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GENERAL RADIOACTIVE MATERIAL (G-RAM) RADIOLOGICAL FINAL REPORT FOR  
DECOMMISSIONING CHARLESTON NAVAL SHIPYARD VOLUME II SECTION 10 THRU  
SECTION 26 CNC CHARLESTON SC  
4/1/1996  
NAVAL FACILITIES ENGINEERING COMMAND

**GENERAL RADIOACTIVE MATERIAL (G-RAM)  
RADIOLOGICAL FINAL REPORT  
FOR THE DECOMMISSIONING OF  
CHARLESTON NAVAL SHIPYARD**

**(VOLUME II)**

**SECTION 10**

**THRU**

**SECTION 26**

**Prepared by  
Radiological Engineering Division  
Charleston Naval Shipyard  
Charleston, South Carolina**

**April 1, 1996**

**GENERAL RADIOACTIVE MATERIAL (G-RAM)**

**RADIOLOGICAL FINAL REPORT  
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**(VOLUME II)**

**SECTION 10  
THRU  
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### Section 10. Building 58

#### a. Introduction:

Building 58 was constructed in 1940. It is located at Avenue D and McMillan Avenue outside the CIA.

#### (1) Description:

Building 58 is a two-story, office building that faces south off McMillan Avenue. It has an L-shaped floor plan. The east and south ends of the building have a concrete frame. The foundation is poured concrete. The exterior walls are concrete. The northwest corner of the building is constructed of concrete block and, when added in 1973, connected to the east and south sections. A concrete loading dock runs along the north elevation.

#### (2) Brief History:

(a) **Use:** Rooms in this building have been used as office spaces, laboratory, RADIAC storage rooms, and source storage rooms.

(b) **Radiological History:** Building 58 has several areas that received G-RAM surveys.

Rooms 102A and 241 are former RADIAC and source storage rooms. Room 102A is maintained only as a source storage room. Sources stored in room 102A have contained isotopes such as Co-60, Cs-137, Ba-133, Na-22, Cd-109, Co-57, Hg-203, Sn-113, Sr-85, Y-88. Contamination levels were always less than 450  $\mu\mu\text{Ci}/100\text{cm}^2$  equivalent Cobalt 60. Room 241 has been a radioactive material storage area since the mid-1970s and has since been converted to an office.

Rooms 101 and 109 are former internal monitoring and environmental sample counting rooms used to support the radiation health responsibilities of the Radiation Health Division. Both of these rooms are now office spaces. Room 205, immediately adjacent to the former Industrial Hygiene Laboratory, was used as a support area for the laboratory. Room 205 is presently a lavatory.

Rooms 207 and 208 served as the Industrial Hygiene Laboratory which had some of the same functions as the current Radiation Health Division. Both rooms are now offices.

Room 238 is the former location of the room which accommodated some of the activities of the Industrial Hygiene Laboratory. In this room, Sr-90 response check sources installed

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on the AN/PDR-18, high range beta-gamma survey meter were routinely leak checked. Radiological history indicates that small, isolated spills from the Sr-90 check sources occurred during the inspection and leak test of the RADIACs. This room is currently an office.

Rooms 101, 102A, 109, 205 and 241 received a Class B release survey. History also indicates that the laboratories had the same potential for contamination. Therefore, Rooms 207/208 and 238 received a Class B release survey.

#### (3) Survey Requirements:

(a) Class B release survey.

#### b. Discussion:

The floor of Building 58 was divided into a total of 24 grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into 56 grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

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Background levels used in Building 58 were determined from similar materials in Building 233.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect any areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect any areas greater than or equal to twice background.

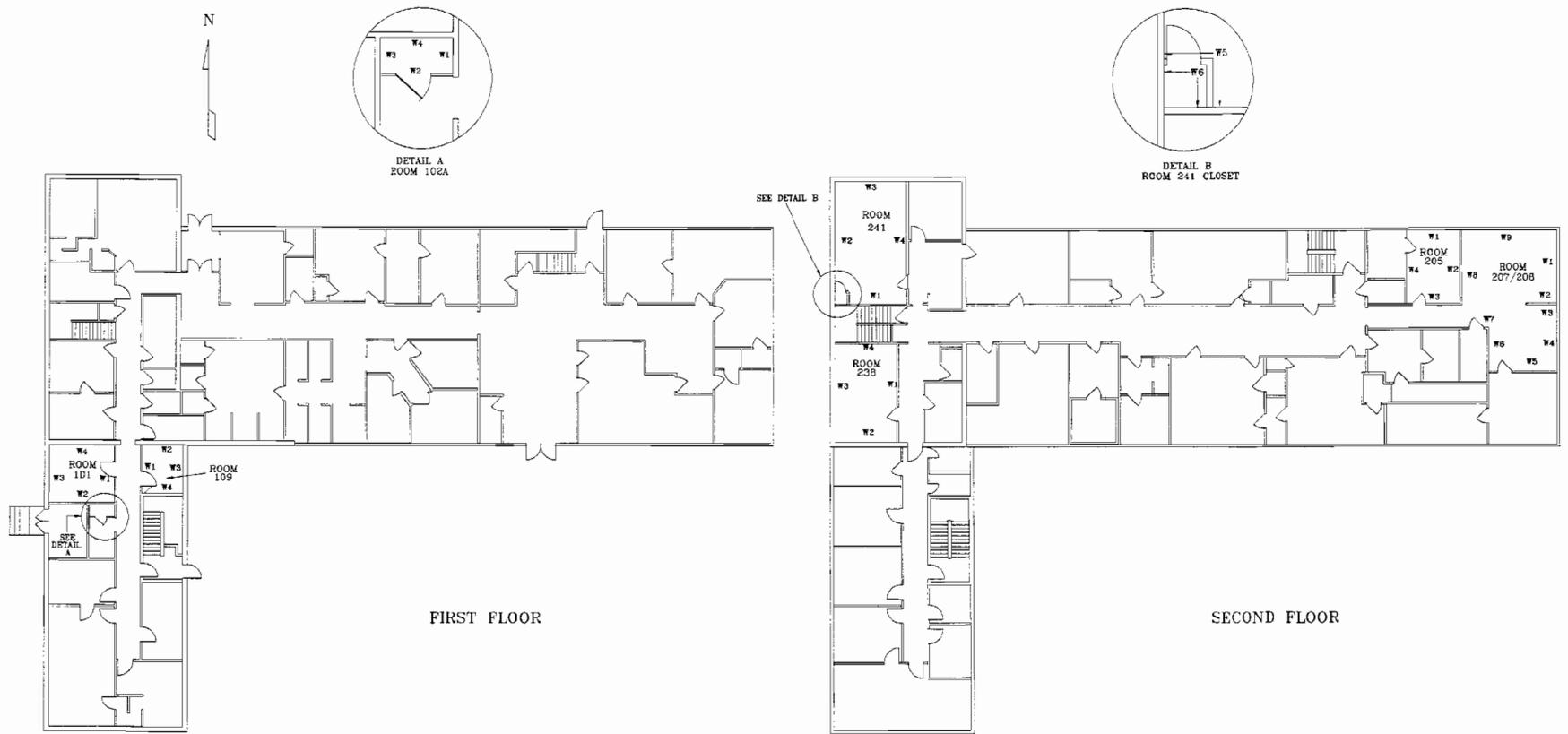
Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels ranged from a low of less than 0.52 pCi/100 cm<sup>2</sup> to a high of 1.99 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.15 pCi/g to a high of 1.57 pCi/g and Th-232 solid material samples ranged from a low of 0.15 pCi/g to a high of 2.40 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 1.00 pCi/100 cm<sup>2</sup> to a high of less than 41.10 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 3.00 pCi/100 cm<sup>2</sup> to a high of less than 84.00 pCi/100 cm<sup>2</sup>.

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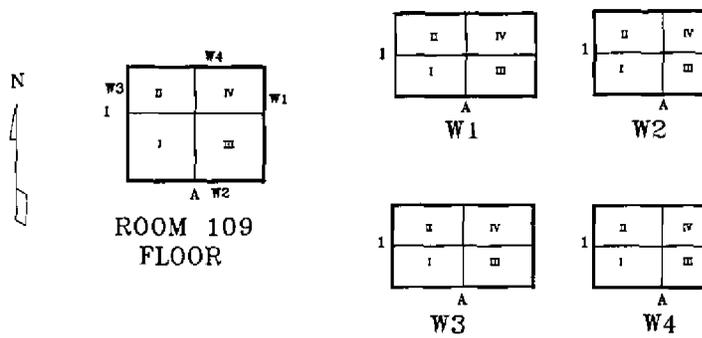
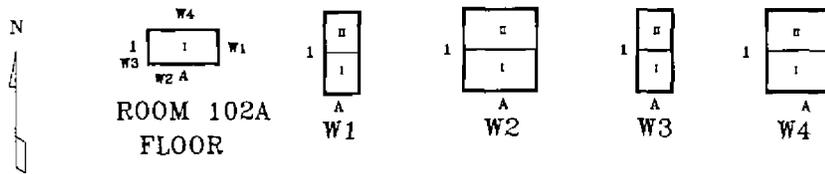
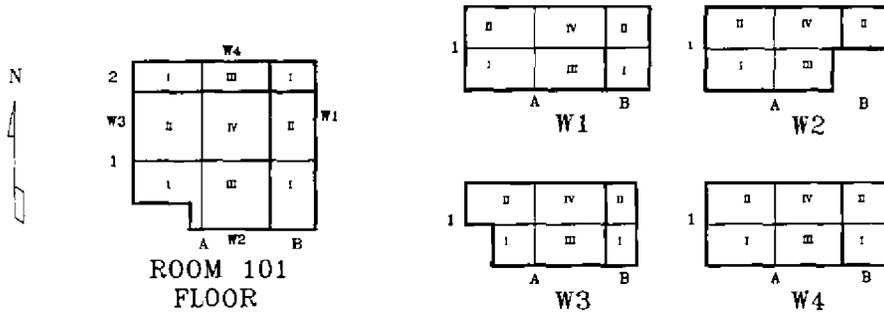
d. Site Map



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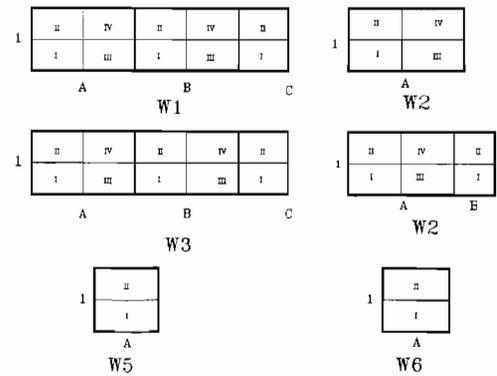
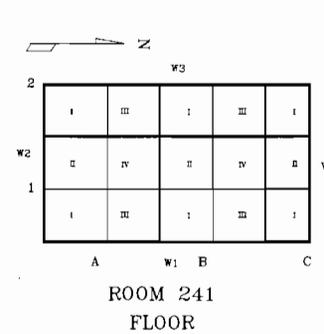
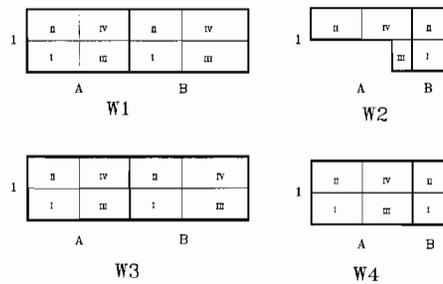
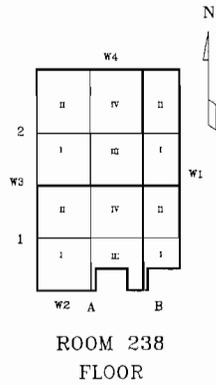
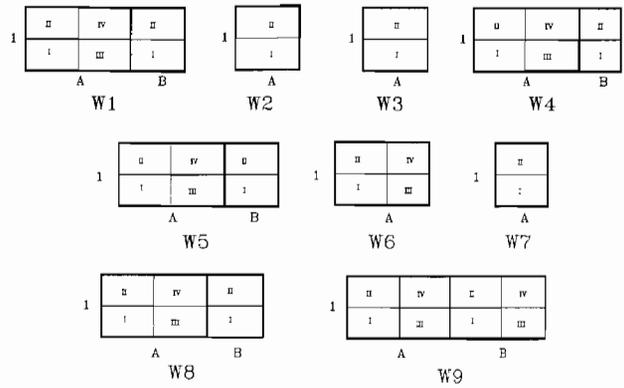
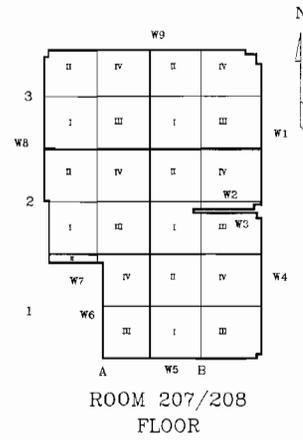
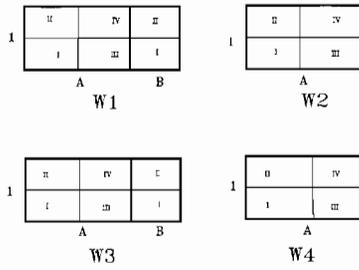
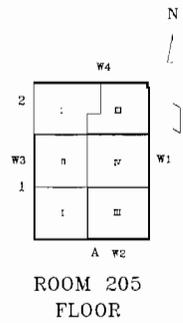
e. Overall Grid Map



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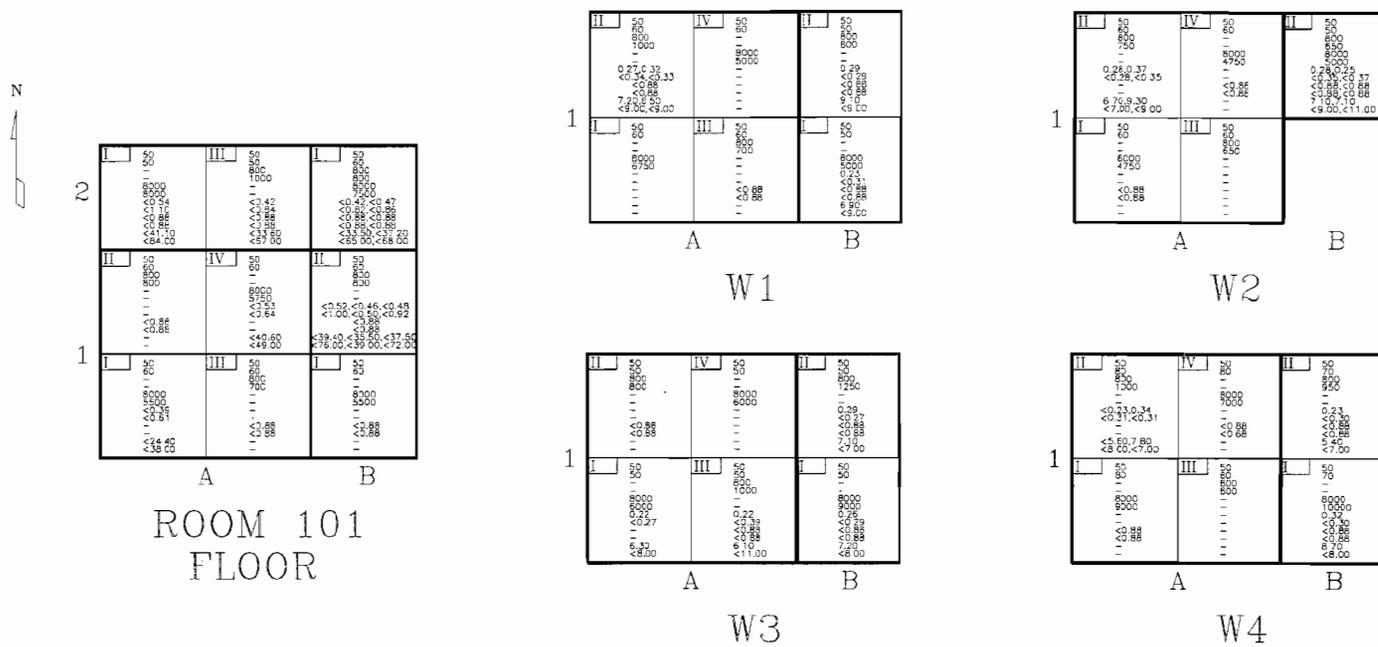
e. Overall Grid Map



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e. Localized Grid Map



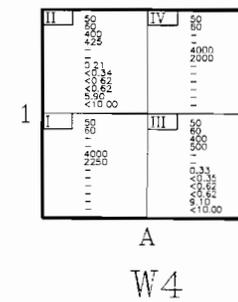
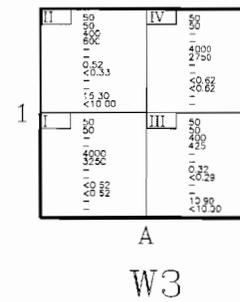
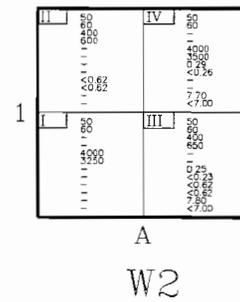
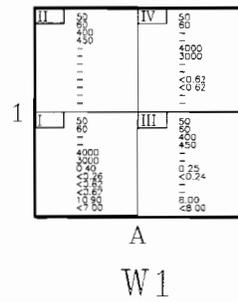
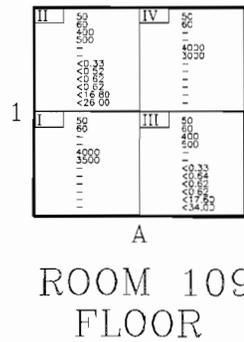
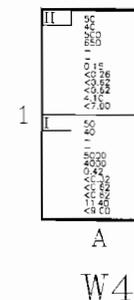
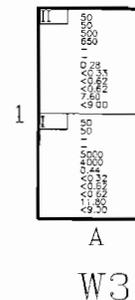
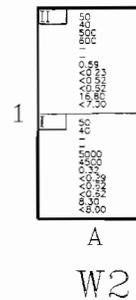
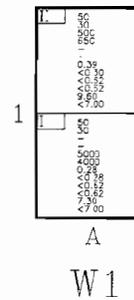
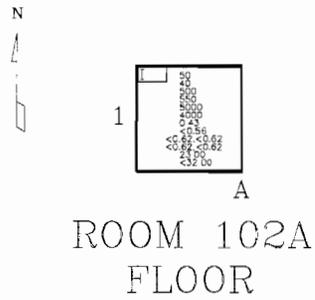
Data Legend

