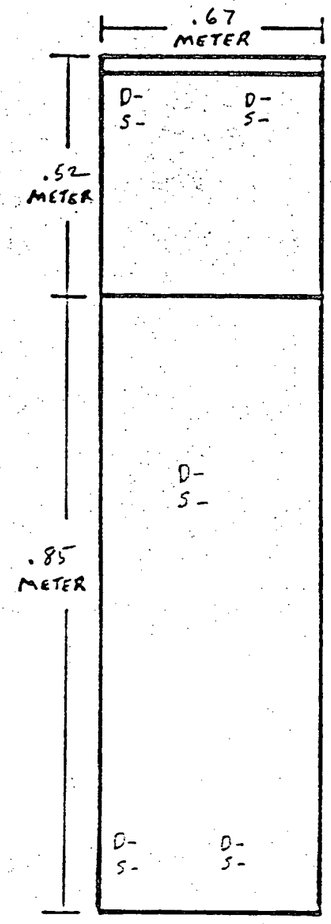
COMPLETION DATE 8-18-88
H.P. SIGNATURE Pamela M Thompson
AUTO. SAMPLE COUNTER #:

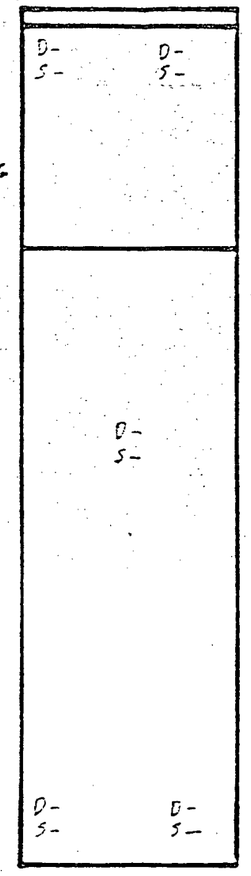
SURVEY UNITS DPM/100cm²
WGR

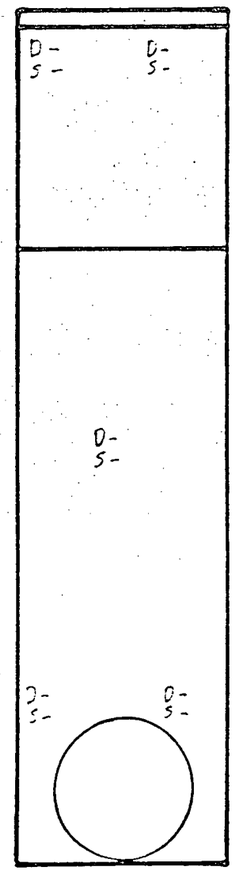
F — FLOOR D - DIRECT
C — CEILING S - SMEAR
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

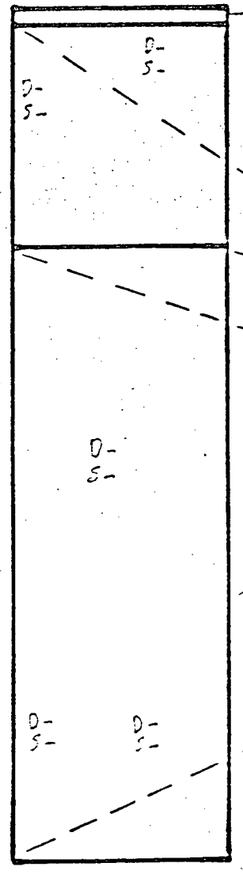
SOURCE #: 6868 VALUE: 1055 DPM

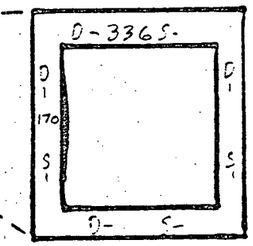
INSTRUMENT		
DATE	SOURCE C/M RESPONSE	EFFICIENCY
8-18-88	286-259	3
"	274-253	3



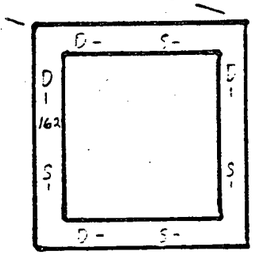




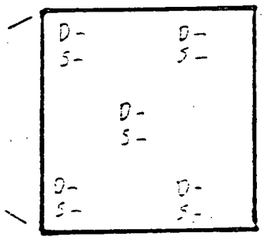


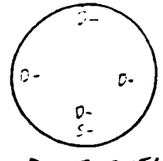


RECESS FOR FLOOR GRATE



LEDGE FOR HEPA FILTER SEAL





DUCT OUTLET
TO TUNNEL

N / W / E / S

AREA Pu-Plant LAB ROOM # 130
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT EBERLINE PRS-2 43-4 / LUDLUM 2220 / DET. 43-68
SERIAL NUMBER 370, 50068

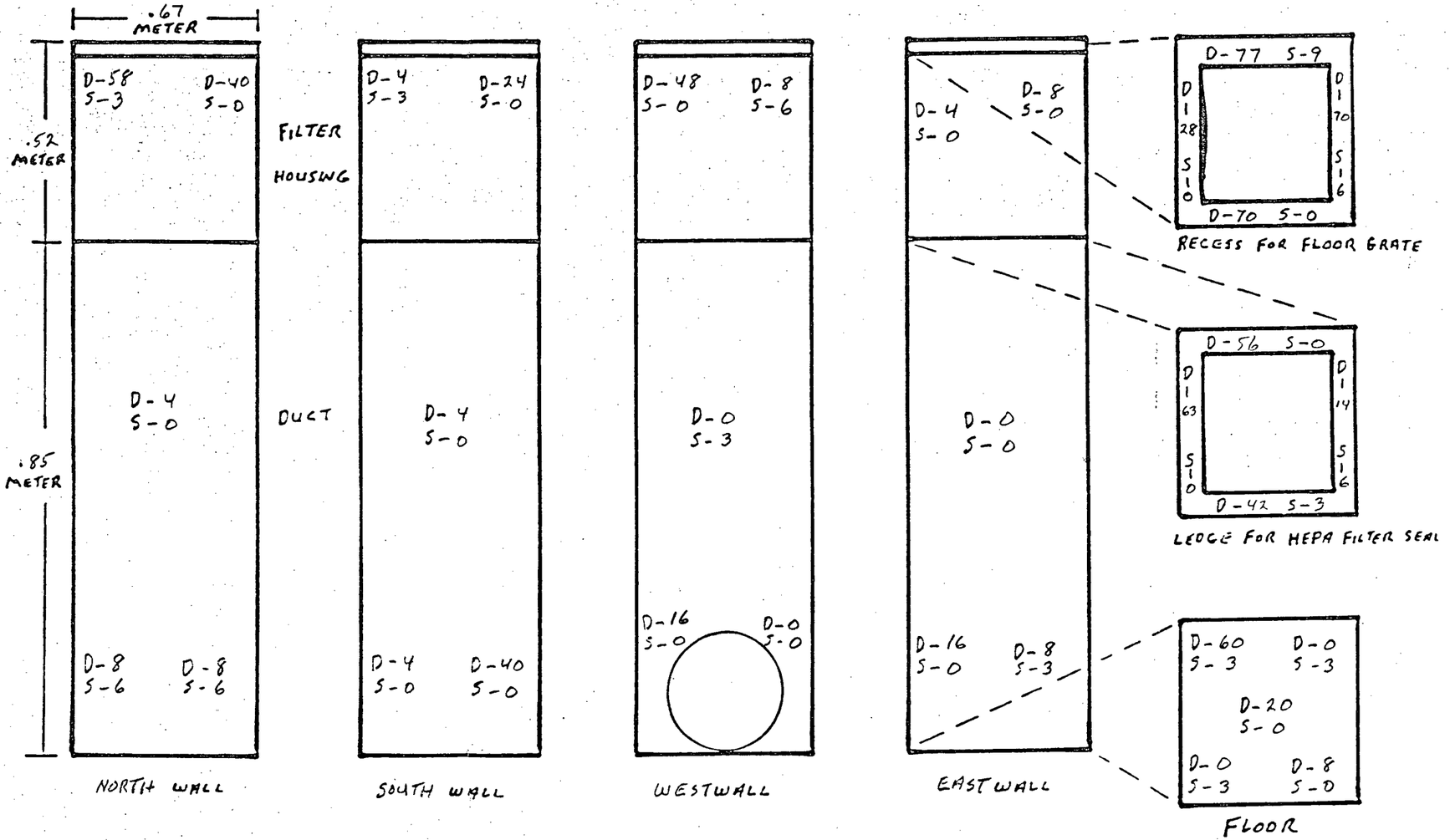
COMPLETION DATE 8-18-88
H.P. SIGNATURE Claude W Thompson
SURVEY UNITS DPM/100cm² W/GR
AUTO. SAMPLE COUNTER #: #2 83600108

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
370	8-18-88	286,258	3
370	8-18-88	274,253	3
50068	8-18-88	350,351	2
50068	8-18-88	361,423	2
		ASC #2	
	8-18-88	33	.3



N / W / E / S

AREA LAB Fu-Flint ROOM # 131

FLOOR EXHAUST HOLE BEFORE DECON

READINGS > 100 DPM/100CM²

TYPE OF SURVEY ✓ DIRECT + SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. PRS-2 43-4 43-68

SERIAL NUMBER 370, 50068

COMPLETION DATE 8-12-88

H.P. SIGNATURE Planck & Thompson

AUTO. SAMPLE COUNTER #:

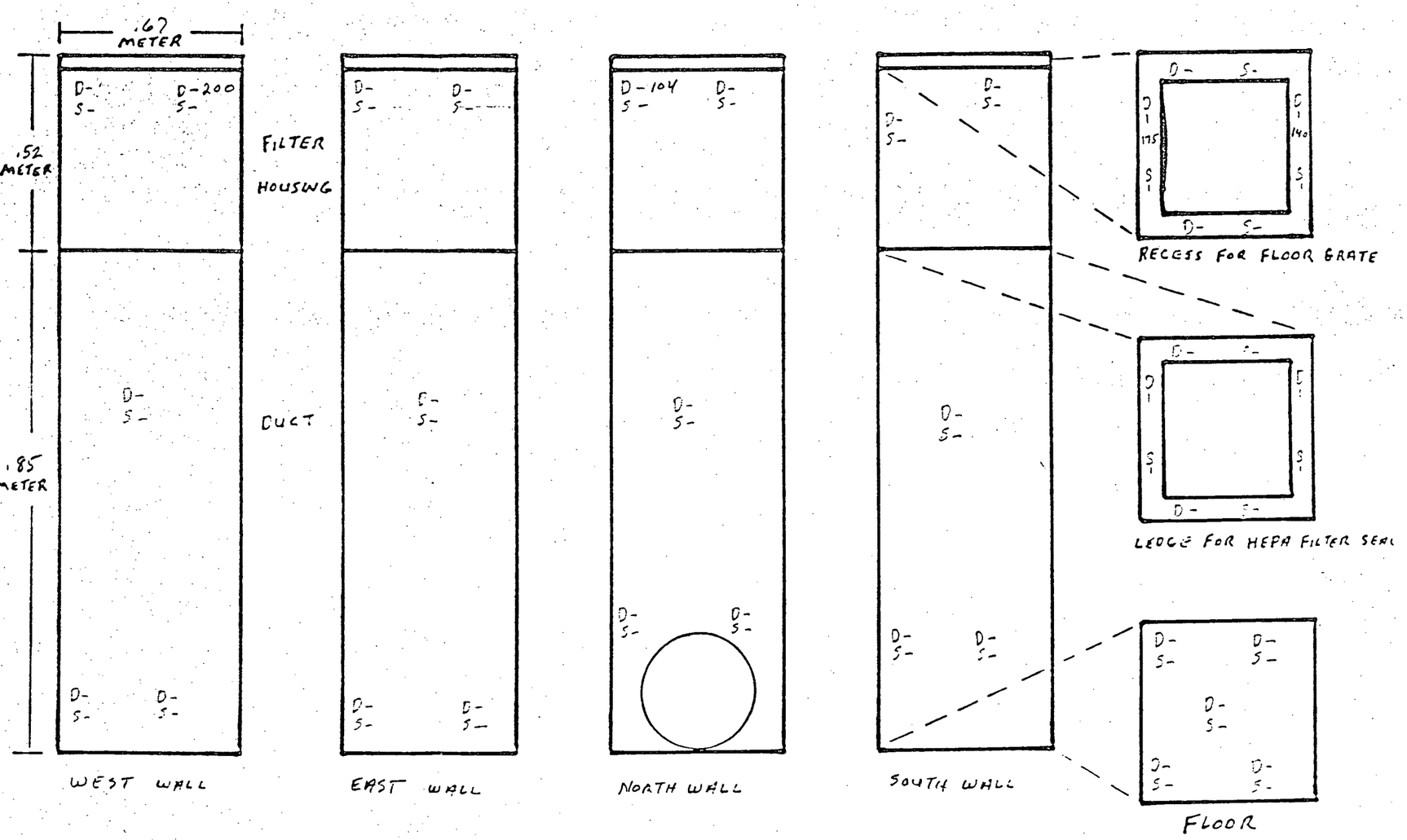
SURVEY UNITS DPM/100cm² W&A

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 VALUE: 1054 DPM

INSTRUMENT		
DATE	SOURCE & RESPONSE #	RECORD #
8-12-88	276-264	1
"	253-266	2
"	233-282	2
"	256-257	1



N / W / E / S

AREA Pu-PLANT LAB ROOM # 131
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT EBERLINE PRS-2 LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 370, 50068, 48395, 50064

COMPLETION DATE 7-14-89
H.P. SIGNATURE Charles M Thompson
SURVEY UNITS DPM/100cm² WGR

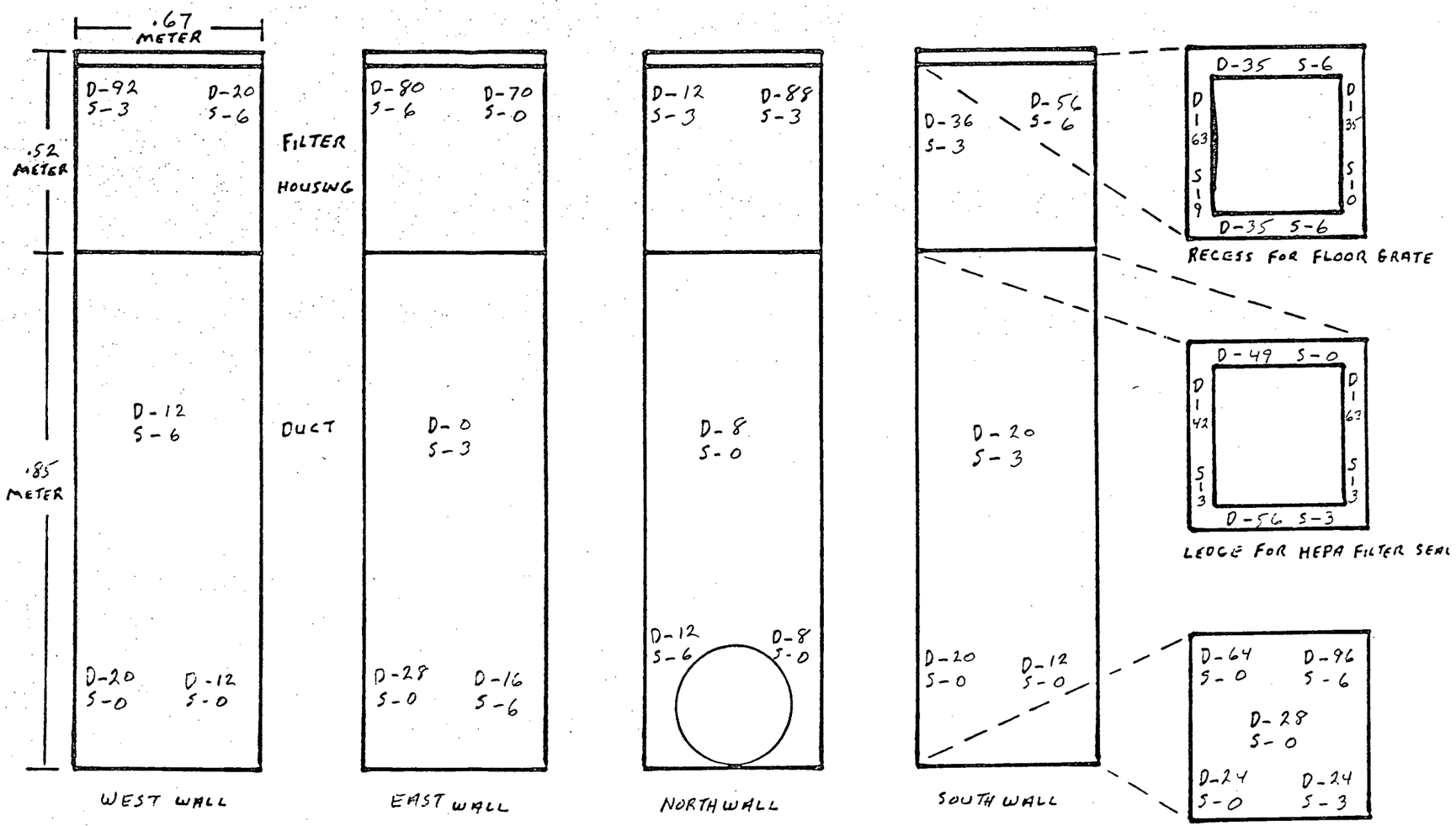
AUTO. SAMPLE COUNTER #: #2 83600108, #1 83600115

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 6868 VALUE: 1078 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
370	8-12-88	276, 264, 241	1
	"	253, 266, 286	2
	8-18-88	286, 258	3
	"	274, 253	3
50068	8-12-88	233, 242, 246	2
	"	256, 257, 248	1
	8-18-88	350, 351	2
	"	361, 423	2
48395	7-14-89	275, 269	0
50064	"	300, 256	1
		ASC #2	
	8-16-88	31	0
		ASC #1	
	7-14-89	30	.2



N / W / E / S

AREA Fu-Flint LAB ROOM # 132 — FLOOR EXHAUST HOLE BEFORE DECON

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUCLUM 2220/DET. PRS-2 43-4 43-68

READINGS > 100 DPM/100CM² SERIAL NUMBER 370, 50068

COMPLETION DATE 8-12-88

H.P. SIGNATURE Charles A. Thompson

AUTO. SAMPLE COUNTER #:

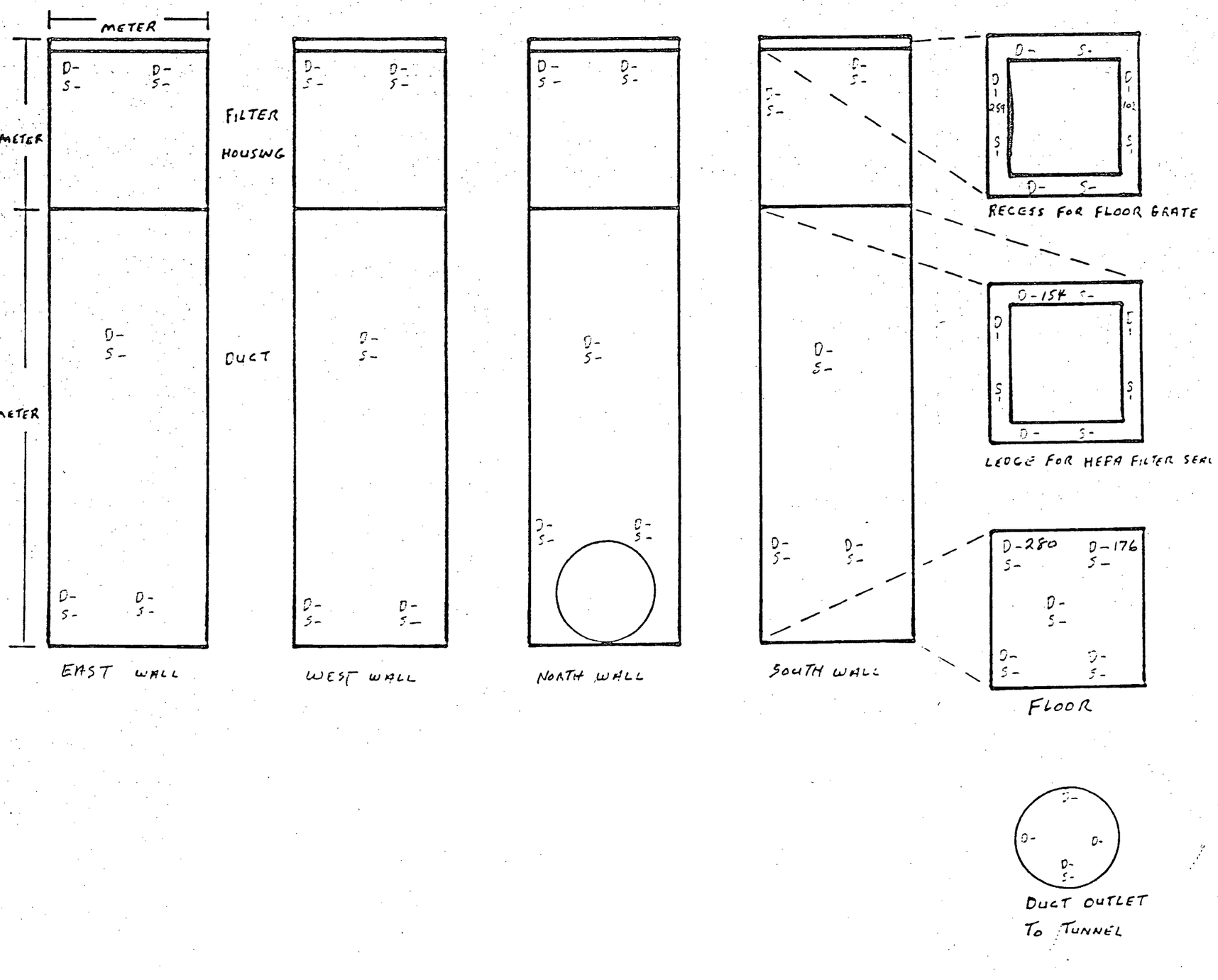
SURVEY UNITS DPM/100CM² w/aR

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE CPM RESPONSE	EFFICIENCY
8-12-88	276-241	1
"	253-266	2
"	233-282	2
"	256-257	1



N / W / E / S

AREA Pu-Plant LAB ROOM # 132

FLOOR EXHAUST HOLE AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT EBERLINE PRS-2 / LUCLUM 2220 / DET. 43-4, 43-68

SERIAL NUMBER 370, 50068

COMPLETION DATE 8-22-88

H.P. SIGNATURE Charles M Thompson

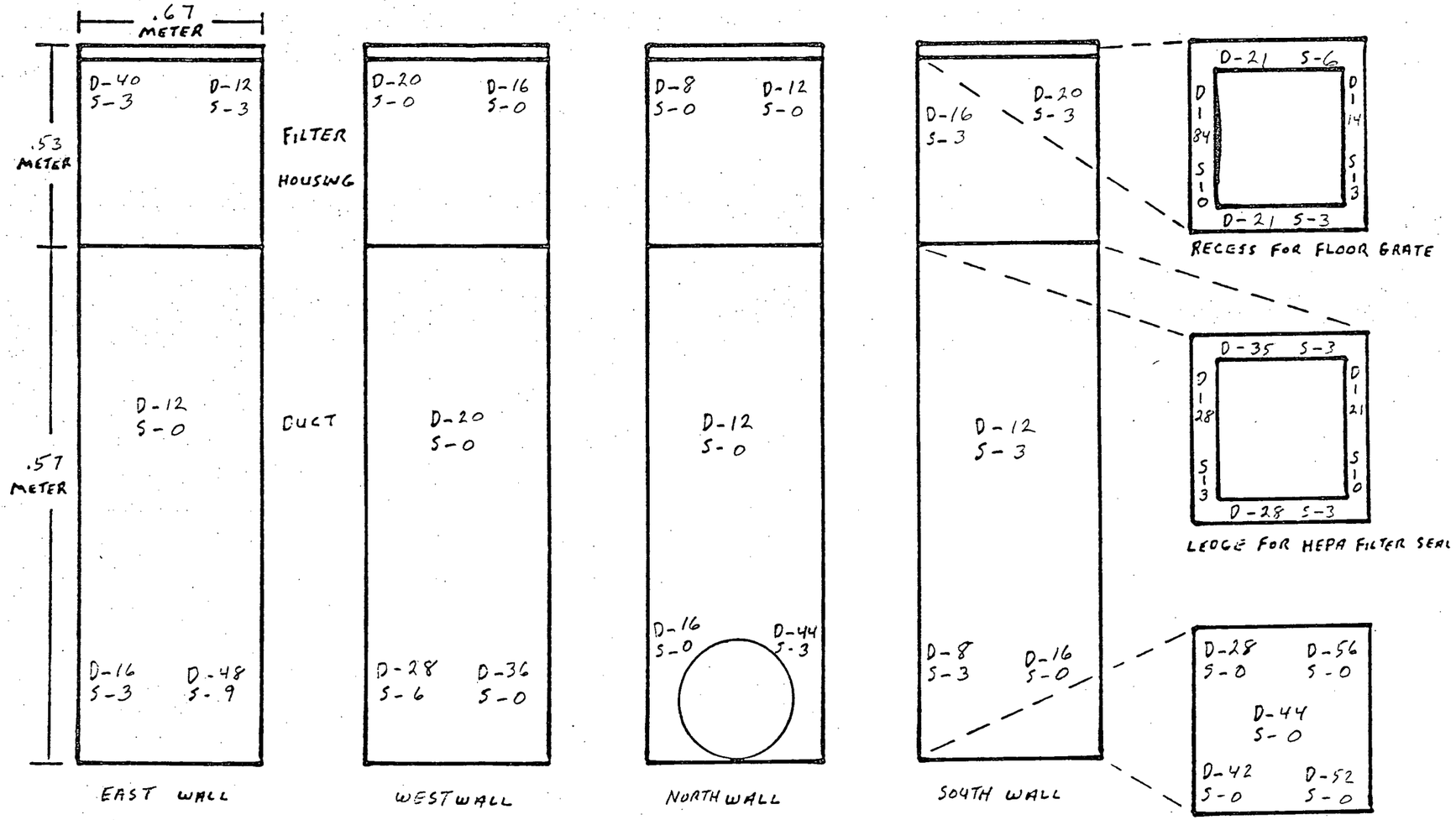
SURVEY UNITS DPM/100cm² WGA

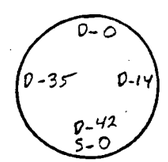
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
370	8-22-88	269,258	3
	"	268,254	3
50068	8-22-88	303,302	1
	"	334,382	1
	ASC #2		
	8-12-88	36	.2





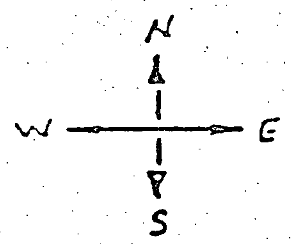
DUCT OUTLET TO TUNNEL

AREA Pu-PLANT LAB ROOM # 133
FLOOR EXHAUST HOLE BEFORE DECON
READINGS > 100 DPM/100cm²

TYPE OF SURVEY α DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/CET. 43-?? PRS-2 43-4
SERIAL NUMBER 320, 50068

COMPLETION DATE 8-16-88
H.P. SIGNATURE [signature]
AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm² WALL

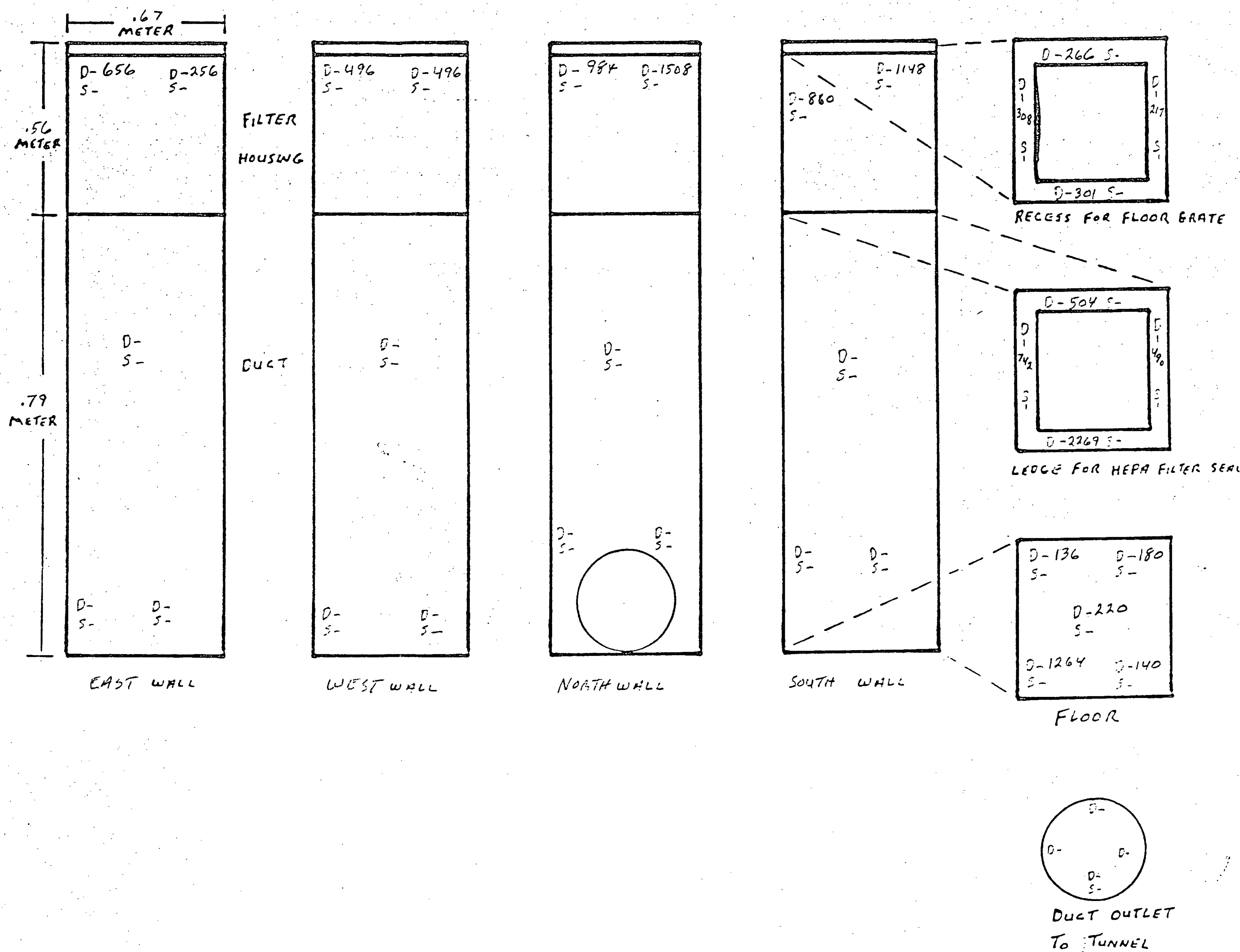


F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
8-16-88	271-274	2
"	295-260	2
"	433-477	2
"	516-553	2



N / W / E / S

AREA Pu-PLANT LAB ROOM # 133
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR
TYPE OF INSTRUMENT EBERLINE PRS2 / LUDLUM 2220 / DET. 43-4, 43-68
SERIAL NUMBER 370, 50068

COMPLETION DATE 8-24-88
H.P. SIGNATURE Claude M. Thompson
AUTO. SAMPLE COUNTER #: 83600115

