

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 70-734/87-15

Docket No. 70-734

License No. SNM-696

Safeguards Group I

Licensee: GA Technologies, Inc.
P.O. Box 85608
San Diego, California 92138

Facility Name: Science Laboratories Building (Building 2)

Inspection at: Same

Inspection Conducted: December 14 through 16, 1987

Inspectors:

R. D. Thomas
R. D. Thomas, Chief
Nuclear Materials Safety Section

2/26/88
Date Signed

David D. Skov
D. D. Skov, Radiation Specialist

2/26/88
Date Signed

Approved by:

J. L. Montgomery
J. L. Montgomery, Chief
Nuclear Materials Safety and Safeguards
Branch

2/26/88
Date Signed

Summary:

Inspection on December 14-16, 1987 (Report No. 70-734/87-15)

A decontamination confirmatory survey was conducted by NRC inspectors of the portions of the Science Laboratories Building (Building 2) in which NRC licensed activities had been conducted. The survey results indicate that the NRC licensed portions have been satisfactorily decontaminated by the licensee. The areas examined under the confirmatory survey are acceptable for release to unrestricted use.

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DETAILS

1. Persons Contacted

Keith Asmussen, Manager, Licensing and Nuclear Compliance
Laura Quintana, Manager, Health Physics
Steve Perelman, Staff Health Physics Technician
Robert Dalry, Director, Facilities
Keith Johnson, Manager, Facilities Engineering
Harry Lomax, Construction Planner

2. Introduction

In a letter and accompanying report to NRC Region V dated November 18, 1987, GA Technologies Inc. requested an NRC confirmatory survey of several laboratories within the Laboratory B section of the Science Laboratories Building (Building 2 or "L" Building). The licensee's final report, "Decontamination of Selected GA Technologies' Science Laboratories for Release to Unrestricted Use", indicated that twenty laboratories within the building had been surveyed, and the building decontaminated to levels below the limits required for release to unrestricted use.

On December 10, 1987, the licensee reported by phone that additional areas within Building 2, which had not been included in the GA report, had also been decontaminated and were acceptable for release to unrestricted use. The additional areas identified included four laboratories within Laboratory Sections A and B, and two locations inside the Laboratory Section C service corridor. The licensee's decontamination activities with respect to the additional laboratory and service corridor areas were described in the revised GA Technologies' decontamination report to the NRC dated January 18, 1988.

Activities conducted within the various laboratories of Building 2 were authorized by NRC and California State licenses. The confirmatory survey, conducted during the period of December 14 thru 16, 1987, included all Building 2 laboratory areas referenced in the licensee reports. Inspectors from the State of California also performed a confirmatory survey of Building 2 beginning December 17, 1987. The State of California plans to release the Building 2 laboratory areas checked pending the results of the combined confirmatory surveys. The Building 2 complex is shown in Figure 1.

3. Procedure

Radiation surveys were conducted in the following laboratories of Building 2, which the licensee had identified for release to unrestricted use (see Figures 2 thru 4):

Section A Laboratories: 641, 643

Section B Laboratories: 102, 104, 107, 109, 111, 113, 115, 117, 119,
122, 128, 130, 132, 134, 137, 139, 141, 143,
145, 147, 149, 151, 154

Several of the laboratories with separate room numbers identified above were combined into one larger room. Some laboratories also contained an upper level mezzanine which had been occupied previously as either office space or as an additional laboratory area for the use of licensed material. At the time of the confirmatory survey, Rooms 147, 149, 151, and 154 had been released to unrestricted use and were occupied by rental tenants. With the exception of Room 104, all of the remaining rooms included in the confirmatory survey had been vacated by licensee personnel. Most rooms were empty except for such items as laboratory work benches, wall cabinets, fume hoods (Rooms 113, 122, 130-134, 143), drain pipes and ventilation ducts.

Gamma surveys were conducted in the laboratory rooms over nearly all accessible floor areas, including the mezzanine levels. Additional floor scans were also made along the entire hallway providing direct access to the laboratories which were surveyed within Section B of Building 2. The floor scan included one area of Room 141 where concrete had been scabbled by the licensee to remove surface contamination. All gamma scans were made one to two inches above the floor surfaces with Eberline PRM-7 survey meter Serial Numbers 247 and 510, which had been calibrated on 7/21/87 and 7/23/87 respectively.