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| 2 - Iu-247/PC [cpm]              | 8 - Th-232 Solid Sample Radioactivity [pCi/g] Regulator value: <5 above bkg. of 3.2 pCi/g |
| 3 - Iu-235/PC (HV-1 PHA) [pug]   | 9 - Re-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <9          |
| 4 - Iu-235/PC (HV-1 PHA) [cpm]   | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <90        |
| 5 - Iu-235/PC (HV-2 GROSS) [pug] | 11 - Re-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <45          |
| 6 - Iu-235/PC (HV-2 GROSS) [cpm] | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <450         |

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e. Localized Grid Map



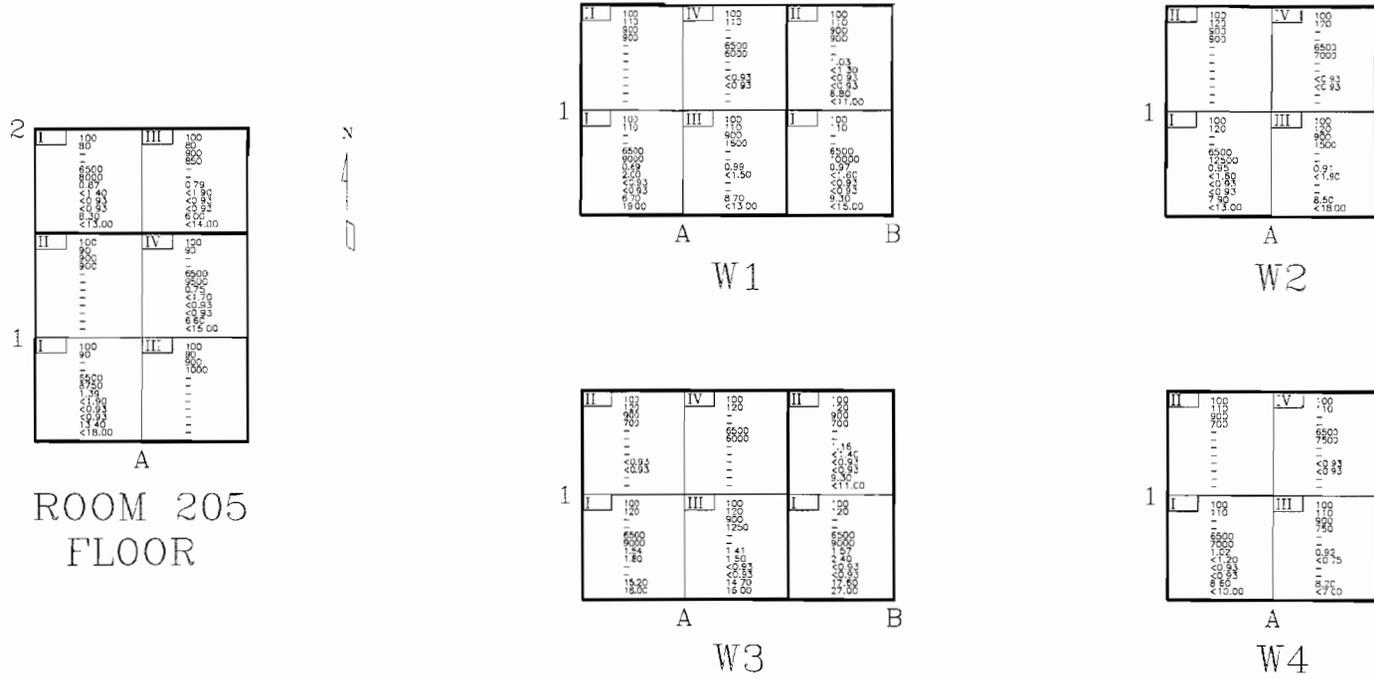
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1 - M-247/PD [bkg]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
2 - M-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <8 above bkg. of 3.2 pCi/g
3 - M-253/PD [IV-1] [pHA] [bkg]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9
4 - M-253/PD [IV-1] [pHA] [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9
5 - M-253/PD [IV-2] GROSS [dwc]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45
6 - M-253/PD [IV-2] GROSS [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45

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e. Localized Grid Map

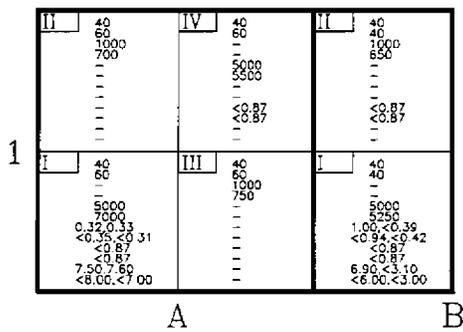




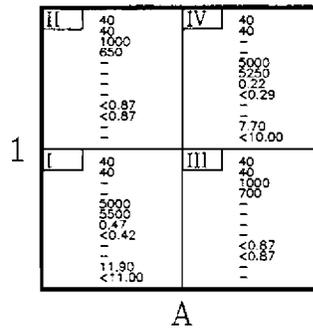
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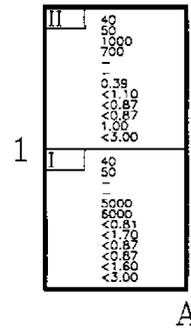
### e. Localized Grid Map



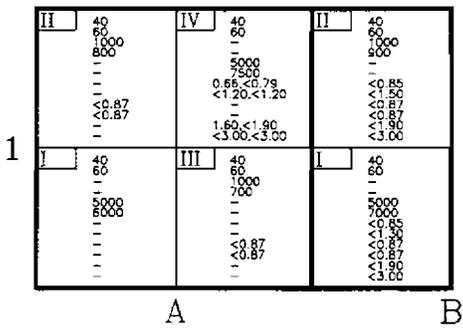
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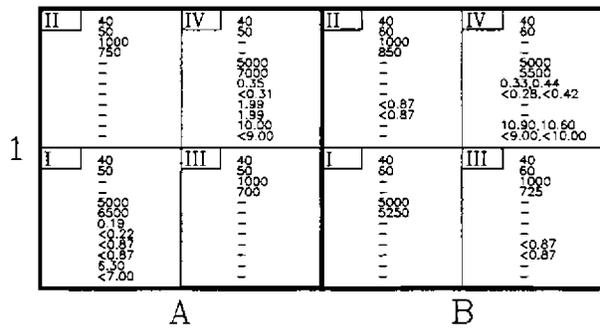
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W7



W8



W9

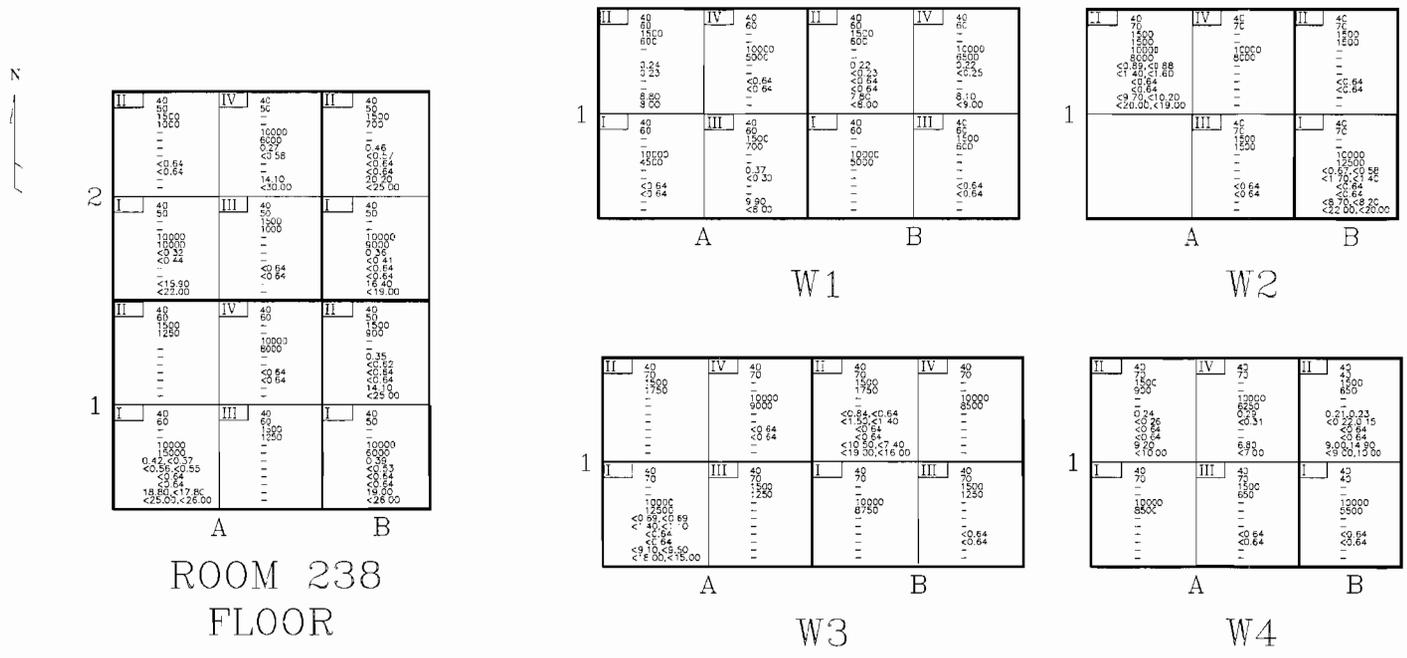
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1 - IM-247/PD [bkg.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
2 - IM-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
3 - IM-253/PD (HV-1 PHA) [bkg.]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9
4 - IM-253/PD (HV-1 PHA) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90
5 - IM-253/PD (HV-2 GROSS) [bkg.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45
6 - IM-253/PD (HV-2 GROSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450

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e. Localized Grid Map



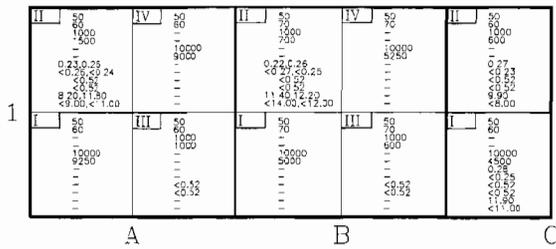
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2 - Iw-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g] Regulator value: <5 above bkg. of 32 pCi/g
3 - Iw-253/PD [Bq - PhA] [Bq]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <9
4 - Iw-253/PD [Bq - PhA] [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <90
5 - Iw-253/PD [Bq - 2 GROSS] [Bq]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <45
6 - Iw-253/PD [Bq - 2 GROSS] [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ] Regulator value: <450

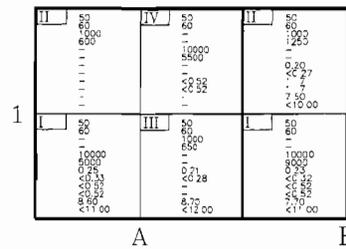
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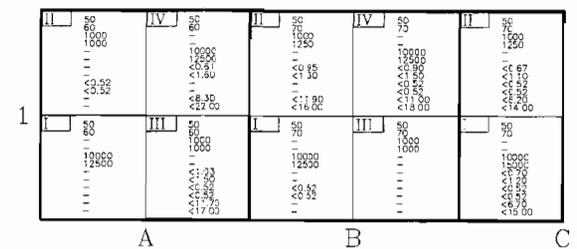
e. Localized Grid Map



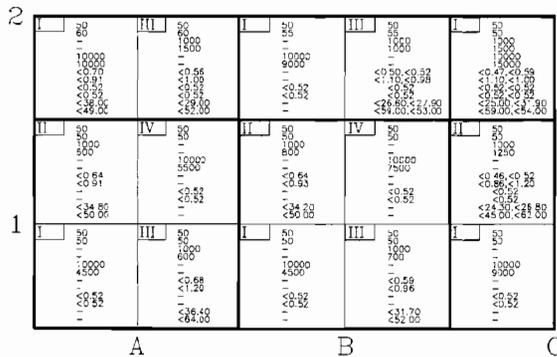
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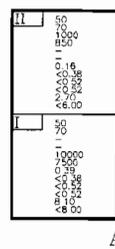
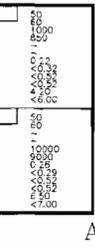
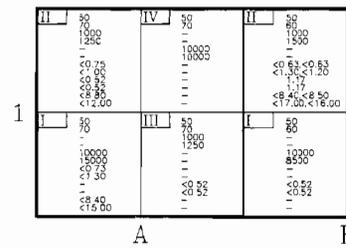
W2



W3



ROOM 241 FLOOR



W4

W5

W6

Data Legend  
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 2 - W-247/PD [cpm]  
 3 - W-253/PD (W-1) [bq/g]  
 4 - W-253/PD

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f. Photographs

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Room 101, viewing west.

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Section 10. Building 58

f. Photographs

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Room 102A, viewing west.

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Section 10. Building 58

f. Photographs

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Room 102A, viewing east.

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Section 10. Building 58

f. Photographs

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Room 109, viewing east.

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f. Photographs

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Room 205, viewing north.

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Section 10. Building 58

f. Photographs

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Room 205, viewing south.

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Section 10. Building 58

f. Photographs

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Room 207/208, W3,W8 & W9, viewing north.

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Section 10. Building 58

f. Photographs

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Room 207/208, W1 & W9 viewing, northeast.

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Section 10. Building 58

f. Photographs

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Room 207/208, W2, W4 & W5, viewing southeast.

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Section 10. Building 58

f. Photographs

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Room 238, W1 & W2, viewing southeast.

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Section 10. Building 58

f. Photographs

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Room 238, W2 & W3, viewing northwest.

CNSY G-RAM FINAL REPORT

Section 10. Building 58

f. Photographs

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Room 241, viewing south.

CNSY G-RAM FINAL REPORT

Section 10. Building 58

f. Photographs

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Room 241, viewing north.

# CNSY G-RAM FINAL REPORT

## Section 11. Building 59/59A

### a. Introduction:

Building 59 was built in 1940 as a Shipfitter's Lay-out Area. Building 59A was added to the east end of Building 59 in 1972 as a Sheet Metal Shop. Building 59A was maintained as a Sheet Metal shop.

#### (1) Description:

Building 59/59A is a one-story industrial building oriented northeast to southwest along First Street in the Controlled Industrial Area. It adjoins Building 2A along its entire south wall. The foundation is poured concrete with concrete walls.

#### (2) Brief History:

(a) **Use:** Building 59/59A has been used as a Shipfitter Lay-out area, a Boiler Shop, and Sheet Metal work area.

(b) **Radiological History:** In an area towards the east end of the building, tungsten welding rods were handled, stored and prepared. No other radiological work operations were performed in this area. Radiological history indicates that no loose surface contamination above the limit has been detected.

#### (3) Survey Requirements:

(a) Class B release survey.

### b. Discussion:

The floors were divided into a total of 20 grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into 30 grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD survey is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid. Solid samples for greater than or equal to twice background surveys are taken only in the sub-grid(s) that contain the twice background area(s).

## **CNSY G-RAM FINAL REPORT**

### **Section 11. Building 59/59A**

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 59/59A were determined from similar materials in Building 672.

Supplemental Surveys were taken after ventilation system filter housings were opened and the filters disposed of as General Radioactive Material waste.

The portable flexible exhaust system ducts in the overhead center of the room were removed. All accessible surfaces inside the ducts were surveyed.

Selected locations in the permanent exhaust ducting were opened and the accessible internal surfaces surveyed.

#### **c. Summary:**

Initial surveys and solid material samples indicated the presence of Thorium 232 on Floor 3 and Wall 3. Floor 3 grids A1 and A2 in a small area, approximately 6 inches wide and 15 feet long along wall 13, indicated the following IM 247/PD and IM 253/PD (HV-1 PHA and HV-2 GROSS) results, respectively: 800 cpm above a background of 40 cpm; 7000 cpm compared to a background of 750 cpm; and 50000 cpm compared to a background of 7500. This small area was remediated based on these direct instrument readings. Additional remediation from Floor 3 was based on solid sample results from the remaining affected area of Floor 3, grid A1, approximately 36 square feet. The solid sample activity of this area was approximately 10.7 pCi/g. These levels were fairly uniform throughout the affected areas. Wall 3 had a small area in grid A1, approximately 6 square feet, which had levels as high as 48.0 pCi/g. Remediation was performed on these areas, and the post remediation results are summarized below on the localized grid maps.