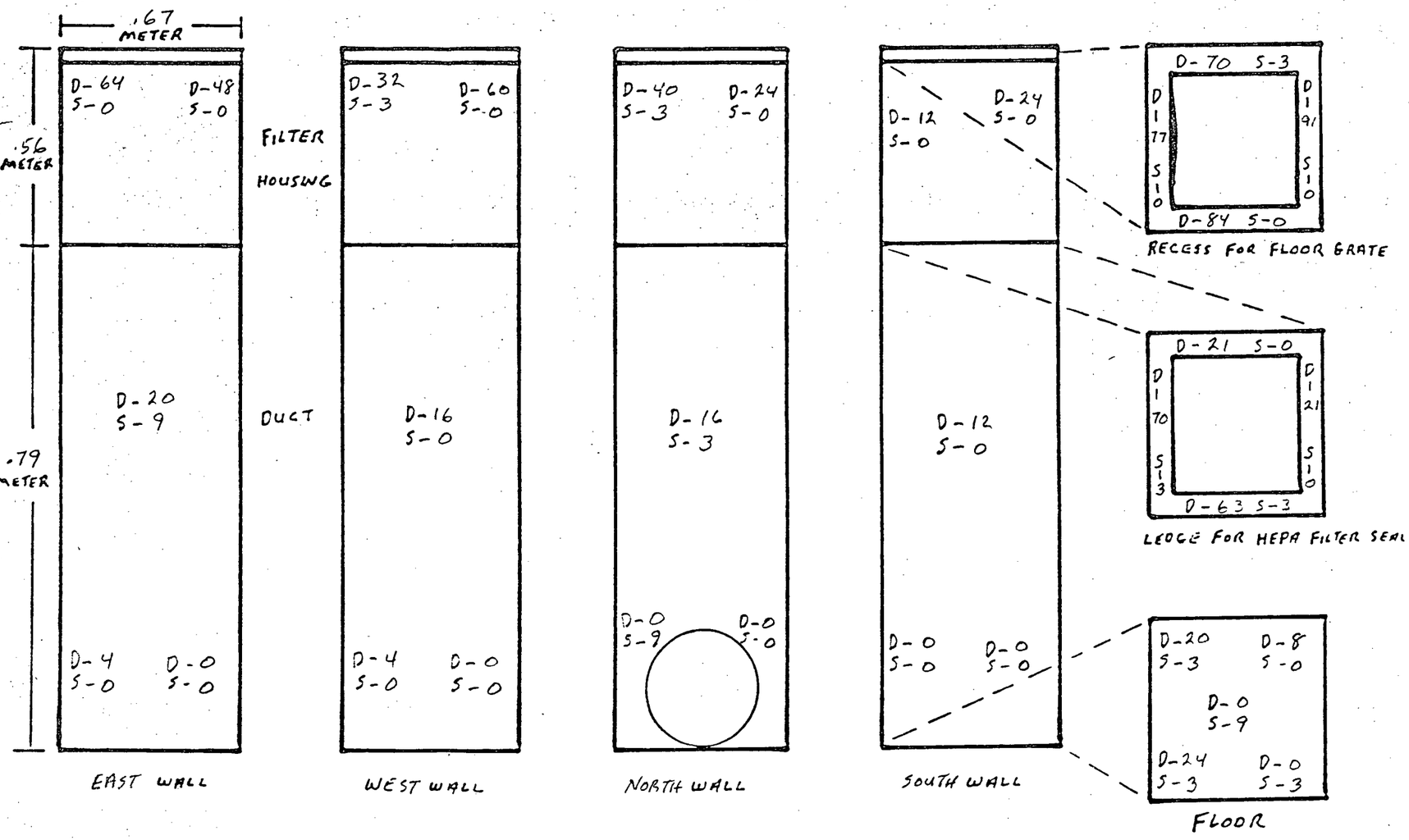
SURVEY UNITS DPM/100cm² AVGR

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

Source #: 6868 VALUE: 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
370	8-22-89	269,258	3
"	"	268,254	3
50068	"	303,302	1
"	"	334,382	1
	ASC #1		
8-24-88	34	.3	



N
W — E
S

AREA Pu-PLANT LAB ROOM # 134
FLOOR EXHAUST HOLE
BEFORE DECON
READINGS > 100 DPM/100cm²

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / PRS-2 / DET. 43-4 43-68
SERIAL NUMBER 370, 50068

COMPLETION DATE 8-16-88
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #:

SURVEY UNITS
DPM/100cm²
WGR

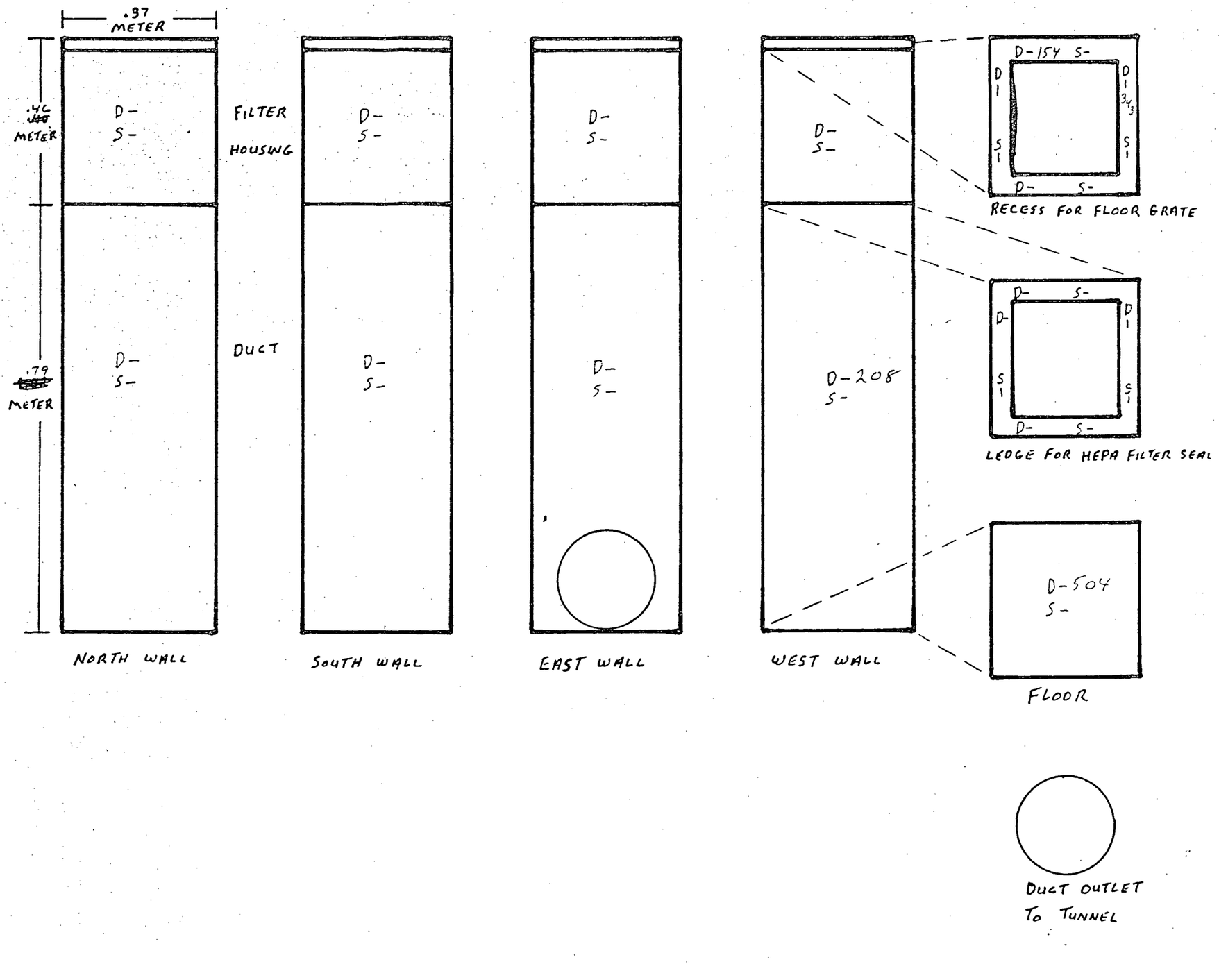
1cm = .1 METER

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
8-16-88	271-274	2
"	295-260	2
"	473-477	2
"	516-553	2



N / W / E / S

AREA Pu-Plant LAB ROOM # 134

FLOOR EXHAUST HOLE

AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT EBERLINE PRS-2 43-4 / LUDLUM 2220 / DET. 43-68

SERIAL NUMBER 320, 50068, 48395

COMPLETION DATE 7-14-89

H.P. SIGNATURE Paul A. McThompson

SURVEY UNITS DPM/100cm² WGR

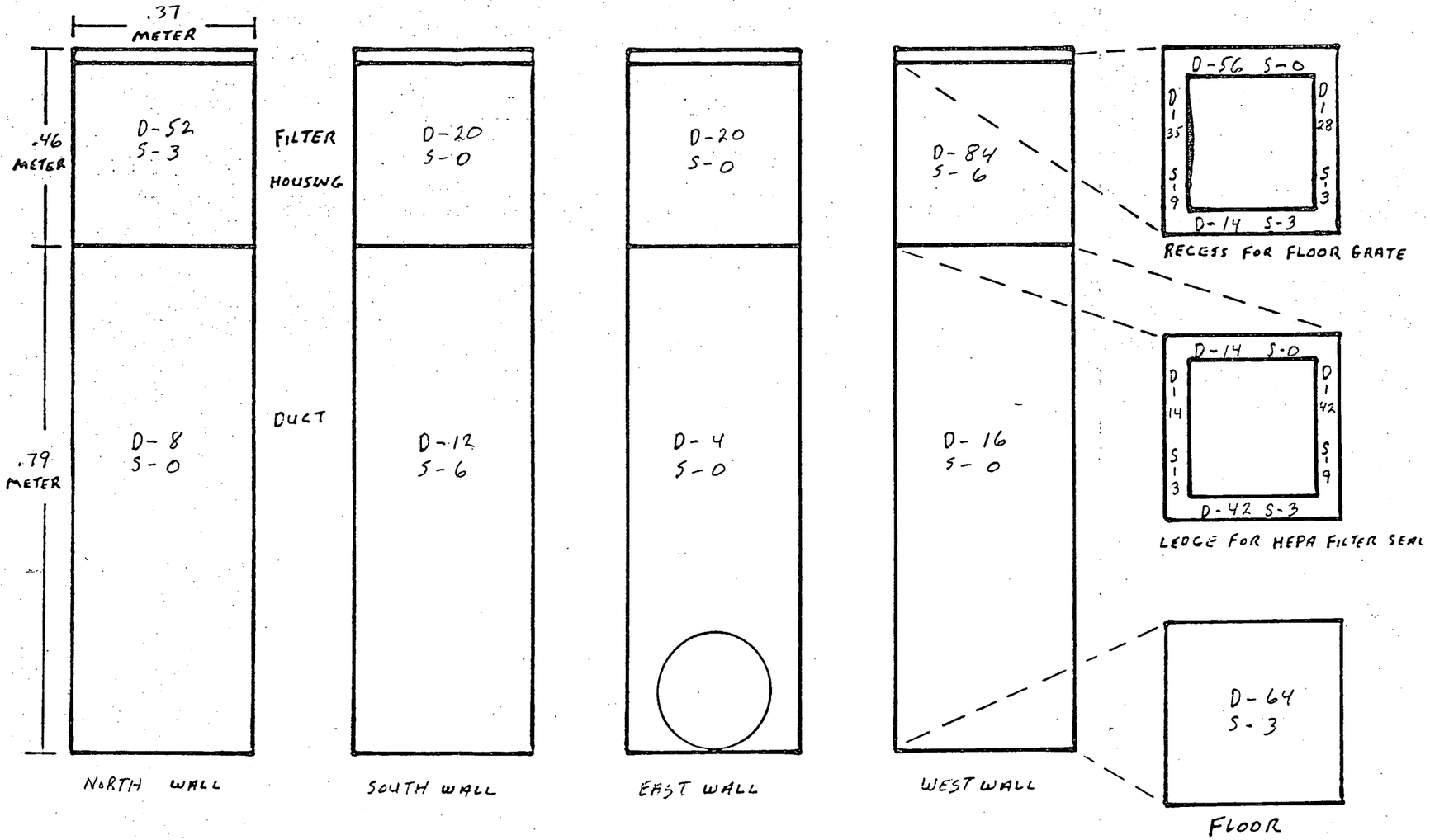
AUTO. SAMPLE COUNTER #: #2 83600108, 83100115

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 (6816) VALUE: 1055 (1078) DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFF.
370	8-16-88	271,274	2
"	"	295,260	2
"	8-18-88	286,258	3
"	"	274,253	3
50068	8-16-88	433,477	2
"	"	516,553	2
"	8-18-88	350,351	2
"	"	361,423	2
48395	7-14-89	275,269	0
		ASC # 2	
	8-17-88	34	.3
		ASC # 1	
	7-14-89	30	.2



N

W — E

S

1cm = .1 METER

AREA Pu-PLANT LAB ROOM # 135 NORTH
FLOOR EXHAUST HOLE
BEFORE DECON
READINGS > 100 DPM/100cm²

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 PRS-2/DET. 43-68 43-4
SERIAL NUMBER 370, 50068

COMPLETION DATE 8-15-88
H.P. SIGNATURE
AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm²
W.9R

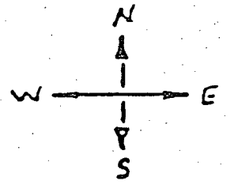
F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6968 VALUE: 1055 DPM

INSTRUMENT

DATE	SOURCE RESPONSE c/m	BKGD. c/m
8-15-88	307-303	2
"	294-286	2
"	527-538	2
"	519-497	2



AREA Pu-PLANT LAB ROOM # 135 — FLOOR EXHAUST HOLE NORTH AFTER DECON

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. EBERLINE PRS-2 43-4 43-68

SERIAL NUMBER 320, 50068, 50064

COMPLETION DATE 7-14-89

H.P. SIGNATURE Claude Mc Thompson

SURVEY UNITS DPM/100cm² WGR

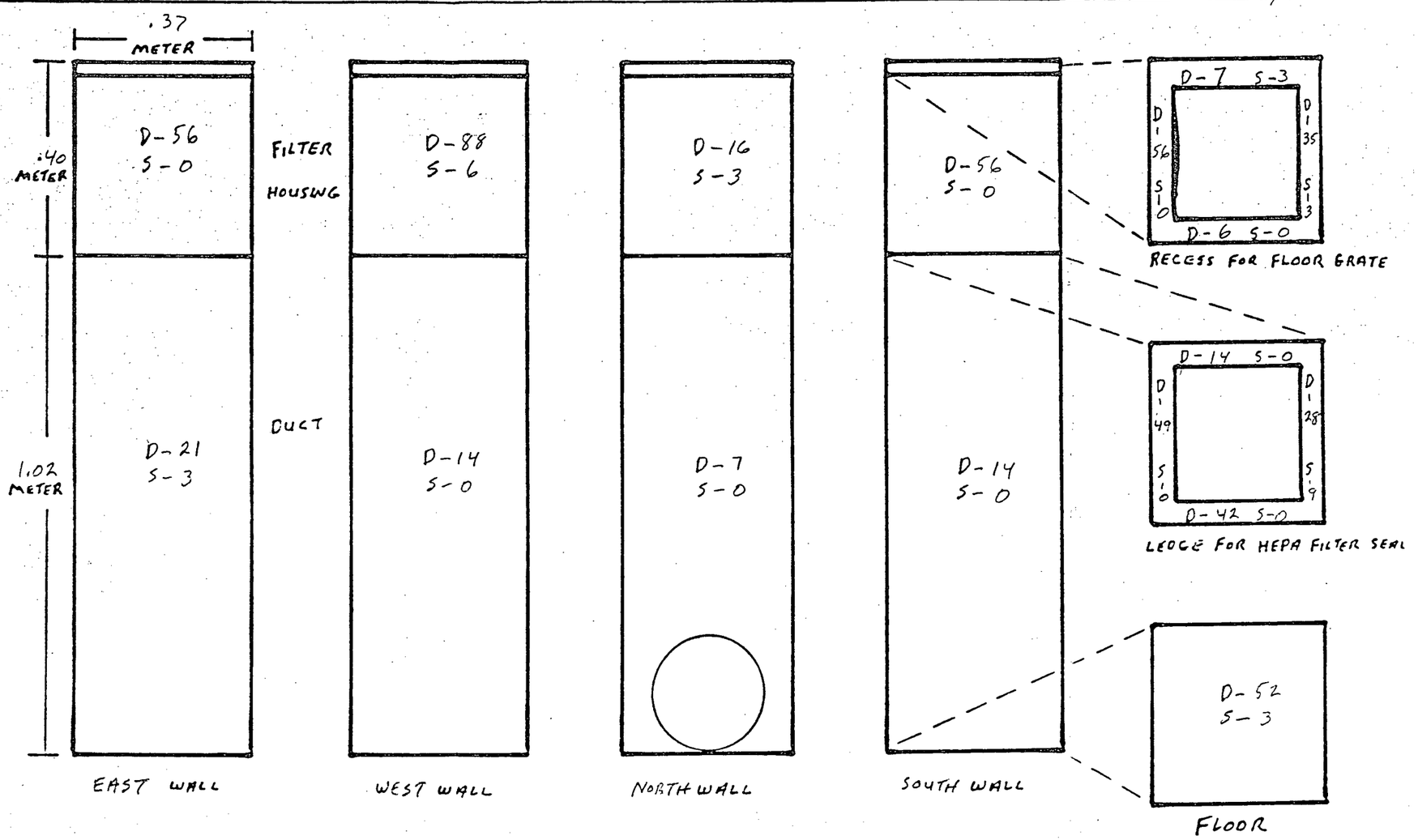
AUTO. SAMPLE COUNTER #: #2 83600108, #1 83600115

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 6868 VALUE: 1078 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
320	8-18-88	286,258	3
"	"	274,253	3
50068	"	350,351	2
"	"	361,423	2
50064	7-14-89	300,256	1
		ASC #2	
	8-17-88	34	.3
		ASC #1	
	7-14-89	30	.2



N / W / E / S

AREA Pu-PLANT LAB ROOM # 135
FLOOR EXHAUST HOLE SOUTH

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT EBERLINE PRS 2 / LUDLUM 2220 / DET. 43-4 / 43-68
SERIAL NUMBER 370, 50068, 48395

COMPLETION DATE 7-14-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: #2 83600108, 83600115

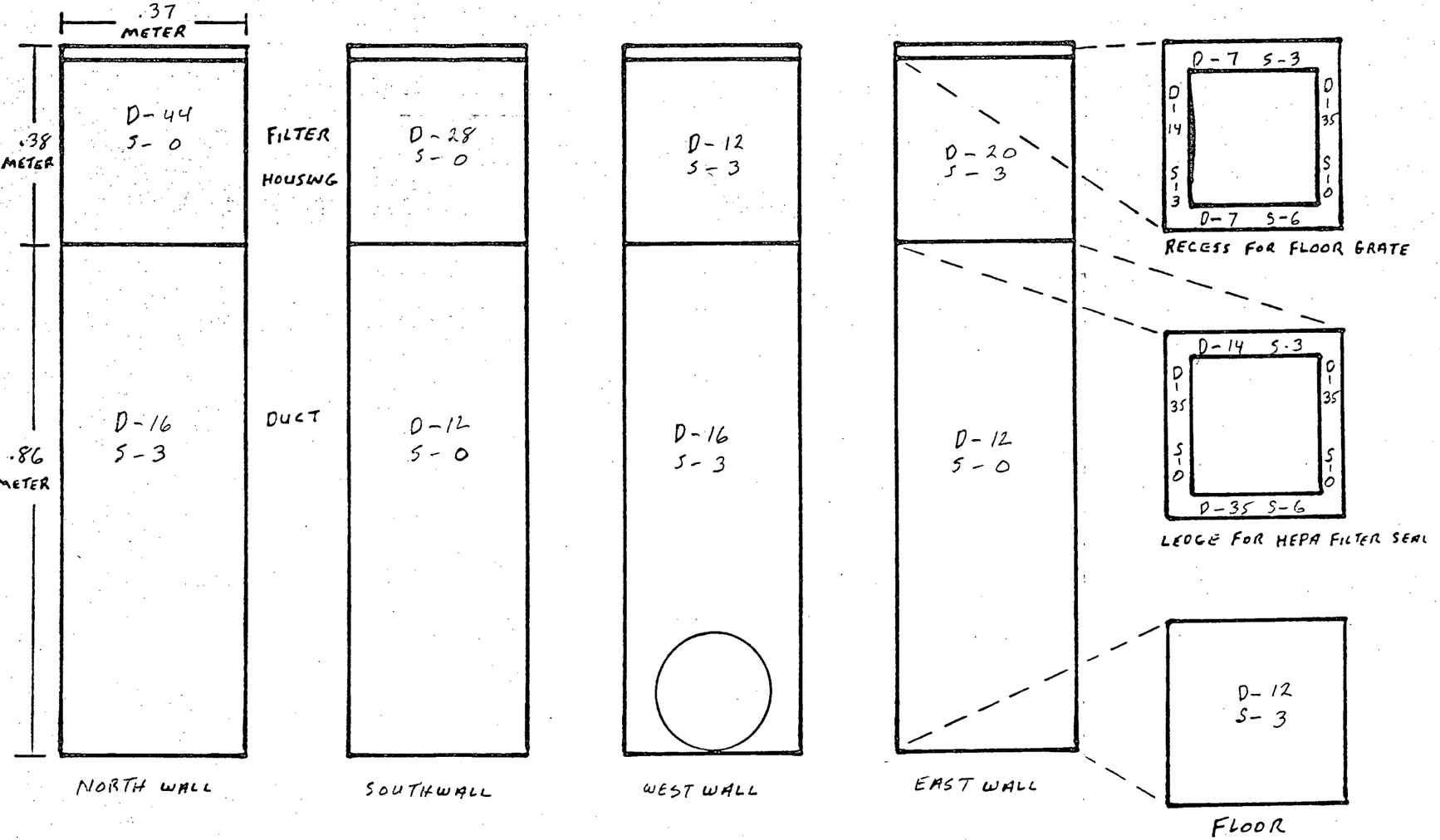
SURVEY UNITS DPM/100cm² W/A #1

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6916 6868 VALUE: 1078 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EXCESS C/M
370	8-15-88	307, 303	2
"	"	294, 280	2
50068	"	527, 538	2
"	"	519, 497	2
48395	7-14-89	275, 269	0
	ASC #2		
8-18-88	33	.3	
	ASC #1		
7-14-89	30	.2	



N
W — E
S

1cm = .1 METER

AREA Pu-PLANT LAB ROOM # 136
FLOOR EXHAUST HOLE
BEFORE DECON
READINGS >100 DPM/100cm²

TYPE OF SURVEY ∝ DIRECT ∨ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 43-68
SERIAL NUMBER 370, 50068

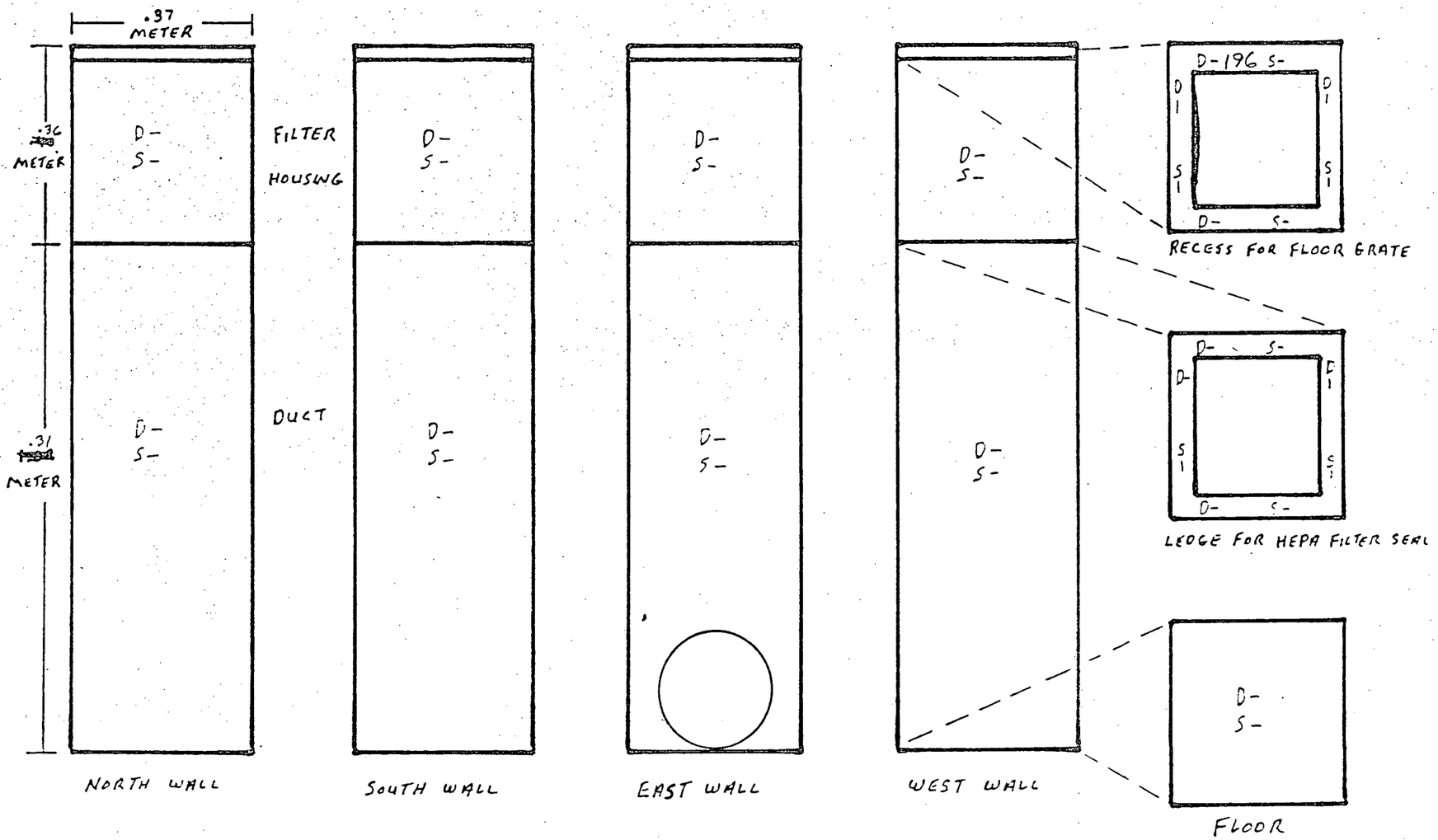
COMPLETION DATE 8-15-88
H.P. SIGNATURE Planchon
AUTO. SAMPLE COUNTER #:

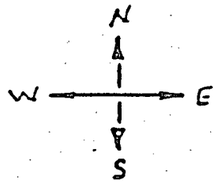
SURVEY UNITS
DPM/100cm²
NAR

F — FLOOR D - DIRECT
C — CEILING S - SMEAR
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
8-15-88	307-303	2
"	294-286	2
"	527-538	2
"	519-497	2





AREA Pu-PLANT LAB ROOM # 136
FLOOR EXHAUST HOLE
AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT EBERLINE PRS-2 43-4 / LUDLUM 2220 / DET. 43-68
SERIAL NUMBER 370, 50068, 50064

COMPLETION DATE 7-14-89
H.P. SIGNATURE Claude W Thompson
AUTO. SAMPLE COUNTER #: #2 83600108, #1 83600115

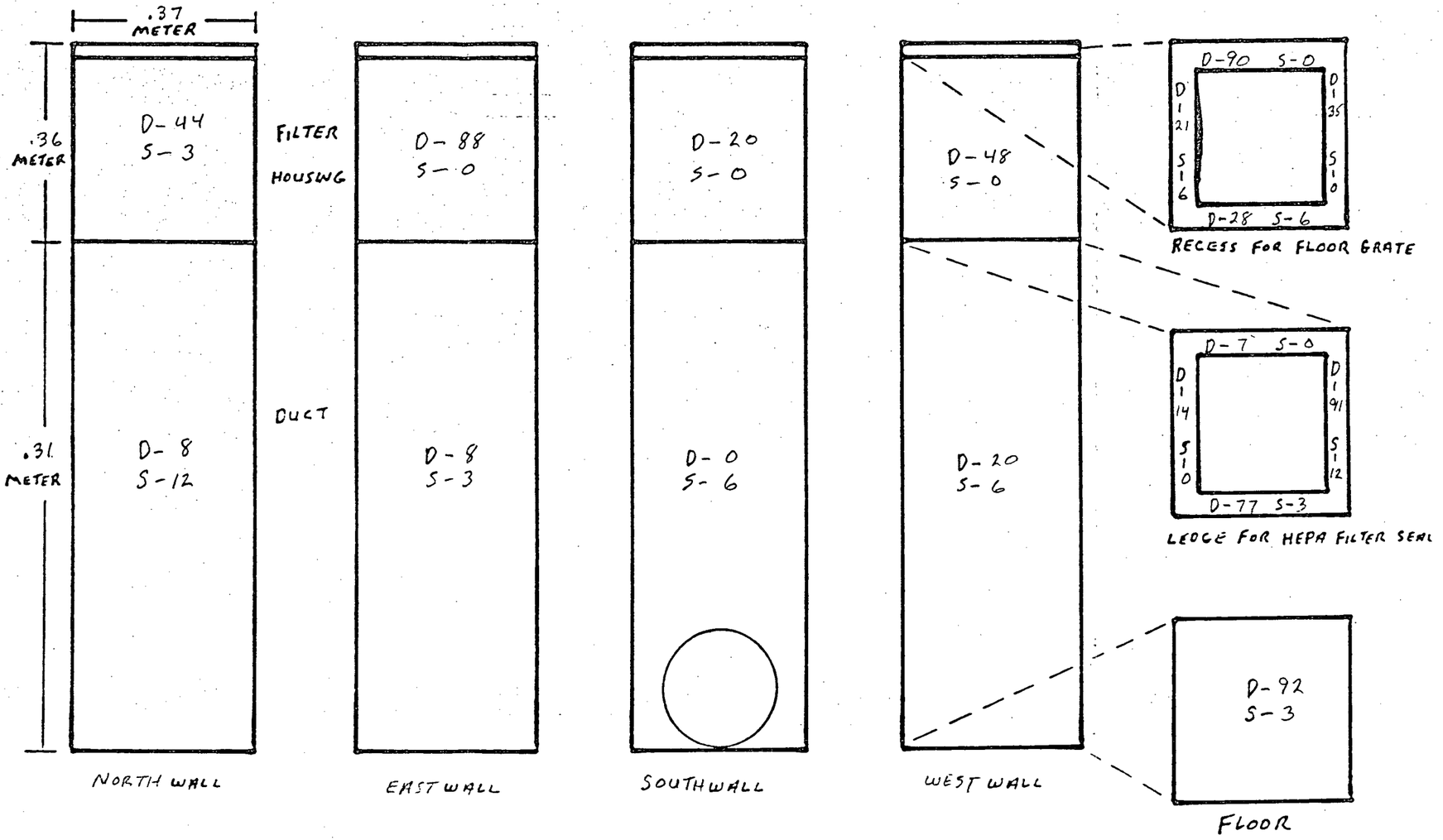
SURVEY UNITS DPM/100cm² AVGR

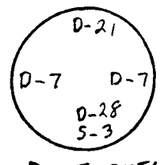
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6868 6916 VALUE: 1055 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
370	8-15-88	307,303	2
"	"	294,286	2
50068	"	527,538	2
"	"	519,497	2
50064	7-14-89	300,256	1
		ASC #2	
	8-18-88	34	.3
		ASC #1	
	7-14-89	30	.2