Selected locations within the various laboratories were also surveyed using Eberline E-520 portable survey meters, Serial Numbers 2120 and 1586, which were calibrated on 10/8/87 and 11/11/87 respectively. The Eberline E-520 instruments, equipped with Model HP-260 pancake GM detectors, were used to define beta-gamma contamination levels. Twenty-five wipe samples were also collected and analyzed for alpha and beta-gamma radioactivity (Table 1). The wipe samples were counted in the NRC Region V Tennelec Model LB5100 Low Background System.

Confirmatory decontamination surveys were also conducted in two areas within the Laboratory Section C service corridor. The licensee had dug a pit about four feet in depth and had scabbled concrete nearby to remove soil and surface contamination from the service area behind Laboratory Room 331. A similar size pit was also observed in the service area behind Laboratory Room 359/361 where the licensee had removed a contaminated floor drain, concrete and soil.

Three soil samples were collected by the inspectors from the two service corridor areas. These samples were analyzed at the Radiological and Environmental Sciences Laboratory (RESL) of the U.S. Department of Energy, Idaho Operations Office (see Tables 2 thru 4). The Region V office received the results of the soil sample analysis on February 4, 1988.

4. Discussion and Findings

Radiation level and contamination surveys indicated the presence of radioactive contamination in four laboratories. In Room 113, an area of less than 15 cm² on the inside of a bench drawer had a beta-gamma contamination level of approximately 33,000 dpm. Also, a small spot on a lead brick left in the same room had beta-gamma contamination of approximately 80,000 dpm. Low level removable beta-gamma contamination was measured from the wipes of both drawer and lead brick. Both the drawer and lead brick were removed by the licensee for disposal.

Beta-gamma radiation levels of up to 6600 dpm were measured from a wall section and adjoining floor covering an area of approximately one to two square feet in Room 128. The wall section and portions of the adjacent floor (tiles and concrete) were removed by the licensee. A resurvey of the wall and floor areas showed the removal of all radioactive contamination.

A small spot of beta-gamma contamination measuring up to 11,600 dpm was also measured on a shelf in a cabinet beneath the fume hood in Room 143. The shelf was removed by the licensee for disposal. Removable beta-gamma contamination of 128 dpm was also measured on the countertop inside the same fume hood; however the contamination level is well below the limit for release to an unrestricted area under NRC guidelines.

The counter top of one bench cabinet on the mezzanine level of Room 641/643 had fixed beta-gamma contamination measuring approximately 100,000 dpm over an area of less than 100 cm². Much lower contamination levels covering about 15 cm² were measured on a small diameter pipe and floor tile behind the cabinet. The pipe section was decontaminated, and the floor tile and portions of the wood bench top were removed by the licensee for disposal. A resurvey of the above areas showed that the contamination had been removed.

Analyses of the soil samples collected from the two service corridor areas indicated that uranium-235 contamination was not detectable.

5. Conclusions

The portions of the Science Laboratory Building which were included in the confirmatory survey had been satisfactorily decontaminated by the licensee and are acceptable for release to unrestricted use in accordance with NRC guidelines.

TABLE 1
Wipe Contamination Survey

<u>Wipe No.</u>	<u>Description of Location</u>	<u>Results in dpm per 100 cm²</u>	
		<u>Alpha</u>	<u>Beta-Gamma</u>
1	Room 113 - Inside top left drawer of bench cabinet	0	89
2	Room 113 - Lead brick	4	582
3	Room 113 - Hot sink drain	0	5
4	Room 113 - Drain pipe adjacent to fume hood	1	3
5	Room 113 - Inside doorknob of room door	0	4
6	Room 115 - Cabinet benchtop	0	2
7	Room 115 - Handrail in stairway	0	2
8	Room 119 - Sink facet handle	1	1
9	Room 119 - Concrete tabletop	0	2
10	Room 122 - Sink drain	1	3
11	Room 122 - Countertop inside fume hood	1	8
12	Room 122 - Doorknob between rooms 119-122	0	0
13	Room 128 - Wall behind refrigerator (after decontamination)	0	1
14	Room 128 - Floor behind refrigerator (after decontamination)	66	32
15	Room 134 - Sink (ground level)	1	2
16	Room 134 - Fumehood (ground level)	0	8
17	Room 134 - Sink (mezzanine)	0	1
18	Room 134 - Countertop of bench (mezzanine)	0	1
19	Room 143 - Bottom shelf inside fume hood cabinet	1	21
20	Room 143 - Countertop inside fume hood	1	128