Surveys performed with the IM-247/PD did not detect any areas having surface

## CNSY G-RAM FINAL REPORT

### Section 11. Building 59/59A

radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 11 areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) detected five areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 levels ranged from a low of less than 0.59 pCi/100 cm<sup>2</sup> to a high of 2.35 pCi/100 cm<sup>2</sup> and removable Th-232 levels ranged from a low of less than 0.59 pCi/100 cm<sup>2</sup> to a high of 2.35 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.48 pCi/g to a high of 4.14 pCi/g and Th-232 solid material samples ranged from a low of less than 0.26 pCi/g to a high of 7.30 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 0.90 pCi/100 cm<sup>2</sup> to a high of 29.80 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 1.00 pCi/100 cm<sup>2</sup> to a high of less than 67.00 pCi/100 cm<sup>2</sup>.

Solid material samples from portions of grids W2-B-1, W3-A-1, and F3-A-1 were found to be in excess of the allowable limits. In these areas, loose thoriated tungsten welding rod debris was removed by vacuuming and the concrete material removed and disposed of as General Radioactive Material waste.

CNSY G-RAM FINAL REPORT

Section 11. Building 59/59A

d. Site Map

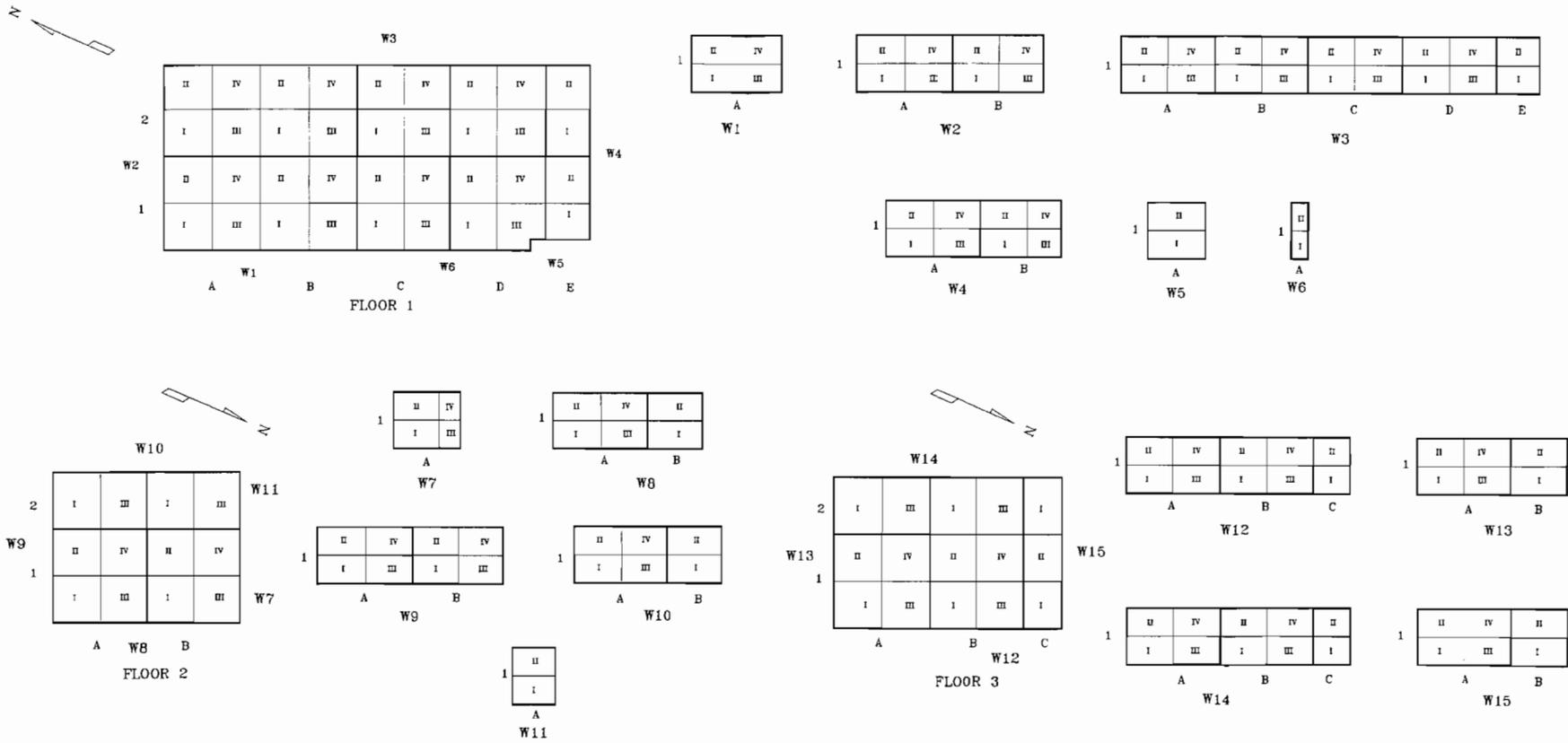


ROD ROOM, WELDING ROD  
STORAGE, ISSUE & PREP AREA

CNSY G-RAM FINAL REPORT

Section 11. Building 59/59A

e. Overall Grid Map

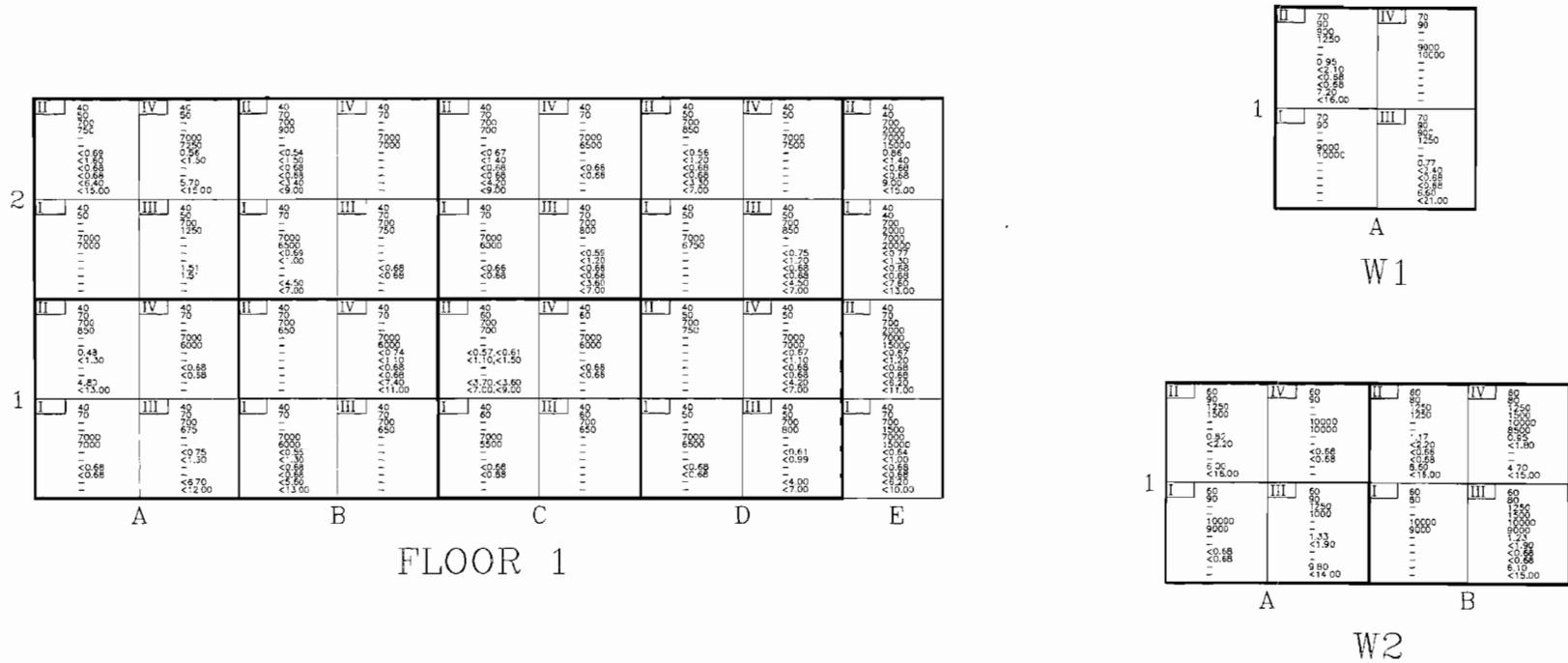




CNSY G-RAM FINAL REPORT

Section 11. Building 59/59A

e. Localized Grid Map



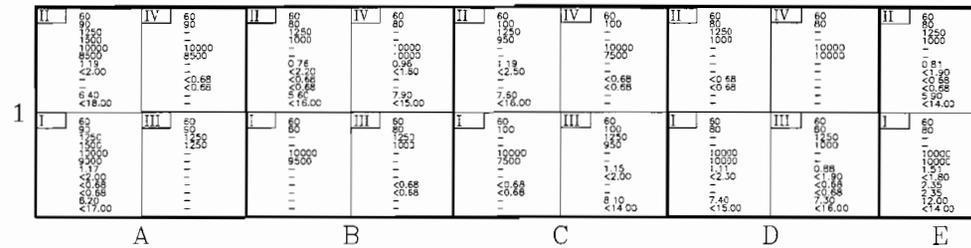
FLOOR 1

- Data Legend:
- 1 - M-247/PD [Bq]
  - 2 - M-247/PD [cpm]
  - 3 - M-253/PD [Bq]
  - 4 - M-253/PD (HV-1 PHA) [cpm]
  - 5 - M-253/PD (HV-2 GROSS) [Bq]
  - 6 - M-253/PD (HV-2 GROSS) [cpm]
  - 7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above the. of 2.3 pCi/g
  - 8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above the. of 3.2 pCi/g
  - 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9
  - 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <90
  - 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <45
  - 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <450

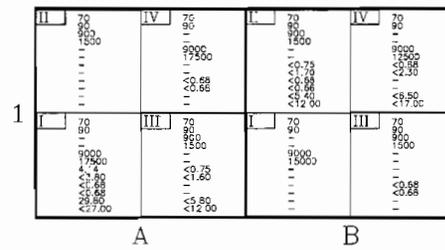
CNSY G-RAM FINAL REPORT

Section 11. Building 59/59A

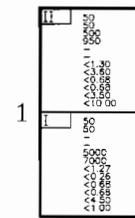
e. Localized Grid Map



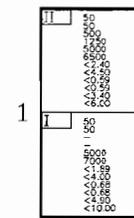
W3



W4



W5



W6

Data Legend:

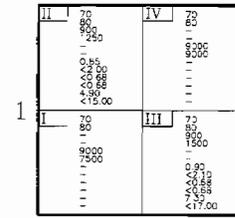
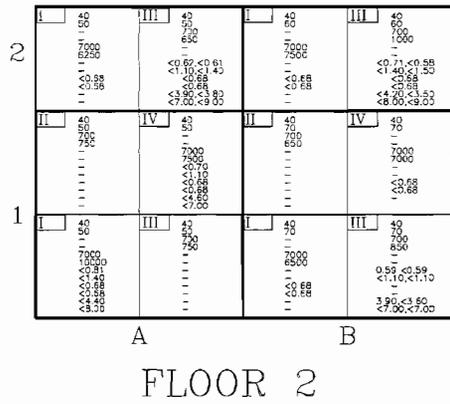
- 1 - M-247/PD [bkg.]
- 2 - M-247/PD [cpm]
- 3 - M-253/PD (HV-1 PHA) [bkg.]
- 4 - M-253/PD (HV-1 PHA) [cpm]
- 5 - M-253/PD (HV-2 GROSS) [bkg.]
- 6 - M-253/PD (HV-2 GROSS) [cpm]

- 7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <5
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <50
- 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <450

CNSY G-RAM FINAL REPORT

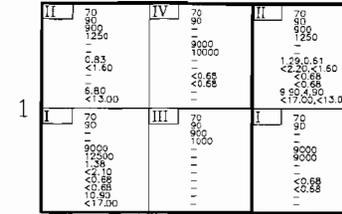
Section 11. Building 59/59A

e. Localized Grid Map



A

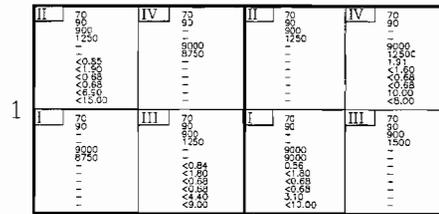
W7



A

B

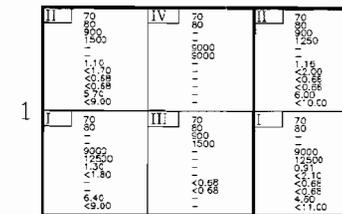
W8



A

B

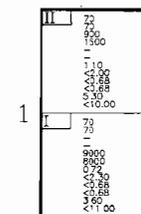
W9



A

B

W10



A

W11

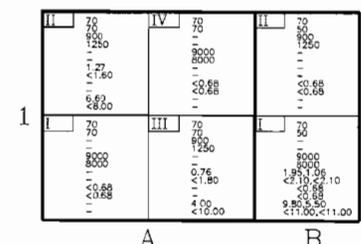
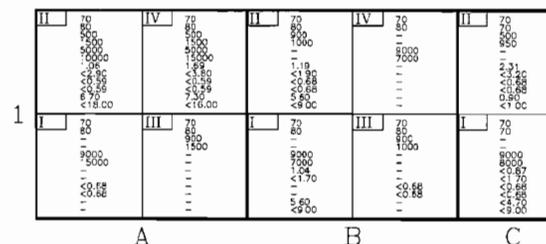
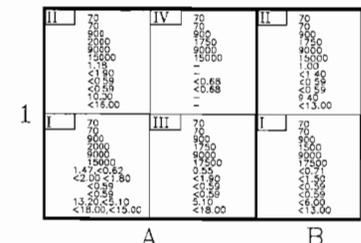
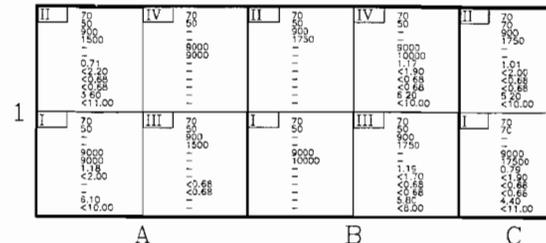
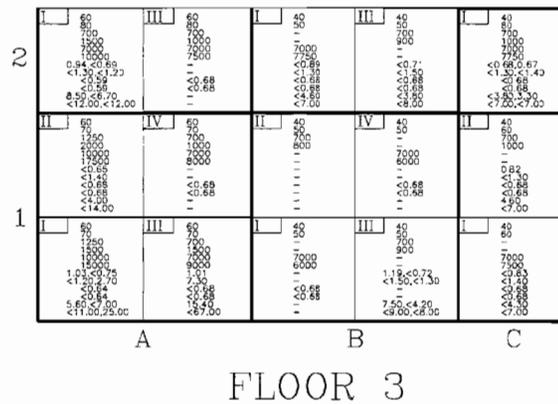
Data Legend:  
 1 - M-247/PP [bkg]  
 2 - M-247/PP [cpm]  
 3 - M-253/PP (HV-1 PHA) [bkg]  
 4 - M-253/PP (HV-1 PHA) [cpm]  
 5 - M-253/PP (HV-2 GROSS) [bkg]  
 6 - M-253/PP (HV-2 GROSS) [cpm]

7 - Ra-226 Salt Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Th-232 Salt Sample Radioactivity [pCi/g], Regulator value: <3 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 11. Building 59/59A

e. Localized Grid Map



Data Legend:  
 1 - M-247/PD [bkg.]  
 2 - M-247/PD [cpm]  
 3 - M-253/PD HV-1 PHA [dkt.]  
 4 - M-253/PD HV-1 PHA [cpm]  
 5 - M-253/PD HV-2 GROSS [dkt.]  
 6 - M-253/PD HV-2 GROSS [cpm]