DUCT OUTLET TO TUNNEL

N
W — E
S

LAB
AREA Pu-PLANT ROOM # 138
FLOOR EXHAUST HOLE BEFORE DECON
READINGS 7100DPM/100CM²

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4, 43-68
SERIAL NUMBER 370, 50068

COMPLETION DATE 8-15-88
H.P. SIGNATURE Claude W. Thompson
AUTO. SAMPLE COUNTER #:

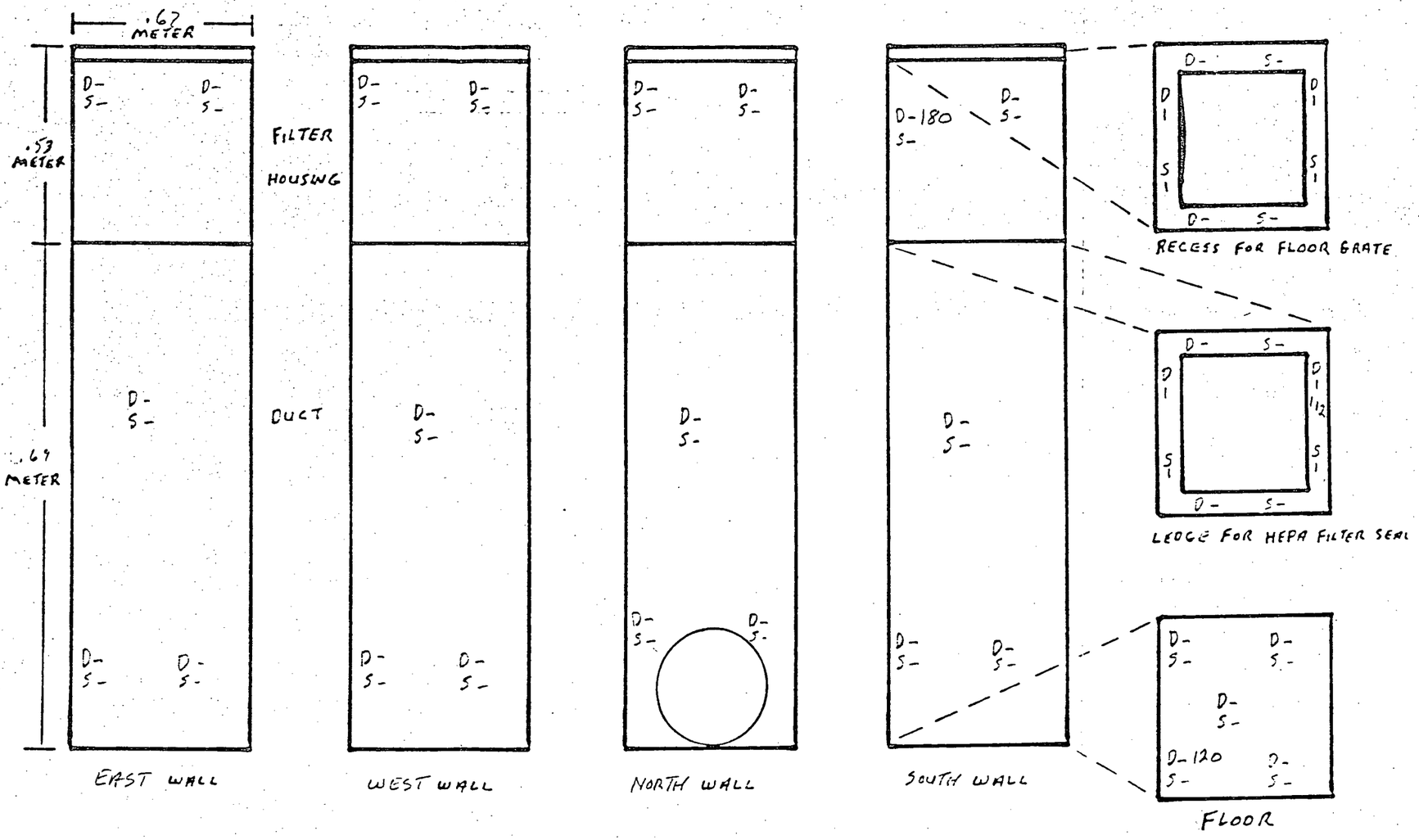
SURVEY UNITS DPM/100CM² ΔBKG

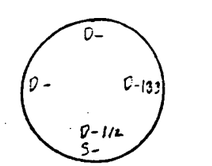
F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE CPM RESPONSE	BKGD CPM
8-15-88	307-303	2
"	294-286	2
"	527-538	2
"	519-497	2





DUCT OUTLET
TO TUNNEL

N / W / E / S

AREA Pu-PLANT LAB ROOM # 138

FLOOR EXHAUST HOLE AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT EBERLINE PRS-2 43-4 / LUCLUM 2220 / DET. 43-68

SERIAL NUMBER 370, 50068, 48395, 50064

COMPLETION DATE 7-14-89

H.P. SIGNATURE Claude Ann Thompson

SURVEY UNITS DPM/100cm² WRK #1

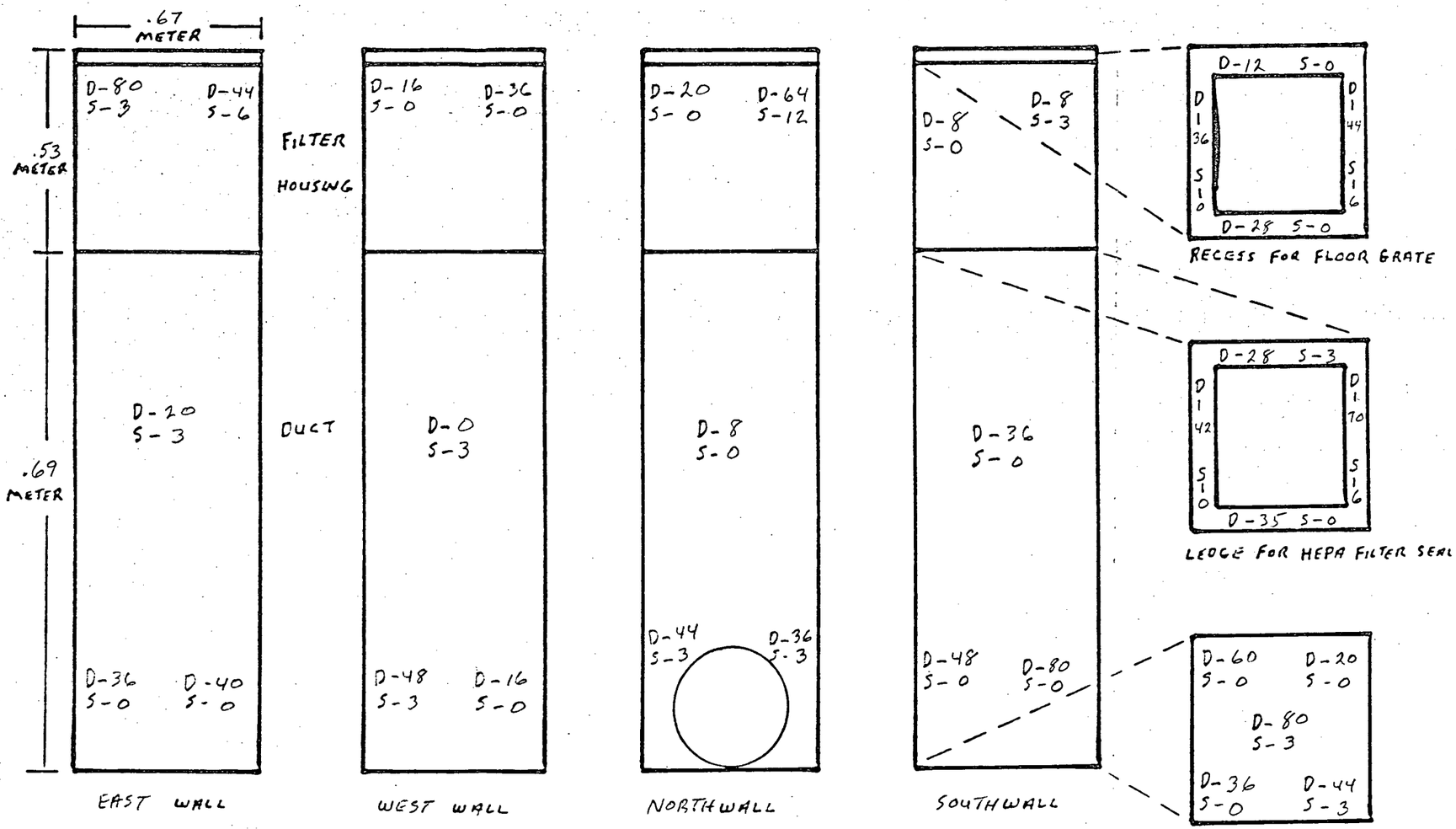
AUTO. SAMPLE COUNTER #: #2 8360010⁸, 8360011⁶

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 6868 VALUE: 10078 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	RECORD #
370	8-15-88	307, 303	2
"	"	294, 286	2
50068	"	527, 538	2
"	"	519, 497	2
370	8-17-88	297, 270	3
"	"	284, 254	3
50064	7-14-89	300, 256	1
48395	"	275, 269	0
		ASC #2	
	8-18-88	34	.3
		ASC #1	
	7-14-89	30	.2



N / W / E / S

AREA Fu-FLINT LAB ROOM # 141

FLOOR EXHAUST HOLE BEFORE DECON

READINGS >100 DPM/100cm²

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUCLUM 2220/DET. 43-4, 43-6

SERIAL NUMBER 370, 50068

COMPLETION DATE 8-11-88

H.P. SIGNATURE Harold M Thompson

AUTO. SAMPLE COUNTER #:

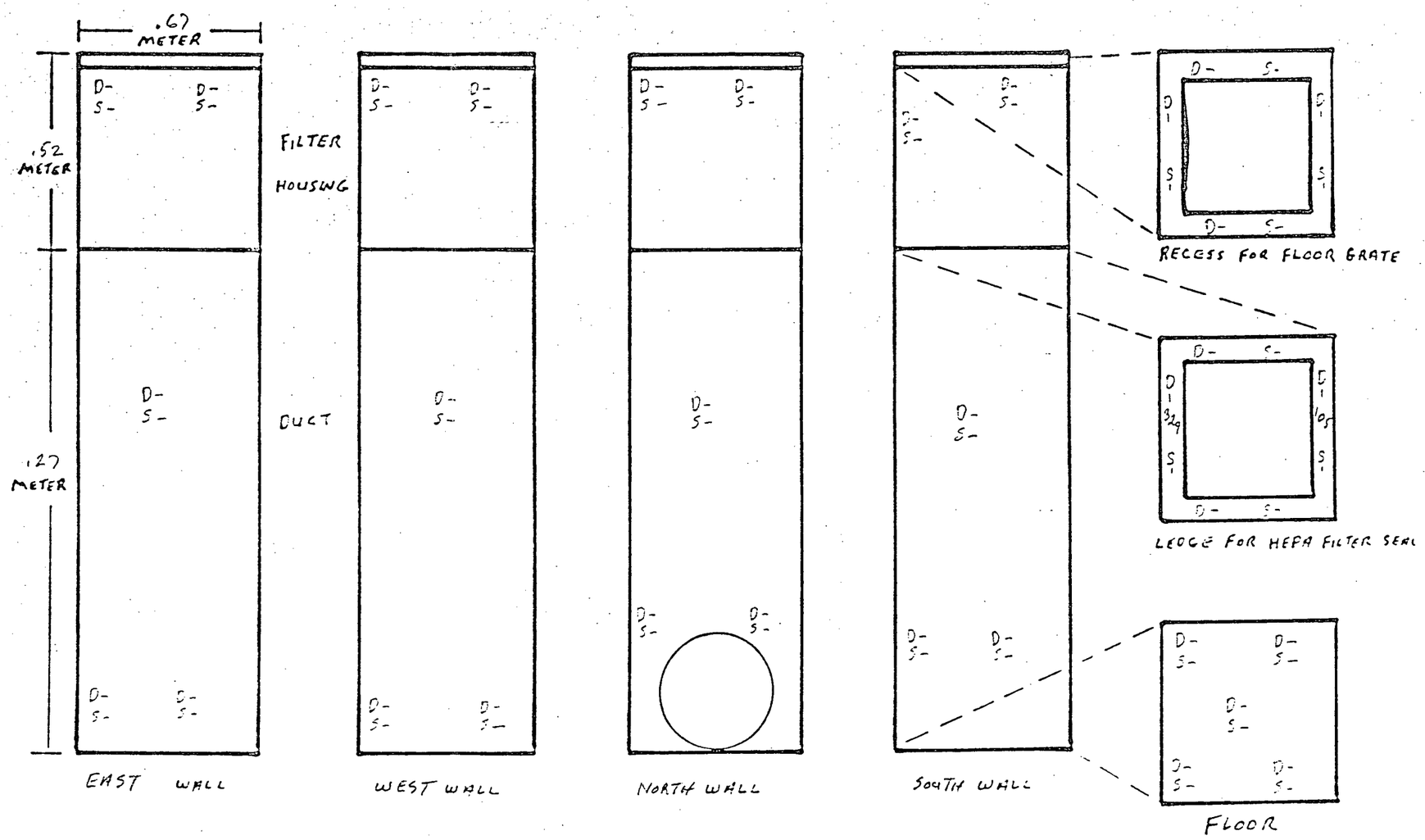
SURVEY UNITS DPM/100cm² WALL

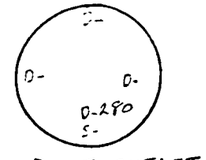
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 VALUE: 1078 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	EFFICIENCY
8-11-88	292-269	3
"	270-268	3
"	276-239	1
"	263-247	1





DUCT OUTLET TO TUNNEL

N / W / E / S

AREA Pu-Plant LAB ROOM # 141

FLOOR EXHAUST HOLE AFTER DECON

TYPE OF SURVEY ∝ DIRECT ∨ SMEAR

TYPE OF INSTRUMENT EBERLINE PAS-1 / LUDLUM 2220 / DET. 43-4, 43-68

SERIAL NUMBER 370, 50068

COMPLETION DATE 8-17-88

H.P. SIGNATURE Claude M Thompson

SURVEY UNITS DPM/100cm² WGR

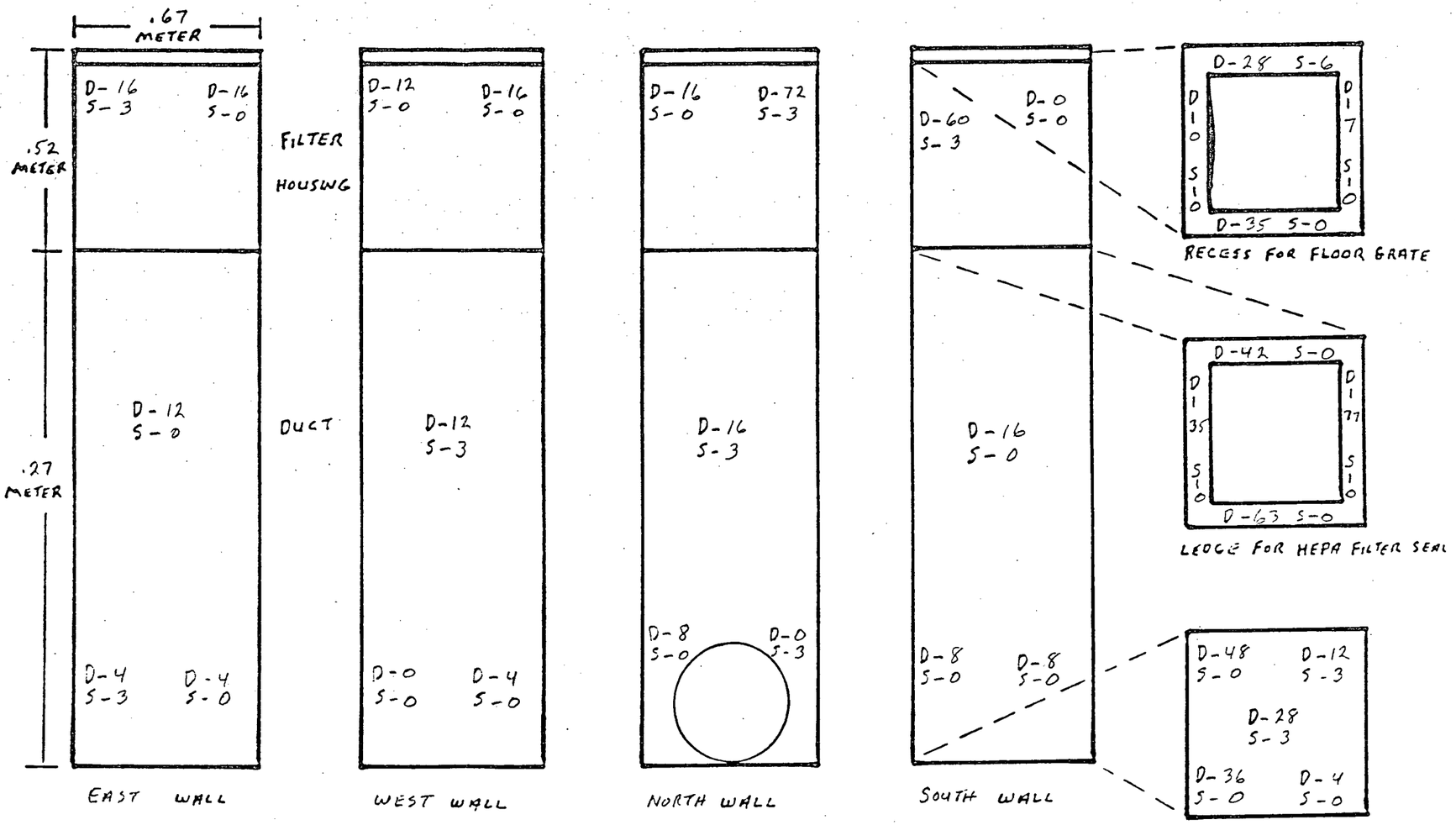
AUTO. SAMPLE COUNTER #: #2 83600108

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE RESPONSE C/M	EFFICIENCY
370	8-11-88	292,269	3
"	"	270,268	3
"	8-17-88	297,270	3
"	"	284,254	3
50068	8-11-88	276,239	1
"	"	263,247	1
	ASC #2		
8-12-88	36	.2	



AREA Pu-PLANT LAB ROOM #142
FLOOR EXHAUST HOLE

TYPE OF SURVEY α DIRECT & SMEAR
TYPE OF INSTRUMENT EBERLINE PRS-2 / LUDLUM 2220 / DET. 43-4 43-68
SERIAL NUMBER 370, 50068

COMPLETION DATE 8-16-88
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #2 83600108

SURVEY UNITS DPM/100cm²
WQU

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
370	8-11-88	292, 269	3
"	"	270, 268	3
"	8-16-88	271, 274	2
"	"	295, 260	2
50068	8-11-88	276, 239	1
"	"	263, 247	1
		ASC #2	
	8-12-88	36	.2

AREA Pu-PLANT LAB ROOM # 143

FLOOR EXHAUST HOLE

WEST

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT EBERLINE PAS-2 43-4 / LUDLUM 2220 / DET. 43-68

SERIAL NUMBER 370, 50068

COMPLETION DATE 8-18-88

H.P. SIGNATURE Claude M. Thompson

SURVEY UNITS DPM/100cm² WGR

AUTO. SAMPLE COUNTER #: #2 83600108

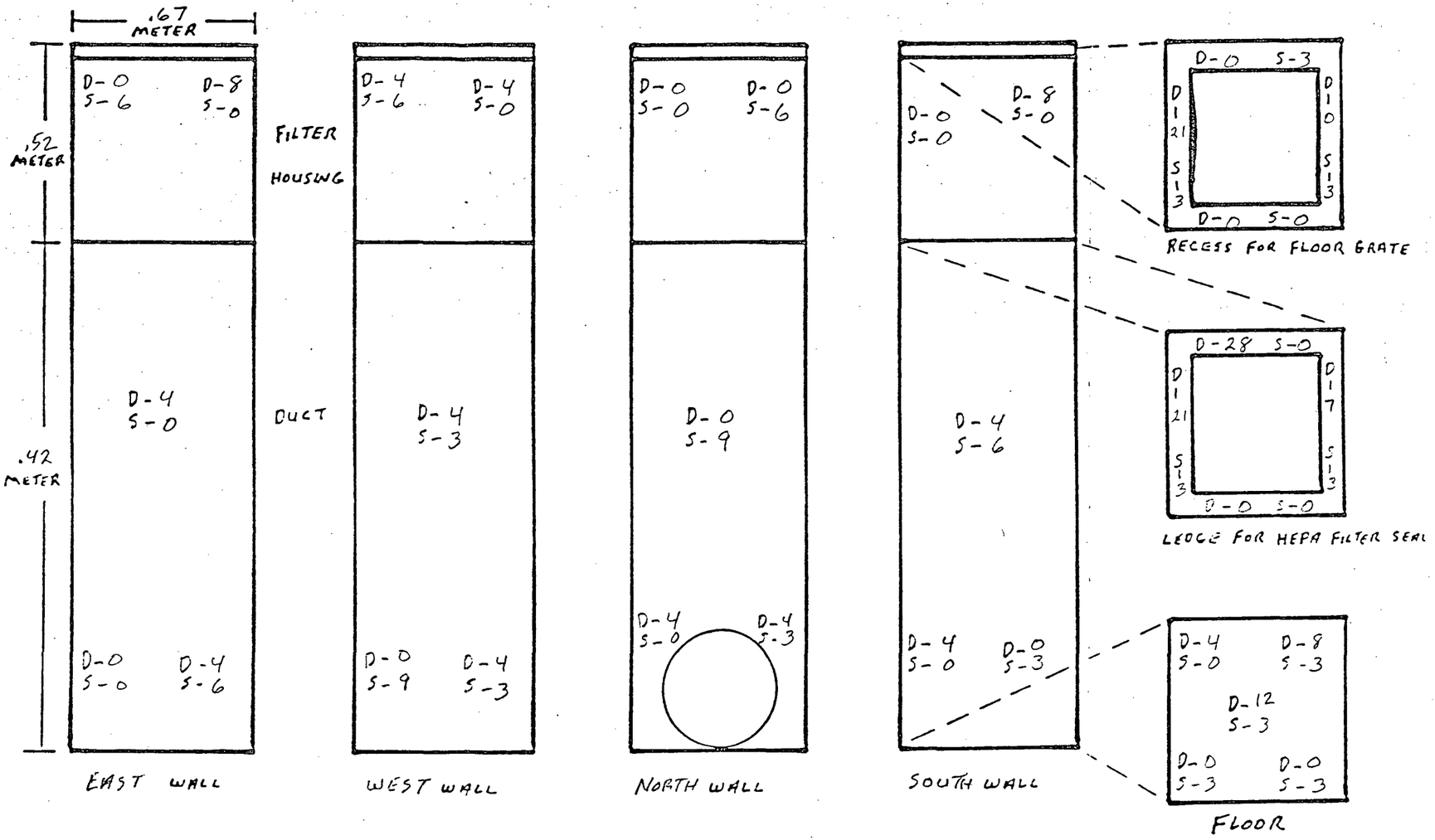
N
W E
S

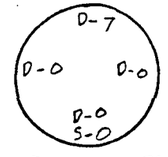
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE & RESPONSE TIME	EFFICIENCY
370	8-15-88	307,303	2
"	"	294,286	2
50068	"	527,538	2
"	"	519,497	2
	ASC #2		
8-18-88	33	.3	





DUCT OUTLET
TO TUNNEL

N / W / E / S

AREA Pu-PLANT LAB ROOM # 143

FLOOR EXHAUST HOLE SOUTH

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT EBERLINE PRS-2 / LUCLUM 2220 / DET. 43-4, 43-68

SERIAL NUMBER 370, 50068

COMPLETION DATE 8-17-88

H.P. SIGNATURE Claude M. Thompson

SURVEY UNITS DPM/100cm² WGR

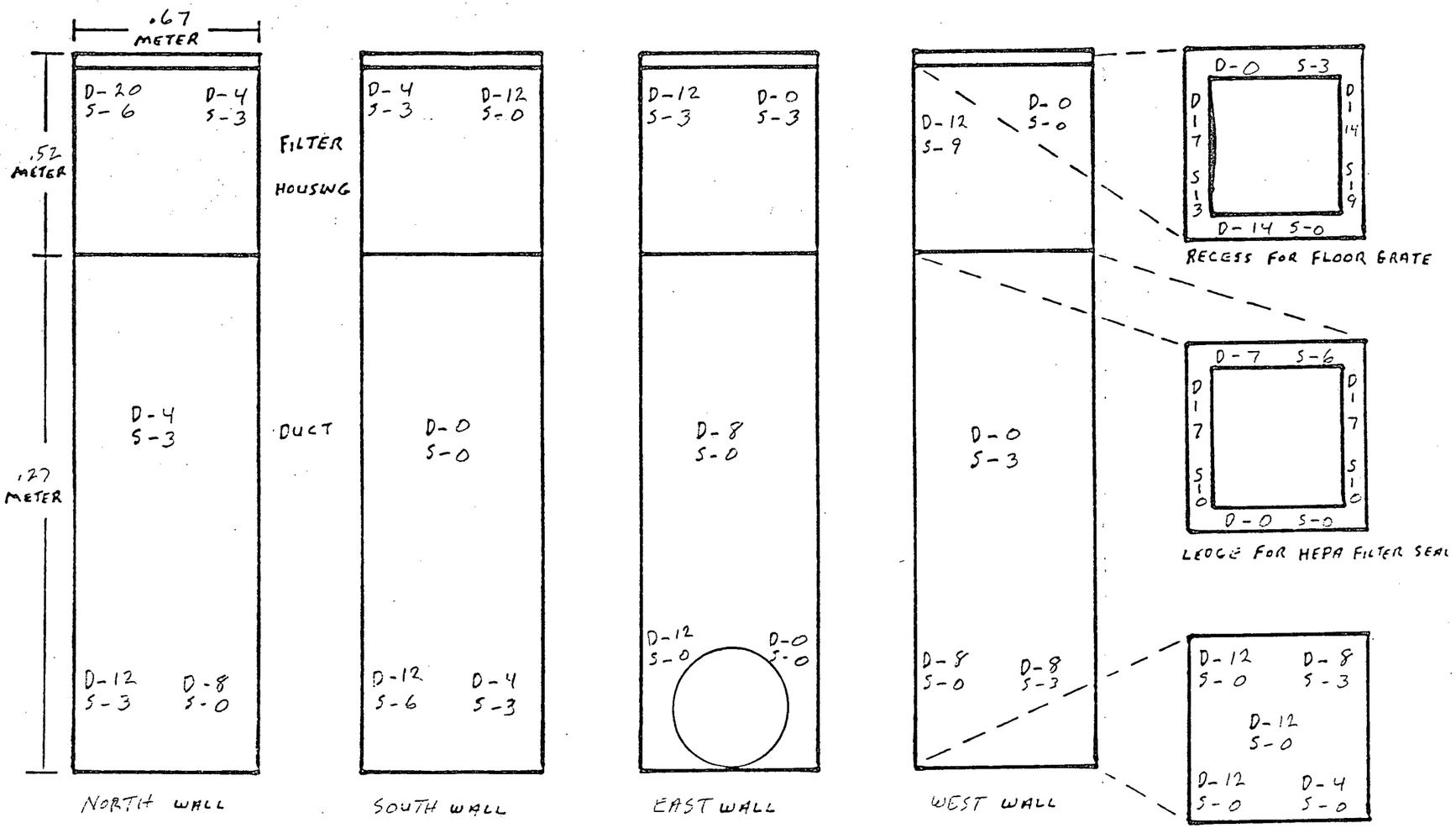
AUTO. SAMPLE COUNTER #: #2 83600108

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

SOURCE #: 6816 VALUE: 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
370	8-15-88	307,303	2
"	"	294,286	2
50068	"	527,538	2
"	"	519,497	2
	ASC #2		
8-17-88	34		.3



N / W / E / S

AREA Fu-Flint ROOM # 116
FLOOR EXHAUST HOLE

TYPE OF SURVEY ☌ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET 43-68 43-4
SERIAL NUMBER 43-4 58318 - 43-68 37800 - 43-4 50064

COMPLETION DATE 7-26-89
H.P. SIGNATURE S. Wagstaff
AUTO. SAMPLE COUNTER #: #1 93600115

SURVEY UNITS DPM/100cm² NWA

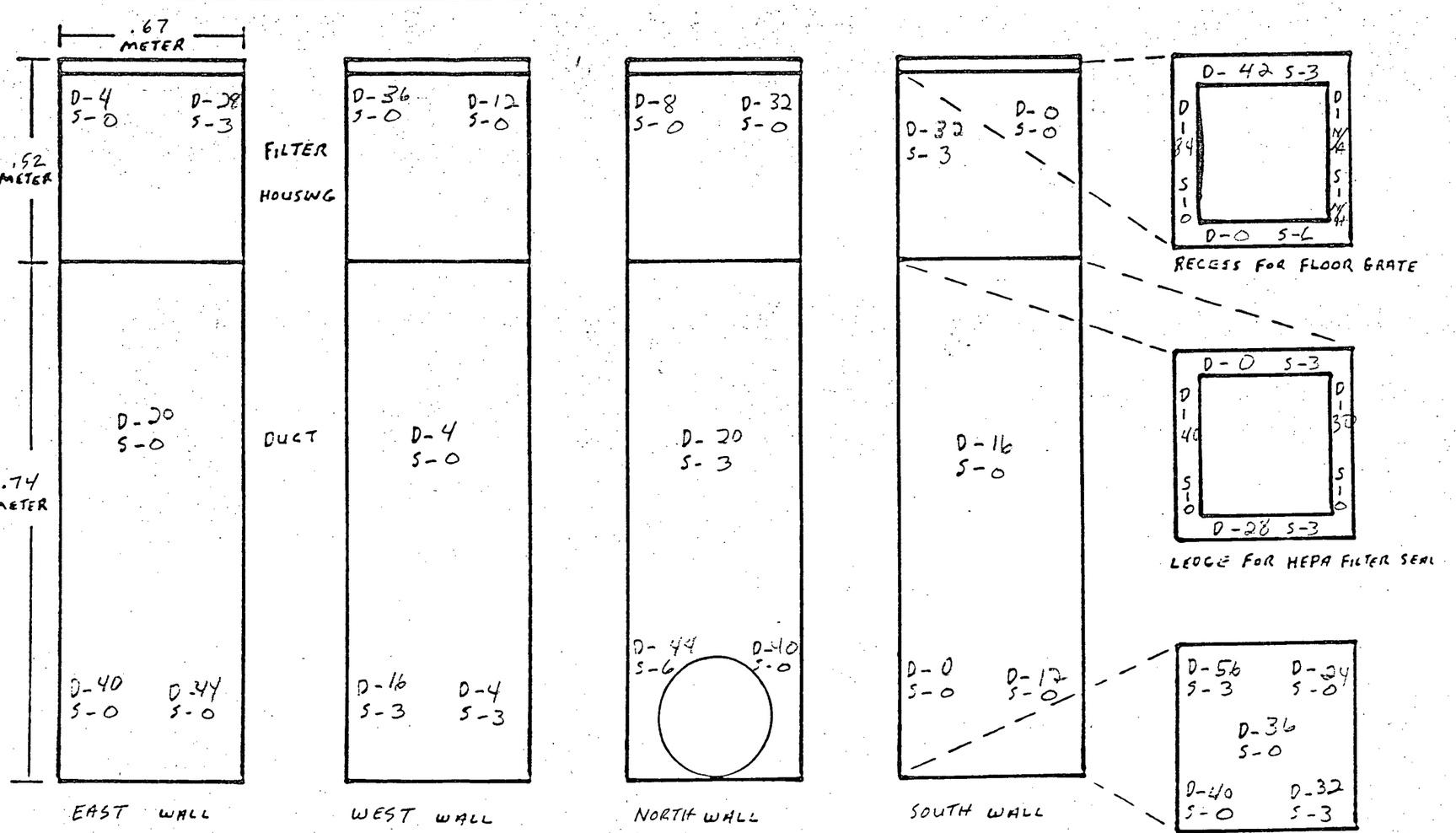
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