TABLE 1
Wipe Contamination Survey

<u>Wipe No.</u>	<u>Description of Location</u>	<u>Results in dpm per 100 cm²</u>	
		<u>Alpha</u>	<u>Beta-Gamma</u>
21	Room 641 - Wall ventilation duct	0	0
22	Room 641 - Benchtop (mezzanine) before decontamination	15	46
23	Room 641 - Benchtop (mezzanine) after decontamination	0	3
24	Room 641 - Sink	3	2
25	Room 641 - Pipe outer surface behind bench (mezzanine) after decontamination	0	0

Table 2

UNITED STATES DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICE
RADIOLOGICAL AND ENVIRONMENTAL SCIENCES LABORATORY
SAMPLE RECORD SHEET

SERIAL NO. 14387A

NRC5

* NRC MOD NO. ?????? *
* INPLANT *

DATE NEEDED 01/11/88
NONROUTINE

RECEIVED
RE IN V

1988 FEB -4 4 12 21

SAMPLE DATE 12/14/87
SAMPLE HOUR 1200 MST
ORGANIZATION NRC5

SAMPLE SENT 12/21/87
SAMPLE RECEIVED 12/29/87
HARDCOPY PRINTOUT 01/20/88

ANALYZED BY: J.S.MORTON, S.GIMPEL
ORIGINAL SIGNED BY: D.B. MARTIN

COMMENTS:

NRC; COLLECTED BY D.D. SKOV; GA TECHNOLOGIES; SOIL FROM AN OPEN PIT,
SERVICE CORRIDOR TO RM 359; (URANIUM BY GAMMA SCAN)

COLLECTION DATE: 12/14/87 ANALYSIS DATE: 01/06/88 DECAY TIME 23.9 DAYS*
COUNT TIME 60 MIN. DETECTOR NUMBER 6 SAMPLE SIZE 2.81E+02 g

TOTAL COUNT	GROSS COUNT C/M	BKGD COUNT C/M	MINOR COUNT C/M	NET COUNT C/M	ISOTOPE	RESULTS +/- 1S;O** uCi/gram
-4	-0.07			-0.07	Co 60	(-3 +/- 4; 4)E -8
18	0.30			0.30	CsD137	(9 +/- 4; 4)E -8
281	4.68	0.12		4.56	K 40	(2.23 +/- 0.15;0.17)E -5
-4	-0.07			-0.07	PaM234	(-3 +/- 6; 6)E -6
54	0.90	0.24	0.42	0.24	U 235	(3 +/- 6; 6)E -8

* DECAY CORRECTION OF NATURAL CHAIN DAUGHTERS PER LONGEST LIVED PARENT

** ESTIMATED RANDOM UNCERTAINTY REPORTED IS ONE STANDARD DEVIATION, 1S. SMALL NEGATIVE AND OTHER RESULTS LESS THAN OR EQUAL TO 2S ARE INTERPRETED BY RESL AS INCLUDING "ZERO" OR AS NOT DETECTED. FOR RESULTS GREATER THAN 2S BUT LESS THAN OR EQUAL TO 3S, DETECTION IS QUESTIONABLE. RESULTS GREATER THAN 3S INDICATE DETECTION. 0 IS THE ESTIMATED OVERALL UNCERTAINTY.