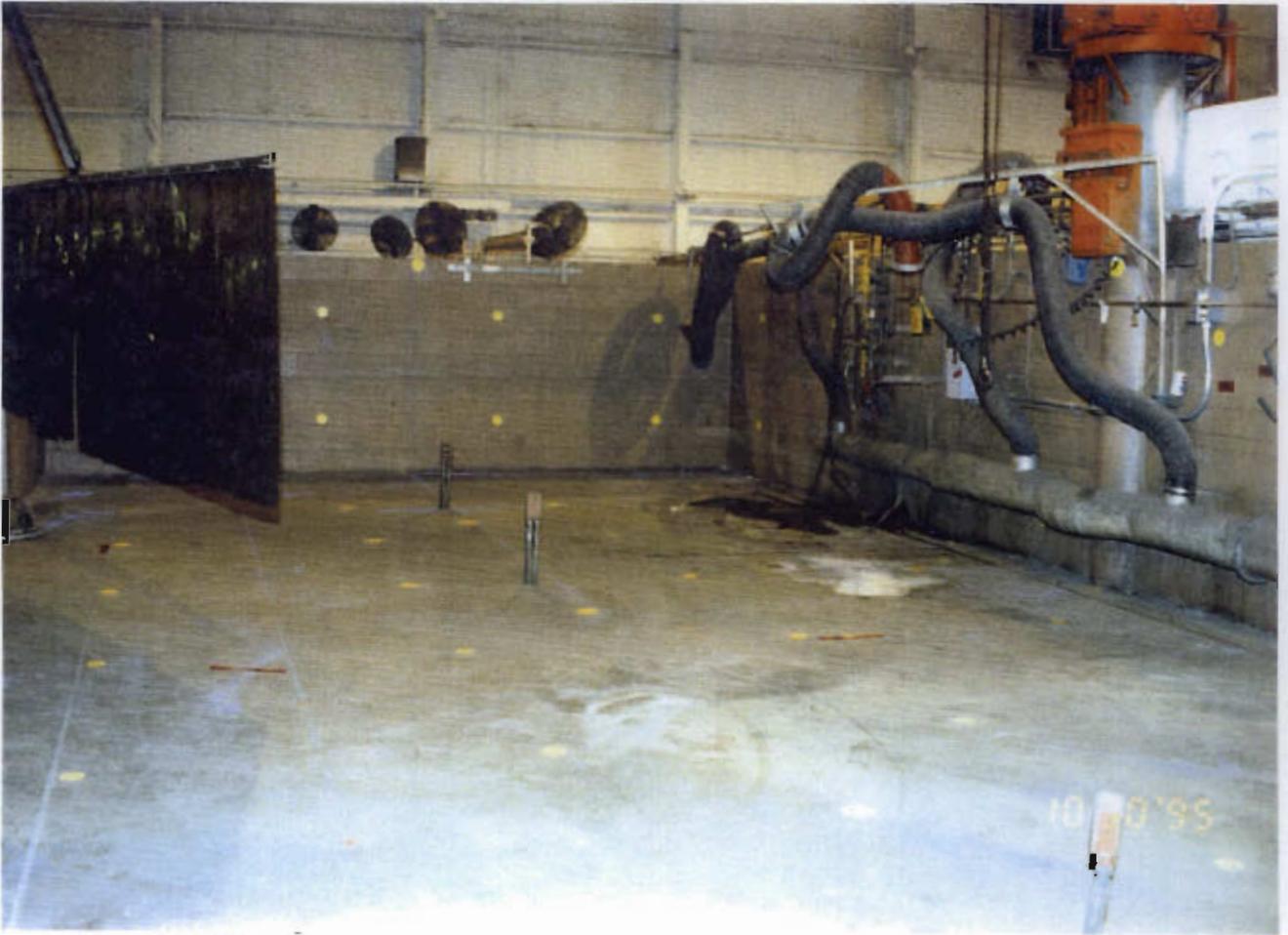
7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 11. Building 59/59A

f. Photographs

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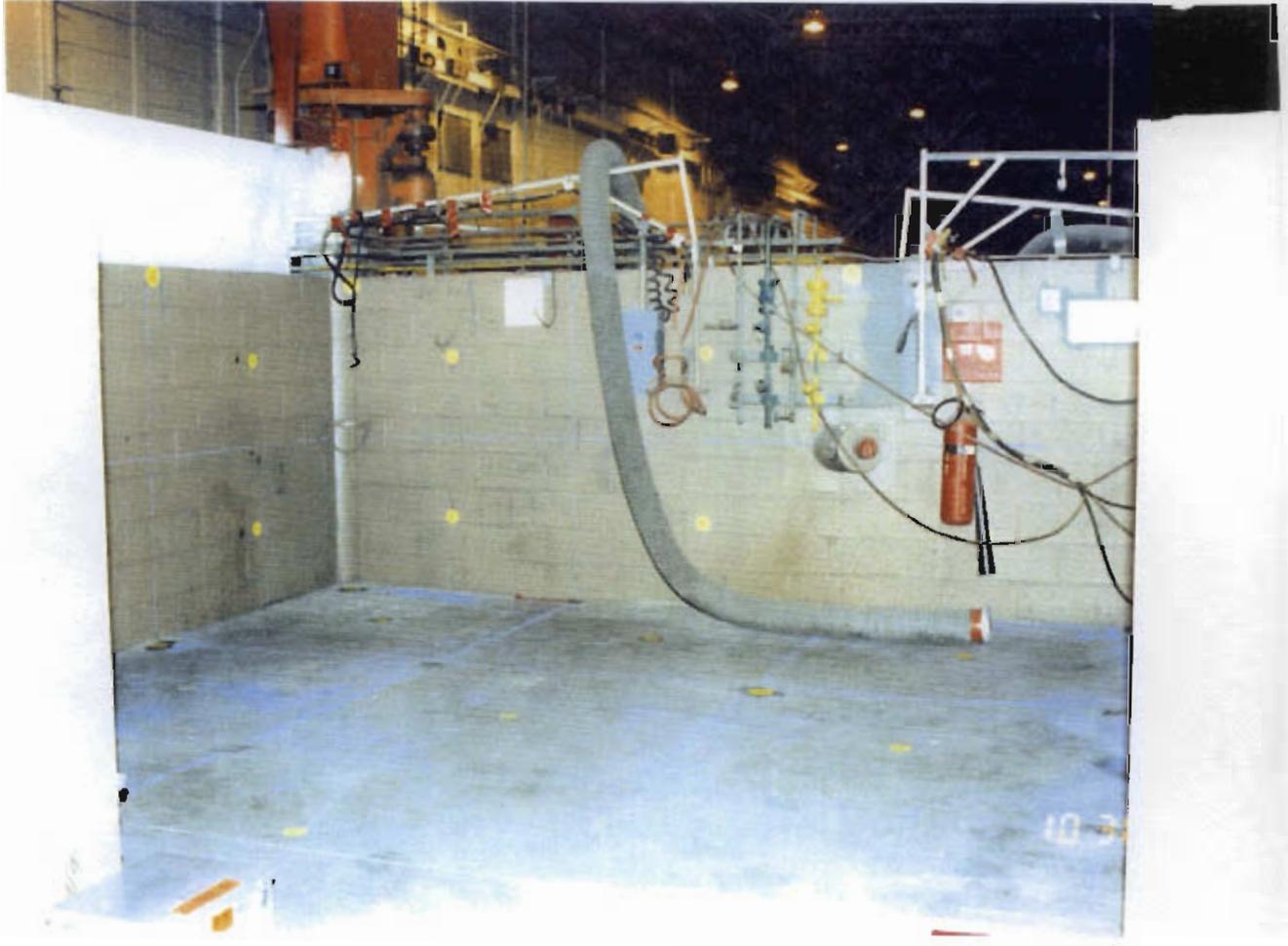
Rod Room, Welding Rod Storage, Issue & Prep Area, floor area 1.

**CNSY G-RAM FINAL REPORT**

**Section 11. Building 59/59A**

**f. Photographs**

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**Rod Room, Welding Rod Storage, Issue & Prep Area, floor area 2.**

**CNSY G-RAM FINAL REPORT**

**Section 11. Building 59/59A**

**f. Photographs**

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**Rod Room, Welding Rod Storage, Issue & Prep Area, floor area 3.**

## CNSY G-RAM FINAL REPORT

### Section 12. Building 62

#### a. Introduction:

Building 62 was built in 1942 as a Storage Building and Latrine. It is a rectangular building located on Roe Street that runs parallel to Pier C.

##### (1) Description:

The concrete block building sits on a concrete foundation. It presently serves as a waterfront support facility.

##### (2) Brief History:

(a) **Use:** In Shop Number 2 of Building 62, tungsten welding rods were handled, stored and prepared.

(b) **Radiological History:** No other radiological work operations were performed in this area. Radiological history indicates that no loose surface contamination above the limit has been detected.

##### (3) Survey Requirements:

(a) Class B release survey.

#### b. Discussion:

The floor of Shop Number 2, in Building 62, was divided into a total of two grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The wall was horizontally marked as one grid with a maximum size of 6' high and 10' wide. The wall grid was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD survey is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent

## CNSY G-RAM FINAL REPORT

### Section 12. Building 62

the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 62 Rod Room were determined from similar materials in Building 1489.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

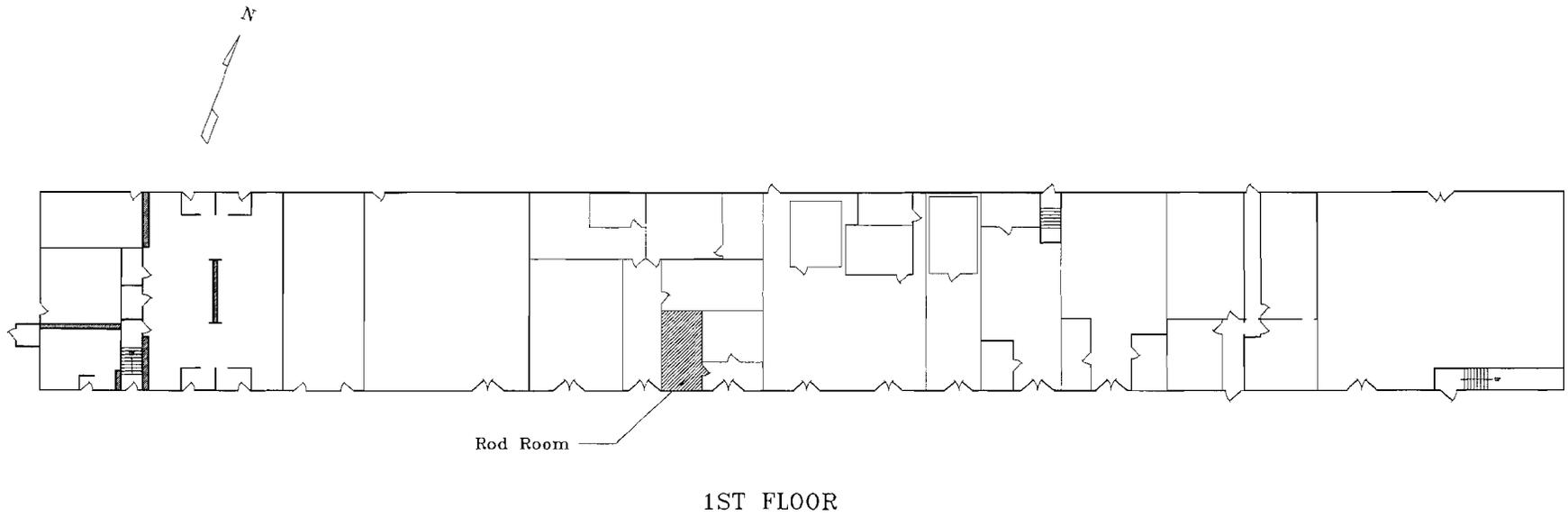
Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 level was less than 0.68 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.39 pCi/g to a high of less than 2.63 pCi/g and Th-232 solid material samples ranged from a low of less than 0.99 pCi/g to a high of less than 4.40 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 0.50 pCi/100 cm<sup>2</sup> to a high of less than 5.30 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 5.00 pCi/100 cm<sup>2</sup> to a high of less than 12.00 pCi/100 cm<sup>2</sup>.

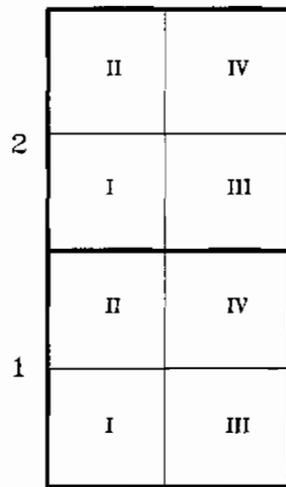
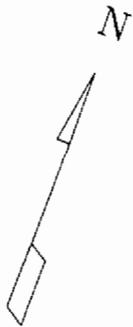


CNSY G-RAM FINAL REPORT

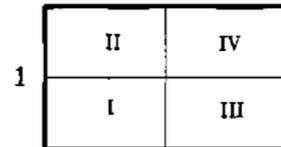
Section 12. Building 62

e. Overall Grid Map

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A W1  
FLOOR

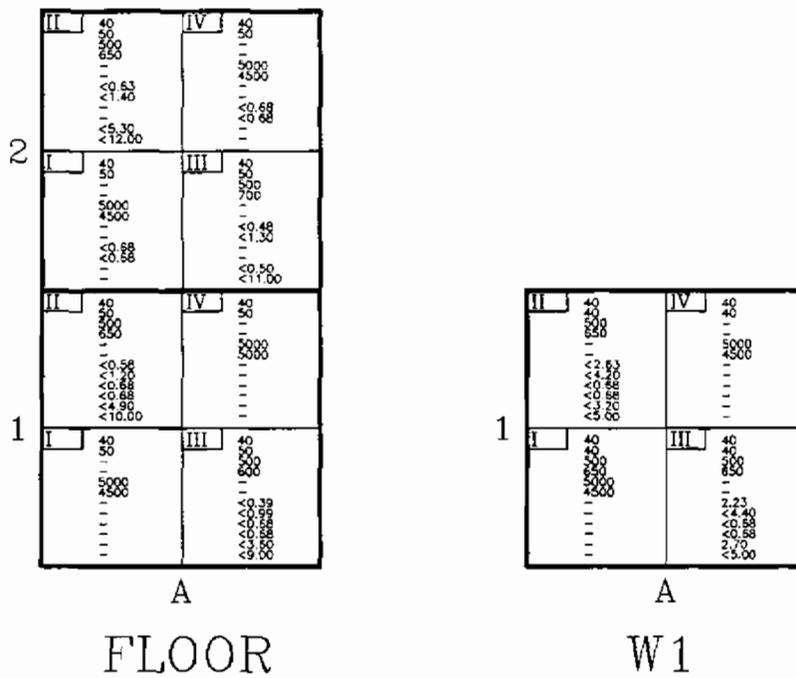


A W1

# CNSY G-RAM FINAL REPORT

## Section 12. Building 62

### e. Localized Grid Map



Data Legend:

- 1 - IM-247/PD [bkg.]
- 2 - IM-247/PD [cpm]
- 3 - IM-253/PD [bkg.]
- 4 - IM-253/PD (HV-1 PHA) [cpm]
- 5 - IM-253/PD (HV-2 GROSS) [bkg.]
- 6 - IM-253/PD (HV-2 GROSS) [cpm]

- 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90
- 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 12. Building 62

f. Photographs

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Building 62, viewing southeast.

## CNSY G-RAM FINAL REPORT

### Section 13. Building 79

#### a. Introduction:

Building 79 first appears on installation maps in 1941. It is located on River Road in the Controlled Industrial Area.

#### (1) Description:

Building 79 is a one and one-half story building approximately 550' long by 125' wide. The metal frame building sits on a concrete slab foundation. The walls are poured concrete, covered with corrugated metal at the roof level. The most current use for this building was for housing both a nuclear repair shop and an administrative office building.

#### (2) Brief History:

(a) **Use:** Building 79 was originally constructed as an Ordinance Shop, however, was most recently used as a Nuclear Repair and Administration Shop.

(b) **Radiological History:** Building 79 has several areas that received a G-RAM release survey. Radiological history indicates that the southeast corner of the building was used to store RADIACs and associated radioactive response check sources. Also, a spread of loose surface contamination, whose source was damaged radium markers (buttons), occurred in the office space located at the southeast corner. Contamination from this spill was tracked into numerous offices. Contamination was detected as far as midway down the office complex along the east section of the building. This office area is the former location of the Nuclear Engineering and Planning Department. These office areas were decontaminated; and following the spill and subsequent cleanup, no loose surface contamination above the limit was ever detected.

The original spill location received a Class C release survey. The remaining portions of the specific site received a Class B release survey.

#### (3) Survey Requirements:

(a) Class B release survey.

(b) Class C release survey.

#### b. Discussion:

## **CNSY G-RAM FINAL REPORT**

### **Section 13. Building 79**

#### **(1) Class B**

The floor of Building 79 was divided into a total of 105 grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into 46 grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD survey is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid. Solid samples for greater than or equal to twice background surveys are taken only in the sub-grid(s) that contain the twice background area(s).

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 79 were determined from similar materials in Building 400.

#### **(2) Class C**

The floor of Building 79 was divided into 56 grids with a maximum size of 5' by 5'.

The walls were horizontally divided into 22 grids with a maximum size of 6' high and 5' wide.

## CNSY G-RAM FINAL REPORT

### Section 13. Building 79

Each grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over 100% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over 100% of the grid surface.

A minimum of one swipe/smear was taken in each grid.

A minimum of 25% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material sample was removed from the grid location having the highest potential for radioactivity.

Background levels used in Building 79 were determined from similar materials in Building 400.

#### c. Summary:

##### (1) Class B

Surveys performed with the IM-247/PD in the Class B areas detected two areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) detected 15 areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) detected 12 areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The alpha/beta analyzer results indicated removable Ra-226 and Th-232 levels ranged from a low of less than 0.66 pCi/100 cm<sup>2</sup> to a high of 1.57 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis

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performed on Ra-226 solid material samples ranged from a low of 0.12 pCi/g to a high of 2.59 pCi/g and Th-232 solid material samples ranged from a low of less than 0.13 pCi/g to a high of less than 8.00 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 1.10 pCi/100 cm<sup>2</sup> to a high of 42.70 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 0.50 pCi/100 cm<sup>2</sup> to a high of less than 126.00 pCi/100 cm<sup>2</sup>.

#### (2) Class C

Surveys performed with the IM-247/PD in the Class C areas did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The alpha/beta analyzer results indicated removable Ra-226 and Th-232 levels ranged from a low of less than 0.64 pCi/100 cm<sup>2</sup> to a high of 1.45 pCi/100 cm<sup>2</sup>.