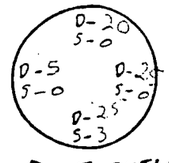
MDA = 19.60 DPM/100cm²

SOURCE #: 113 VALUE: 1113 DPM

	INSTRUMENT		
	DATE	SOURCE # RESPONSE	EFFICIENCY
37800	7-25-89	249-237	1 Am
58318	7-25-89	299-268	1 Am
50064	7-25-89	265-283	1 Pm
58318	7-25-89	263-262	2 Pm
37800	7-25-89	252-246	2 Pm
	ASC # 1		
7-26-89	33		.2



	DIRECT	SMEAR
TOTAL DPM	899	45
# READINGS	36	36
AVG. DPM/100cm²	24.97	1.25
MAX. DPM/100cm²	84	6



DUCT OUTLET TO TUNNEL

AREA Pu-PLANT ROOM # DOCK AIRLOCK
FLOOR EXHAUST HOLES

TYPE OF SURVEY ∝ DIRECT ∀ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 43-68

SERIAL NUMBER 58318 37800 - 43-68

COMPLETION DATE 7-21-89

H.P. SIGNATURE S. Vaden

AUTO. SAMPLE COUNTER #: #2 836 00108

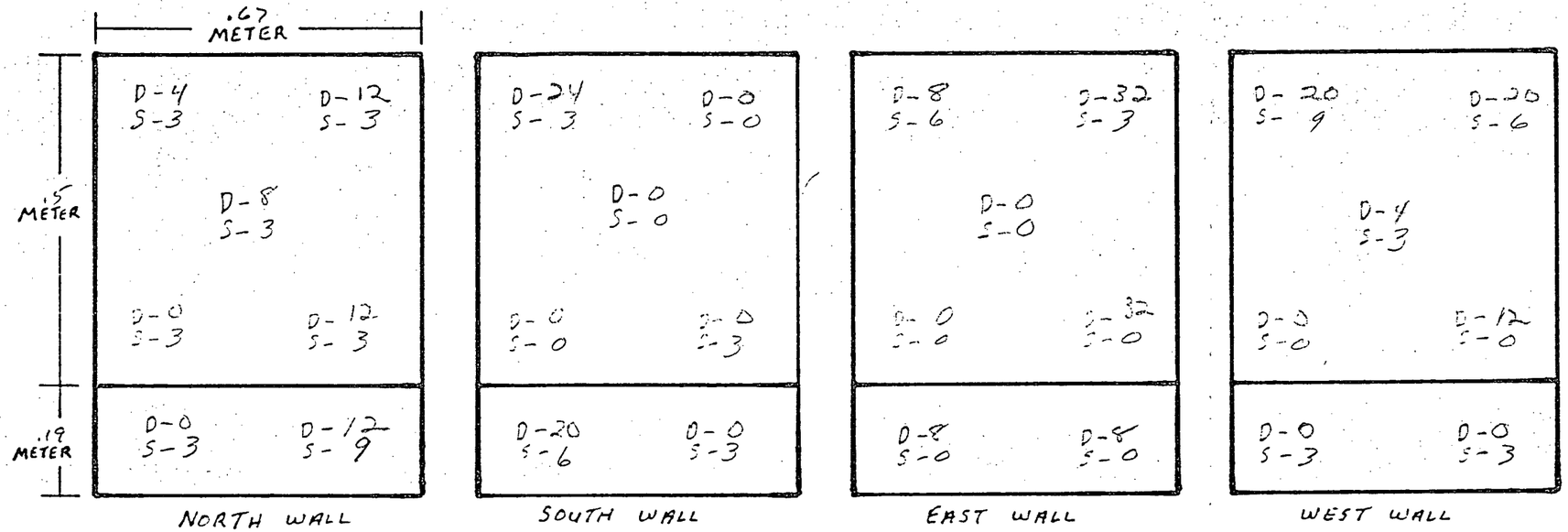
SURVEY UNITS DPM/100cm² wgd

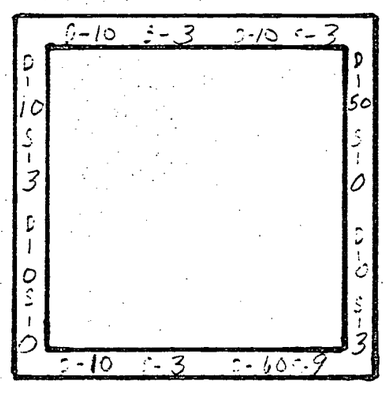
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

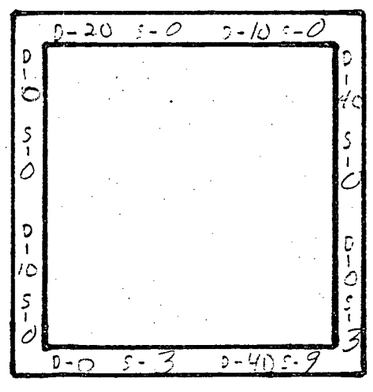
D - DIRECT
S - SMEAR
MDA = 24.00 DPM/100cm²
FIXED

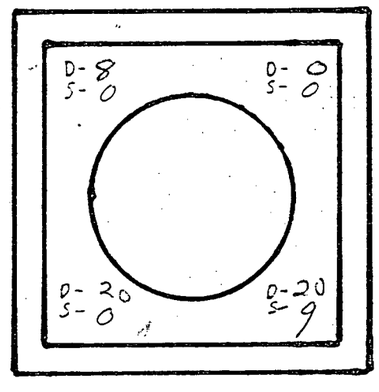
SOURCE #: 112 VALUE: 1113 DPM (6868, 1055)

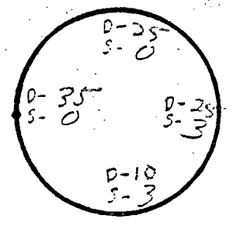
INSTRUMENT			
	DATE	SOURCE CPM RESPONSE	EFFICIENCY
58318	7-20-89	270-284	2 PM
37800	7-21-89	339-352	3 AM
58318	7-21-89	269-287	3 AM
		ASC#2	
	7-21-89	30	.2











	DIRECT	SMEAR
TOTAL DPM	659	129
# READINGS	52	52
AVG. DPM/100cm²	12.67	2.48
MAX. DPM/100cm²	60	9

AREA Pu-PLANT Room # 121 South
FLOOR EXHAUST HOLES

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 43-68
SERIAL NUMBER 37800 - SN 58318

COMPLETION DATE 7-20-89
H.P. SIGNATURE [signature]
AUTO. SAMPLE COUNTER #: #1 83600115

SURVEY UNITS DPM/100cm² wall

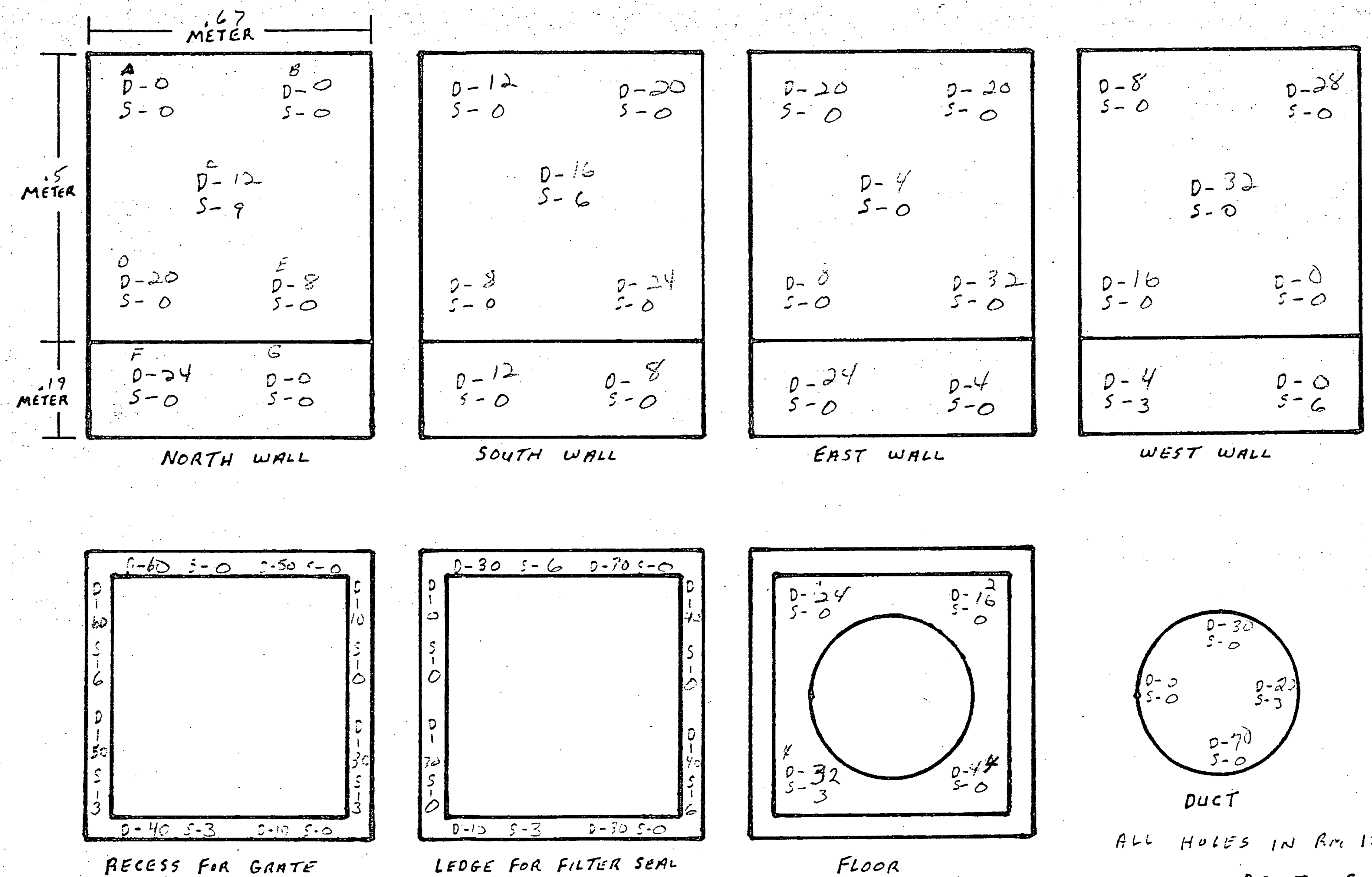
N / E / S / W

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR
MDA = 24.00 DPM/100 cm² FIXED

SOURCE #: 112 VALUE: 1113 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
37800	7-19-89	286-266	2 Pm
58318	7-19-89	278-294	2 Pm
58318	7-20-89	263-281	3 Am
37800	7-20-89	262-246	2 Am
		ASC #1	
	7-20-89	26	.3



ALL HOLES IN Rm 121 (5)

	DIRECT	SMEAR
TOTAL DPM	4191	402
# READINGS	215	215
AVG. DPM/100cm²	19.49	1.87
MAX. DPM/100cm²	90	9

AREA Pu-PLANT ROOM #121 WEST FLOOR EXHAUST HOLES

TYPE OF SURVEY ∝ DIRECT ∀ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68

SERIAL NUMBER 37800 – 58318 (43-4)

COMPLETION DATE 7-21-89

H.P. SIGNATURE S. Deasley, Jr

AUTO. SAMPLE COUNTER #: #1 83600115

SURVEY UNITS DPM/100cm² WALL

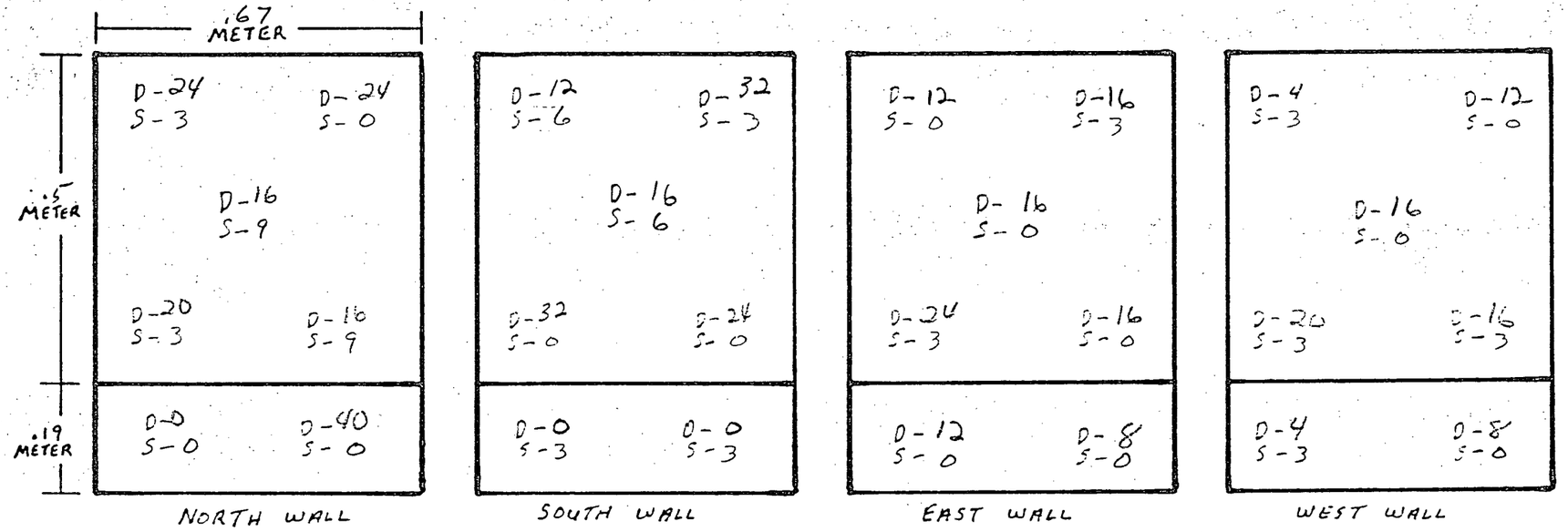
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

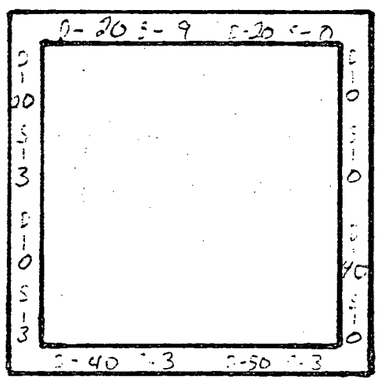
D – DIRECT
S – SMEAR

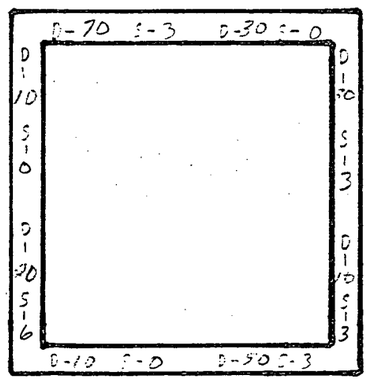
MDA = 24,000 DPM/100cm² FIXED

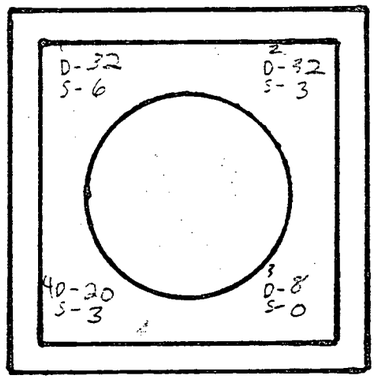
SOURCE #: 112 VALUE: 1113 DPM

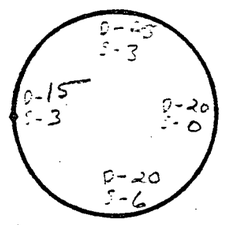
	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
37800	7-20-89	262-246	2 AM
37800	7-20-89	263-278	1 PM
58318	7-20-89	263-281	3 AM
58318	7-20-89	283-270	2 PM
		ASC #1	
	7-21-89	35	.3











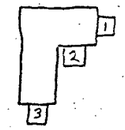
N / W / E / S

AREA Pu-PLANT ROOM #121 PIT
FLOOR EXHAUST HOLE #1

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68 43-4
SERIAL NUMBER 37800, 58318 (43-68, 43-4)

COMPLETION DATE 7-25-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: #2 8360108

SURVEY UNITS DPM/100cm² W.C.N.



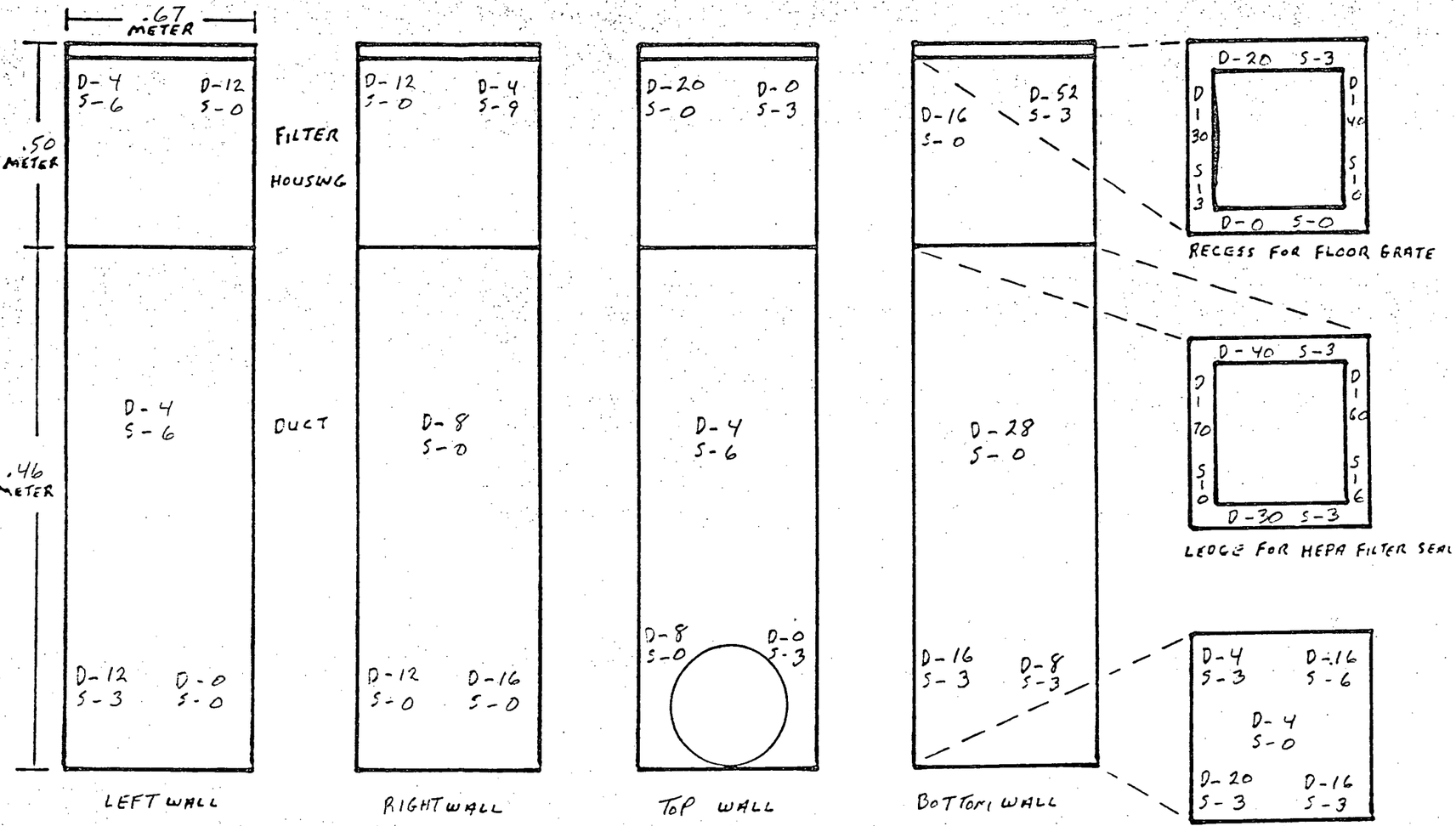
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

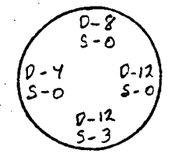
D – DIRECT
S – SMEAR

MDA = 19.60 DPM/100cm² FIXED

SOURCE #: 112 VALUE: 1113 DPM

INSTRUMENT			
	DATE	SOURCE C/M RESPONSE	EFF. C/M
37800	7-24-89	240, 245	2
58318	"	264, 300	2
		ASC #2	
	7-25-89	29	.2





DUCT OUTLET TO TUNNEL

N / W / E / S

AREA Pu-Plant Room #121 P.T
Floor Exhaust Hole #2

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68, 43-4

SERIAL NUMBER 37800, 58318 (43-68, 43-4)

COMPLETION DATE 7-24-89

H.P. SIGNATURE Claude M Thompson

SURVEY UNITS DPM/100cm² WGK

AUTO. SAMPLE COUNTER #: #1 83600115

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

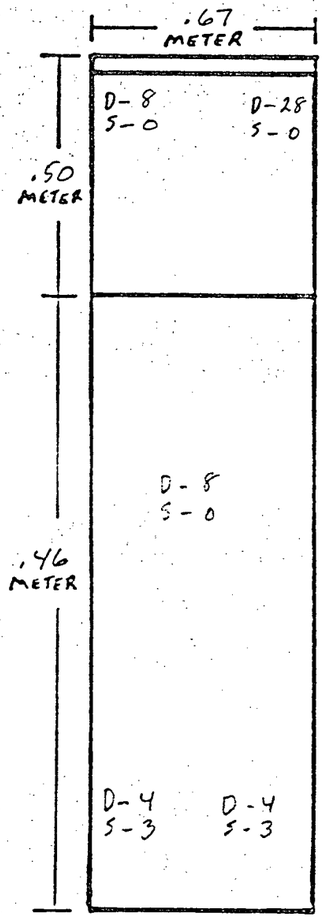
D – DIRECT
S – SMEAR

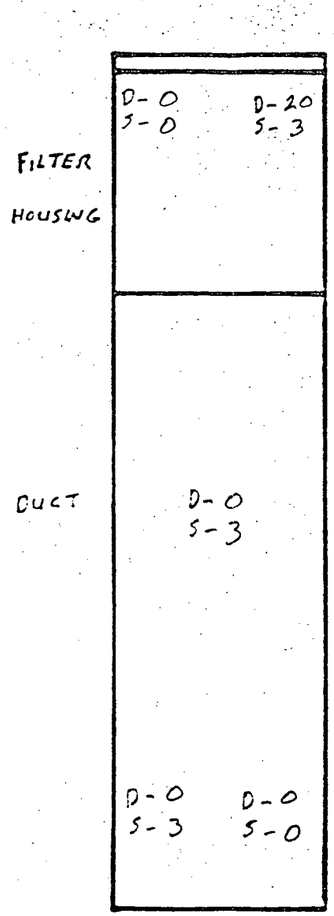
MDA = 15.68 DPM/100cm²

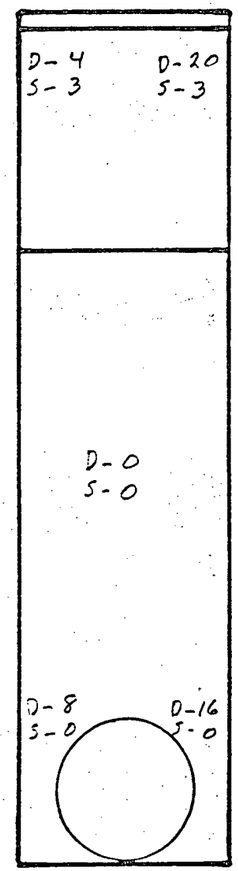
FIXED

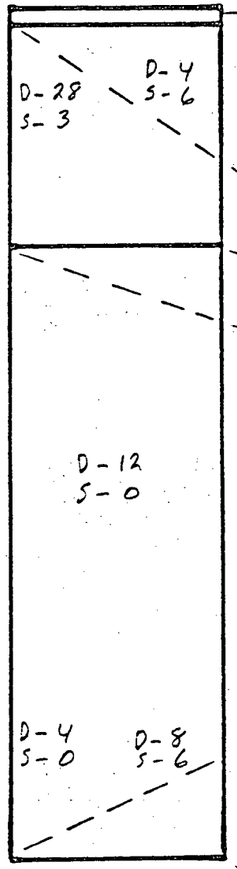
SOURCE #: 112 VALUE: 1113 DPM

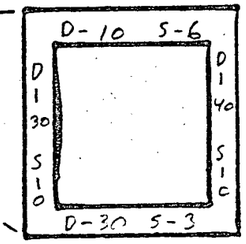
	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	RECORD
37800	7-24-89	291, 288	2
"	"	240, 245	2
58318	"	273, 272	1
	ASC #1		
	7-24-89	33	.3



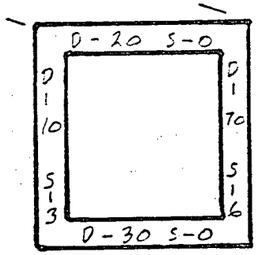




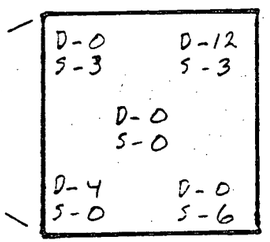




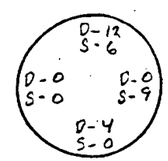
RECESS FOR FLOOR GRATE



LEDGE FOR HEPA FILTER SEAL



~~BACK~~ BACK



DUCT OUTLET TO TUNNEL

N / W / E / S

AREA Pu-PLANT ROOM #121 PIT
FLOOR EXHAUST HOLE #3

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68, 43-4
SERIAL NUMBER 37800 (43-68), 58318 (43-4)

COMPLETION DATE 7-24-89
H.P. SIGNATURE Charles M Thorpe
AUTO. SAMPLE COUNTER #: #1 83600115

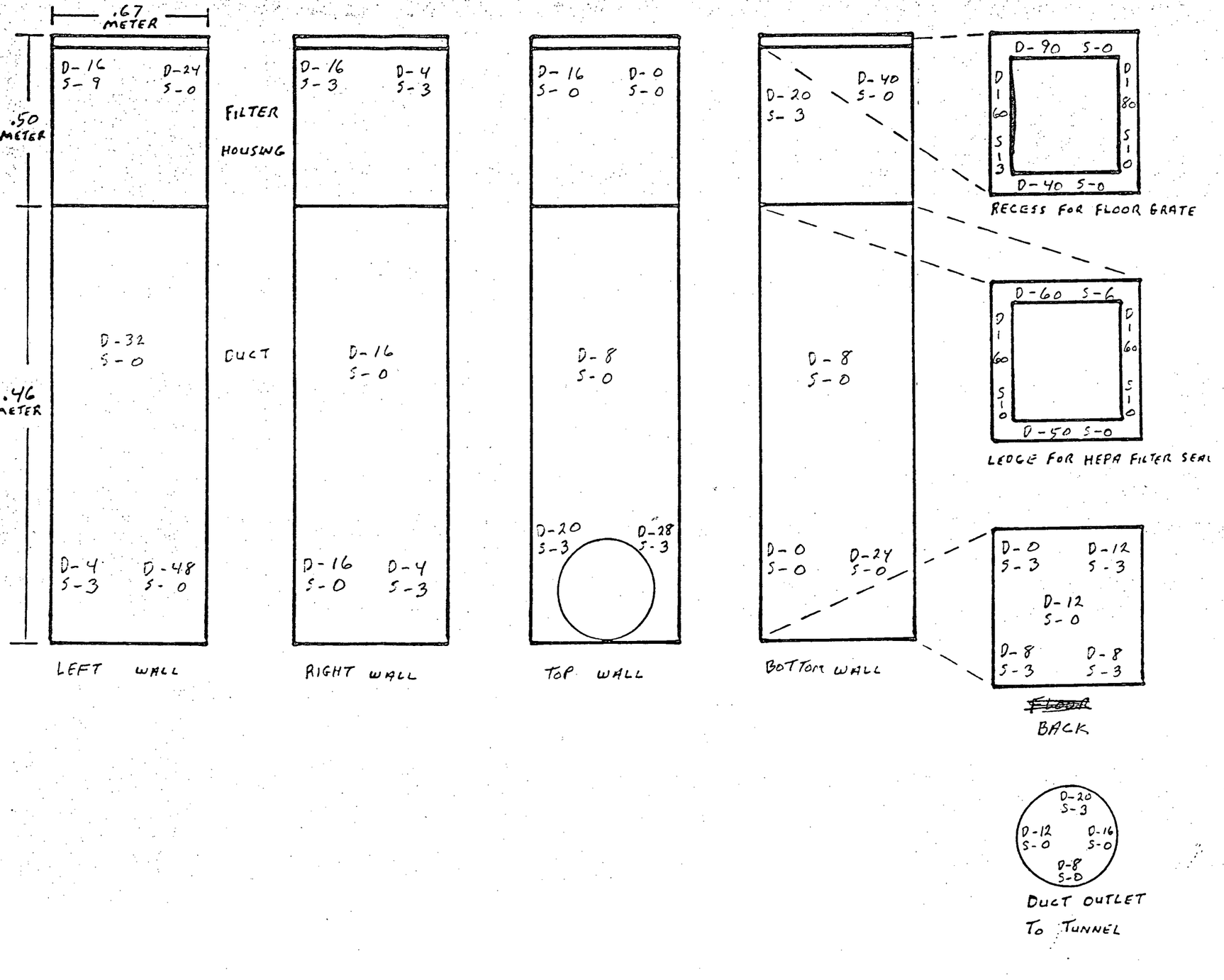
SURVEY UNITS DPM/100cm² MAX

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR
MDA = 15.68 DPM/100cm² FIXED

SOURCE #: 112 VALUE: 1113 DPM

	INSTRUMENT		
	DATE	SOURCE RESPONSE C/M	BKGD C/M
37800	7-24-89	291, 288	2
58318	"	273, 272	1
		ASC #1	
	7-24-89	33	.3



N / W / E / S

AREA Pu-Plant ROOM #121 PIT — FLOOR EXHAUST HOLE #1

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT LUCLUM 2220/DET. 43-4, 43-68