Table 3

UNITED STATES DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICE
RADIOLOGICAL AND ENVIRONMENTAL SCIENCES LABORATORY
SAMPLE RECORD SHEET

SERIAL NO. 14387B

NRC5

* NRC MOD NO. ?????? *
* INPLANT *

DATE NEEDED 01/11/88
NONROUTINE

SAMPLE DATE 12/14/87
SAMPLE HOUR 1200 MST
ORGANIZATION NRC5

SAMPLE SENT 12/21/87
SAMPLE RECEIVED 12/29/87
HARDCOPY PRINTOUT 01/20/88

ANALYZED BY: J.S.MORTON, S.GIMPEL
ORIGINAL SIGNED BY: D.B. MARTIN

COMMENTS:

NRC; COLLECTED BY D.D. SKOV; GA TECHNOLOGIES; SOIL FROM AN OPEN PIT,
SERVICE CORRIDOR TO RM 331; (URANIUM BY GAMMA SCAN)

COLLECTION DATE: 12/14/87 ANALYSIS DATE: 01/06/88 DECAY TIME 25.0 DAYS*
COUNT TIME 60 MIN. DETECTOR NUMBER 6 SAMPLE SIZE 2.92E+02 g

TOTAL COUNT	GROSS COUNT C/M	BKGD COUNT C/M	MINOR COUNT C/M	NET COUNT C/M	ISOTOPE	RESULTS +/- 1S;0** uCi/gram
3	0.05			0.05	Co 60	(2 +/- 4; 4)E -8
0	0.00			0.00	CsD137	(0 +/- 3; 3)E -8
294	4.90	0.12		4.78	K 40	(2.27 +/- 0.15;0.17)E -5
1	0.02			0.02	PaM234	(1 +/- 4; 4)E -6
25	0.42	0.24	0.30	-0.12	U 235	(-2 +/- 6; 6)E -8

* DECAY CORRECTION OF NATURAL CHAIN DAUGHTERS PER LONGEST LIVED PARENT

** ESTIMATED RANDOM UNCERTAINTY REPORTED IS ONE STANDARD DEVIATION, 1S. SMALL NEGATIVE AND OTHER RESULTS LESS THAN OR EQUAL TO 2S ARE INTERPRETED BY RESL AS INCLUDING "ZERO" OR AS NOT DETECTED. FOR RESULTS GREATER THAN 2S BUT LESS THAN OR EQUAL TO 3S, DETECTION IS QUESTIONABLE. RESULTS GREATER THAN 3S INDICATE DETECTION. 0 IS THE ESTIMATED OVERALL UNCERTAINTY.

Table 4

UNITED STATES DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICE
RADIOLOGICAL AND ENVIRONMENTAL SCIENCES LABORATORY
SAMPLE RECORD SHEET

SERIAL NO. 14387C

NRC5

* NRC MOD NO. ?????? *
* INPLANT *

DATE NEEDED 01/11/88
NONROUTINE

SAMPLE DATE 12/14/87
SAMPLE HOUR 1200 MST
ORGANIZATION NRC5

SAMPLE SENT 12/21/87
SAMPLE RECEIVED 12/29/87
HARDCOPY PRINTOUT 01/20/88

ANALYZED BY: J.S.MORTON, S.GIMPEL
ORIGINAL SIGNED BY: D.B. MARTIN

COMMENTS:

NRC; COLLECTED BY D.D. SKOV; GA TECHNOLOGIES; SOIL FROM DIRT PILE,
SERVICE CORRIDOR TO RM 331; (URANIUM BY GAMMA SCAN)

COLLECTION DATE: 12/14/87 ANALYSIS DATE: 01/07/88 DECAY TIME 24.9 DAYS*
COUNT TIME 60 MIN. DETECTOR NUMBER 6 SAMPLE SIZE 2.90E+02 g