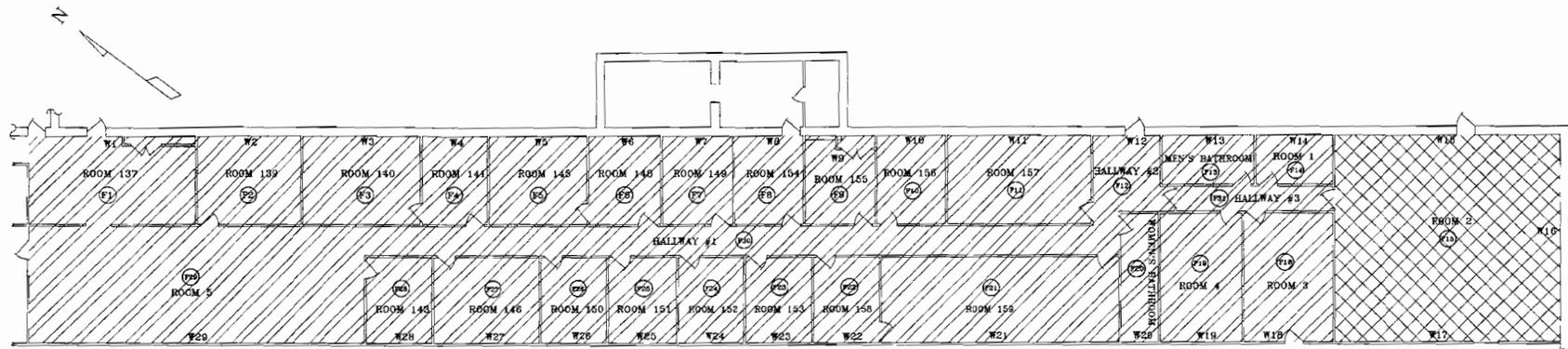
Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.21 pCi/g to a high of 1.79 pCi/g and Th-232 solid material samples ranged from a low of less than 0.17 pCi/g to a high of less than 2.40 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 3.00 pCi/100 cm<sup>2</sup> to a high of 37.30 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 9.00 pCi/100 cm<sup>2</sup> to a high of less than 57.00 pCi/100 cm<sup>2</sup>.

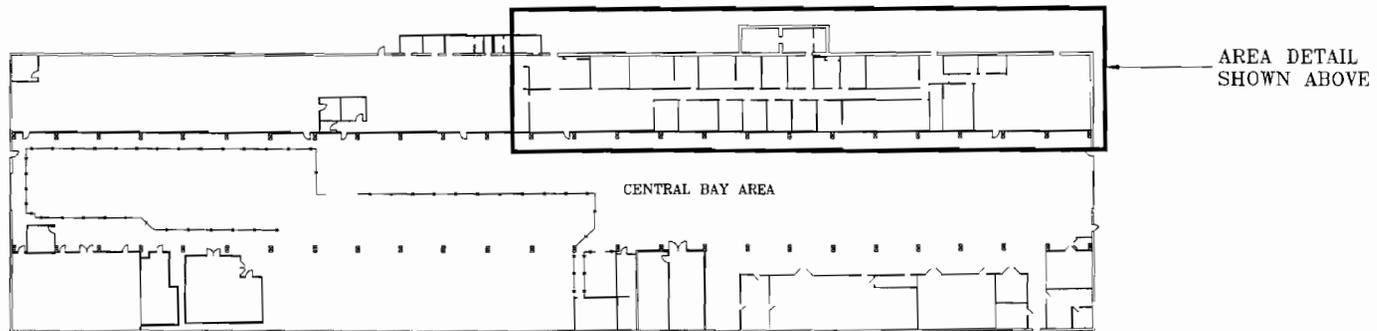
CNSY G-RAM FINAL REPORT

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d. Site Map



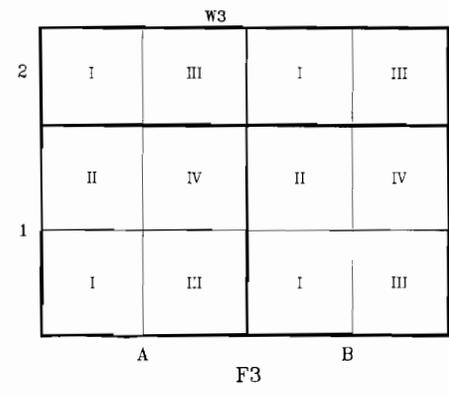
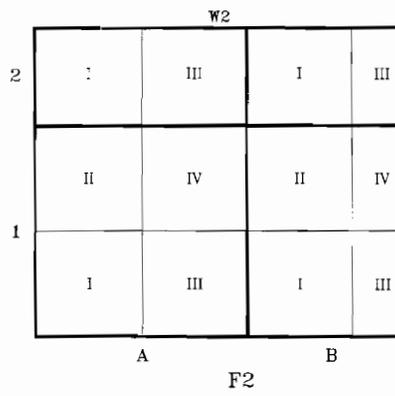
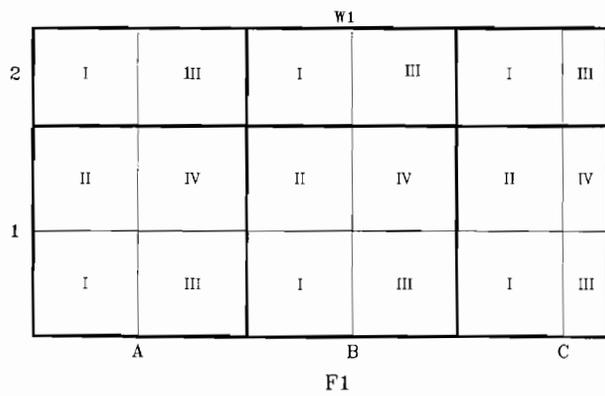
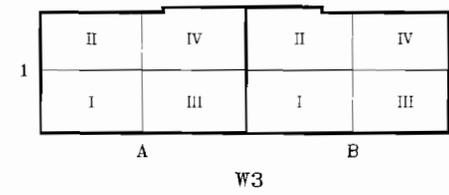
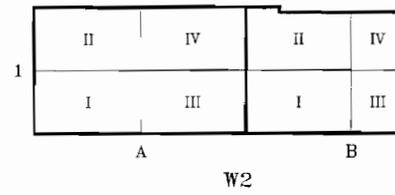
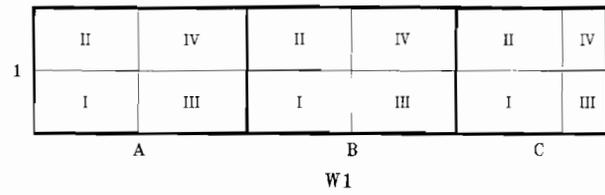
 DENOTES CLASS B AREA       DENOTES CLASS C AREA



CNSY G-RAM FINAL REPORT

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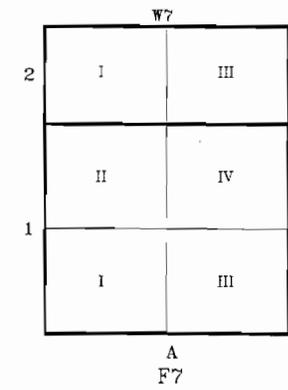
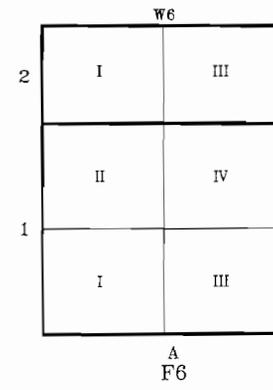
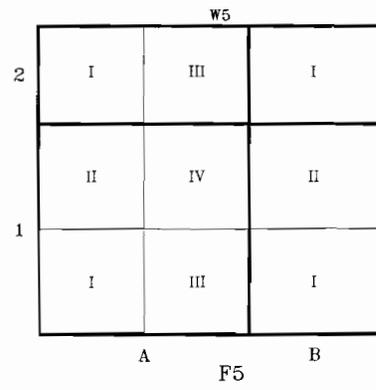
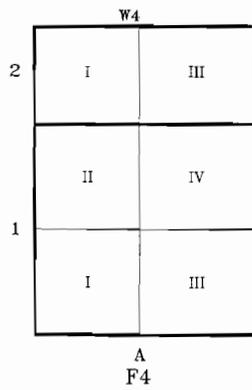
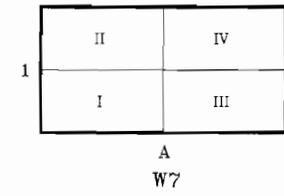
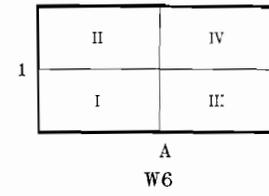
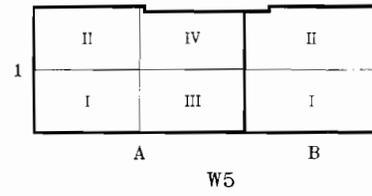
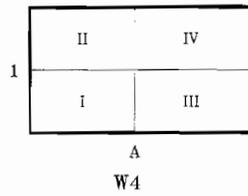
e. Overall Grid Map



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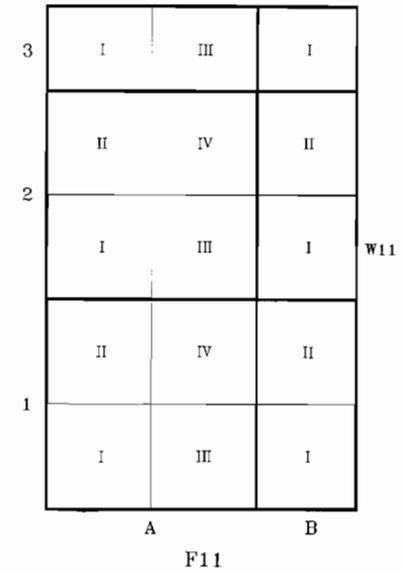
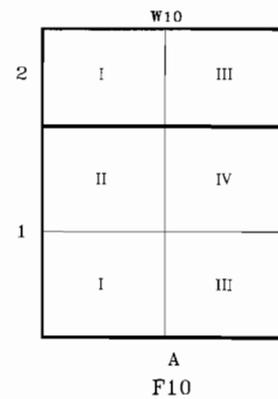
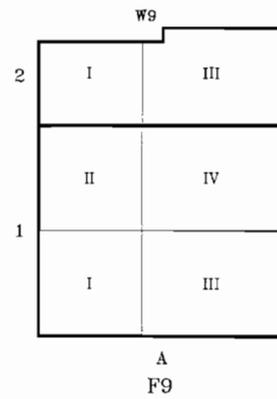
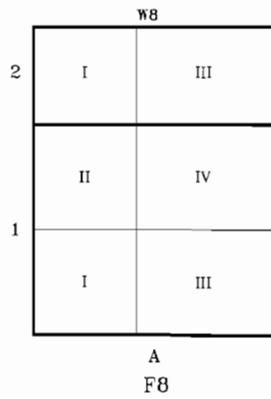
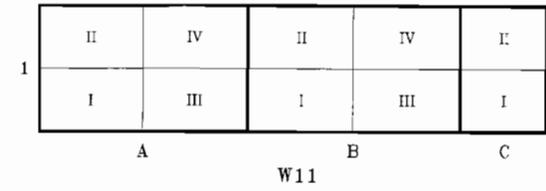
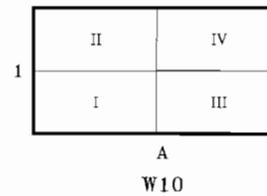
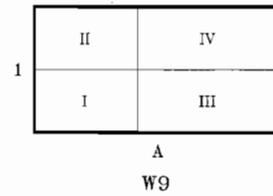
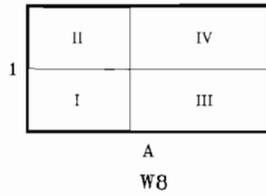
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

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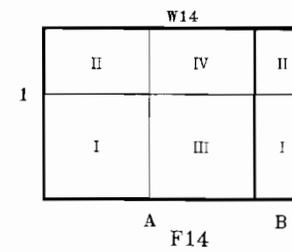
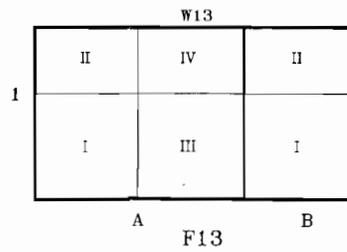
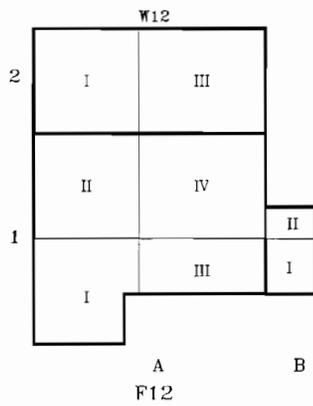
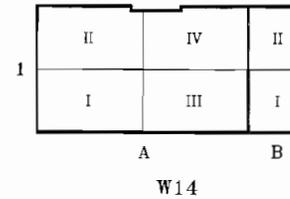
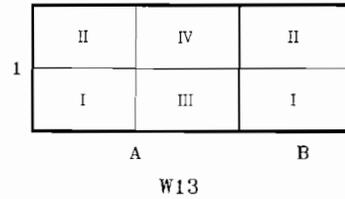
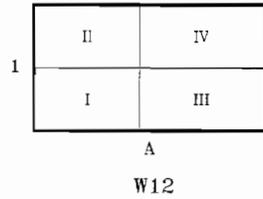
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

Section 13. Building 79

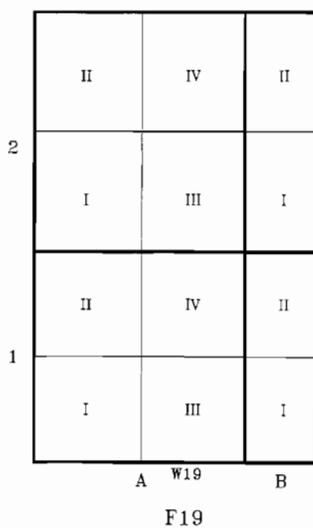
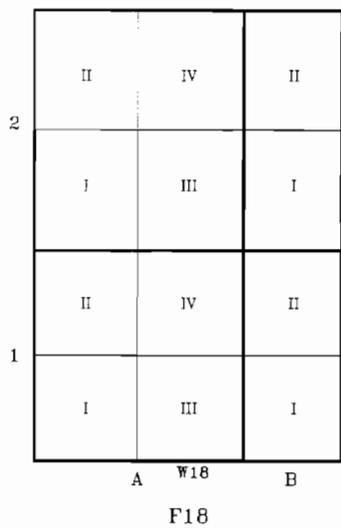
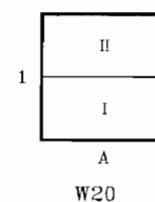
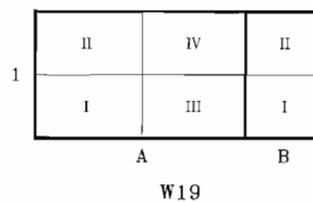
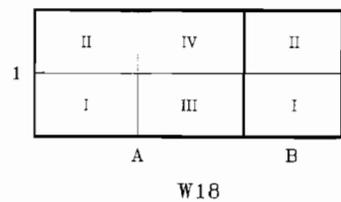
e. Overall Grid Map



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e. Overall Grid Map



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e. Overall Grid Map

1	II	IV	II	IV	II	IV	II	IV
	I	III	I	III	I	III	I	III
	A	B	W21		C	D		

1	II	IV
	I	III
	A	

1	II	IV
	I	III
	A	

2	I	III	I	III	I	III	I	III
	II	IV	II	IV	II	IV	II	IV
	I	III	I	III	I	III	I	III
1			W21		C	D		
	A	B	F21					

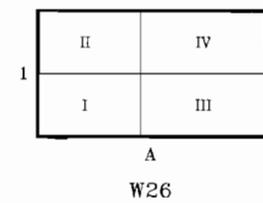
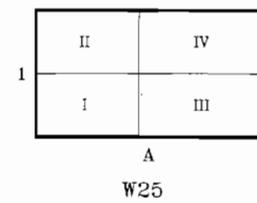
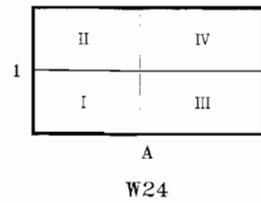
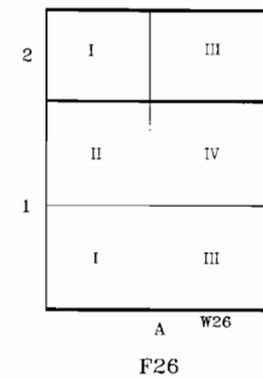
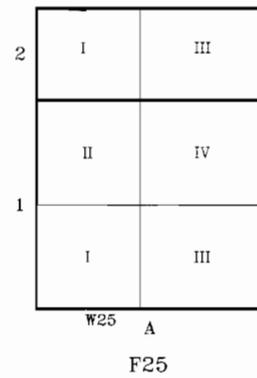
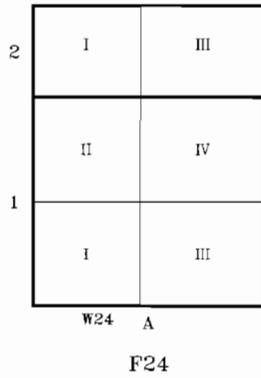
2	I	III
	II	IV
	I	III
1		
	A	W22
	F22	