SERIAL NUMBER 37800, 58318

COMPLETION DATE 8-4-89

H.P. SIGNATURE Claude M Thompson

SURVEY UNITS DPM/100cm² WALL

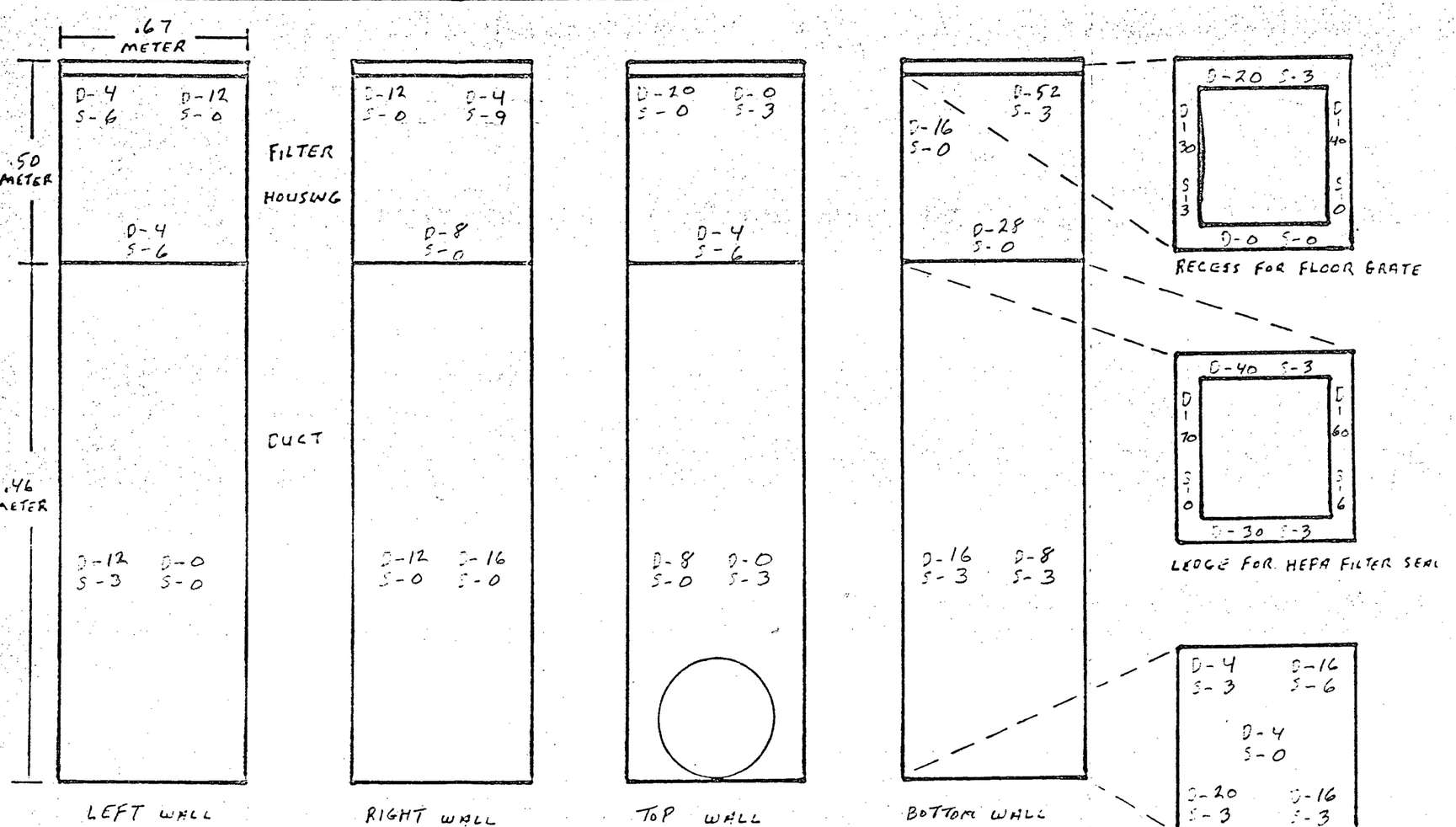
AUTO. SAMPLE COUNTER #: 2 83600108

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 112 VALUE: 1113 DPM

	INSTRUMENT		
	DATE	SOURCE CPM RESPONSE	EFFICIENCY
37800	7-24-89	240-245	2
58318	"	264-300	2
	8-4-89	279-292	4
		ASC #2	
	7-25-89	29	.2



LEFT WALL

RIGHT WALL

TOP WALL

BOTTOM WALL

RECESS FOR FLOOR GRATE

LEDGE FOR HEPA FILTER SEAL

~~FILTER~~ BACK

DUCT OUTLET TO TUNNEL

N / W / E / S

AREA Pu-PLANT ROOM #121 PIT — FLOOR EXHAUST HOLE #2

TYPE OF SURVEY ∝ DIRECT ∀ SMEAR

TYPE OF INSTRUMENT LUCLUM 2220/DET. 43-4 43-68

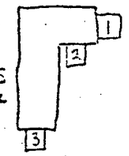
SERIAL NUMBER 58318-37800

COMPLETION DATE 8-4-89

H.P. SIGNATURE Claude W Phipps

AUTO. SAMPLE COUNTER #: 1 83600115

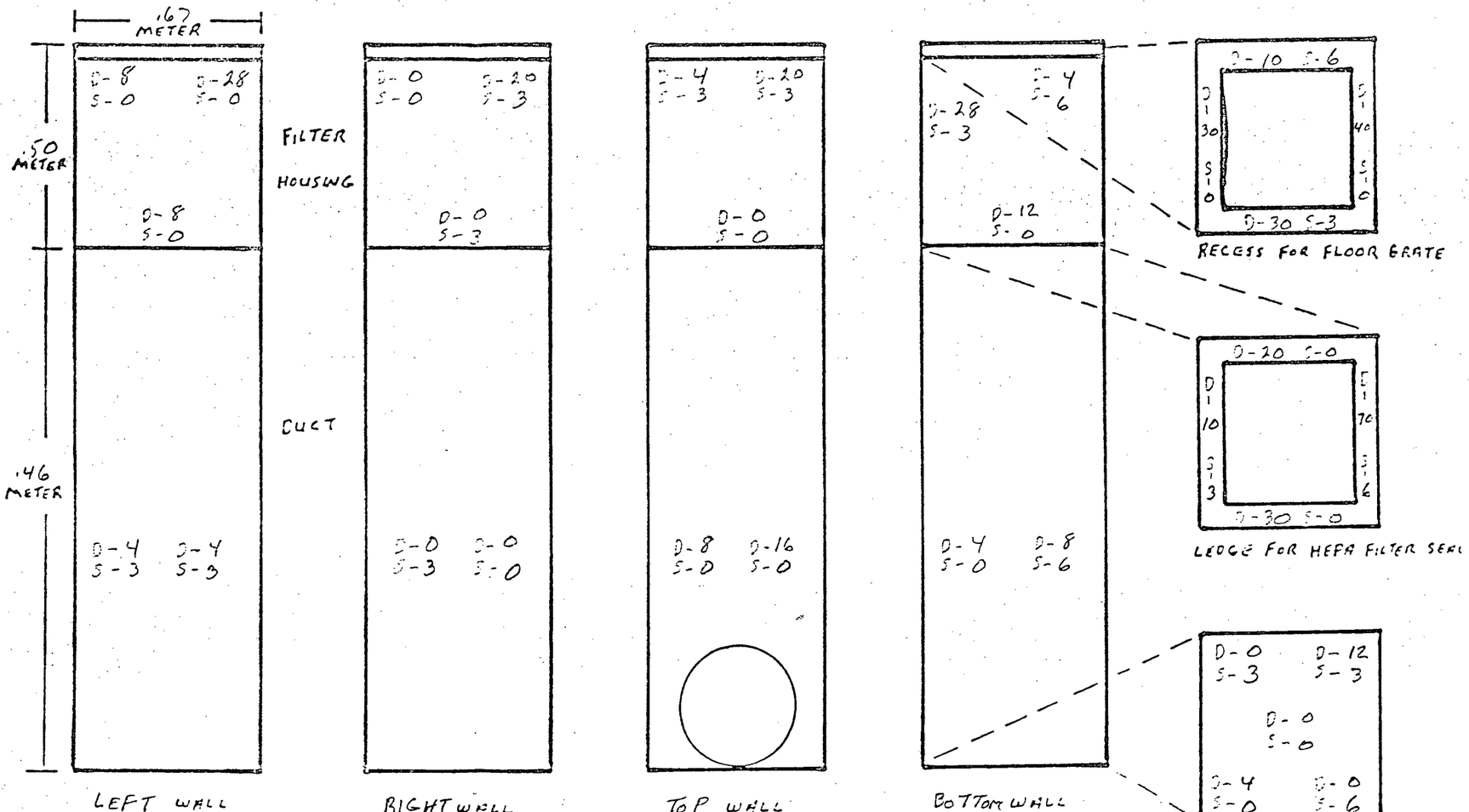
SURVEY UNITS DPM/100cm²

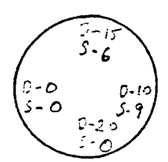


F – FLOOR D - DIRECT
C – CEILING S - SMEAR
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

SOURCE #: 112 VALUE: 1113 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFF. C/M DPM
37800	7-24-89	291-288	2
	"	240-245	2
58318	"	273-272	1
	8-4-89	279-292	4
		ASC #1	
	7-24-89	33	.3





DUCT OUTLET TO TUNNEL

N / W / E / S

AREA Fu-Flant ROOM # 121 PIT
FLOOR EXHAUST HOLE #3

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/GET. 43-4 43-6
SERIAL NUMBER 37800 – 58318

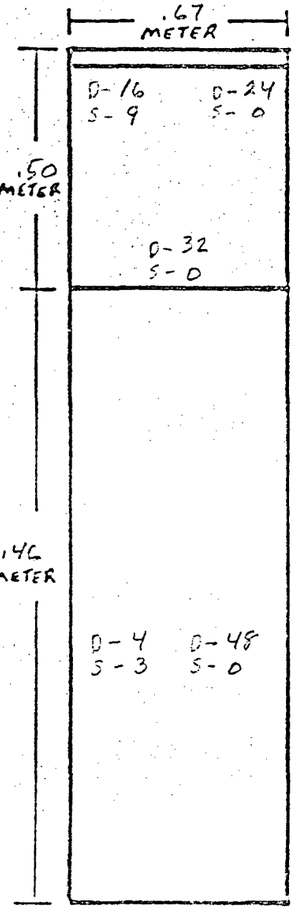
COMPLETION DATE 7-24-89
H.P. SIGNATURE Claude M Thorpe
AUTO. SAMPLE COUNTER #: 1 83600115

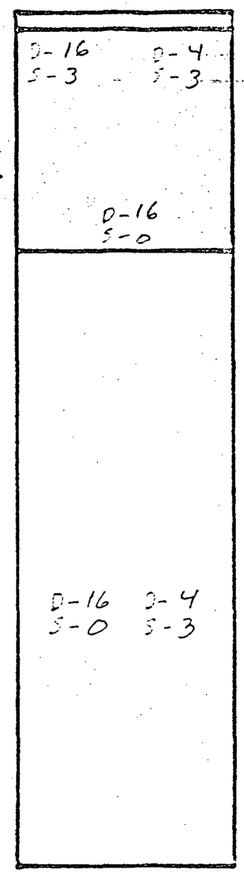
SURVEY UNITS DPM/100cm² α/β

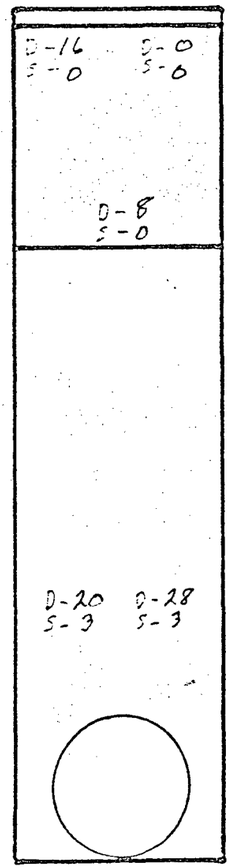
F – FLOOR D – DIRECT
C – CEILING S – SMEAR
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

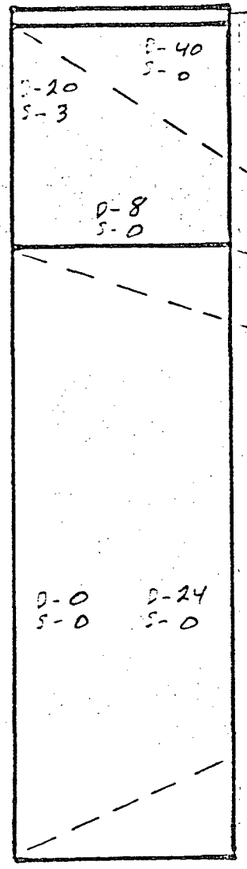
SOURCE #: 112 VALUE: 1113 DPM

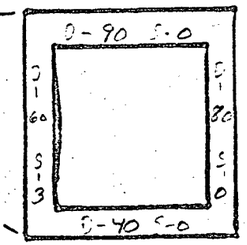
	INSTRUMENT		
	DATE	SOURCE CPM RESPONSE	EFFICIENCY
37800	7-24-89	291-288	2
58318	"	273-272	1
"	8-4-89	279-292	4
		ASC #1	
	7-24-89	33	.3



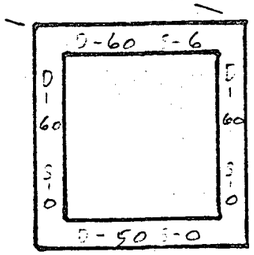




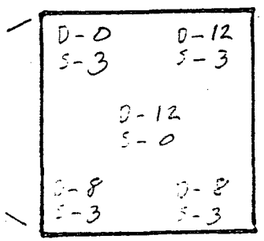




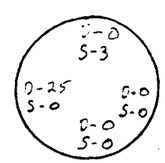
RECESS FOR FLOOR GRATE



LEDGE FOR HEPA FILTER SEAL



FLOOR



DUCT OUTLET
TO TUNNEL

AREA Pu-PLANT Room # 123
FLOOR EXHAUST HOLES
#1
BEFORE DECON
READINGS >100 DPM/100cm²

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 50069

COMPLETION DATE 10-26-88
H.P. SIGNATURE
AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm²

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: VALUE: DPM

INSTRUMENT

DATE	SOURCE RESPONSE C/M	BKGD C/M
10-26-88	195-210	1

NORTH WALL

SOUTH WALL

EAST WALL

WEST WALL

RECESS FOR GRATE

LEDGE FOR FILTER SEAL

FLOOR

DUCT

AREA Pu-PLANT ROOM # 123 — FLOOR EXHAUST HOLES #1 — AFTER DECON

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4, 43-68

SERIAL NUMBER 50064, 37800, 58318

COMPLETION DATE 7-18-89

H.P. SIGNATURE Claude M Thompson

AUTO. SAMPLE COUNTER #: #1 83600115, #2 83600108

SURVEY UNITS DPM/100cm² WCM

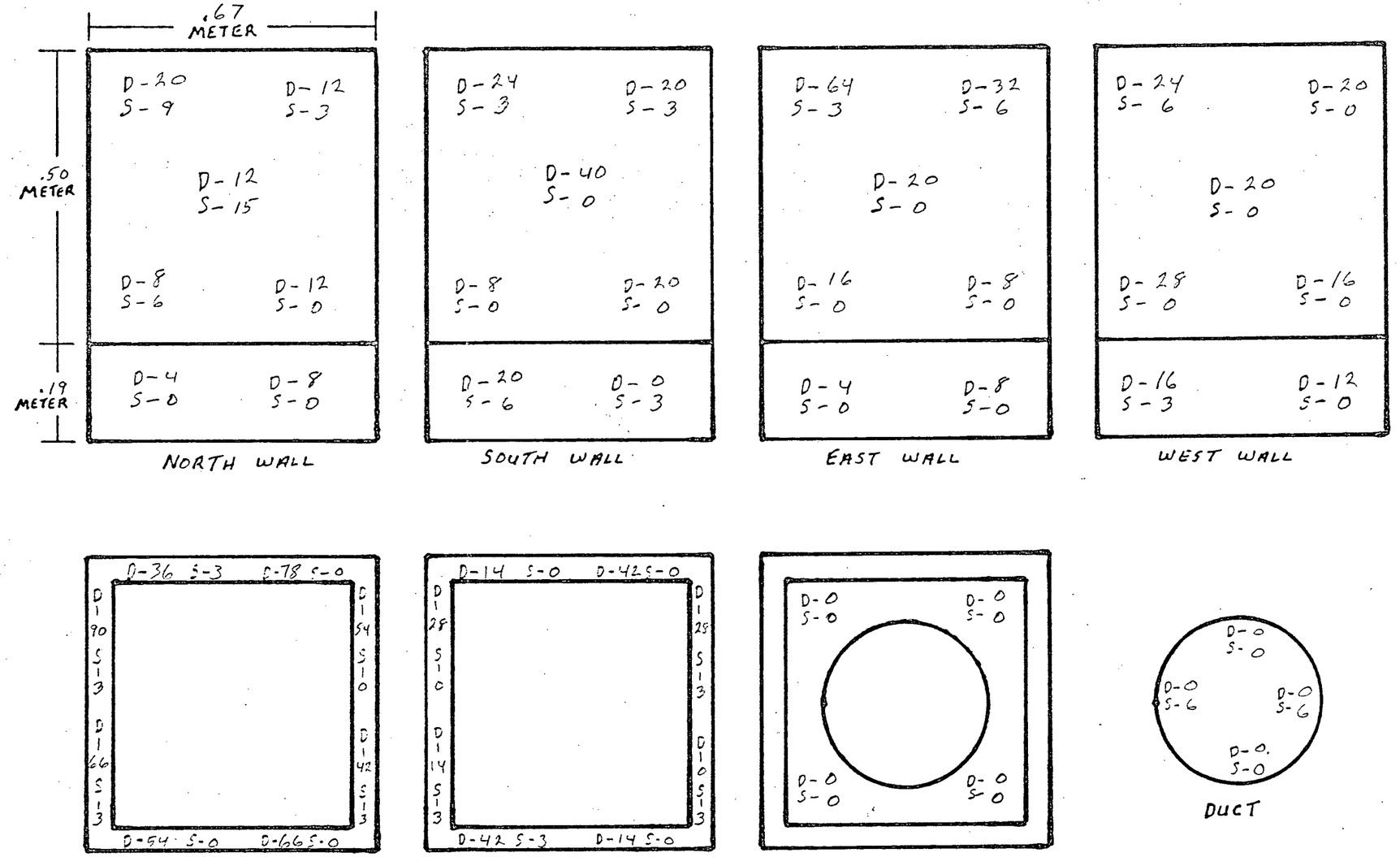
N — W — E — S

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6816, 112, 1055, 1113 VALUE: 1078 DPM

INSTRUMENT			
	DATE	SOURCE c/m RESPONSE	BKGD c/m
50064	11-3-88	285,248	2
"	"	261,252	2
37800	"	263,240	2
"	"	243,243	3
58318	7-17-89	253,263	2
	ASC #1		
11-8-88	33		.3
	ASC #2		
11-8-88	26		0
11-9-88	34		.1
7-18-89	29		.2



MDA = 33.26 DPM/100cm² FIXED

ALL RM. 123 EXHAUST FILTER HOLES

	DIRECT	SMEAR
TOTAL DPM	6260	483
# READINGS	260	260
AVG. DPM/100cm²	24.08	1.86
MAX. DPM/100cm²	98	15

AREA Pu-PLANT Room #123
FLOOR EXHAUST HOLES
#2
BEFORE DECON
READINGS >100DPM/100cm²

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 50069

COMPLETION DATE 10-26-88
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm² WGM

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: VALUE: DPM

INSTRUMENT		
DATE	SOURCE RESPONSE C/M	BKGD C/M
10-26-88	195-210	1

NORTH WALL

SOUTH WALL

EAST WALL

WEST WALL

RECESS FOR GRATE

LEDGE FOR FILTER SEAL

FLOOR

DUCT

N / W / E / S

AREA Pu-PLANT ROOM # 123
FLOOR EXHAUST HOLES #2
AFTER DECON

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 50064, 37800, 58318

COMPLETION DATE 7-18-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: #1 8360011S, #2 83600108

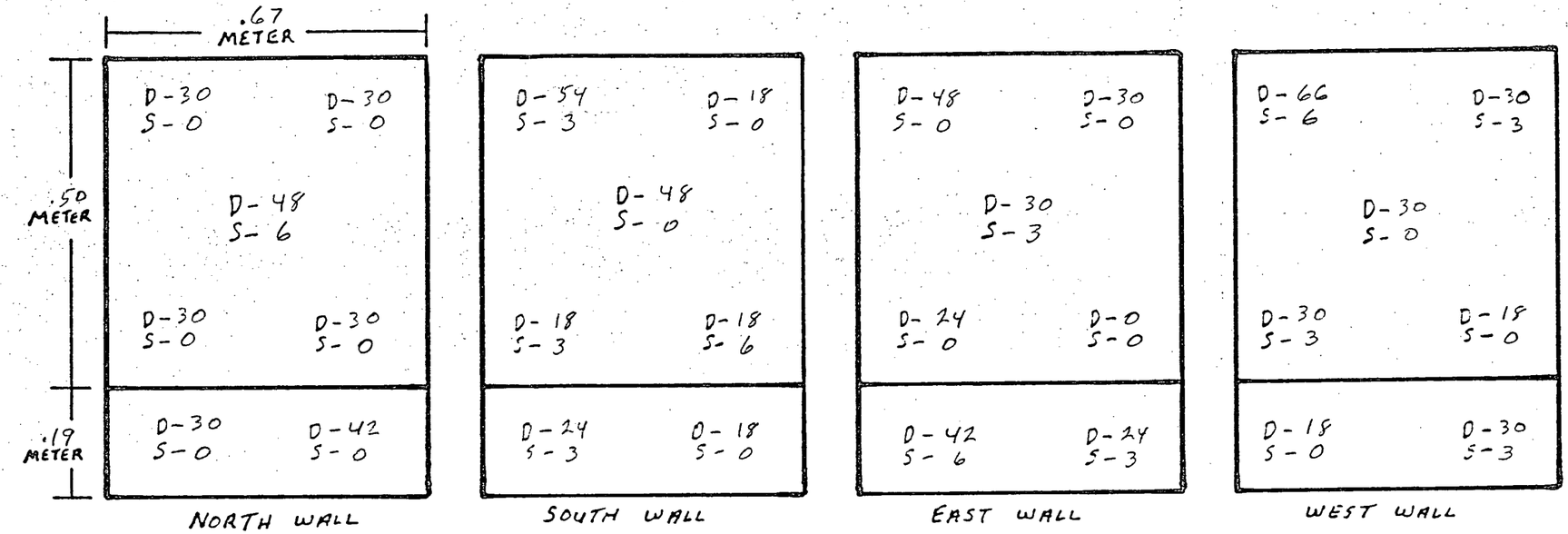
SURVEY UNITS DPM/100cm² WAN

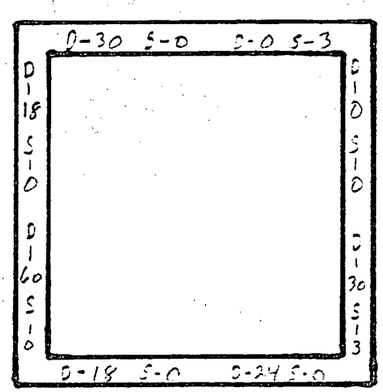
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

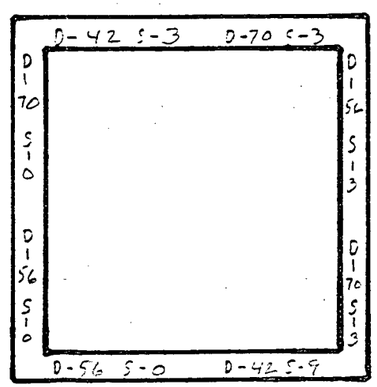
D - DIRECT
S - SMEAR

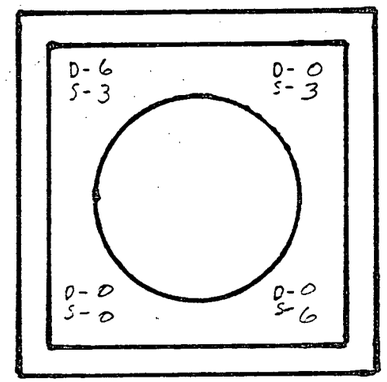
SOURCE #: 6816 6868, 112 VALUE: 1078 1055, 1113 DPM

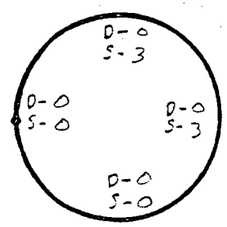
	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50064	11-4-88	271,281	2
37800	"	257,240	2
58318	7-18-89	276,283	1
		ASC #1	
	11-8-88	33	.3
		ASC #2	
	11-8-88	26	0
	11-9-88	34	.1
	7-18-89	29	.2











AREA Pu-PLANT Room # 123
FLOOR EXHAUST HOLES
#3
BEFORE DECON
READINGS >100 DPM/100cm²

TYPE OF SURVEY α DIRECT γ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 / 43-68

SERIAL NUMBER 50069

COMPLETION DATE 10-27-88

H.P. SIGNATURE Claude M. Thayer

AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm² WRM

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: VALUE: DPM

INSTRUMENT		
DATE	SOURCE RESPONSE C/M	BKGD C/M
10-27-88	180-189	1

N / W / E / S

AREA Pu-PLANT ROOM # 123
FLOOR EXHAUST HOLES
#3
AFTER DECON

TYPE OF SURVEY ∝ DIRECT ∨ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 50064, 37800, 58318

COMPLETION DATE 7-18-89
H.P. SIGNATURE Claude Thompson
AUTO. SAMPLE COUNTER #: #1 83600115, #2 83600108

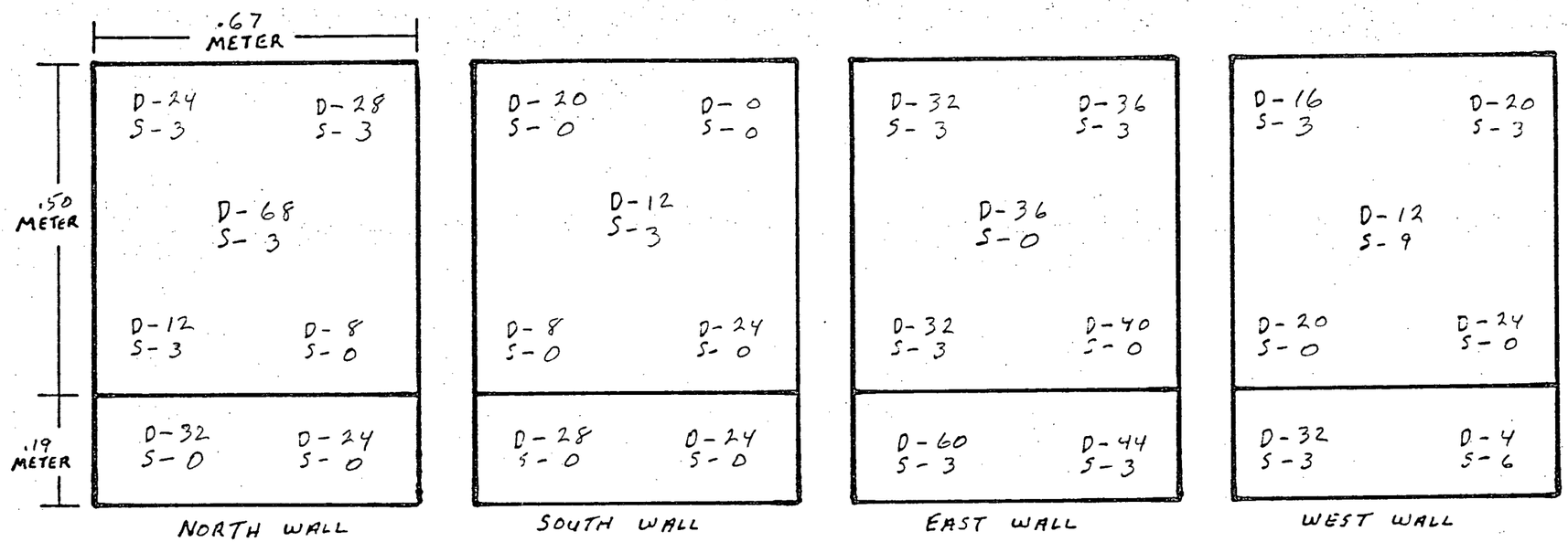
SURVEY UNITS DPM/100cm² wav

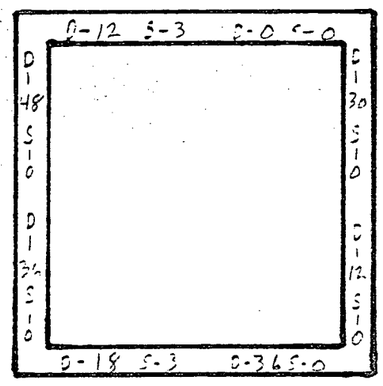
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

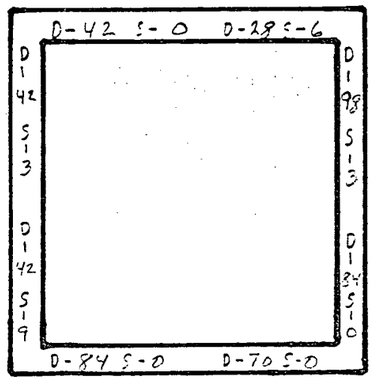
D – DIRECT
S – SMEAR

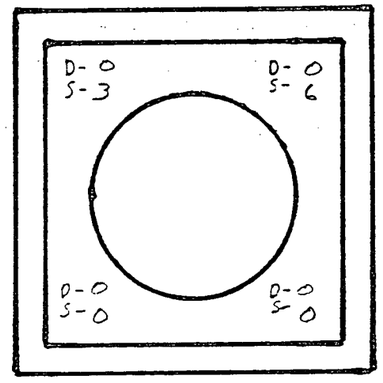
SOURCE #: 6816, 112 VALUE: 1055, 1113 1075 DPM

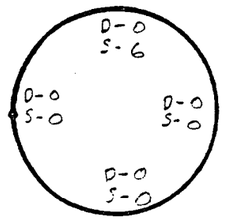
	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50064	11-3-88	285, 248	2
"	"	261, 252	2
37800	"	263, 240	2
"	"	243, 243	3
58318	7-18-89	276, 283	1
		ASC #1	
	11-8-88	33	.3
		ASC #2	
	11-8-88	26	0
	11-9-88	34	.1
	7-18-89	29	.2