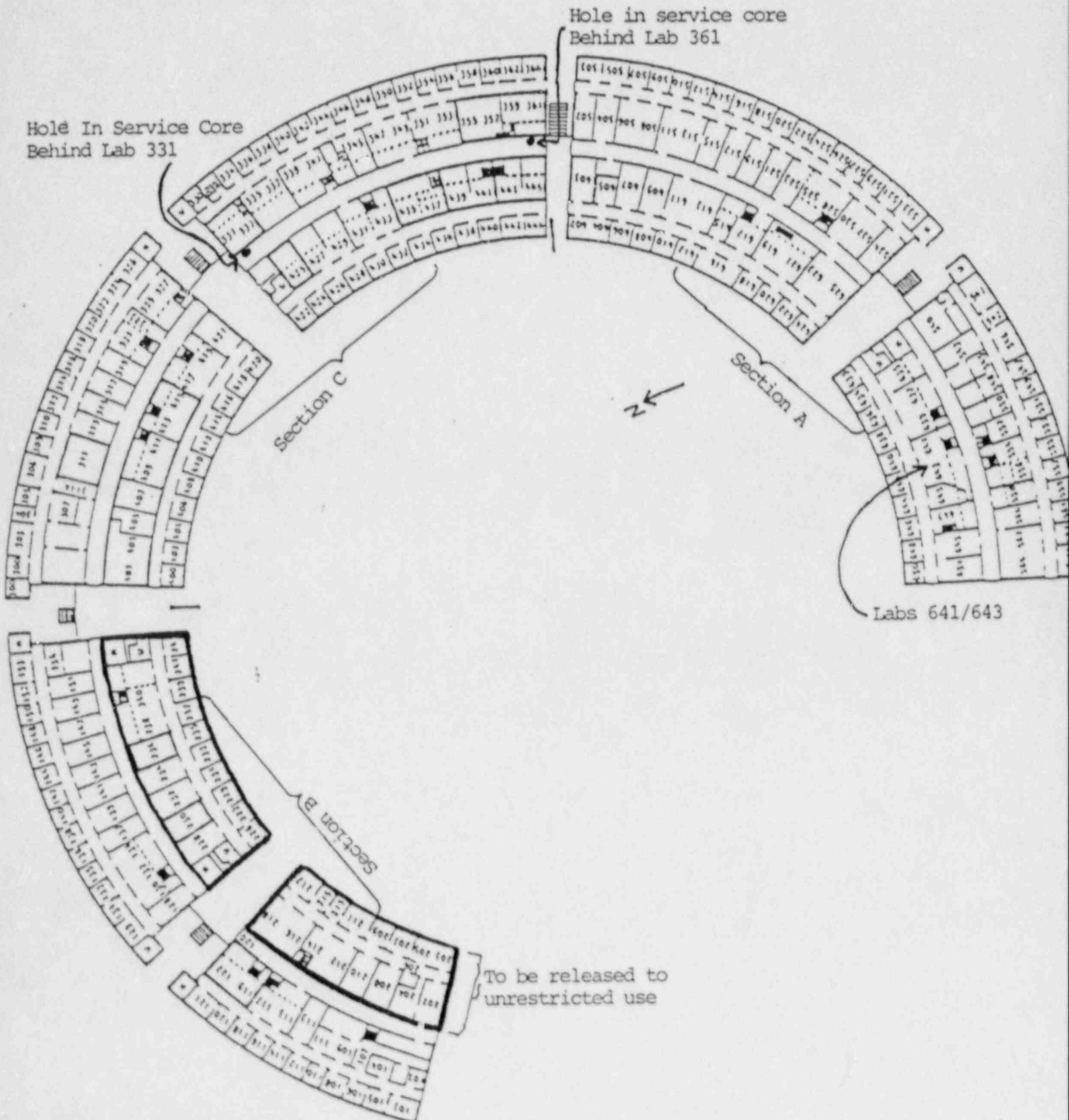
TOTAL COUNT	GROSS COUNT C/M	BKGD COUNT C/M	MINOR COUNT C/M	NET COUNT C/M	ISOTOPE	RESULTS +/- 1S;0** uCi/gram
0	0.00			0.00	Co 60	(0 +/- 5; 5)E -8
-9	-0.15			-0.15	CsD137	(-4 +/- 4; 4)E -8
271	4.52	0.12		4.40	K 40	(2.09 +/- 0.14;0.16)E -5
-1	-0.02			-0.02	PaM234	(0 +/- 6; 6)E -6
57	0.95	0.24	0.23	0.48	U 235	(6 +/- 5; 5)E -8

* DECAY CORRECTION OF NATURAL CHAIN DAUGHTERS PER LONGEST LIVED PARENT

** ESTIMATED RANDOM UNCERTAINTY REPORTED IS ONE STANDARD DEVIATION, 1S. SMALL NEGATIVE AND OTHER RESULTS LESS THAN OR EQUAL TO 2S ARE INTERPRETED BY RESL AS INCLUDING "ZERO" OR AS NOT DETECTED. FOR RESULTS GREATER THAN 2S BUT LESS THAN OR EQUAL TO 3S, DETECTION IS QUESTIONABLE. RESULTS GREATER THAN 3S INDICATE DETECTION. 0 IS THE ESTIMATED OVERALL UNCERTAINTY.