2	I	III
	II	IV
	I	III
1		
	W23	A
	F23	

CNSY G-RAM FINAL REPORT

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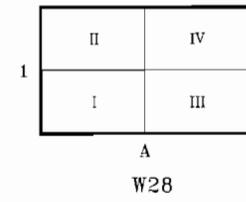
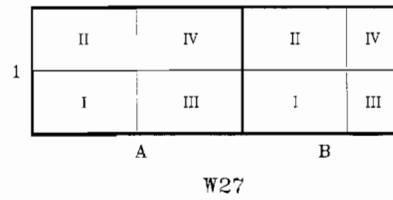
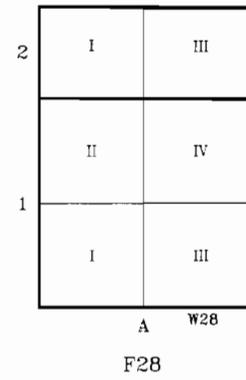
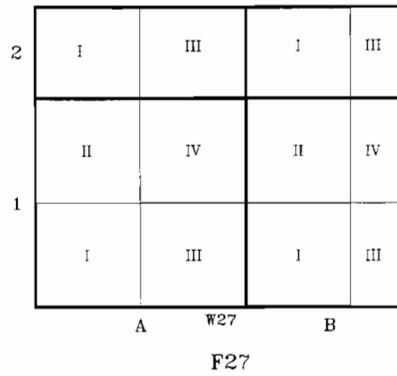
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Overall Grid Map



CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Overall Grid Map

1	II	IV	II								
	I	III	I								
	A		B		C		D		E		F

W29

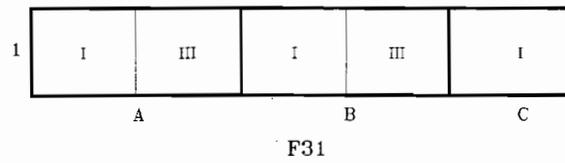
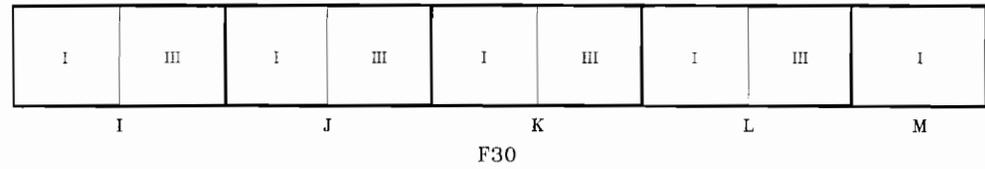
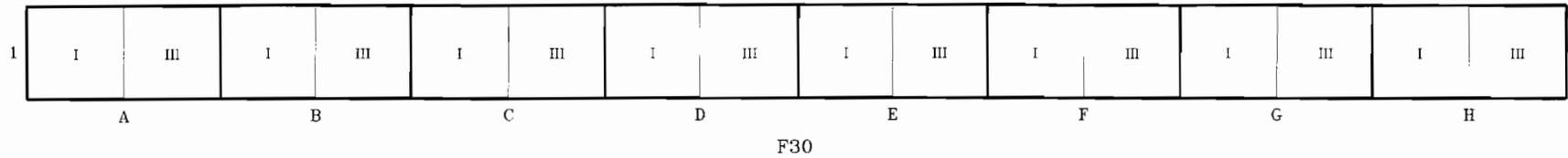
2	II	IV	II								
	I	III	I								
1	II	IV	II								
	I	III	I								
	A		B		C		D		E		F

W29  
F29

CNSY G-RAM FINAL REPORT

Section 13. Building 79

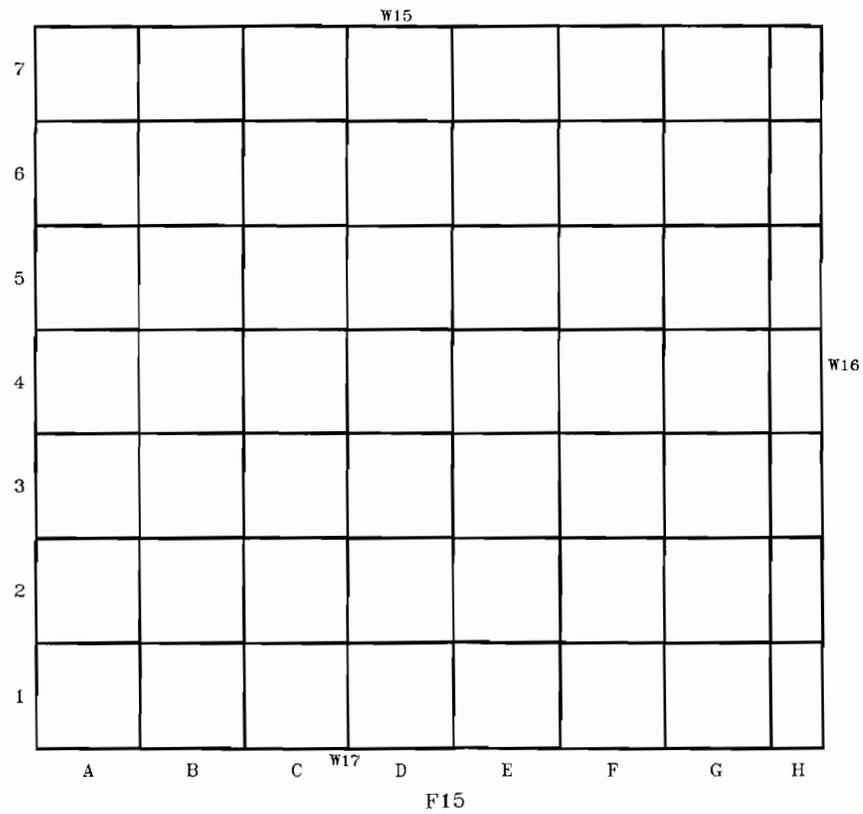
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

Section 13. Building 79

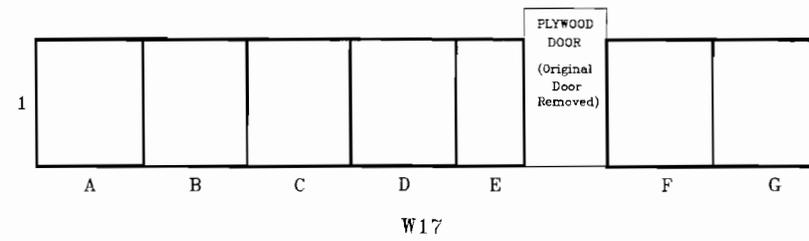
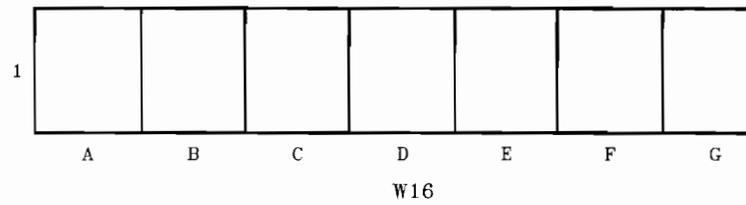
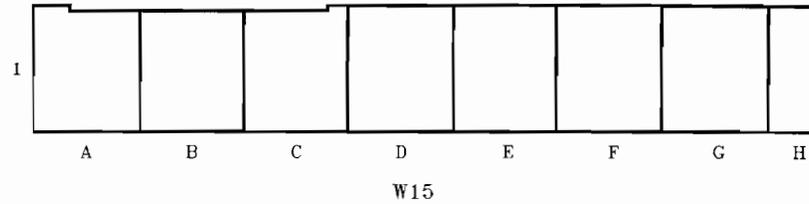
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

Section 13. Building 79

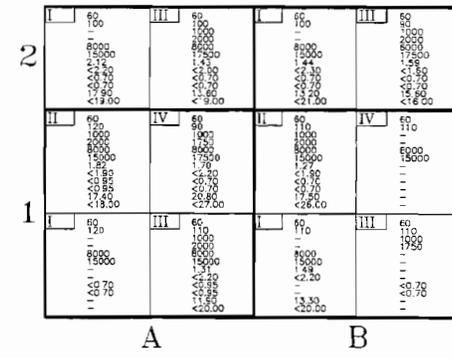
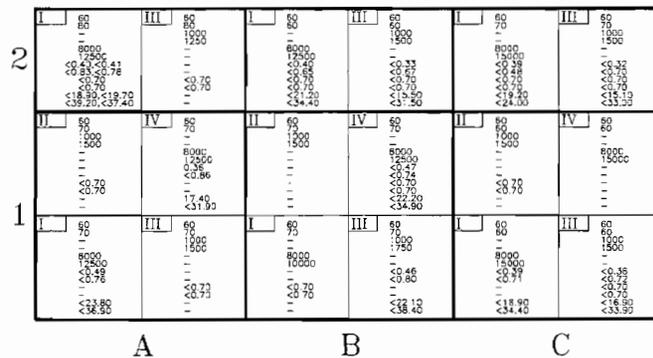
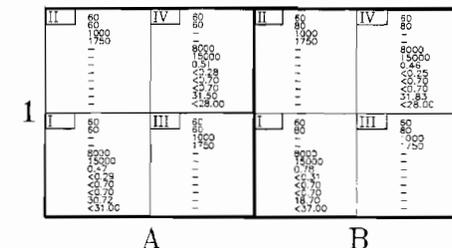
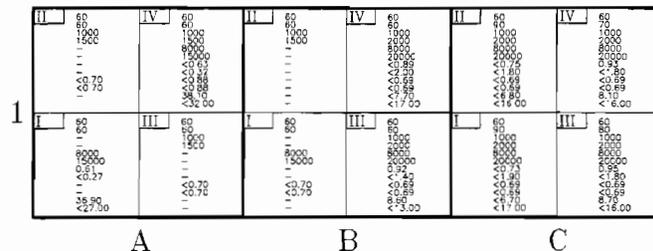
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

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e. Localized Grid Map



Data Legend:  
 1 - W-247/PD [bkg]  
 2 - M-247/PD [cpm]  
 3 - M-251/PD (HV-1) PHA [bkg]  
 4 - M-251/PD (HV-1) PHA [cpm]  
 5 - M-251/PD (HV-2) GROSS [cpm]  
 6 - M-251/PD (HV-2) GROSS [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <45

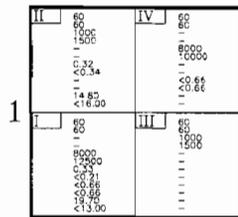




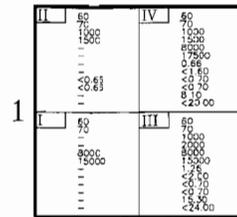
CNSY G-RAM FINAL REPORT

Section 13. Building 79

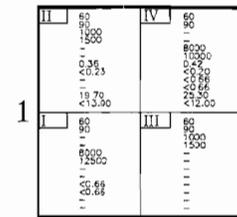
e. Localized Grid Map



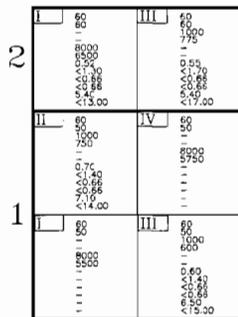
A  
W8



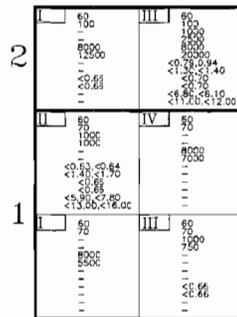
A  
W9



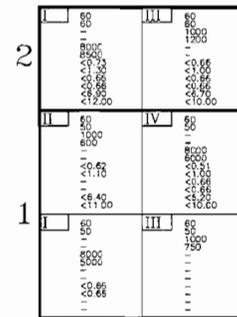
A  
W10



A  
F8



A  
F9



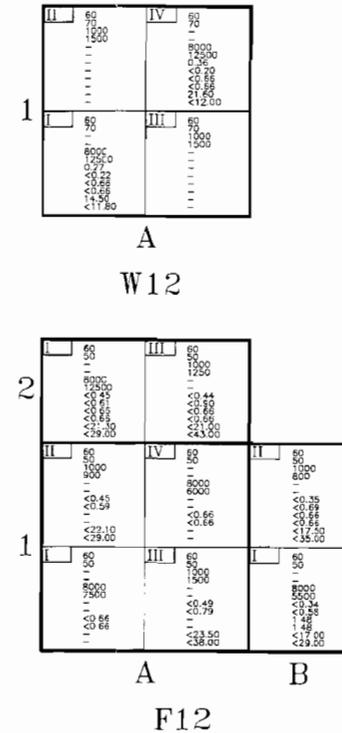
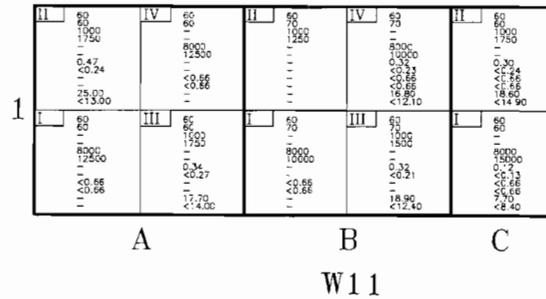
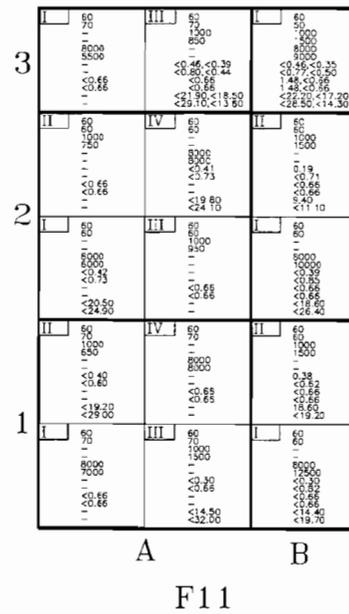
A  
F10

Data Legend:  
 \* - IM-247/PD [bkg]  
 1 - IM-247/PD [cpm]  
 2 - IM-253/PD (IV-1 PhA) [bkg]  
 3 - IM-253/PD (IV-1 PhA) [cpm]  
 4 - IM-253/PD (IV-2 GROSS) [bkg]  
 5 - IM-253/PD (IV-2 GROSS) [cpm]  
 6 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g  
 7 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <5  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <5  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <40  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

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e. Localized Grid Map



Data Legend:

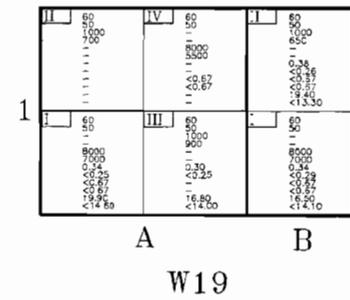
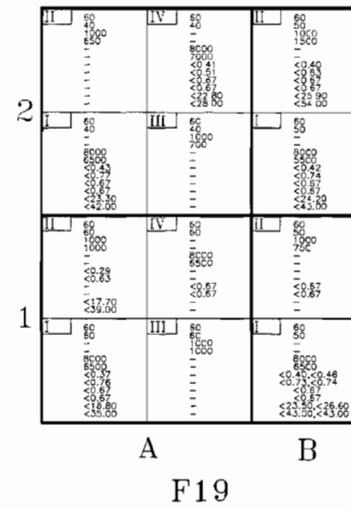
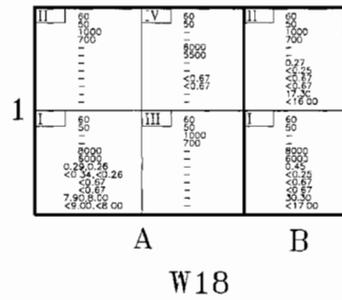
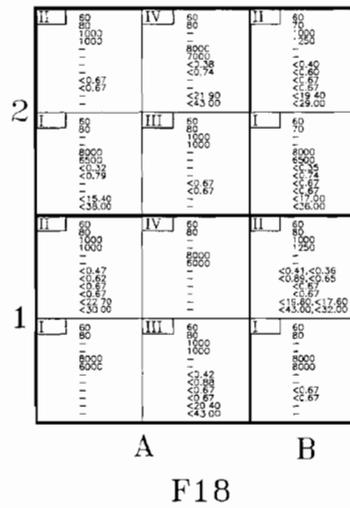
- 1 - IM-247/PD [Bq]
- 2 - IM-247/PD [cpm]
- 3 - IM-253/PD [Bq]
- 4 - IM-253/PD [HY-1 PHA] [cpm]
- 5 - IM-253/PD [HY-2 GROSS] [Bq]
- 6 - IM-253/PD [HY-2 GROSS] [cpm]
- 7 - Re-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Re-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90
- 11 - Re-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450



CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Localized Grid Map



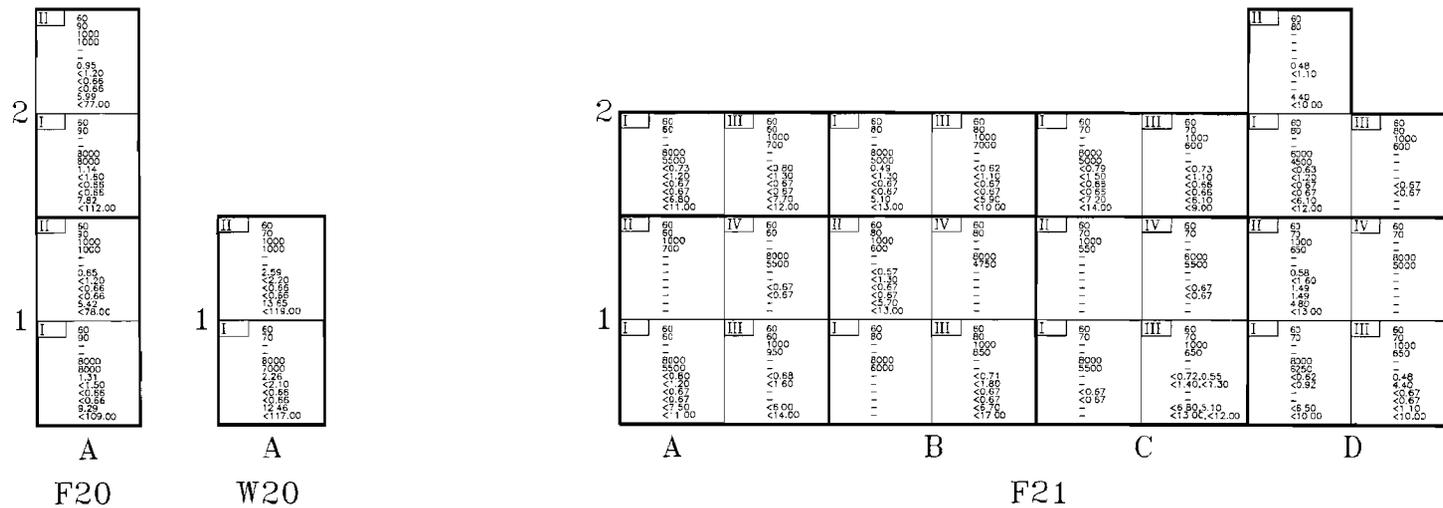
Data Legend:  
 1 - I-247/PD [bkg.]  
 2 - I-247/PD [cpm]  
 3 - I-235/PD HV-1 PMA [bkg.]  
 4 - I-235/PD HV-1 PMA [cpm]  
 5 - I-235/PD HV-2 CROSS [bkg.]  
 6 - I-235/PD HV-2 CROSS [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Re-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
 11 - R-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Localized Grid Map



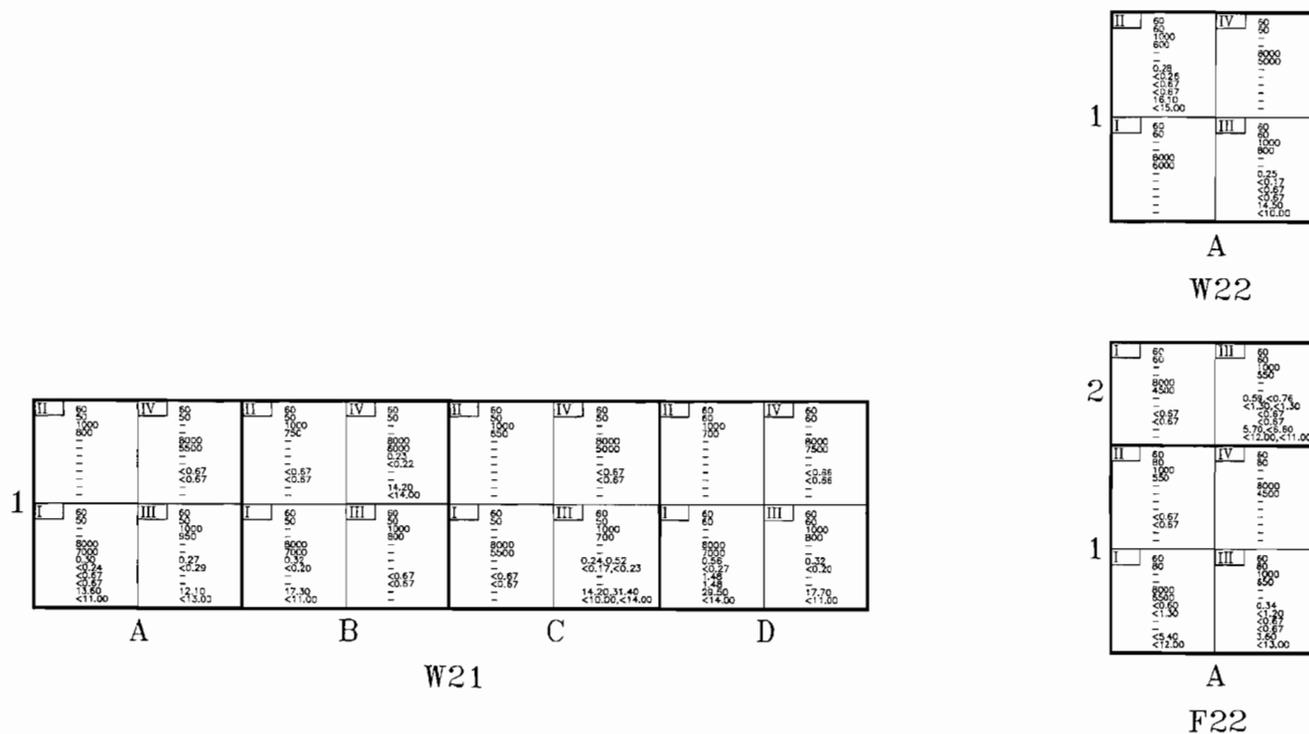
Data Legend.

1 - IM-247/PD [bkg.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <math><5</math> above bkg. of 2.3 pCi/g
2 - IM-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <math><5</math> above bkg. of 3.2 pCi/g
3 - IM-253/PD HV-1 [PMA] [bkg.]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <math><9</math>
4 - IM-253/PD HV-1 [PMA] [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <math><9</math>
5 - IM-253/PD HV-2 GROSS [pCi]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <math><45</math>
6 - IM-253/PD HV-2 GROSS [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <math><45</math>

CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Localized Grid Map



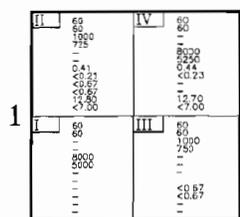
Data Legend:

1 - M-247/PD [Bq]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above big of 3.3 pCi/g
2 - IM-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above big of 3.2 pCi/g
4 - M-233/PD (W-1 PHA) [Bq]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <3
5 - M-233/PD (W-1 PHA) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <30
6 - M-233/PD (W-2 GROSS) [Bq]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45
6 - M-233/PD (W-2 GROSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450

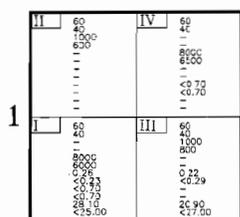
CNSY G-RAM FINAL REPORT

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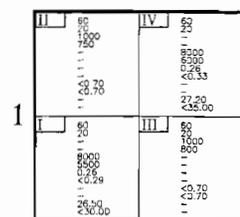
e. Localized Grid Map



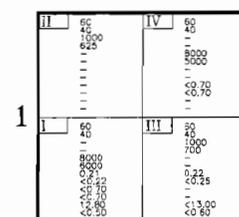
A  
W23



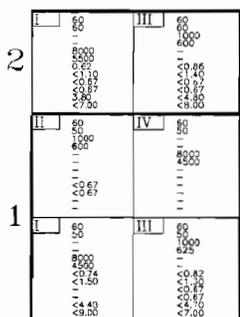
A  
W24



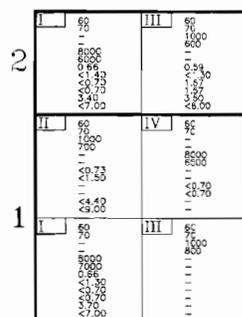
A  
W25



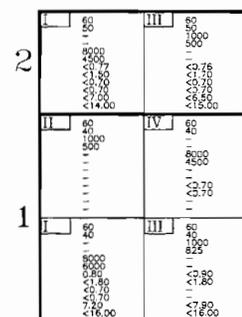
A  
W26



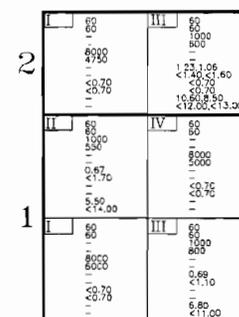
A  
F23



A  
F24



A  
F25



A  
F26

Data Legend:  
 1 - IM-247/PD [bkg]  
 2 - IM-247/PD [cpm]  
 3 - IM-243/PD HV-1 PMA [bkg]  
 4 - IM-233/PD HV-1 PMA [cpm]  
 5 - IM-233/PD HV-2 CROSS [bkg]  
 6 - IM-233/PD HV-2 CROSS [cpm]

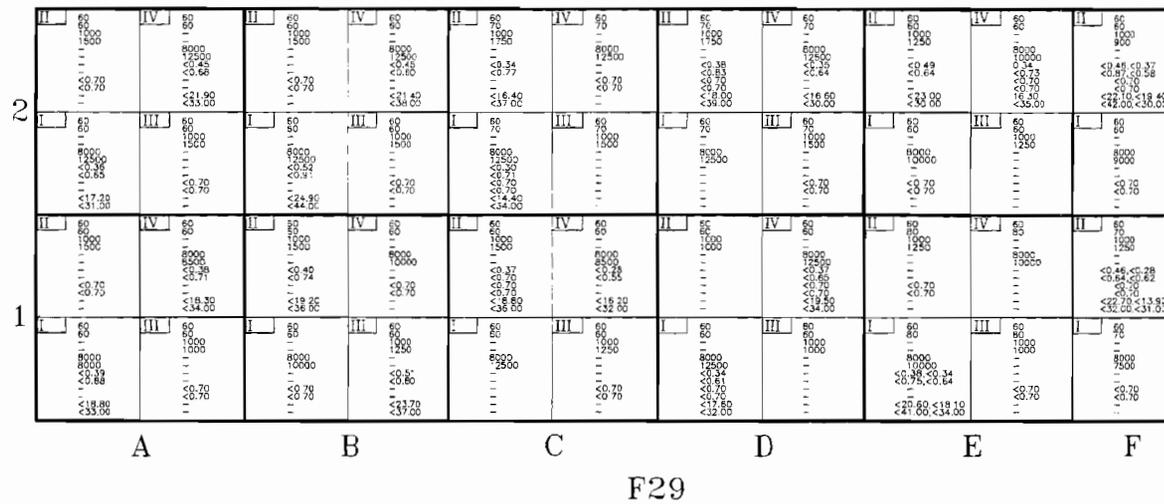
7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <math><5</math> above bkg. of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <math><5</math> above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <math><9</math>  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <math><9</math>  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <math><45</math>  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <math><450</math>



CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Localized Grid Maps



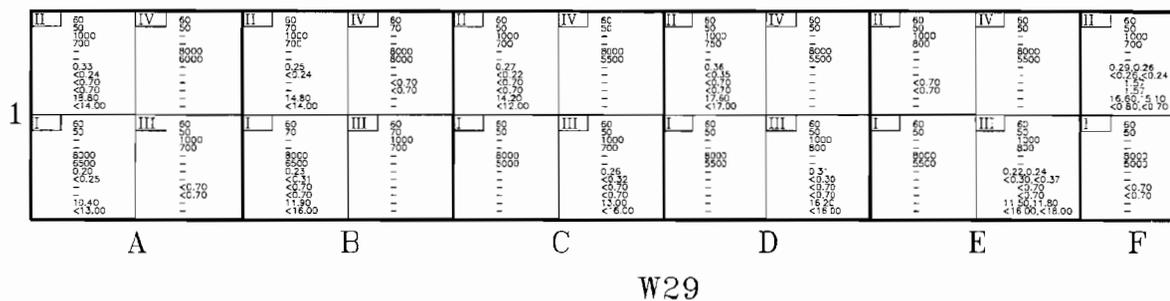
Data Legend:

1 - M-247/PP [bkg]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 2.3 pCi/g
2 - M-247/PP [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g
3 - M-253/PP (V-1) P(A) [bkg]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <9
4 - M-253/PP (V-1) P(A) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <9
5 - M-253/PP (V-2) GROSS [bkg]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <45
6 - M-253/PP (V-2) GROSS [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <45

CNSY G-RAM FINAL REPORT

Section 13. Building 79

e. Localized Grid Map



Data Legend:

1 - M-247/PD [Bq]	7 - Re-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 2.3 pCi/g
2 - M-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 3.2 pCi/g
3 - M-223/PD (V-1) [Bq]	9 - Re-228 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
4 - M-223/PD (V-1) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <50
5 - M-223/PD (V-2) GROSS [Bq]	11 - Re-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45
6 - M-223/PD (V-2) GROSS [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <450



CNSY G-RAM FINAL REPORT

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e. Localized Grid Map

6	60 60 1000 2000 8000 10000 <0.25 <0.56 <0.85 <14.00 <35.00	60 70 2000 2000 7500 <0.32 <0.41 <0.82 <14.00 <38.00	60 80 2000 2000 8500 <0.34 <0.54 <0.85 <14.00 <51.00	60 80 2000 2000 8500 <0.35 <0.50 <0.85 <14.00 <43.00	60 70 2000 2000 10000 <0.65 <1.98 <0.85 <0.85 <14.00	60 70 2000 2000 12000 <0.75 <1.40 <0.84 <0.84 <17.00	60 70 2000 2000 15000 <0.84 <1.81 <0.84 <0.84 <9.00	60 40 2000 2000 15000 <0.84 <1.20 <0.84 <0.84 <11.00
5	60 40 2000 2000 0.25 <0.65 <0.85 14.00 <44.00	60 40 2000 2000 <0.26 <0.85 <0.85 <24.00 <47.00	60 40 2000 2000 <0.26 <0.85 <0.85 <24.00 <53.00	60 40 2000 2000 <0.41 <0.85 <0.85 <24.00 <44.00	60 40 2000 2000 <0.75 <0.85 <0.85 <4.00 <10.00	60 40 2000 2000 <0.92 <0.85 <0.85 4.00 <1.00	60 40 2000 2000 <0.87 <0.84 <0.84 <9.00 <12.00	60 40 2000 2000 <0.87 <0.84 <0.84 <9.00 <11.00
4	60 40 2000 8000 <0.75 <0.85 <18.00 <28.00	60 40 2000 8000 <0.39 <0.85 <18.00 <5.00	60 40 2000 8000 <0.39 <0.85 <18.00 <57.00	60 40 2000 8000 <1.00 <0.85 <18.00 <50.00	60 40 2000 8000 <1.10 <0.85 <18.00 <10.00	60 40 2000 8000 <1.30 <0.85 <18.00 <11.00	60 40 2000 8000 <1.40 <0.84 <18.00 <12.00	60 40 2000 8000 <1.40 <0.84 <18.00 <12.00
3	60 40 2000 8000 0.43 <0.85 <0.85 20.00 <38.00	60 40 2000 8000 <0.38 <0.85 <18.00 <17.00 <41.00	60 40 2000 8000 <0.35 <0.85 <18.00 <31.00 <47.00	60 40 2000 8000 <0.36 <0.85 <18.00 <18.00 <4.00	60 40 2000 8000 <0.75 <0.85 <18.00 6.10 <1.00	60 40 2000 8000 <0.80 <0.85 <18.00 3.00 <1.00	60 40 2000 8000 0.34 <0.84 <0.84 3.00 <9.00	60 40 2000 8000 <0.85 <0.84 <0.84 <9.00 <9.00
2	60 40 2000 8000 <0.85 <0.85 <18.00 <33.00	60 40 2000 8000 <0.87 <0.85 <18.00 <43.00	60 40 2000 8000 <0.58 1.45 1.70 <53.00	60 40 2000 8000 <0.89 <0.85 <18.00 <42.00	60 40 2000 8000 <1.20 <0.85 <18.00 <11.00	60 40 2000 8000 <1.30 <0.85 <18.00 <17.00	60 40 2000 8000 <0.84 <0.84 <0.84 6.85 <13.00	60 40 2000 8000 <0.84 <0.84 <0.84 6.85 <13.00
1	60 40 2000 7000 <0.12 <0.85 <0.85 <14.00 <41.00	60 40 2000 8000 <0.28 <0.85 <0.85 <14.00 <33.00	60 40 2000 8000 <0.11 <0.85 <0.85 <14.00 <45.00	60 40 2000 8000 <0.27 <0.85 <0.85 <14.00 <45.00	60 40 2000 8000 <0.75 <0.85 <0.85 <14.00 <11.00	60 40 2000 8000 <0.75 <0.85 <0.85 <14.00 <1.00	60 40 2000 8000 0.61 <0.84 <0.84 <10.00 <11.00	60 40 2000 8000 <0.68 <0.84 <0.84 <9.00 <11.00
	A	B	C	D	E	F	G	H

F15

Data Legend  
 1 - M-247/PD [Bq]  
 2 - M-247/PD [cpm]  
 3 - M-253/PD [W-1 P/A] [Bq]  
 4 - M-253/PD [W-1 P/A] [cpm]  
 5 - M-253/PD [W-2 GROSS] [Bq]  
 6 - M-253/PD [W-2 GROSS] [cpm]  
 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450



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Section 13. Building 79

e. Localized Grid Map

1	60	60	60	60	60	60	60
	2000	2000	2000	2000	2000	2000	2000
	17000	20000	20000	20000	20000	20000	20000
	150000	150000	150000	150000	150000	150000	150000
	0.33	0.36	0.36	0.36	0.36	0.36	0.36
	<0.17	<0.27	<0.32	<0.19	<0.17	<0.71	<0.82
	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64
	18.30	18.30	14.90	16.10	17.10	<0.20	6.50
	<14.00	<13.00	<13.00	<9.00	<10.00	<15.00	<16.00
	A	B	C	D	E	F	G

W15

1	60	60	60	60	60	60
	2000	2000	2000	2000	2000	2000
	150000	150000	150000	150000	150000	150000
	1.30	0.91	<0.68	1.53	0.72	0.62
	1.86	<1.80	<1.40	<1.20	<2.40	<1.80
	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64
	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64
	18.30	18.30	<15.00	<18.00	<20.00	<18.00
	<14.00	<16.00	<15.00	<18.00	<18.00	<14.00
	A	B	C	D	E	F

W16

1	60	60	60	60	60	60
	2000	2000	2000	2000	2000	2000
	150000	150000	150000	150000	150000	150000
	0.33	0.36	0.43	0.47	0.37	0.43
	<0.17	<0.41	<0.36	<0.32	<0.24	<0.23
	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64
	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64
	18.30	18.30	17.50	19.30	19.30	17.40
	<12.00	<17.00	<14.00	<13.00	<13.00	<14.00
	A	B	C	D	E	F

W17

Data Legend:  
 1 - IM-247/PD [bkg.]  
 2 - IM-247/PD [cpm]  
 3 - IM-253/PD (HV-1 PHA) [bkg.]  
 4 - IM-253/PD (HV-1 PHA) [cpm]  
 5 - IM-253/PD (HV-2 GRCS5) [bkg.]  
 6 - IM-253/PD (HV-2 GRCS5) [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g] Regulator value: <5 above bkg. or 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g] Regulator value: <3 above bkg. or 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>] Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>] Regulator value: <80  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>] Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>] Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 13. Building 79

f. Photographs

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Room 2, viewing west.