N / W — E / S

AREA Pu-PLANT Room # 123
FLOOR EXHAUST HOLES
4

TYPE OF SURVEY α DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 / 43-68

SERIAL NUMBER 50064, 37800, 58318

COMPLETION DATE 7-18-89

H.P. SIGNATURE Claude M. Thompson

AUTO. SAMPLE COUNTER #: #1 83600115, #2 83600108

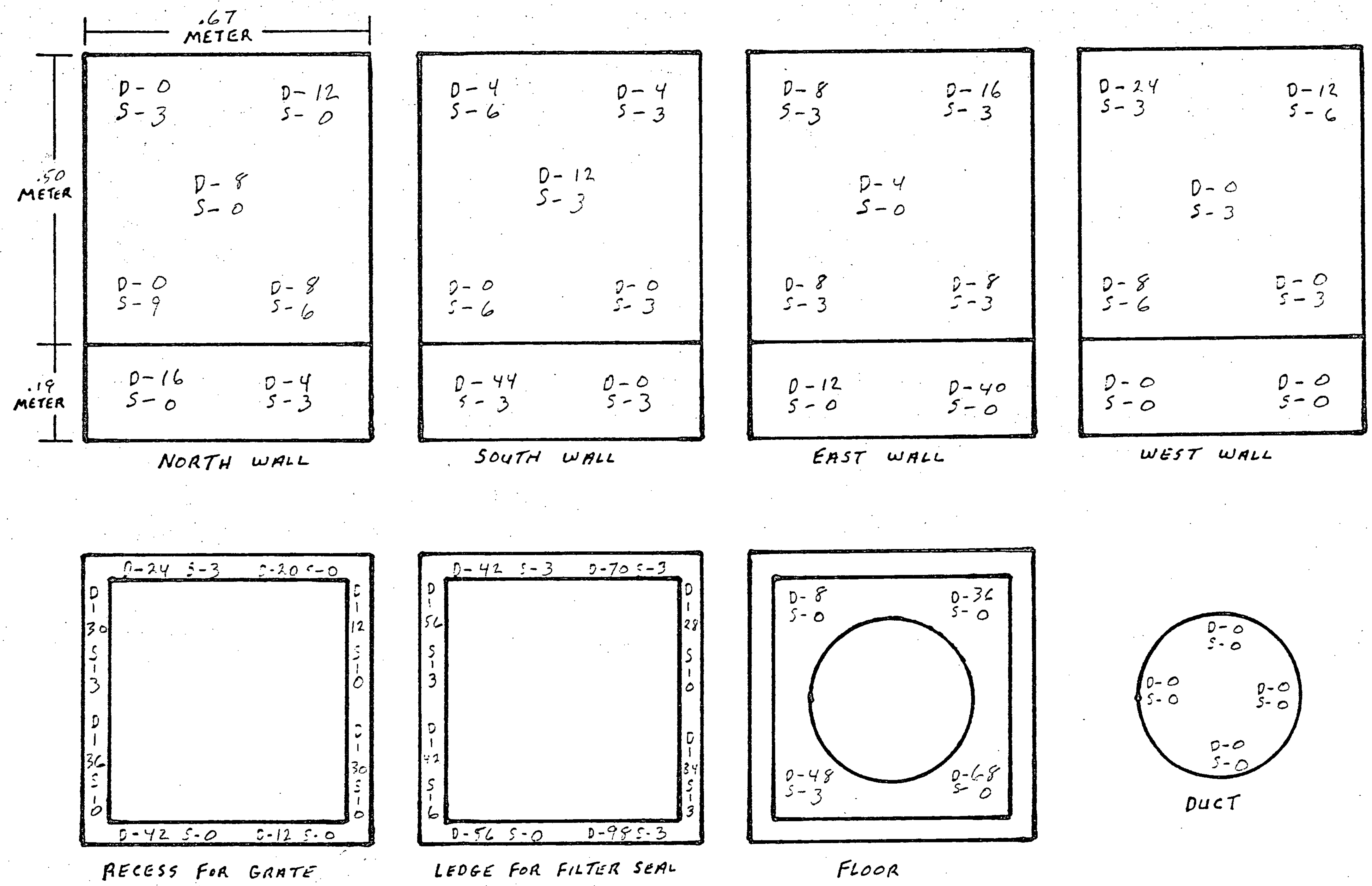
SURVEY UNITS DPM/100cm² alpha

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D- DIRECT
S- SMEAR

SOURCE #: 6816 (6868, 112) VALUE: 1075 (1055, 1113) DPM

	INSTRUMENT		
	DATE	SOURCE c/m RESPONSE	BKGD c/m
50064	11-3-88	285, 248	2
"	"	261, 252	2
37800	"	263, 240	2
"	"	243, 243	3
58318	7-18-89	276, 283	1
		ASC #1	
	11-8-88	33	.3
		ASC #2	
	11-8-88	26	0
	11-9-88	34	.1
	7-18-89	29	.2



N
W — E
S

AREA Pu-PLANT Room # 123
FLOOR EXHAUST HOLES #5
BEFORE DECON
READINGS >100DPM/100cm²

TYPE OF SURVEY α DIRECT γ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 50069

COMPLETION DATE 10-27-88
H.P. SIGNATURE
AUTO. SAMPLE COUNTER #:

SURVEY UNITS DPM/100cm²
WGA

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: VALUE: DPM

INSTRUMENT		
DATE	SOURCE RESPONSE C/M	BKGD C/M
10-27-88	180-189	1

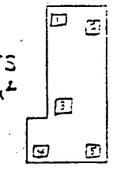
N / W / E / S

AREA Pu-PLANT ROOM # 123
FLOOR EXHAUST HOLES
#5
AFTER DECON

TYPE OF SURVEY ∝ DIRECT ∨ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-4 43-68
SERIAL NUMBER 50064, 37800, 58318

COMPLETION DATE 7-18-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: #1 836 00115, #2 836 00108

SURVEY UNITS DPM/100cm² wall

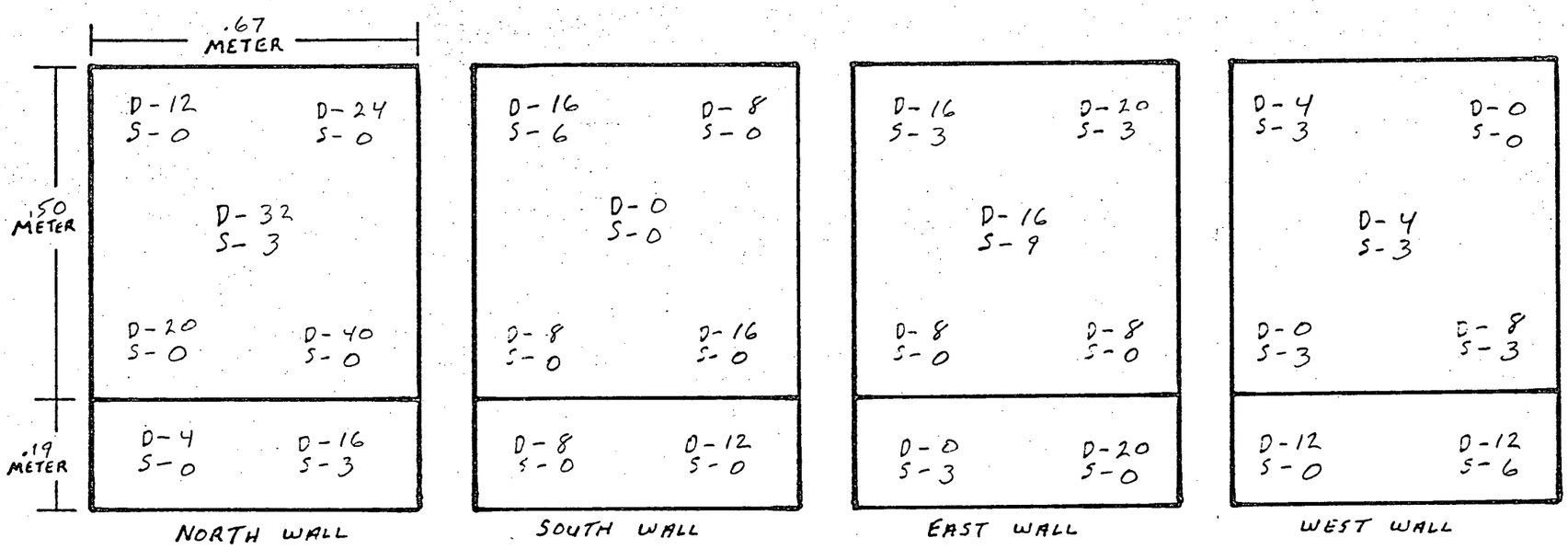


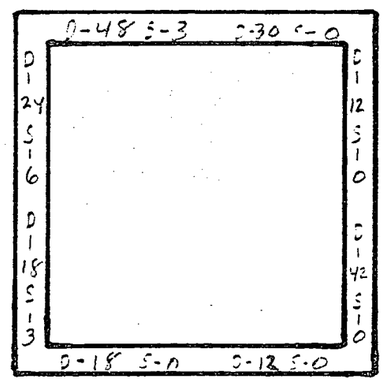
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

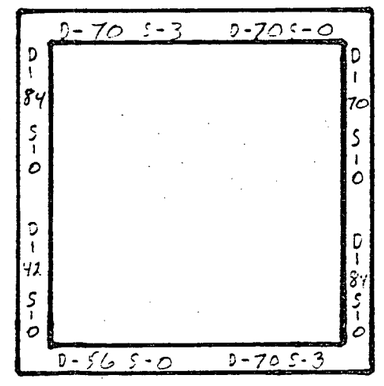
SOURCE #: 6868, 112 6816 VALUE: 1055, 1113 1078 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50064	11-3-88	285,248	2
"	"	261,252	2
37800	"	263,240	2
"	"	243,243	3
58318	7-18-89	276,283	1
		ASC #1	
	11-8-88	33	.3
		ASC #2	
	11-8-88	26	0
	11-9-88	34	.1
	7-18-89	29	.2

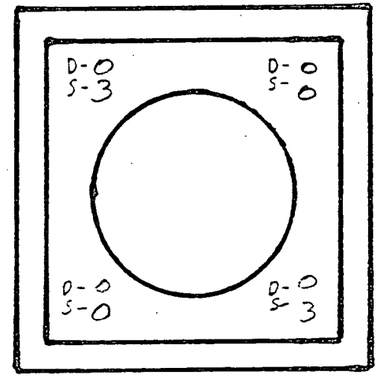




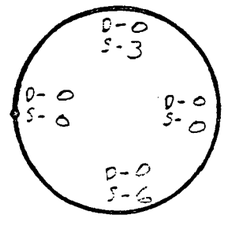
RECESS FOR GRATE



LEDGE FOR FILTER SEAL



FLOOR



DUCT

AREA Pu-PLANT ROOM # 124
FLOOR EXHAUST HOLES
HOLE # 1

TYPE OF SURVEY ∝ DIRECT + SMEAR

TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68 & 43-4

SERIAL NUMBER 43-68: 48395 — 43-4: 52834

COMPLETION DATE 5-3-89

H.P. SIGNATURE Claude McThompson

AUTO. SAMPLE COUNTER #: 2 SN 83600108

SURVEY UNITS DPM/100cm² WALL

05 04 07 03 06 02 01

N
W E
S

1cm = .1 METERS

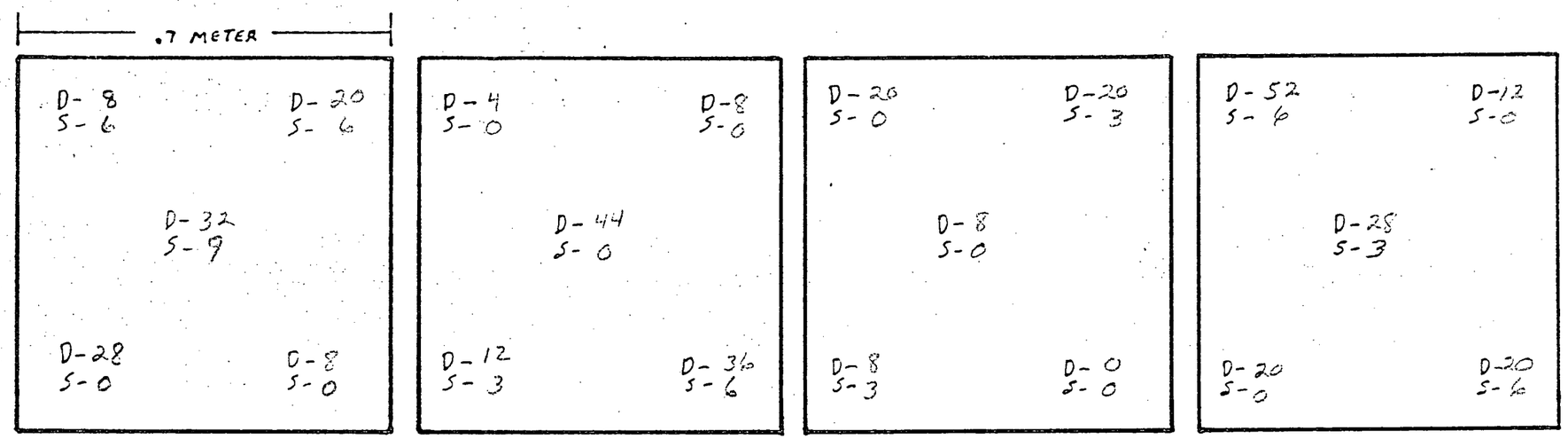
F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

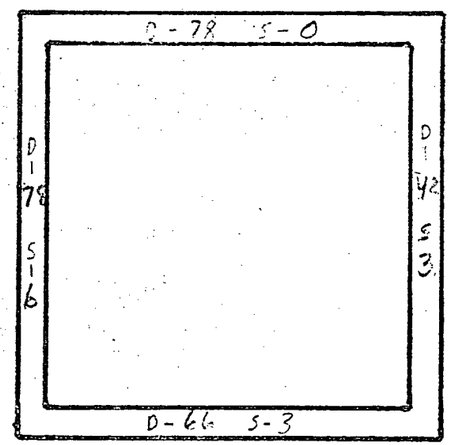
D = DIRECT
S = SMEAR

MDA 15.68 DPM/100cm² FIXED

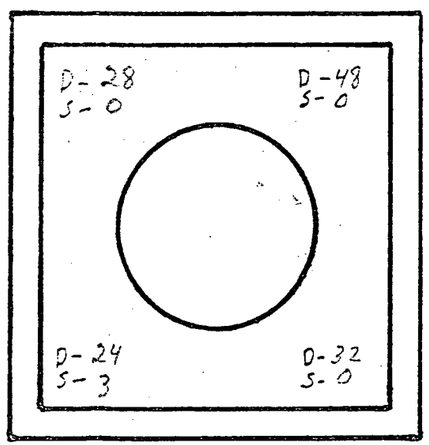
SOURCE #: 6498 7273 VALUE: 890 850 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
49395	4-28-89	190,202	2
52834	4-28-89	231,236	1
		ASC # 2	
	5-3-89	33	.1

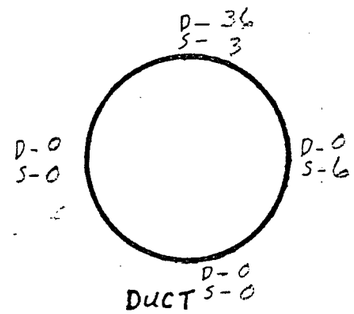




TOP LIP
FOR FLOOR GRATE



FLOOR



DIRECT
798 TOTAL DPM
32 READINGS
24.94 DPM/100cm² AVG
78 MAX DPM/100cm²

SMEAR
75 TOTAL DPM
32 SMEARS
2.34 DPM/100cm² AVG
6 MAX DPM/100cm²

AREA Pu-PLANT ROOM# 124
FLOOR EXHAUST HOLES
HOLE # 2

TYPE OF SURVEY α DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68 & 43-4
SERIAL NUMBER 52834 (43-4) - 48395 (43-68)

COMPLETION DATE 5-3-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER#: 2 SN 23600108

SURVEY UNITS DPM/100cm² WAN
☐5 ☐4 ☐7 ☐3 ☐6 ☐2 ☐1

1cm = .1 METERS

F — FLOOR D=DIRECT
C — CEILING S=SMEAR
N — NORTH WALL MDA 28.81
S — SOUTH WALL DPM/100 cm²
E — EAST WALL FIXED
W — WEST WALL
SOURCE#: ~~7777~~ 6498 VALUE: ~~8500PM~~ 890

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
48395	5-1-89	173-183	1
52834	5-1-89	227-239	3
		ASC#2	
	5-3-89	33	.1

DIREST
852 TOTAL DPM
32 READINGS
26.63 DPM/100cm² AVG
72 MAX DPM/100cm²

SMEAR
48 TOTAL DPM
32 SMEARS
1.50 DPM/100cm² AVG
6 MAX DPM/100cm²

N / W — E / S

1cm = .1 METERS

F – FLOOR D = DIRECT
C – CEILING S = SMEAR
N – NORTH WALL MDA 28.81 DPm/100cm²
S – SOUTH WALL
E – EAST WALL FIXED
W – WEST WALL

SOURCE #: 7272 / L-43 VALUE: 850 DPM

AREA Pu-PLANT ROOM # 124
FLOOR EXHAUST HOLES
HOLE # 3

TYPE OF SURVEY α DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68 & 43-4 (43-4, 43-68)
SERIAL NUMBER 52834 - 48395

COMPLETION DATE 5-3-89
H.P. SIGNATURE [signature]
AUTO. SAMPLE COUNTER #: 2 SN 83600108

SURVEY UNITS DPM/100cm² Wall

☐5 ☐4 ☐7 ☐3 ☐6 ☐2 ☐1

	INSTRUMENT		
	DATE	SOURCE c/m RESPONSE	BKGD c/m
52834	5-1-89	227-239	3
48395	5-1-89	173-183	1
		ASC#2	
	5-3-89	22	.1

.7 METER

NORTH WALL
D-16 S-0; D-8 S-0; D-24 S-6; D-0 S-0; D-4 S-0

SOUTH WALL
D-40 S-0; D-24 S-0; D-12 S-0; D-20 S-3; D-52 S-3

EAST WALL
D-32 S-6; D-28 S-3; D-4 S-0; D-20 S-0; D-16 S-0

WEST WALL
D-12 S-0; D-20 S-0; D-16 S-0; D-28 S-0; D-16 S-0

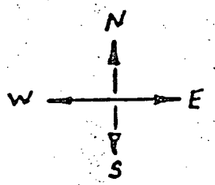
TOP LIP FOR FLOOR GRATE
D-36 S-3 (top); D 36 S 3 (left); D 0 S 0 (right); D-36 S-3 (bottom)

FLOOR
D-64 S-0; D-40 S-0; D-24 S-0; D-12 S-0

DUCT
D-52 S-3; D-16 S-6; D-8 S-0; D-8 S-0

DIRECT
732 TOTAL DPM
32 READINGS
22.88 DPm/100cm² AVG
64 max DPm/100cm²

SMEAR
39 TOTAL DPM
32 SMEARS
1.22 DPm/100cm² AVG
6 MAX DPm/100cm²



1cm = .1 METERS

AREA Pu-PLANT ROOM # 124
~~FLOOR EXHAUST HOLES~~
4
HOLE CUT FOR ACCESS TO DUCT

TYPE OF SURVEY ∝ DIRECT & SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68 & 43-4
SERIAL NUMBER 37800 (43-68) – 58318 (43-4)

COMPLETION DATE 7-26-89
H.P. SIGNATURE J. Wade
AUTO. SAMPLE COUNTER #: 1 83600115

SURVEY UNITS
DPM/100cm²
WAR

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D = DIRECT
S = SMEAR

MDA = 19.60 DPM/100cm²

SOURCE #: 6868 VALUE: 1113 / 1055 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
37800	7-26-89	~~288~~ – 256	2 Am
58318	7-26-89	302 – 264	2 Am
		ASC # 1	
	7-26-89	33	.2

.7 METER

NORTH WALL

D-0 S-3		D-4 S-0
	D-12 S-0	
D-0 S-0		D-0 S-0

SOUTH WALL

D-4 S-3		D-12 S-3
	D-4 S-0	
D-8 S-0		D-0 S-0

EAST WALL

D-0 S-0		D-12 S-0
	D-28 S-0	
D-12 S-3		D-8 S-3

WEST WALL

D-0 S-0		D-16 S-3
	D-12 S-0	
D-8 S-9		D-4 S-0

TOP LIP
WOOD

	D-10 S-6	
D-10 S-0		D-15 S-0
	D-5 S-3	

Top of Duct
~~FLOOR~~

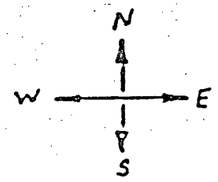
	D-10 S-6	
D-10 S-3 (North)		D-65 S-0 (East)
D-20 S-10		D-10 S-0
D-30 S-3 (West)		D-20 S-3 (South)
	D-5 S-3	

BOTTOM LEDGE (wood)

DUCT

	D	S
1. Top – 5		3
2. Bottom – 20		0

	DIRECT	SMEAR
TOTAL DPM	369	57
# READINGS	34	34
AVG. DPM/100cm²	10.85	1.68
MAX DPM/100cm²	65	9



1cm = .1 METERS

AREA Pu-PLANT ROOM # 124
FLOOR EXHAUST HOLES
HOLE # 5

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68 & 43-4

SERIAL NUMBER 43-4 52834 — 43-68 48395

COMPLETION DATE 5-3-89

H.P. SIGNATURE Claude M Thompson

SURVEY UNITS DPM/100cm² W.R.

AUTO. SAMPLE COUNTER #: 2 SN 8360010R

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D = DIRECT
S = SMEAR

MDA = 28.81 DPM/100cm² FIXED

SOURCE #: 7272 6498 VALUE: 850 900 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EXCOS C/M
52834	5-1-89	227-239	3
48395	5-1-89	173-183	1
		ASC #9	
	5-3-89	33	.1

.7 METER

NORTH WALL

D- 8 S- 3 | D- 28 S- 3
D- 32 S- 3
D- 20 S- 0 | D- 8 S- 3

SOUTH WALL

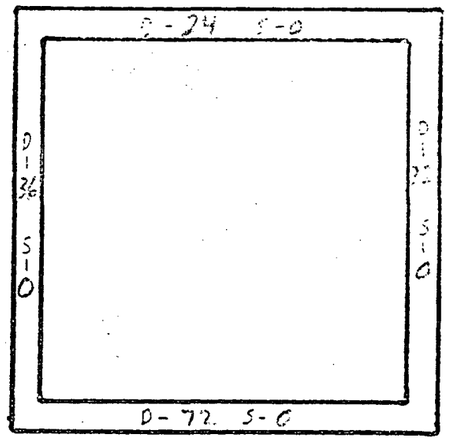
D- 8 S- 3 | D- 40 S- 0
D- 40 S- 0
D- 24 S- 0 | D- 20 S- 0

EAST WALL

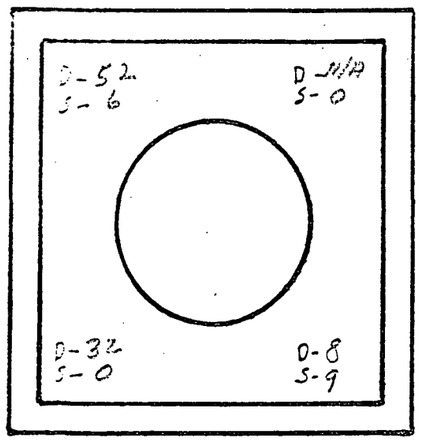
D- 24 S- 0 | D- 32 S- 3
D- 52 S- 0
D- 4 S- 3 | D- 20 S- 3

WEST WALL

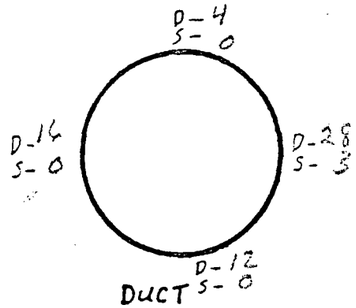
D- 20 S- 6 | D- 16 S- 0
D- 8 S- 0
D- 24 S- 3 | D- 12 S- 0



TOP LIP FOR FLOOR GRATE



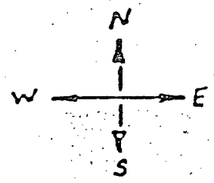
FLOOR



DUCT

DIRECT
796 TOTAL DPM
31 READINGS
25.68 DPM/100cm² AVG
72 MAX DPM/100cm²

SMEAR
51 TOTAL DPM
32 SMEARS
1.59 DPM/100cm² AVG
9 MAX DPM/100cm²



1cm = .1 METERS

AREA Pu-PLANT ROOM # 124
FLOOR EXHAUST HOLES
HOLE # 6

TYPE OF SURVEY ✓ DIRECT ✓ SMEAR
TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68 & 43-4
SERIAL NUMBER 50057 (43-68), 52934 (43-4)

COMPLETION DATE 5-3-89
H.P. SIGNATURE Claude W. Thayer
AUTO. SAMPLE COUNTER #: 2 87600108

SURVEY UNITS DPM/100cm² Wipe

F – FLOOR D = DIRECT
C – CEILING S = SMEAR
N – NORTH WALL MDA 38.81
S – SOUTH WALL DPM/100cm²
E – EAST WALL FIXED
W – WEST WALL

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
50057	5-1-89	185-194	3
50057	5-1-89	204-209	1
52934	5-1-89	227-239	3
52934	5-1-89	239-238	1
		ASC #2	
	5-3-89	33	.1

.7 METER

50057

NORTH WALL
D-56 S-0
D-40 S-0
D-14 S-6
D-20 S-0
D-24 S-3

SOUTH WALL
D-52 S-0
D-24 S-0
D-12 S-0
D-28 S-0
D-20 S-3

EAST WALL
D-32 S-0
D-16 S-0
D-40 S-0
D-32 S-0
D-16 S-3

WEST WALL
D-16 S-3
D-12 S-0
D-24 S-0
D-32 S-0
D-16 S-0

TOP LIP FOR FLOOR GRATE
D-4 S-6
D-40 S-3
D-12 S-3
D-20 S-2

FLOOR
D-32 S-0
D-28 S-0
D-60 S-3
D-12 S-3

DUCT
D-20 S-3
D-16 S-3
D-28 S-0
D-12 S-3

DIRECT
812 TOTAL DPM
32 READINGS
25.38 DPM/100cm² AVG
60 MAX DPM/100cm²

SMEAR
48 TOTAL DPM
32 SMEARS
1.50 DPM/100cm² AVG
6 MAX. DPM/100cm²

AREA Pu-PLANT ROOM # 124
FLOOR EXHAUST HOLES
HOLE # 7

TYPE OF SURVEY ∝ DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68 & 43-4 (43-68 / 43-4)
SERIAL NUMBER 50057 - 52834

COMPLETION DATE 5-3-89
H.P. SIGNATURE Claude M Thompson
AUTO. SAMPLE COUNTER #: 28360010R

SURVEY UNITS: DPM/100cm² WAR

N
W — E
S

1cm = .1 METERS

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D = DIRECT
S = SMEAR
MDA = 28.81 DPM/100cm² FIXED

SOURCE #: 6498 VALUE: 890 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	EKOD C/M
50057	5-1-89	185-194	3
50057	5-1-89	204 209	1
52834	5-1-89	227-239	3
52834	5-1-89	238-238	1
		ASC #2	
	5-10-89	33	.1

.7 METER

NORTH WALL
D-12 S-0
D-20 S-3
D-12 S-3
D-32 S-3
D-36 S-0

SOUTH WALL
D-12 S-9
D-28 S-0
D-56 S-6
D-28 S-0
D-12 S-9

EAST WALL
D-16 S-0
D-32 S-0
D-56 S-0
D-64 S-0
D-32 S-0

WEST WALL
D-56 S-0
D-76 S-6
D-0 S-3
D-24 S-3
D-32 S-0

TOP LIP FOR FLOOR GRATE
S-0 S-3
D-84 S-3
D-24 S-6
D-60 S-0

FLOOR
D-52 S-0
D-28 S-3
D-12 S-3
D-24 S-6

DUCT
D-0 S-3
D-24 S-6
D-28 S-3
D-12 S-3

DIRECT
996 TOTAL DPM
32 READINGS
31.13 DPM/100cm² AVG
84 MAX DPM/100cm²

SMEARS
78 TOTAL DPM
32 SMEARS
2.44 DPM/100cm² AVG
9 MAX DPM/100cm²

N / W / E / S

AREA Pu-PLANT ROOM # VAULT 126
FLOOR EXHAUST HOLE

TYPE OF SURVEY ☒ DIRECT ☒ SMEAR
TYPE OF INSTRUMENT LUCLUM 2220/GET
SERIAL NUMBER 50069, 58318

COMPLETION DATE 7-20-89
H.P. SIGNATURE Planck M Thompson
AUTO. SAMPLE COUNTER #: #1 83600115

SURVEY UNITS DPM/100cm² WGA

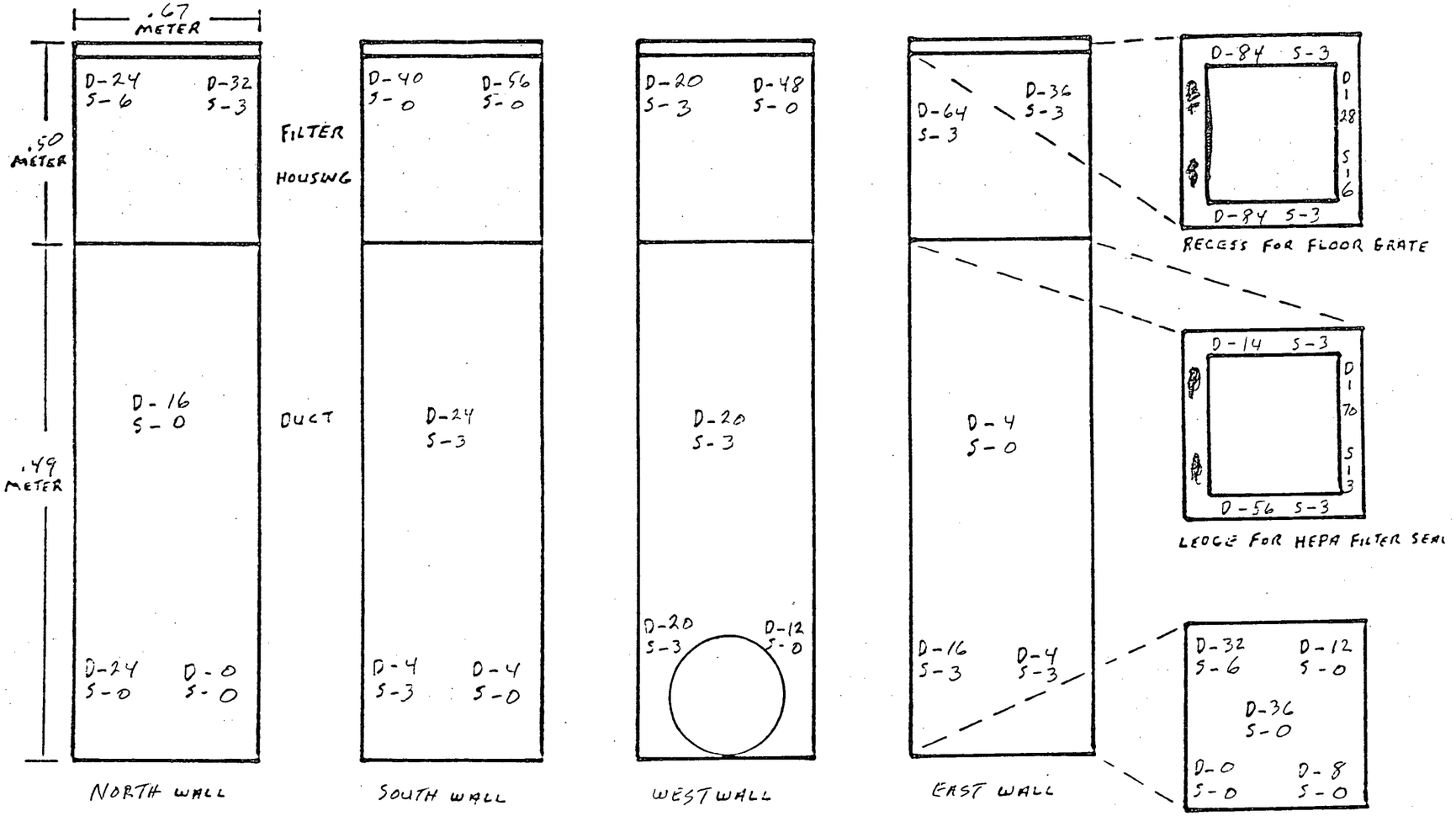
F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D – DIRECT
S – SMEAR

MDA = 27.44 DPM/100 cm²

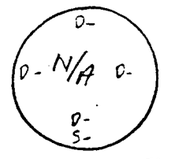
SOURCE #: 6868 7272 VALUE: 1055 850 DPM

INSTRUMENT			
	DATE	SOURCE C/M RESPONSE	EFFICIENCY
50069	10-26-88	20,195	2
	"	196,192	1
58318	7-19-89	305,278	2
		ASC #1	
	10-25-88	29	.2
	7-20-89	27	.2