Figure 1

Building 2 Complex (Science Laboratories Building)



LAB A

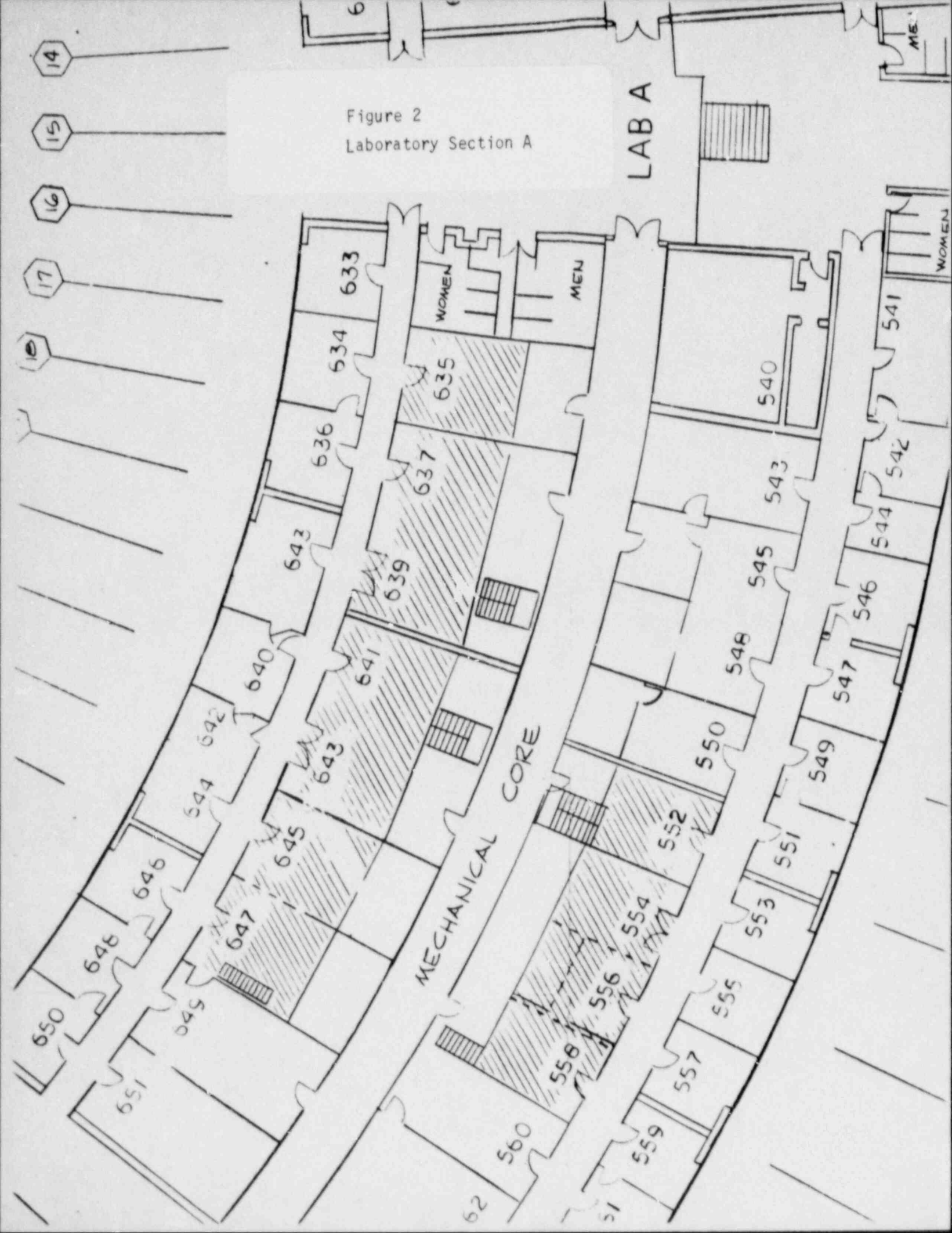
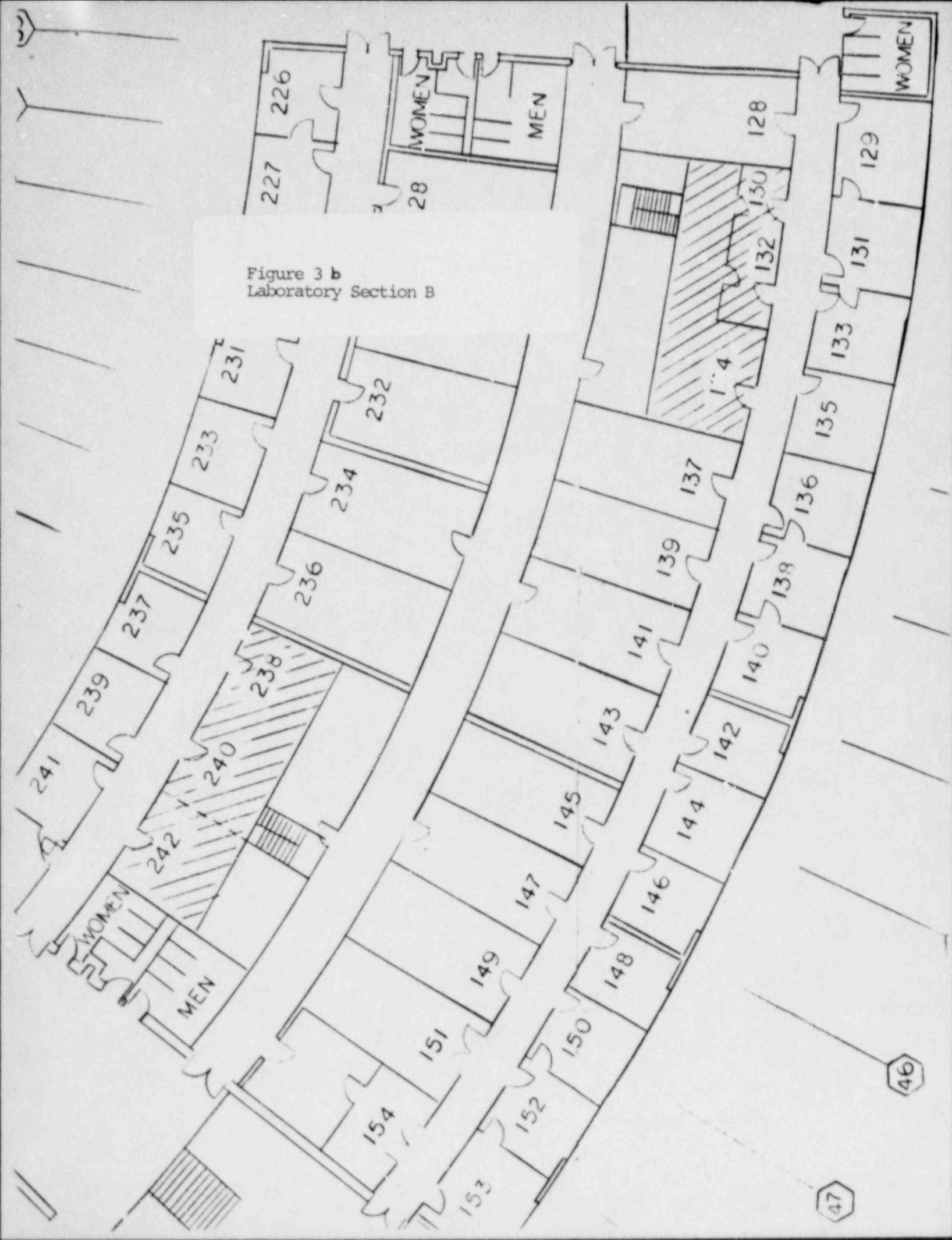


Figure 3 a
Laboratory Section B



Figure 3 b
Laboratory Section B



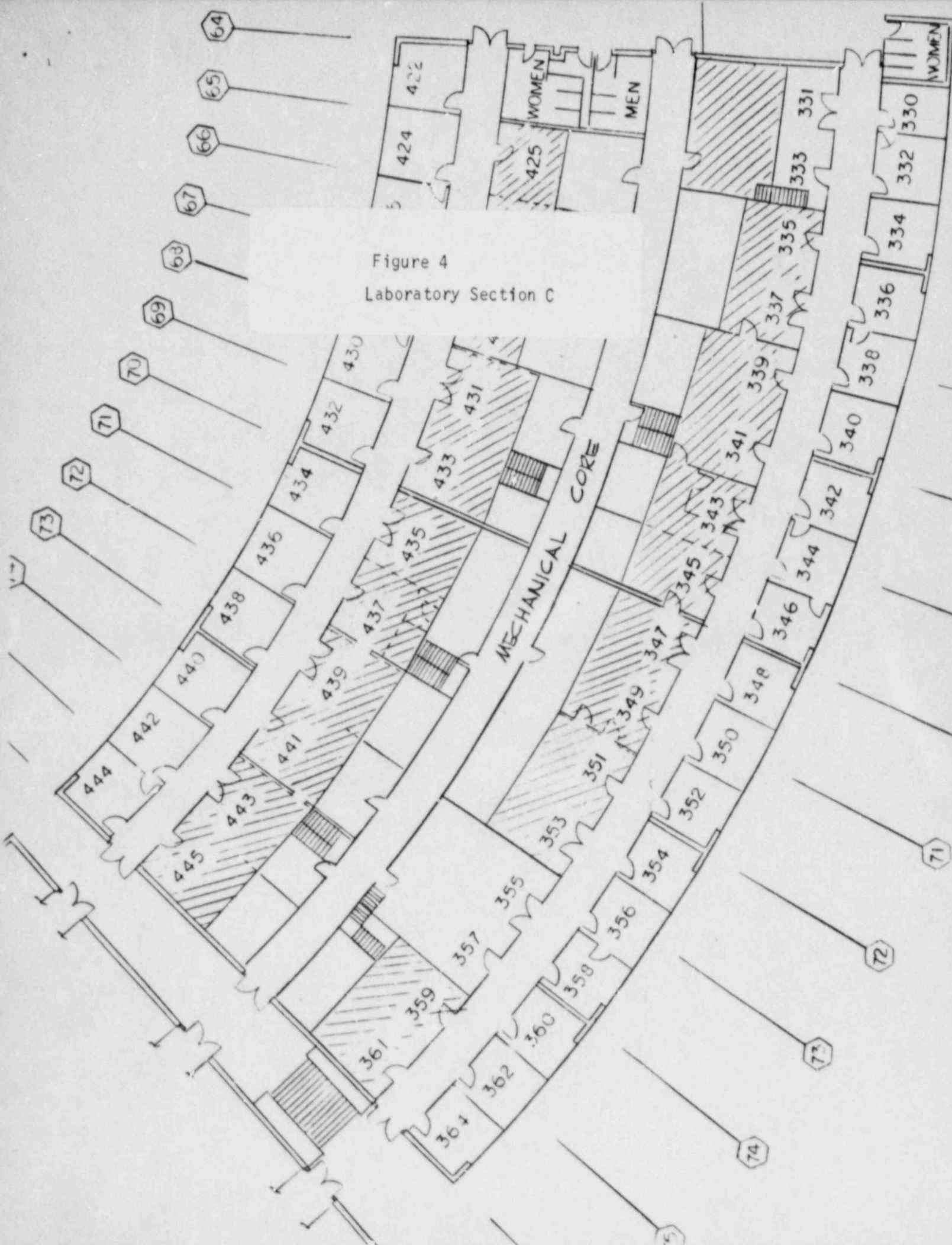


Figure 4
Laboratory Section C