EXHAUST HOLE & VALVE BOX

	DIRECT	SMEAR
TOTAL DPM	1,516	117
# READINGS	64	64
AVG. DPM/100cm²	23.69	1.83
MAX DPM/100cm²	84	6



DUCT OUTLET
TO TUNNEL

AREA Pu-PLANT ROOM # VAULT 126
FLOOR EXHAUST HOLE VALVE BOX

TYPE OF SURVEY α DIRECT + SMEAR
TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-4 43-68
SERIAL NUMBER 50069, 58318

COMPLETION DATE 7-20-89
H.P. SIGNATURE [signature]
AUTO. SAMPLE COUNTER #: #1 83600115

SURVEY UNITS DPM/100cm² WGR

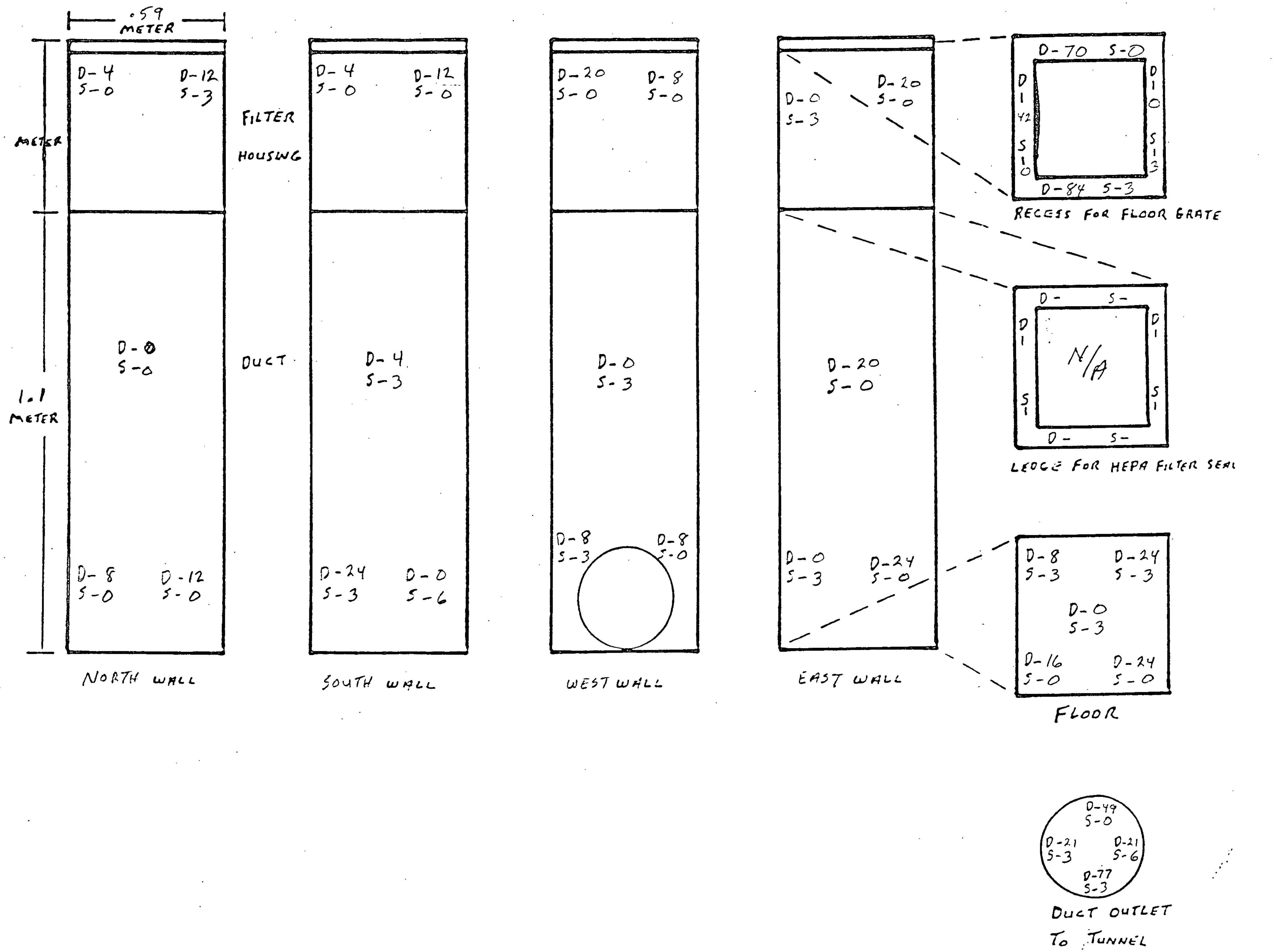
N / W — E / S

F — FLOOR
C — CEILING
N — NORTH WALL
S — SOUTH WALL
E — EAST WALL
W — WEST WALL

D - DIRECT
S - SMEAR

SOURCE #: 6868 7272 VALUE: 1055 850 DPM

	INSTRUMENT		
	DATE	SOURCE C/M RESPONSE	BKGD C/M
50069	10-27-88	184,211	1
58318	7-19-89	305,278	2
		ASC #1	
	10-28-88	29	.2
	7-20-89	27	.2



PLANT PU AREA Pulab-East Floor Exhaust

SURVEYED BY [signature]

INST. LUDLUM 2220 #58309 DET. 43-4

SOURCE CK 258/256 BKG. 2

DATE: 7-18-89 Source # 6498 Value: 890 DPM

ASC # 2 83600108

CTD. BY J Black

SOURCE CK. AVG. 35

BKG. .2

DATE: 7-19-89

READINGS IN DPM/100 cm^2

SAMPLE # OR DESCRIPTION 24" DIA	DIRECT CPM	DIRECT DPM	SMEAR
Entry at North End of Exhaust duct	—	—	
Top	3	18	0
Bottom	10	60	0
East	12	72	3
West	2	12	6
2M Bottom	4	24	3
East	11	66	3
West	8	48	3
130 Air Port East Side 3M Top	8	48	0
Bottom	2	12	3
East	4	24	3
West	6	36	0
131 Air Port East Side 3.5M Top	4	24	3
Bottom	3	18	0
East	4	24	0
West	7	42	0
4M Bottom	3	18	0
East	8	48	0
West	0	0	0
6M Bottom	4	24	3
East	8	48	0
West	6	36	6
8M Bottom	4	24	3
East	4	24	3
West	7	42	0
10M Bottom	6	36	3
East	4	24	0
West	9	54	0
12M Bottom	11	66	3
East	9	54	0
West	11	66	6
14M Bottom	0	0	0
East	9	54	0
West	6	36	0

PLANT PU AREA Pulab-East Floor Exhaust

SURVEYED BY [signature]

INST. LUDLUM 2220 #58309 DET. 43-4

SOURCE CK 258/256 BKG. 2

DATE: 7-18-89 Source # 6498 Value: 890 DPM

ASC #

CTD. BY

SOURCE CK. AVG.

BKG.

DATE:

READINGS IN DPM/100 cm^2

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
132 Air Port East Side 14M Top	39	234	3
Bottom	18	108	0
Left	0	0	3
Right	1	6	3
14M Bottom	7	42	3
East	1	6	9
West	4	24	0
END			
SURVEYS AROUND 14M TOP (234)	5	30	
	5	30	
	4	24	
	6	36	
BOTTOM (108)	6	36	
	8	48	
	6	36	
	6	36	
	TOTALS	1878	75
	# READINGS	48	40
	AVG DPM	39.13	1.88
	MAX DPM	234	9
	MDA	28.91	

PLANT Pu AREA Pu Lab Middle Exhaust duct

SURVEYED BY [signature]

INST. LUDLUM 2220 #58309 DET. 43-4

SOURCE CK 214/257 BKG. 3

DATE: 7-19-89 Source # 6118? VALUE: 890 DPM

ASC # 2 83600108

CTD. BY [signature]

SOURCE CK. AVG. 35

BKG. .2

DATE: 7-19-89

READINGS IN DPM/100 cm^2

SAMPLE # OR DESCRIPTION 20" DIA	DIRECT CPM	DIRECT DPM	SMEAR
North Entry Middle Exhaust duct TOP	3	18	0
Bottom	6	36	9
East	3	18	6
West	7	42	3
2M Bottom	7	42	0
East	3	18	0
West	0	0	6
4M Bottom	10	60	0
East	2	12	0
West	3	18	0
6M Bottom	5	30	3
East	4	24	3
West	2	12	3
8M Bottom	12	72	0
East	0	0	3
West	4	24	0
10M Bottom	5	30	6
East	3	18	0
West	2	12	0
133 Air Port West Side 11M TOP	0	0	0
Bottom	5	30	0
Left	4	24	9
Right	1	6	0
12M Bottom	8	48	3
East	7	42	0
West	4	24	3
	END		
	TOTAL	660	57
	# READINGS	26	26
	AVG DPM	25.38	2.19
	MAX DPM	72	9
	MDA	28.81	

PLANT PU AREA PuLab West Exhaust duct

SURVEYED BY [signature]

INST. LUDLUM 2220 #58309 DET. 43-4

SOURCE CK 214/257 BKG. 3

DATE: 7-19-89 Source # 6118? VALUE: 890 DPM

263/214 4

ASC #

CTD. BY

SOURCE CK. AVG.

BKG.

DATE:

READINGS IN DPM/100 cm^2

SAMPLE # OR DESCRIPTION 24" DIA.	DIRECT CPM	DIRECT DPM	SMEAR
North Entry West Exhaust duct Top	12	72	3
Bottom	9	54	6
East	14	84	3
West	7	42	0
2M Bottom	11	66	0
East	11	66	3
West	9	54	3
4M Bottom	5	30	3
East	7	42	3
West	16	96	3
6M Bottom	12	72	3
East	11	66	0
West	20	120	0
8M Bottom	19	114	0
East	4	24	3
West	5	30	3
135 Air Port East Side 8M TOP	11	66	6
Bottom	14	84	0
Left	7	42	3
Right	5	30	0
10M Bottom	10	60	3
East	9	54	6
West	11	66	3
136 Air Port East Side 10M TOP	6	36	0
Bottom	9	54	0
Left	10	60	6
Right	5	30	0
12M Bottom	13	78	3
East	14	84	0
West	8	48	0
14M Bottom	11	66	0
East	12	72	0
West	7	42	3

Next Page

PLANT Pu AREA Pulab. West Exhaust duct
SURVEYED BY D Hetler
INST. LUDLUM 2220 # 58309 DET. 43-4
SOURCE CK 214/257 BKG. 3
DATE: 7-19-89 SOURCE #6498 VALUE: 89 DPM

ASC # _____
CTD. BY _____
SOURCE CK. AVG. ____
BKG. _____
DATE: _____

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
Air Port East Side 14m Top	4	24	0
138 Bottom	16	96	6
Left	11	66	6
Right	8	48	0
	END		
SURVEYS AROUND 6m WEST & 8m BOTTOM	3	18	
(120) 6m WEST	3	18	
	5	30	
	6	36	
	9	54	
	10	60	
	2	12	
	4	24	
TOTALS	1490	81	
# READINGS	45	37	
AVG DPM	55.33	2.19	
MAX DPM	120	6	
MDA	33.26		

PLANT Pu AREA H.P. AREA EX. DUCT
SURVEYED BY A. Hetzler
INST. LUDLUM 2220 # 58309 DET. 43-4
SOURCE CK 249-231 (253-252) BKG. 2
DATE: 7-20-89 SOURCE #: 6499 VALUE: 890 DPM

ASC # 1 83600115
CTD. BY J Black
SOURCE CK. AVG. 33
BKG. 12
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION 16" DIA.	DIRECT CPM	DIRECT DPM	SMEAR
H.P. AREA EXHAUST DUCT On Top	1	6	0
Bottom	2	12	0
EAST	1	6	3
WEST	1	6	0
1m Bottom	10	60	6
EAST	4	24	6
WEST	22	132	6
SURVEY AROUND 1m WEST (132)	6	36	
	4	24	
	4	24	
	1	6	

	DIRECT	SMEAR
TOTAL DPM	306	21
# READINGS	7	7
AVG. DPM/100 cm²	43.71	3
MAX. DPM/100 cm²	132	6
MDA	23.52	

PLANT Pu AREA Rm 116 EX. DUCT
SURVEYED BY A. Kelly Cox
INST. LUDLUM 2220 * 58309 DET. 43-4
SOURCE CK 249-231 (253-252) BKG. 2 (2)
DATE: 7-20-89 SOURCE #: 1498 VALUE: 890 DPM

ASC # 1 83C00115
CTD. BY J Black
SOURCE CK. AVG. 33
BKG. .2
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
ROOM 116 FLOOR EXHAUST DUCT 16" DIA.				
0M	TOP	4	24	0
	BOTTOM	5	30	3
	EAST	3	18	0
	WEST	3	18	6
1M	BOTTOM	3	18	0
	EAST	5	30	0
	WEST	7	42	0
	DIRECT	SMEAR		
TOTAL DPM	180	9		
# READINGS	7	7		
AVG. DPM/100 cm²	25.71	1.29		
MAX. DPM/100 cm²	42	6		
MDA	23.52			

PLANT PU AREA 121 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * 52834 DET. 43-4
SOURCE CK 277-281 BKG. 3(AM)
DATE: 7-24-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY J Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
RM 121 WEST DUCT 30" DIA.				
LEADING TO TUNNEL	0 METERS			
	T	1	6	0
	B	2	12	0
	E	1	6	0
	W	2	12	6
	2 METERS			
	T	1	6	0
	B	8	48	6
	E	5	30	3
	W	3	18	0
	4 METERS			
	T	4	24	0
	B	0	0	3
	E	3	18	3
	W	1	6	0
	6 METERS			
	B	1	6	0
	E	1	6	3
	W	1	6	3
	8 METERS			
	T	1	6	3
	B	3	18	0
	E	2	12	0
	W	1	6	0
	10 METERS			
	B	2	12	0
	E	0	0	0
	W	0	0	6
	12 METERS			
	T	1	6	0
	B	2	12	0
	E	1	6	6
	W	1	6	0

PLANT PU AREA 121 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * #52834 DET. 43-4
SOURCE CK 277-281 BKG. 3(AM)
DATE: 7-24-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY L Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
RM 121 EAST DUCT 24" DIA.			
LEADING TO TUNNEL OMETERS			
T	3	18	0
B	10	60	0
E	2	12	0
W	4	24	0
2 METERS			
T	8	48	0
B	8	48	0
E	5	30	0
W	5	30	0
4METERS			
B	5	30	3
E	1	6	3
W	1	6	3
6METERS			
B	5	30	0
E	2	12	0
W	3	18	0
8 METERS			
T	1	6	3
B	5	30	0
E	1	6	0
W	2	12	3
10 METERS			
B	7	42	0
E	5	30	3
W	1	6	3
12 METERS			
B	2	12	3
E	2	12	0
W	7	42	0

PLANT PU AREA 121 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * #52834 DET. 43-4
SOURCE CK 277-281 BKG. 3(AM)
DATE: 7-24-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY L Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
RM 121 EAST DUCT			
LEADING TO TUNNEL			
14METERS			
T	2	12	0
B	6	36	0
E	3	18	0
W	3	18	0
16METERS			
T	2	12	0
B	1	6	0
E	0	0	0
W	3	18	0
TOTALS		690	24
# READING		32	32
AVG. DPM/100cm²		21.56	0.75
MAX. DPM/100cm²		60	6
MDA =		28.81	

PLANT PU AREA 123 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * 52834 DET. 43-4
SOURCE CK 269-296 BKG. 1 (PM)
DATE: 7-24-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY J Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
RM 123 WEST DUCT 24" DIA.			
LEADING TO TUNNEL 0 METERS			
T	2	12	3
B	4	24	0
E	1	6	0
W	0	0	0
2 METERS			
T	0	0	0
B	7	42	0
E	5	30	0
W	4	24	0
4 METERS			
B	4	24	0
E	4	24	3
W	4	24	3
6 METERS			
B	4	24	3
E	0	0	0
W	2	12	0
8 METERS			
B	7	42	0
E	0	0	0
W	0	0	0
10 METERS			
T	0	0	3
B	2	12	0
E	4	24	6
W	0	0	0
12 METERS			
B	0	0	0
E	1	6	0
W	3	18	0

PLANT PU AREA 123 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * 52834 DET. 43-4
SOURCE CK 269-296 BKG. 1 (PM)
DATE: 7-24-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY J Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
RM 123 WEST DUCT			
LEADING TO TUNNEL			
14 METERS			
B	8	48	0
E	3	18	3
W	0	0	0
16 METERS			
B	6	36	3
E	6	36	0
W	2	12	3
18 METERS			
B	5	30	6
E	1	6	3
W	1	6	0
20 METERS			
T	7	42	3
B	6	36	0
E	5	30	0
W	1	6	0
TOTALS		654	42
# READINGS		37	37
AVG. DPM/100cm²		17.68	1.14
MAX DPM/100cm²		48	6
MDA		16.63	

PLANT PU AREA 123 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * 52834 DET. 43-4
SOURCE CK 285-302 BKG. 2(AM)
DATE: 7-25-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY 1 Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION (30" DIA)	DIRECT CPM	DIRECT DPM	SMEAR
RM 123 EAST DUCT			
LEADING TO TUNNEL			
0 METERS			
T	3	18	3
B	5	30	0
E	3	18	0
W	4	24	0
2 METERS			
~~T~~			
B	1	6	0
E	3	18	3
W	3	18	0
4 METERS			
B	3	18	0
E	1	6	3
W	6	36	3
6 METERS			
B	0	0	0
E	1	6	0
W	4	24	6
8 METERS			
B	1	6	6
E	0	0	0
W	1	6	3
10 METERS			
T	4	24	0
B	8	48	3
E	0	0	0
W	1	6	0
12 METERS			
B	1	6	6
E	0	0	6
W	7	42	0

PLANT PU AREA 123 DUCT
SURVEYED BY ILP
INST. LUDLUM 2220 * 52834 DET. 43-4
SOURCE CK 285-302 BKG. 2(AM)
DATE: 7-25-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 2 83600108
CTD. BY 1 Black
SOURCE CK. AVG. 29
BKG. .3
DATE: 7-26-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION	DIRECT CPM	DIRECT DPM	SMEAR
RM 123 EAST DUCT			
LEADING TO TUNNEL			
14 METERS			
T	1	6	3
B	2	12	0
E	4	24	6
W	2	12	0
16 METERS			
T	1	6	3
B	5	30	0
E	1	6	3
W	9	54	0
18 METERS			
B	3	18	0
E	1	6	0
W	2	12	0
20 METERS			
T	2	12	3
B	7	42	3
E	4	24	0
W	5	30	0
TOTALS		654	63
# READINGS		38	38
AVG. DPM/100cm²		17.21	1.66
MAX DPM/100cm²		54	6
MDA =		23.52	

overhead = O/hd
Air Port = A/p

PLANT Pu AREA Rm 124 West Exhaust duct
SURVEYED BY [illegible]
INST. LUDLUM 2220 # 158309 DET. 43-4
SOURCE CK 256/255 BKG. 1
DATE: 7-21-89 SOURCE #: 648 VALUE: 890 DPM

ASC # 83600108
CTD. BY S. Black
SOURCE CK. AVG. 30
BKG. .2
DATE: 7-21-89

223/258 BKG 1

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
West Exhaust duct South Entry Top		1	6	3
	East	8	48	9
	Bottom	23	138	6
	West	5	30	9
Air Port O/hd 2M	North	11	66	3
	East	2	12	6
	South	5	30	3
	West	11	66	3
TOTAL DPM	984	90	2M Bottom	14	84	3
# READINGS	27	23	East	4	24	6
AVG. DPM/100cm²	36.44	3.91	West	3	18	6
MAX. DPM/100cm²	138	9	4M Bottom	12	72	3
MDA	28.81		East	5	30	0
			West	2	12	3
			6M Bottom	5	30	6
			East	3	18	0
			West	7	42	0
			8M Bottom		N/A	
			East	6	36	6
			West	7	42	0
~~6M Bottom~~						
~~East~~						
~~West~~						
Air Port O/hd 8M North		6	36	3
	East	4	24	3
	South	1	6	6
	West	3	18	3
		END		
SURVEY AROUND ENTRY (138)		3	18	
		3	18	
		7	42	
		3	18	

PLANT Pu AREA EAST Rm. 124 Ex. Duct
SURVEYED BY A Hetzler
INST. LUDLUM 2220 # 158309 DET. 43-4
SOURCE CK 256-255 BKG. 1
DATE: 7-21-89 SOURCE #: 648 VALUE: 890 DPM

ASC # 83600115
CTD. BY J. Black
SOURCE CK. AVG. 35
BKG. .3
DATE: 7-21-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION			DIRECT CPM	DIRECT DPM	SMEAR
124 EAST EXHAUST DUCT "0" METER		T	5	30	3
FROM TUNNEL		B		N/A	—
		E	13	78	3
T - TOP		W	12	60	0
B - BOTTOM					
E - EAST	1 METER	B	37	185	0
W - WEST		E	10	60	0
N - NORTH		W	13	78	0
S - SOUTH					
	2 METERS	B		N/A	
		E	7	42	0
		W	11	66	6
	3 METERS	B	11	66	6
		E	1	6	0
		W	6	36	0
	4 METERS	B		N/A	
		E	15	90	3
		W	18	90	6
	5 METERS	B	12	72	0
		E	4	24	0
		W	5	30	0
	INLET PORT	N	7	42	0
		E	0	0	3
		S	5	30	6
		W	4	24	3
	6 METERS	B	17	85	3
		E	31	155	6
		W	12	72	0

EAST

PLANT Pu AREA Rm. 124 EX. DUCT

SURVEYED BY A. H. Taylor

INST. LUDLUM 2220 # 58309 DET. 43-4

SOURCE CK 256-255 BKG. 1

DATE: 7-21-89 SOURCE #: 6498 VALUE: 890 DPM

ASC # 1 83600115

CTD. BY J Black

SOURCE CK. AVG. 35

BKG. .3

DATE: 7-21-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
7 METERS	B	12	72	3
	E	11	66	0
	W	10	60	6
8 METERS	B		N/A	
	E	15	90	6
	W	27	135	0
9 METERS	B	10	60	0
	E	1	6	0
	W	8	48	3
INLET PORT	N	7	42	0
	E	10	60	0
	S	2	12	0
	W	5	30	3
10 METERS	B	6	36	0
	E	16	96	3
	W	2	12	6
11 METERS	B	5	30	3
	E	4	24	3
	W	3	18	0
12 METERS	B	4	24	9
	E	5	30	0
	W	8	48	3
13 METERS	B	5	30	3
	E	1	6	0
	W	2	12	0

EAST

PLANT Pu AREA Rm 124 EX. DUCT

SURVEYED BY I. POWELL

INST. LUDLUM 2220 # 52834 DET. 43-4

SOURCE CK 288-272 BKG. 3

DATE: 7-27-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 1 83600115

CTD. BY J Black

SOURCE CK. AVG. 27

BKG. .3

DATE: 7-28-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
14 METERS	B	6	36	3
	E	5	30	0
	W	7	42	3
15 METERS	B	11	66	0
	E	4	24	0
	W	1	6	3
INLET PORT	N	11	66	3
	E	5	30	0
	S	2	12	0
	W	3	18	0
16 METERS	B	26	156	0
	E	4	24	0
	W	2	12	0
17 METERS	B	5	30	3
	E	1	6	6
	W	2	12	3
18 METERS	B	5	30	3
	E	2	12	3
	W	5	30	3
19 METERS	B	4	24	0
	E	2	12	0
	W	7	42	3
INLET PORT	N	4	24	6
	E	2	12	6
	S	1	6	0
	W	7	42	0

PLANT Pu AREA BM 124 EAST EX. DUCT
SURVEYED BY I PANELL
INST. LUDLUM 2220 # 52834 DET. 43-4
SOURCE CK 288-272 BKG. 3
DATE: 7-27-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 1 83C00115
CTD. BY J Black
SOURCE CK. AVG. 27
BKG. .3
DATE: 7-28-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION			DIRECT CPM	DIRECT DPM	SMEAR
INLET PORT	20 METERS	N	11	66	0
		E	7	42	3
		S	2	12	3
		W	3	18	6
		B	2	10	0
		E	0	0	0
		W	0	0	0
	DIRECT	SMEAR			
TOTAL DPM	3420	153			
# READINGS	80	80			
AVG. DPM/100cm²	42.75	1.91			
MAX. DPM/100cm²	185	9			
MDA=	28.81				

PLANT Pu AREA BO-1 EX. DUCT
SURVEYED BY A. Hetzler
INST. LUDLUM 2220 # 58309 DET. 43-4
SOURCE CK 249-231 BKG. 2
DATE: 7-20-89 SOURCE #: 6498 VALUE: 890 DPM

ASC # 2 83600108
CTD. BY J Black
SOURCE CK. AVG. 27
BKG. .2
DATE: 7-20-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION			DIRECT CPM	DIRECT DPM	SMEAR
BO-1 EXHAUST DUCT "0" METERS FROM TUNNEL	24" DIA.	T	7	42	0
		E	0	0	0
		B	10	60	0
T - TOP		W	4	24	6
B - BOTTOM					
E - EAST	1 METER	B	6	36	0
W - WEST		E	9	54	0
N - NORTH		W	10	60	0
S - SOUTH					
	2 METER	E	6	36	0
		B	19	114	6
		W	5	30	3
	3 METER	B	3	18	3
		E	3	18	3
		W	3	18	6
	4 METER	E	4	30	3
		B	3	24	0
		W	14	70	3
	5 METER	B	10	60	3
		E	6	36	0
		W	10	60	3
	6 METER	E	12	12	6
		B	11	66	0
		W	14	84	6
	7 METER	B	8	48	0
		E	14	84	0
		W	11	66	0

PLANT Pu AREA BO-1 EX. DUCT
SURVEYED BY I. POWELL
INST. LUDLUM 2220 # 52834 DET. 43-4
SOURCE CK 288-272 BKG. 3
DATE: 7-27-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 1 83600115
CTD. BY J Black
SOURCE CK. AVG. 27
BKG. 3
DATE: 7-28-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
8 METER	B	13	65	0
	E	9	45	0
	W	4	20	0
9 METER	B	8	48	3
	E	16	96	9
	W	10	60	0
10 METER	B	28	168	0
	E	12	72	9
	W	8	48	3
11 METER	B	4	24	3
	E	6	36	3
	W	14	84	0
12 METER	B	7	42	3
	E	22	132	0
	W	11	66	3
13 METER	B	10	60	0
	E	6	36	0
	W	12	72	3
INLET FROM VAULT	T	16	96	3
	E	8	48	0
BROKEN OUT	B	—	N/A	—
	W	3	18	9
14 METER	B	10	60	0
	E	12	72	0
	W	11	55	3

PLANT Pu AREA BO-1 EX. DUCT
SURVEYED BY I. POWELL
INST. LUDLUM 2220 # 52834 DET. 43-4
SOURCE CK 288-272 BKG. 3
DATE: 7-27-89 SOURCE #: 112 VALUE: 1113 DPM

ASC # 1 83600115
CTD. BY J Black
SOURCE CK. AVG. 27
BKG. 3
DATE: 7-28-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
15 METER	B	13	78	0
	E	10	60	6
	W	8	48	0
INLET TO BO-1 16 METER	T	5	30	0
	E	0	0	6
	W	17	85	6
	B	6	36	3

	DIRECT	SMEAR
TOTAL DPM	3010	126
# READINGS	56	56
AVG. DPM/100 cm²	53.75	2.25
MAX. DPM/100 cm²	168	9
MDA	27.72 DPM/100 cm²	

BO-2 DOOR 7-6-89 LUDLUM 2220

LEADING TO TUNNEL #58318, 43-4

SOURCE #6868

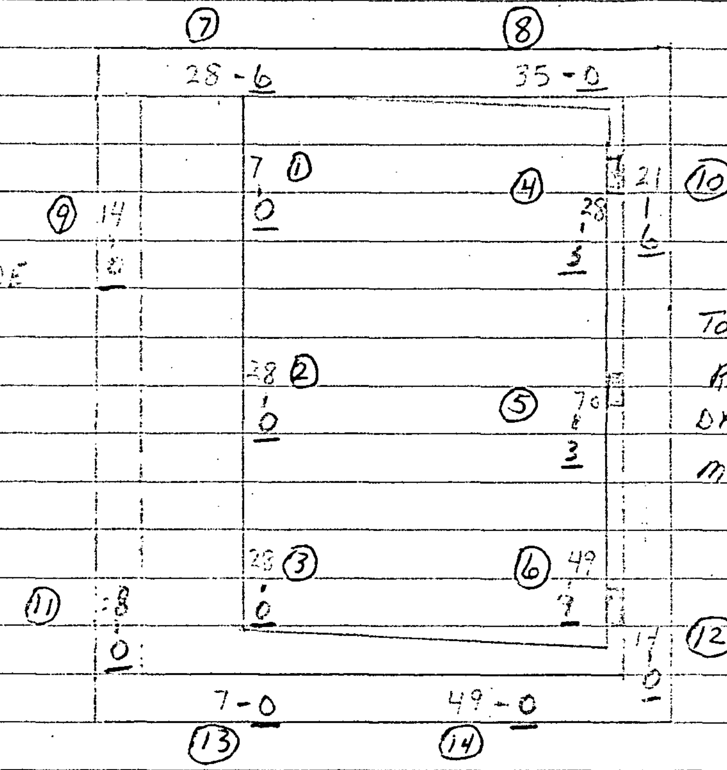
1655dpm

SOURCE CK;

[illegible] 279, SRG-2 (A)

[illegible], BKG-2(A)

DOOR OUTSIDE



Inside AND OUTSIDE

	DIRECT	SMEAR
TOTAL DPM	2,807	150
READINGS	82	82
DPm/100cm² AVG	34.23	1.83
MAX DPm/100cm²	84	9

MDA 27.44

DPm/100cm²

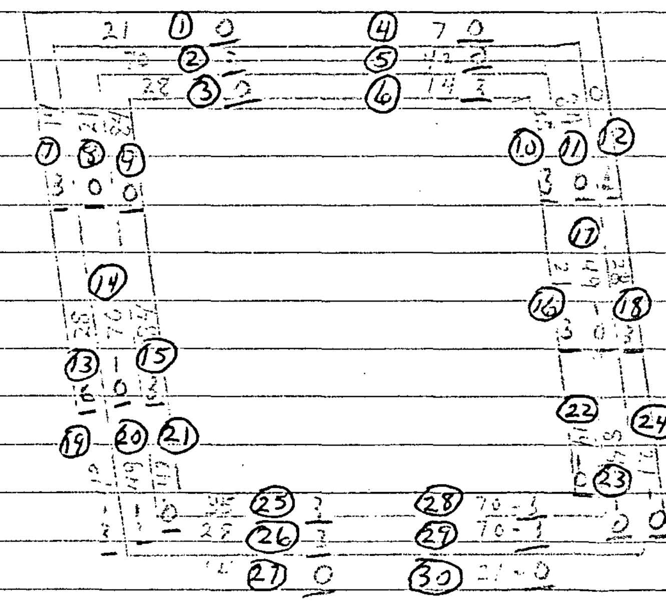
FIXED

IDENFICATION # CIRCLED

SMEARS UNDERLINED

FRAME

OUTSIDE



PLANT PU AREA Bo2 Tunnel Door

SURVEYED BY I Powell

INST. LUDLUM 2220 # 58318 DET. 43-4

SOURCE CK 264-279 284-265 BKG. 2-2

DATE: 7-6-89 SOURCE #: 6868 VALUE: 1055 DPM

ASC # 1-83600115

CTD. BY Jim Black

SOURCE CK. AVG. 32

BKG. .3

DATE: 7-7-89

READINGS IN DPM/100 cm^2

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
Bo2 Door LEADING TO TUNNEL	1	1	7	0
Outside	2	4	28	0
	3	4	28	0
	4	4	28	3
	5	10	70	3
	6	7	49	9
	7	4	28	6
	8	5	35	0
	9	2	14	0
	10	3	21	6
	11	4	28	0
	12	2	14	0
	13	1	7	0
	14	7	49	0
Door Frame Leading				
to Tunnel Outside	1	3	21	0
	2	10	70	3
	3	4	28	0
	4	1	7	0
	5	6	42	0
	6	2	14	3
	7	2	14	3
	8	3	21	0
	9	12	84	0
	10	5	35	3
	11	12	84	0
	12	0	0	3
	13	4	29	6
	14	10	70	0
	15	12	84	3
	16	3	21	3
	17	7	49	0
	18	4	28	3
	19	7	49	3

PLANT PU AREA Bo2 Tunnel Door Frame

SURVEYED BY I Powell

INST. LUDLUM 2220 # 58318 DET. 43-4

SOURCE CK 264-279 286-265 BKG.

DATE: 7-6-89 SOURCE #: 6868 VALUE: 1055 DPM

ASC # 1-83600115

CTD. BY Jim Black

SOURCE CK. AVG. 32

BKG. .3

DATE: 7-7-89

READINGS IN DPM/100 cm^2

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
Bo2 Door Frame Leading	20	7	49	3
To Tunnel	21	6	42	0
	22	2	14	0
	23	12	84	0
	24	3	21	0
	25	5	35	3
	26	4	28	3
	27	2	14	0
	28	10	70	3
	29	10	70	3
	30	3	21	0

AREA *FLOOR EXHAUST TUNNEL ENTRANCE FINAL GRID*

TYPE OF SURVEY *& DIRECT & SMEAR*

TYPE OF INSTRUMENT *LUDLUM 2220 / DET. 43-68*

SERIAL NUMBER *50068*

COMPLETION DATE *4-28-89*

H.P. SIGNATURE *Claudia Thayer*

SURVEY UNITS DPM/100cm² wax

AUTO. SAMPLE COUNTER #: *1 836 COUNTS*

N / W / E / S

1.5cm = .5 Meter

D-DIRECT
S-SMEAR

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

MDA 15.68 DPM/100cm² FIXED

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
4-27-89 AM	237/249	2
	Rec #1	
4-28-89	227	3

FLOOR

D-16 S-6		D-36 S-0
	D-16 S-3	
D-44 S-9		D-44 S-0

CEILING

D-28 S-3		D-8 S-0
	D-4 S-0	
D-8 S-6		D-4 S-0

NORTH WALL

D-4 S-3		D-8 S-3
	D-0 S-3	
D-0 S-0		D-4 S-3

SOUTH WALL

D-8 S-0		D-16 S-3
	D-12 S-3	
D-4 S-0		D-0 S-0

EAST WALL

D-4 S-3		D-12 S-3
	D-0 S-0	
D-0 S-0		D-4 S-0

WEST WALL

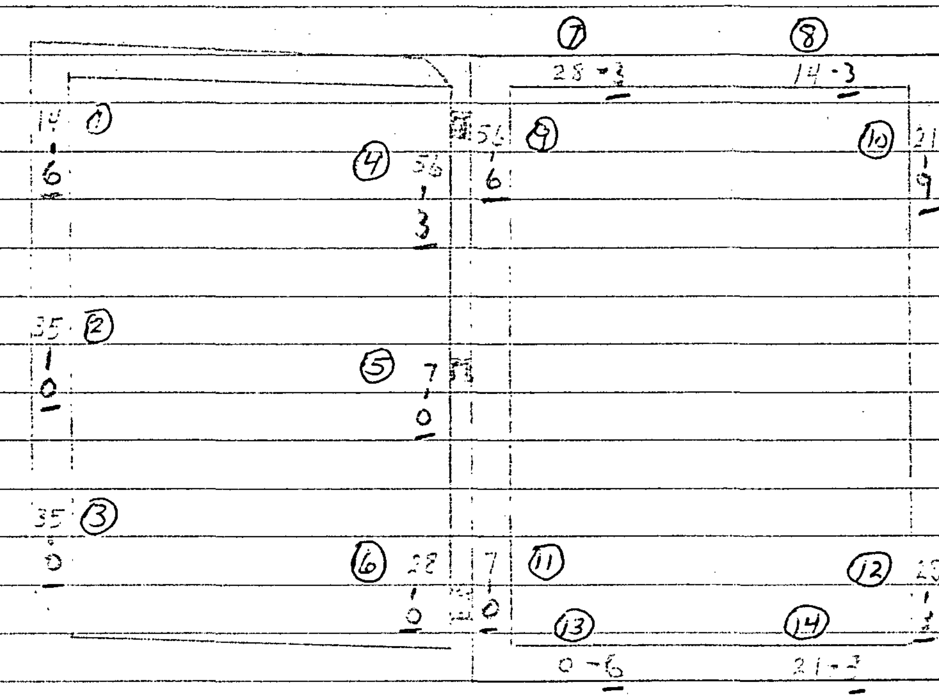
D-0 S-0		D-16 S-3
	D-4 S-3	
D-0 S-3		D-16 S-0

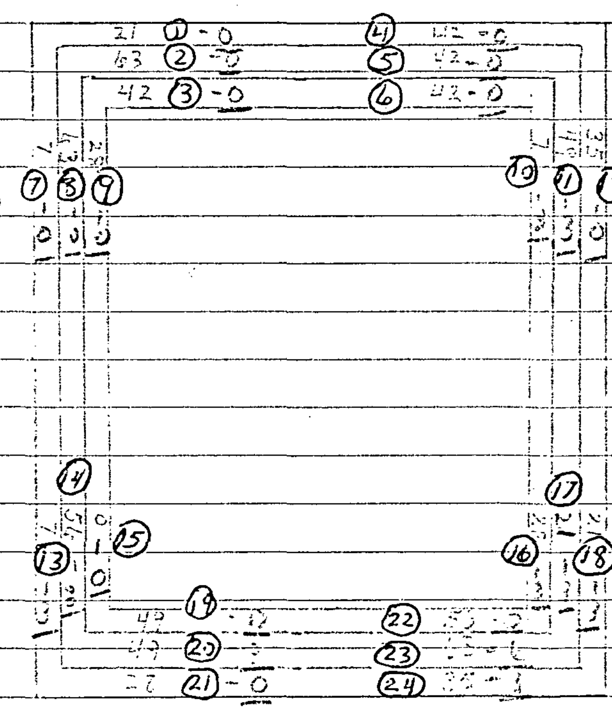
#		DIRECT	SMEAR
	TOTAL DPM	320	60
	READINGS	30	30
	AVG DPM/100cm²	10.67	2.0
	MAX DPM/100cm²	44	9

7-6-89

LUDLUM 2220
#58318, 43-4
SOURCE # 6868
1055 dpm
SOURCE CK.:
267-279, PKG-2 (FP)
256-265 BKG-2 (FP)

DOOR INSIDE TUNNEL





IDENTIFICATION # CIRCLED
SMEARS UNDERLINED

PLANT PH AREA Dam INSIDE TUNNEL
SURVEYED BY I POWELL
INST. LUDLUM 2220 # 58318 DET. 43-4
SOURCE CK 264-279 286-265 BKG. 2-2
DATE: 7-6-89 SOURCE #6868 VALUE 1055 DPM

ASC # 2 8360108
CTD. BY Jm Blake
SOURCE CK. AVG. 31
BKG. 3
DATE: 7-7-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
B02 Dam Inside Tunnel	1	2	14	6
	2	5	35	0
	3	5	35	0
	4	8	56	3
	5	1	7	0
	6	4	28	0
	7	4	28	3
	8	2	14	3
	9	8	56	6
	10	3	21	9
	11	1	7	0
	12	4	28	3
	13	0	0	6
	14	3	21	3
Dam Frame Inside Tunnel	1	3	21	0
	2	9	63	0
	3	6	42	0
	4	6	42	0
	5	6	42	0
	6	6	42	0
	7	1	7	0
	8	9	63	0
	9	4	28	0
	10	1	7	3
	11	7	49	3
	12	5	35	0
	13	1	7	3
	14	8	56	3
	15	0	0	0
	16	4	28	3
	17	3	21	3
	18	3	21	3
	19	7	49	0

PLANT PH AREA Dam Inside Tunnel
SURVEYED BY I POWELL
INST. LUDLUM 2220 # 58318 DET. 43-4
SOURCE CK 264-279 286-365 BKG. 2-2
DATE: 7-6-89 SOURCE #: 6868 VALUE: 1055 DPM

ASC # 2-8360108
CTD. BY Jm Blake
SOURCE CK. AVG. 31
BKG. 3
DATE: 7-7-89

READINGS IN DPM/100 cm²

SAMPLE # OR DESCRIPTION		DIRECT CPM	DIRECT DPM	SMEAR
Dam Frame Inside Tunnel	20	7	49	3
	21	4	28	0
	22	8	56	0
	23	9	63	6
	24	5	35	3

N / W / E / S

1.5cm = 1 Meter

AREA FLOOR EXHAUST TUNNEL EAST SECTION FINAL GRID

TYPE OF SURVEY & DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68

SERIAL NUMBER 50068, 37800

COMPLETION DATE 6-19-89

H.P. SIGNATURE Claude M Thompson

AUTO. SAMPLE COUNTER #: #2 83600108

SURVEY UNITS DPM/100cm²

W | E / S

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D-DIRECT
S-SMEAR

MDA = 19.20 DPM/100 cm² FIXED

SOURCE #: 6868 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
4-24-89	241-234	2
4-25-89	228-246	2
4-25-89	239-265	3
4-26-89	256-218	2
4-26-89	262-271	3
4-26-89	273-232	3
4-27-89	255-273	2
5-11-89	255-224	2
6-19-89	198-212	2
	ASC# 2	
4-27-89	30	.3
4-28-89	27	.3
6-19-89	29	.3

D-48 S-6	D-80 S-3	D-40 S-3	D-48 S-0	D-60 S-0	D-36 S-3	D-20 S-0	D-16 S-3	D-32 S-0	D-16 S-6	D-32 S-0	D-20 S-3	D-44 S-0	D-36 S-0	D-12 S-3	D-12 S-3	D-12 S-3	D-16 S-0	D-56 S-0	D-8 S-3
D-20 S-3		D-36 S-0		D-80 S-0		D-56 S-0		D-36 S-3		D-36 S-0		D-20 S-0		D-16 S-0		D-4 S-0		D-52 S-3	
D-96 S-0	D-20 S-3	D-16 S-0	D-60 S-0	D-12 S-0	D-36 S-3	D-24 S-3	D-60 S-0	D-36 S-0	D-20 S-0	D-60 S-0	D-44 S-6	D-36 S-0	D-8 S-0	D-4 S-0	D-8 S-0	D-12 S-0	D-32 S-0	D-12 S-3	D-16 S-3

FLOOR

D-34 S-3	D-16 S-6	D-20 S-6	D-20 S-0	D-8 S-3	D-52 S-3	D-84 S-3	D-68 S-3	D-90 S-0	D-84 S-3	D-72 S-0	D-44 S-4	D-8 S-0	D-8 S-0	D-28 S-0	D-28 S-0	D-8 S-0	D-12 S-6	D-36 S-3	D-12 S-0
D-140 S-17		D-96 S-9		D-4 S-3		D-68 S-6		D-76 S-3		D-12 S-0		D-28 S-0		D-24 S-9		D-24 S-3		D-28 S-0	
D-28 S-3	D-40 S-0	D-20 S-0	D-0 S-0	D-32 S-0	D-44 S-0	D-44 S-0	D-68 S-3	D-88 S-6	D-36 S-6	D-16 S-0	D-12 S-0	D-16 S-6	D-52 S-0	D-0 S-3	D-16 S-6	D-36 S-3	D-36 S-3	D-24 S-0	D-12 S-6

CEILING

D-32 S-3	D-20 S-3	D-20 S-3	D-36 S-0	D-32 S-0	D-28 S-0	D-16 S-0	D-32 S-0	D-24 S-0	D-16 S-6	D-20 S-9	D-12 S-3	D-16 S-0	D-44 S-0	D-32 S-9	D-32 S-0	D-16 S-3	D-24 S-0	D-32 S-0	D-52 S-0
D-44 S-0		D-12 S-3		D-36 S-6		D-28 S-6		D-36 S-0		D-28 S-3		D-8 S-3		D-44 S-0		D-48 S-0		D-16 S-3	
D-40 S-3	D-40 S-0	D-36 S-6	D-44 S-0	D-52 S-0	D-28 S-3	D-68 S-0	D-40 S-3	D-16 S-3	D-24 S-6	D-28 S-3	D-16 S-3	D-16 S-3	D-28 S-0	D-20 S-3	D-36 S-0	D-44 S-0	D-32 S-0	D-24 S-0	D-48 S-0

37800

NORTH WALL

D-32 S-3	D-48 S-3	D-44 S-0	D-36 S-0	D-32 S-3	D-20 S-0	D-20 S-0	D-24 S-0	D-16 S-9	D-20 S-6	D-20 S-0	D-8 S-0	D-16 S-3	D-8 S-6	D-8 S-3	D-40 S-3	D-20 S-0	D-16 S-0	D-16 S-0	D-16 S-0
D-16 S-0		D-48 S-6		D-40 S-0		D-20 S-9		D-20 S-3		D-24 S-3		D-48 S-0		D-80 S-3		D-12 S-0		D-40 S-0	
D-36 S-0	D-24 S-0	D-20 S-0	D-24 S-0	D-16 S-3	D-24 S-0	D-32 S-6	D-24 S-0	D-8 S-0	D-20 S-0	D-24 S-0	D-48 S-0	D-12 S-0	D-24 S-0	D-24 S-3	D-44 S-3	D-32 S-7	D-4 S-0	D-4 S-3	D-16 S-0

SOUTH WALL

D-16 S-0	D-32 S-0
D-24 S-0	
D-36 S-0	D-48 S-0

EAST WALL

DIRECT

6290 TOTAL DPM
205 READINGS
30.68 DPM/100cm²
96 MAX DPM/100cm²

SMEAR

TOTAL DPM 378
SMEARS 305
DPM/100cm² 1.24
MAX DPM/100cm² 12

AREA FLOOR EXHAUST TUNNEL TYPE OF SURVEY α DIRECT & SMEAR COMPLETION DATE 4-25-89 SURVEY UNITS DPM/100cm²

FINAL GRID West Section TYPE OF INSTRUMENT LUDLUM 2220/DET. 43-68 H.P. SIGNATURE Claude M Thompson

SERIAL NUMBER 50068 / Detector 43-68 AUTO. SAMPLE COUNTER #: #2 83600108

N W E S

1.5cm = 1 Meter

F – FLOOR
C – CEILING
N – NORTH WALL
S – SOUTH WALL
E – EAST WALL
W – WEST WALL

D - DIRECT
S - SMEAR

MDA 19.20 DPM/100cm² FIXED

SOURCE #: 6968 VALUE: 1055 DPM

INSTRUMENT		
DATE	SOURCE C/M RESPONSE	BKGD C/M
4-21-89 AM	219/237	3
4-21-89 PM	244/250	1
4-23-89 AM	251/238	2
	ASC #2	
4-25-89	28	3

WEST SECTION

D-40 S-0	D-12 S-6	D-4 S-3	D-28 S-3	D-48 S-3	D-84 S-6	D-48 S-3	D-52 S-3	D-24 S-6	D-48 S-3
D-74 S-3		D-0 S-0		D-32 S-0		D-32 S-0		D-64 S-0	
D-28 S-3	D-32 S-0	D-24 S-0	D-36 S-3	D-56 S-6	D-20 S-3	D-44 S-0	D-44 S-6	D-40 S-3	D-48 S-0

FLOOR

D-12 S-0	D-24 S-0	D-8 S-3	D-32 S-0	D-24 S-0	D-32 S-0	D-24 S-3	D-12 S-3	D-16 S-0	D-64 S-3
D-12 S-3		D-12 S-0		D-32 S-3		D-8 S-0		D-16 S-3	
D-16 S-3	D-4 S-0	D-36 S-0	D-12 S-3	D-32 S-6	D-48 S-0	D-24 S-0	D-0 S-3	D-20 S-3	D-56 S-0

CEILING

D-8 S-9	D-28 S-3	D-20 S-0	D-8 S-3	D-24 S-0	D-24 S-0	D-36 S-3	D-16 S-3	D-16 S-6	D-12 S-6
D-20 S-0		D-36 S-3		D-16 S-0		D-28 S-3		D-16 S-3	
D-8 S-6	D-24 S-6	D-4 S-0	D-24 S-3	D-28 S-3	D-20 S-0	D-16 S-0	D-16 S-9	D-28 S-0	D-32 S-3

NORTH WALL

D-20 S-0	D-28 S-0	D-8 S-3	D-24 S-3	D-0 S-0	D-12 S-0	D-20 S-0	D-16 S-0	D-8 S-6	D-20 S-3
D-24 S-0		D-20 S-6		D-12 S-0		D-8 S-3		D-12 S-3	
D- S-	D- S-	D- S-	D-20 S-3	D-16 S-3	D-28 S-3	D-12 S-0	D-20 S-0	D-16 S-0	D-0 S-9

SOUTH WALL

				DIRECT	SMEAR
D-8 S-3	D-16 S-0		TOTAL DPM	2450	231
D-16 S-3			# READINGS	102	102
D-20 S-6	D-4 S-0		AVG DPM/100cm²	24.02	2.26
			MAX DPM/100cm²	84	9

WEST WALL

SOUTH SECTION

ON SEPARATE MAP

D- S-	D- S-	D- S-	D- S-
D- S-		D- S-	
D- S-	D- S-	D- S-	D- S-

FLOOR

D- S-	D- S-	D- S-	D- S-
D- S-		D- S-	
D- S-	D- S-	D- S-	D- S-

SOUTH WALL

D- S-	D- S-	D- S-	D- S-
D- S-		D- S-	
D- S-	D- S-	D- S-	D- S-

EAST WALL

D- S-	D- S-	D- S-	D- S-
D- S-		D- S-	
D- S-	D- S-	D- S-	D- S-

WEST WALL

D- S-	D- S-	D- S-	D- S-
D- S-		D- S-	
D- S-	D- S-	D- S-	D- S-

NORTH WALL

D- S-	D- S-	D- S-	D- S-

FACING NORTH SIDE

AREA Pu-PLANT
EXHAUST TUNNEL RISER
FINAL GRID

TYPE OF SURVEY d DIRECT & SMEAR

TYPE OF INSTRUMENT LUDLUM 2220 / DET. 43-68

SERIAL NUMBER 50068 Ludlum / 43-68 detector

COMPLETION DATE 4-21-89

H.P. SIGNATURE Claude M Thompson

SURVEY UNITS DPM/100cm²

AUTO. SAMPLE COUNTER #: 1 S/N 8360115

N
W E
S

1.5cm = 1 Meter

D - DIRECT
S - SMEAR

F - FLOOR
C - CEILING
N - NORTH WALL
S - SOUTH WALL
E - EAST WALL
W - WEST WALL

MDA 19.20 DPM/100cm² FIXED

SOURCE #: L868 VALUE: 1055DPM

INSTRUMENT		
DATE	SOURCE C/m RESPONSE	BKGD C/m
4-17-89 AM	244/265	3
4-17-89 PM	244/251	2
4-18-89 AM	252/242	3
4-18-89 PM	251/266	2
4-19-89 AM	231/223	3
4-19-89 PM	217/223	3
4-20-89 AM	217/231	3
	ASC #2	
4-20-89	29	.3
	ASC #1	
4-21-89	37	.3
4-21-89	31	.2

A B C D E

NORTH WALL

D-48 S-0	D-16 S-0	D-28 S-0	D-32 S-0
D-36 S-3		D-36 S-0	
D-24 S-0	D-8 S-3	D-52 S-0	D-24 S-3
D-16 S-3	D-16 S-0	D-36 S-0	D-20 S-3
D-36 S-0		D-28 S-0	
D-12 S-3	D-20 S-0	D-32 S-3	D-32 S-0
D-32 S-3	D-40 S-0	D-24 S-0	D-20 S-0
D-24 S-6		D-36 S-3	
D-20 S-0	D-24 S-3	D-36 S-0	D-28 S-0

SOUTH WALL

D-12 S-0	D-28 S-3	D-20 S-6	D-16 S-0
D-12 S-0		D-40 S-0	
D-4 S-0	D-16 S-0	D-20 S-3	D-44 S-3
D-56 S-3	D-64 S-0	D-28 S-0	D-12 S-3
D-44 S-0		D-28 S-0	
D-16 S-0	D-24 S-3	D-12 S-0	D-28 S-0
D-44 S-0	D-12 S-0	D-20 S-6	D-24 S-6
D-32 S-0		D-28 S-6	
D-20 S-3	D-56 S-0	D-32 S-0	D-52 S-0
D-12 S-0	D-4 S-3	D-20 S-0	D-28 S-0
D-24 S-0		D-24 S-3	
D-20 S-0	D-40 S-3	D-12 S-0	D-24 S-3

EAST WALL

D-32 S-0	D-8 S-0
D-16 S-0	
D-20 S-0	D-20 S-3
D-16 S-3	D-12 S-0
D-28 S-0	
D-16 S-3	D-36 S-3
D-40 S-0	D-16 S-0
D-36 S-0	
D-44 S-0	D-36 S-6
D-16 S-0	D-20 S-0
D-24 S-0	
D-44 S-3	D-36 S-0

WEST WALL

D-32 S-0	D-28 S-0
D-52 S-6	
D-16 S-3	D-44 S-3
D-16 S-3	D-12 S-0
D-28 S-0	
D-16 S-3	D-36 S-0
D-40 S-0	D-16 S-0
D-36 S-0	
D-44 S-6	D-36 S-0
D-8 S-0	D-12 S-3
D-24 S-0	
D-12 S-0	D-44 S-0

FLOOR

D-40 S-3	D-28 S-3	D-20 S-0	D-92 S-3
D-40 S-0		D-12 S-0	
D-32 S-0	D-52 S-6	D-24 S-0	D-20 S-6

CEILING

D-32 S-0	D-4 S-3	D-24 S-6	D-12 S-3
D-16 S-3		D-44 S-3	D-20 S-0
D-28 S-6	D-44 S-3	D-36 S-0	D-36 S-0
D-24 S-4		D-32 S-3	D-24 S-3

DIRECT

3688 TOTAL DPM

134 READINGS

27.52 DPM/100cm² AVG

SMEAR

213 TOTAL DPM

134 SMEARS

1.59 DPM/100cm² AVG

92 MAX. DPM/100cm² DIRECT

6 MAX. DPM/100cm² SMEAR

Exhaust Tunnel PIPE SURVEY PAGE 1 OF 10

LINE NUMBER 534 DATE 5-2-89
INSTRUMENT RADIUM 2220 SERIAL NUMBER 58709
DETECTOR 43-4 OPERATOR RHM
SOURCE NUMBER AND VALUE #6868 1055 DPM
SOURCE RESPONSE AND BACKGROUND AM 246/272 Bkg 2
SOURCE RESPONSE AND BACKGROUND PM 268/279 Bkg 3
LIGHT Conduit x12

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
START AT EAST	Conduit	½"	N-0-METERS	7	84	0
WALL OF MAIN			S-0 METERS	7	84	0
TUNNEL NEAR			N-1 METER	7	84	3
ENTRANCE, AND			S-1 METER	4	48	3
IN THE MIDDLE			N-2 METERS	4	48	3
OF CEILING			S-2 METERS	7	84	3
ABOUT 3m FROM			N-3 METERS	7	84	9
WEST WALL			S-3 METERS	4	48	0
			N-4 METERS	6	72	0
			S-4 METERS	6	72	0
			N-5 METERS	4	48	0
			S-5 METERS	5	60	0
			N-6 METERS	0	0	3
	DIRECT SMEAR		S-6 METERS	0	0	0
TOTAL DPM	5502	243	N-7 METERS	3	36	3
#READINGS	118	118	S-7 METERS	0	0	0
AVG DPM/100cm²	46.63	2.06	N-8 METERS	6	72	0
MAX DPM/100cm²	84	9	S-8 METERS	2	24	0
			N-9 METERS	3	36	0
			S-9 METERS	7	84	3
MDA = 57.61			N-10 METERS	3	36	6
DPM/100cm²			S-10 METERS	7	84	0
FIXED			N-11 METERS	2	36	9
			S-11 METERS	1	72	9
			N-12 METERS	5	60	0
			S-12 METERS	3	36	0
			N-13 METERS	3	36	6
			S-13 METERS	6	72	3
			Next Page			

Exhaust Tunnel PIPE SURVEY PAGE 2 OF 10

LINE NUMBER 534 DATE 5-3-89
INSTRUMENT RADIUM 2220 SERIAL NUMBER 58308
DETECTOR 43-4 OPERATOR RHM
SOURCE NUMBER AND VALUE #6868 1055 DPM
SOURCE RESPONSE AND BACKGROUND AM 246/270 Bkg 3
SOURCE RESPONSE AND BACKGROUND PM 253/255 Bkg 2

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
CONTINUED	Conduit	½"	N 14 METERS	2	24	0
FROM PG #1			S 14 METERS	1	12	6
			N 15 METERS	1	12	0
			S 15 METERS	5	60	9
			N 16 METERS	5	60	9
			S 16 METERS	3	36	3
			N 17 METERS	0	0	3
			S 17 METERS	5	60	0
			N 18 METERS	1	12	3
			S 18 METERS	5	60	0
			N 19 METERS	0	0	9
			S 19 METERS	3	36	9
			N 20 METERS	5	60	0
			S 20 METERS	0	0	3
			N 21 METERS	3	36	3
			S 21 METERS	6	72	0
			N 22 METERS	1	12	0
			S 22 METERS	3	36	3
			N 23 METERS	3	36	3
			S 23 METERS	6	72	6
			N 24 METERS	6	72	0
			S 24 METERS	6	72	0
			N 25 METERS	6	72	0
			S 25 METERS	5	60	0
			N 26 METERS	6	72	3
			S 26 METERS	6	72	3

Exhaust Tunnel PIPE SURVEY

LINE NUMBER 535 DATE 5-3-89

INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309

DETECTOR 43-4 OPERATOR PMB

SOURCE NUMBER AND VALUE #4058 1055 DPM

SOURCE RESPONSE AND BACKGROUND AM 246/270 ±3

SOURCE RESPONSE AND BACKGROUND PM 253/255 ±2

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
comes out of	conduit	1½"	0 meters Top	6	72	3
S. Wall and			" " Bottom	6	72	0
straight N to			½ meter T	4	48	3
N. Wall			" " B	1	12	3
			1 meter T	5	60	3
			" " B	7	84	0
			1.5 meters T	3	36	0
			" " B	1	12	0

Exhaust Tunnel PIPE SURVEY

LINE NUMBER 536 DATE 5-3-89

INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309

DETECTOR 43-4 OPERATOR PMB

SOURCE NUMBER AND VALUE #4058 1055 DPM

SOURCE RESPONSE AND BACKGROUND AM [illegible]/2[illegible] ±[illegible]

SOURCE RESPONSE AND BACKGROUND PM [illegible]/255 ±2

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
starts in	conduit	1½"	0 meters T	3	36	0
S. wall			" " B	6	72	0
and straight			½ meter T	3	36	3
to North wall			" " B	1	12	3
			1 meter T	3	36	0
			B	6	72	0
			1.5 meters T	7	84	6
			B	4	48	0

Exhaust Tunnel PIPE SURVEY PAGE 5 OF 10

LINE NUMBER 537 DATE 5-5-89
INSTRUMENT Ludlum 2220 SERIAL NUMBER 58319
DETECTOR 43-4 OPERATOR RMH
SOURCE NUMBER AND VALUE #6868 1055 DPM
SOURCE RESPONSE AND BACKGROUND AM 250/261 0
SOURCE RESPONSE AND BACKGROUND PM 285/275 0

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
Starts in S	conduit	1½	0 meters T	7	84	3
Wall ends			" " B	7	84	6
in N. wall			½ meter T	5	60	0
			" " B	1	12	0
			1 meter T	6	72	3
			" " B	4	48	6
			1.5 meters T	2	24	0
			" " B	3	36	0

Exhaust Tunnel PIPE SURVEY PAGE 6 OF 10

LINE NUMBER 538 DATE 5-8-89
INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309
DETECTOR 43-4 OPERATOR RMH
SOURCE NUMBER AND VALUE #6868 1055 DPM
SOURCE RESPONSE AND BACKGROUND AM 254/268 3
SOURCE RESPONSE AND BACKGROUND PM 250/265 3

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
starts in S. Wall	Conduit	1½"	0 meters T	1	12	0
ends in N. Wall			" B	3	36	0
			½ meter T	5	60	3
			" " B	5	60	0
			1 meter T	0	0	3
			" " B	2	24	0
			1.5 Meters T	4	48	0
			" " B	4	48	3

Exhaust Tunnel PIPE SURVEY

LINE NUMBER 539 DATE 5-8-89

INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309

DETECTOR 43-4 OPERATOR RMH

SOURCE NUMBER AND VALUE #6868 1055 dpm

SOURCE RESPONSE AND BACKGROUND AM 254/268 3

SOURCE RESPONSE AND BACKGROUND PM 250/265 3

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
starts in S.	conduit	1½"	0 meters T	4	48	0
Wall ends in			" " B	3	36	0
N. Wall			½ meter T	3	36	0
			" " B	0	0	6
			1 meter T	3	36	0
			" " B	6	72	0
			1.5 meter T	3	36	3
			" " B	5	60	3

Exhaust Tunnel PIPE SURVEY

LINE NUMBER 540 DATE 5-8-29

INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309

DETECTOR 43-4 OPERATOR RMH

SOURCE NUMBER AND VALUE #6868 1055 DPM

SOURCE RESPONSE AND BACKGROUND AM 254/268 3

SOURCE RESPONSE AND BACKGROUND PM 250/265 3

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
starts in	Conduit	1½"	0 meters T	4	48	0
S. Wall ends			" " B	1	12	0
in N. wall			½ meter T	2	24	3
			" " B	3	36	0
			1 meter T	3	36	0
			" " B	3	36	0
			1.5 meter T	1	12	6
			" " B	4	48	0

Exhaust Tunnel PIPE SURVEY

LINE NUMBER 541 DATE 5-8-89

INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309

DETECTOR 43-4 OPERATOR RMK

SOURCE NUMBER AND VALUE #6868 1055DPM

SOURCE RESPONSE AND BACKGROUND AM 254/268 3

SOURCE RESPONSE AND BACKGROUND PM 250/265 3

Correction Factor X 6 due to large diameter of Pipe.

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
Starts in	Black	4"	0 meters T	12	72	0
S. Wall	iron		" " B	14	84	9
Tunnel goes	Pipe		½ meters T	8	48	3
N into N wall			" " B	13	78	3
			1 meter T	9	54	3
			" " B	3	18	3
			1.5 meters T	10	60	3
			" " B	4	24	0

Exhaust Tunnel PIPE SURVEY

LINE NUMBER 542 DATE 5-8-89

INSTRUMENT Ludlum 2220 SERIAL NUMBER 58309

DETECTOR 43-4 OPERATOR RMK

SOURCE NUMBER AND VALUE #6868 1055 DPM

SOURCE RESPONSE AND BACKGROUND AM 254/268 3

SOURCE RESPONSE AND BACKGROUND PM 250/265 3

START OF SURVEY	TYPE OF LINE	DIA.	READING LOCATION	Direct cpm	Direct dpm/100cm²	Smearable dpm/100cm²
Starts in S	Duriron	2"	0 meters T	5	60	0
Wall ends	(Lab drain)		" " B	7	84	0
in North Wall			½ meters T	7	84	0
			" " B	1	12	3
			1 meter T	4	48	3
			" " B	1	12	0
			1.5 meters T	5	60	0
			" " B	1	12	3