**CNSY G-RAM FINAL REPORT**

**Section 13. Building 79**

**f. Photographs**

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**Hallway**

**CNSY G-RAM FINAL REPORT**

**Section 13. Building 79**

**f. Photographs**

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**Men's Bathroom**

CNSY G-RAM FINAL REPORT

Section 13. Building 79

f. Photographs

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Typical Engineering Space

**CNSY G-RAM FINAL REPORT**

**Section 13. Building 79**

**f. Photographs**

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**Typical Engineering Office**

## CNSY G-RAM FINAL REPORT

### Section 14. Building 177

#### a. Introduction:

Building 177 was built in 1955 as an electronics support shop. It is located at Fourth Street and Avenue "B" inside the Controlled Industrial Area.

#### (1) Description:

Building 177 is a four-story building with an irregular "L" shape. It has concrete block walls resting on a concrete foundation.

#### (2) Brief History:

(a) **Use:** On the first floor was an Antenna Shop and a RADIAC Equipment Receiving and Storage Area. On the second floor was the Optical Shop, Polishing Room, Radium Room, Cleaning Room, Paint Shop and Shop 51 Instrument Rooms (former and present). The Source Storage Room, Radiac Storage Room and Radiac Calibration Laboratory were on the fourth floor.

(b) **Radiological History:** On the first floor was the Antenna Shop, which was used for routine repair of radium-bearing components. Also, located on the first floor was the RADIAC Equipment Receiving and Storage Area, which was used to temporarily store radioactive sources used in RADIAC's.

On the second floor the Optical Shop and adjoining Paint Shop, Shop 51 Instrument Rooms (former and present), Radium Room, and Cleaning Room, were used to paint radium on various dials, gauges and other instrumentation.

On the fourth floor the RADIAC Calibration Laboratory and Source Storage Rooms contained numerous radioactive sources. Three radium capsule holders were found to have loose surface contamination. Also, a RADIAC with an installed Sr 90 check source was found to be leaking with a subsequent spread of radioactivity.

#### (3) Survey Requirements:

- (a) Class A release survey.
- (b) Class B release survey.
- (c) Class C release survey.

#### b. Discussion:

##### Class A Survey:

## **CNSY G-RAM FINAL REPORT**

### **Section 14. Building 177**

For the Class A survey, the floor of the RADIAC Equipment Receiving and Storage Area, Shop 51 Instrument Rooms (former and present), Antenna Shop, and RADIAC Storage Area were divided into 40 grids approximately 20' by 20'. Each of these grids was subdivided into 5' by 5' sub-grids.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over at least four pre-determined 5' by 5' sub-grids in each grid to represent 25% of the total grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over at least four other pre-determined sub-grids in each grid to represent 25% of the total grid surface.

A wide gamma energy range scintillation walk-through scan survey with the IM-253/PD (GROSS mode) was performed over the specific site.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

#### **Class B Survey:**

For the Class B survey, the floor of the Polishing Room, Source Storage Room, and the Optical Shop, were divided into 94 grids approximately 10' by 10'. Each of these grids was subdivided into 5' by 5' sub-grids.

The walls were horizontally divided into 64 grids approximately 6' high and 10' wide. Each of these wall grids was subdivided into 3' high by 5' wide sub-grids.

The columns were divided into 33 grids approximately 6' high. Each of these column grids were subdivided into 3' high grids.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over two diagonal quadrants to represent 50% of the grid surface.

## **CNSY G-RAM FINAL REPORT**

### **Section 14. Building 177**

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other two diagonal quadrants to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

#### **Class C Survey**

For the Class C survey, the floor of the Paint Shop, Radium Room, Cleaning Room, and RADIAC Calibration Laboratory were divided into 158 grids approximately 5' by 5' square.

The walls were horizontally divided into 128 grids approximately 6' high and 5' wide.

The columns were divided into 21 grids approximately 6' high.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over 100% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over 100% of the grid surface.

A minimum of one swipe/smear was taken in each grid.

A minimum of 25% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 177 were determined from similar materials in Building 1720.

## CNSY G-RAM FINAL REPORT

### Section 14. Building 177

#### c. Summary:

##### **Class A Survey:**

Surveys performed in the Class A areas with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels ranged from a low of less than 0.58 pCi/100 cm<sup>2</sup> to a high of less than 0.89 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.38 pCi/g to a high of less than 0.85 pCi/g and Th-232 solid material samples ranged from a low of less than 0.50 pCi/g to a high of less than 2.00 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 4.70 pCi/100 cm<sup>2</sup> to a high of 43.70 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 10.00 pCi/100 cm<sup>2</sup> to a high of less than 51.00 pCi/100 cm<sup>2</sup>.

##### **Class B Survey:**

Surveys performed in the Class B areas with the IM-247/PD detected one area having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100

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cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The alpha/beta analyzer results indicated removable Ra-226 and Th-232 levels ranged from less than 0.62 pCi/100 cm<sup>2</sup> to 2.06 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 ranged from 0.28 pCi/g to 2.45 pCi/g and Th-232 ranged from less than 0.84 pCi/g to less than 2.40 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 3.00 pCi/100 cm<sup>2</sup> to a high of 21.30 pCi/100 cm<sup>2</sup> and the Th-232 level ranged from a low of less than 8.00 pCi/100 cm<sup>2</sup> to a high of less than 19.00 pCi/100 cm<sup>2</sup>.

#### **Class C Survey:**

Solid material samples from portions of grids in the Cleaning Room and RADIAC Calibration Laboratory were found to be in excess of allowable limits.

The area remediated in the Cleaning Room, Building 177 was as follows: the area was small, approximately three sq. ft. The grids affected were W1-A1-B4, W1-A1-C3, and W1-B1-A1. The maximum found was 33.39 pCi/g of Ra 226, the average was 14.36. No removable surface radioactivity was encountered.

The area remediated in the RADIAC Calibration Laboratory, Building 177 was as follows: the area was small, approximately 160 sq. ft.. The grids affected were G177-RMC-W1-C1 and G177-RMC-W2-A1. The maximum found was 10.60 pCi/g of Ra 226, the average was 9.30. In order to remediate, five asbestos wallboard panels, which encompassed an entire grid each, were removed and properly disposed of. No removable surface radioactivity was encountered.

In the Radium Room, Building 177 a small drain trap was found unattached from a nearby sink, and was counted. The drain trap contained approximately 370 pCi/g of Ra 226. Due to this, the associated drain piping was sampled downstream in three different locations. No levels of Radium were found above regulator values. Thus, no remediation was necessary in the room and the drain was properly disposed of. In addition, no removable surface activity was encountered.

Remediation was performed on these areas, and the post remediation results are summarized below and on the localized grid maps.

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Surveys performed in the Class C areas with the IM-247/PD detected one area having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) detected two areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels ranged from a low of less than 0.52 pCi/100 cm<sup>2</sup> to a high of 1.39 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.19 pCi/g to a high of 4.22 pCi/g and Th-232 solid material samples ranged from a low of less than 0.25 pCi/g to a high of less than 3.50 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low less than 0.83 pCi/100 cm<sup>2</sup> to a high of 44.70 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 3.90 pCi/100 cm<sup>2</sup> to a high of less than 79.00 pCi/100 cm<sup>2</sup>.

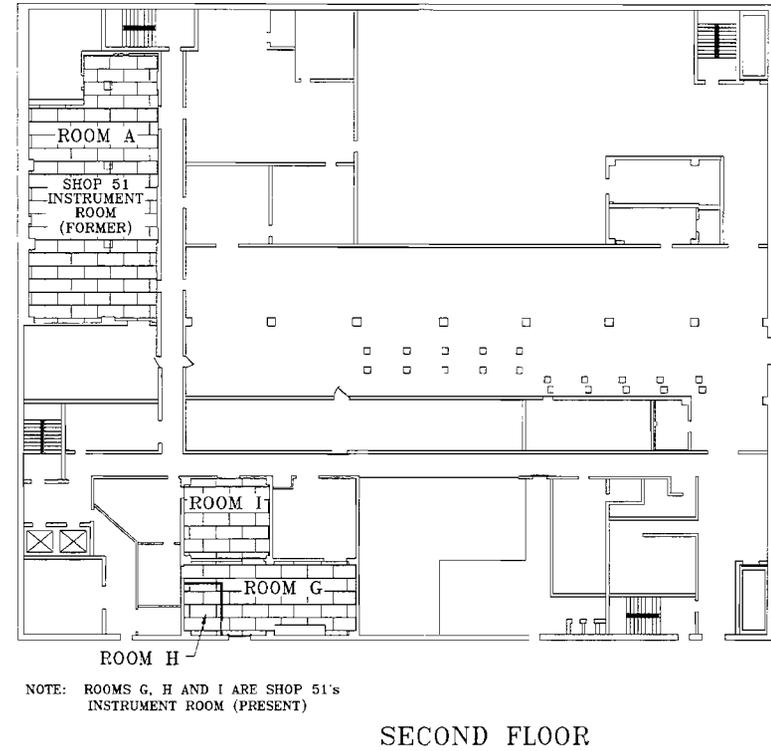
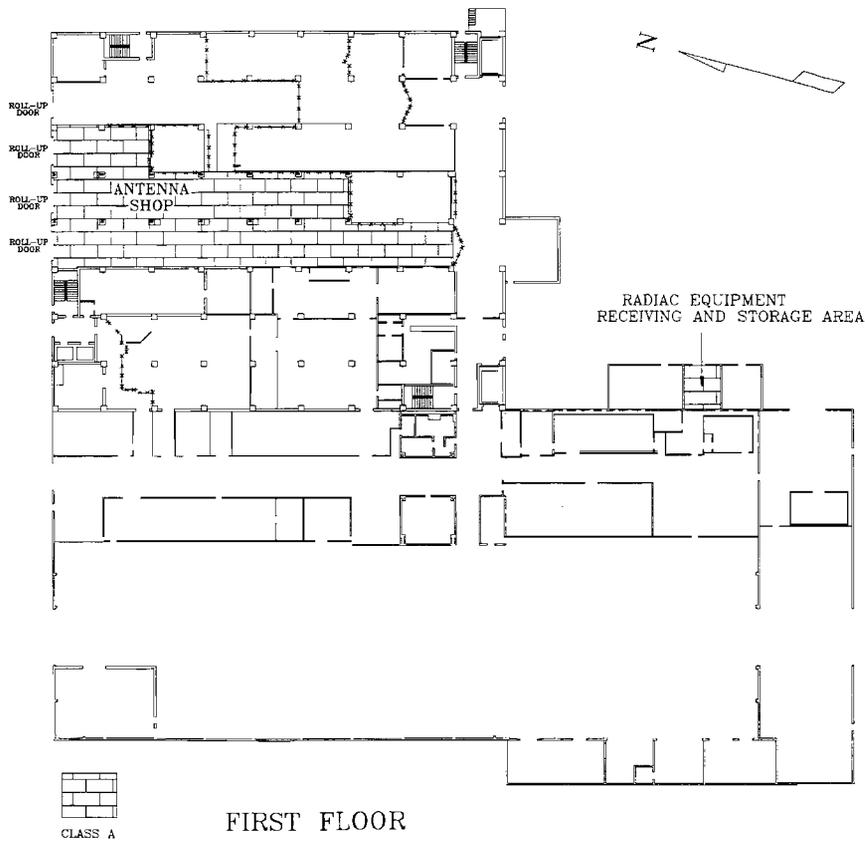
Interior partition walls; W2 Room C, W1 and W4 Room D, and W3 and W4 Radium Room were of new construction, therefore G-Ram survey was not required.

External walls of the RADIAC Calibration Laboratory Room B were of new construction, therefore G-Ram survey was not required.

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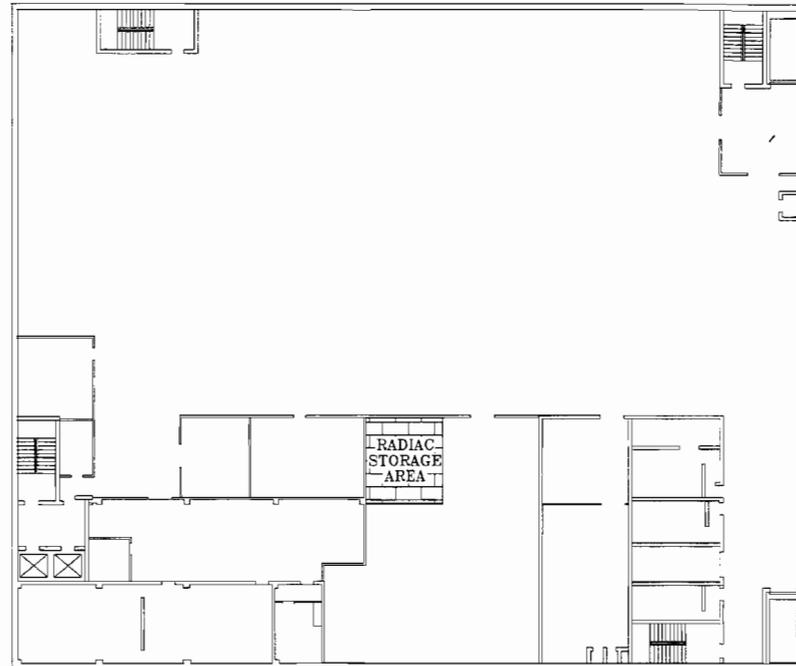
d. Site Map, Class A



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d. Site Map, Class A



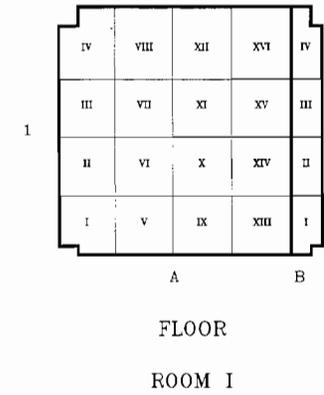
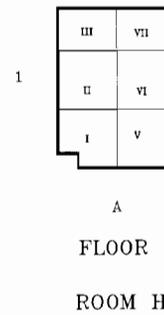
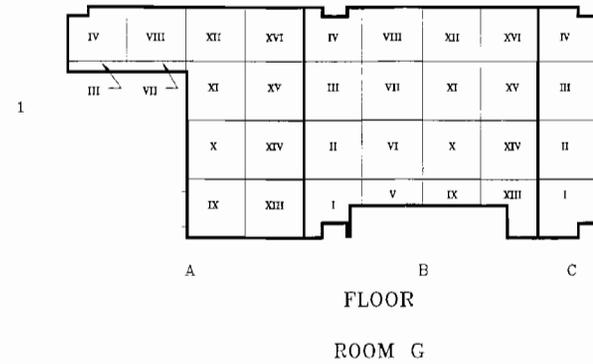
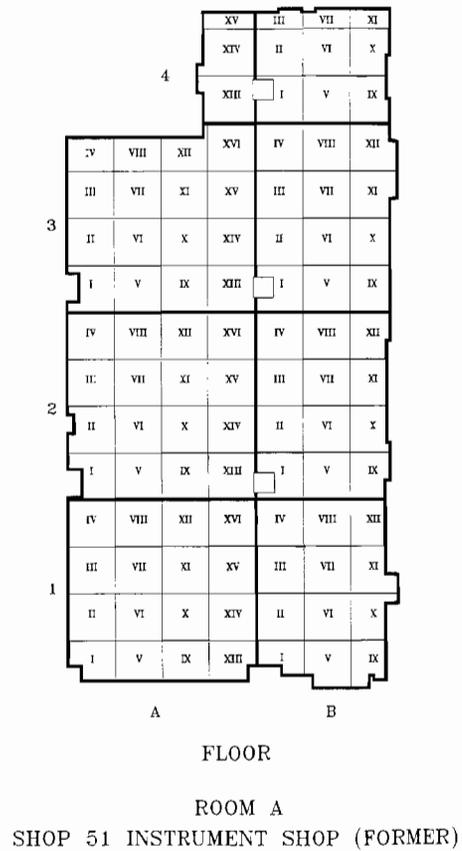
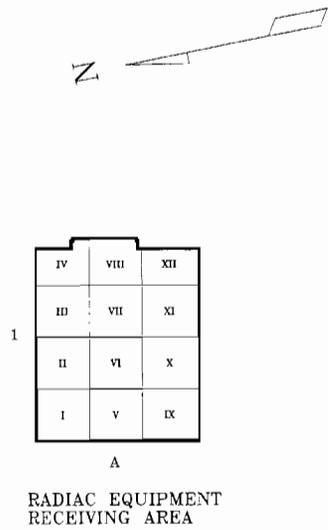
FOURTH FLOOR

  
CLASS A

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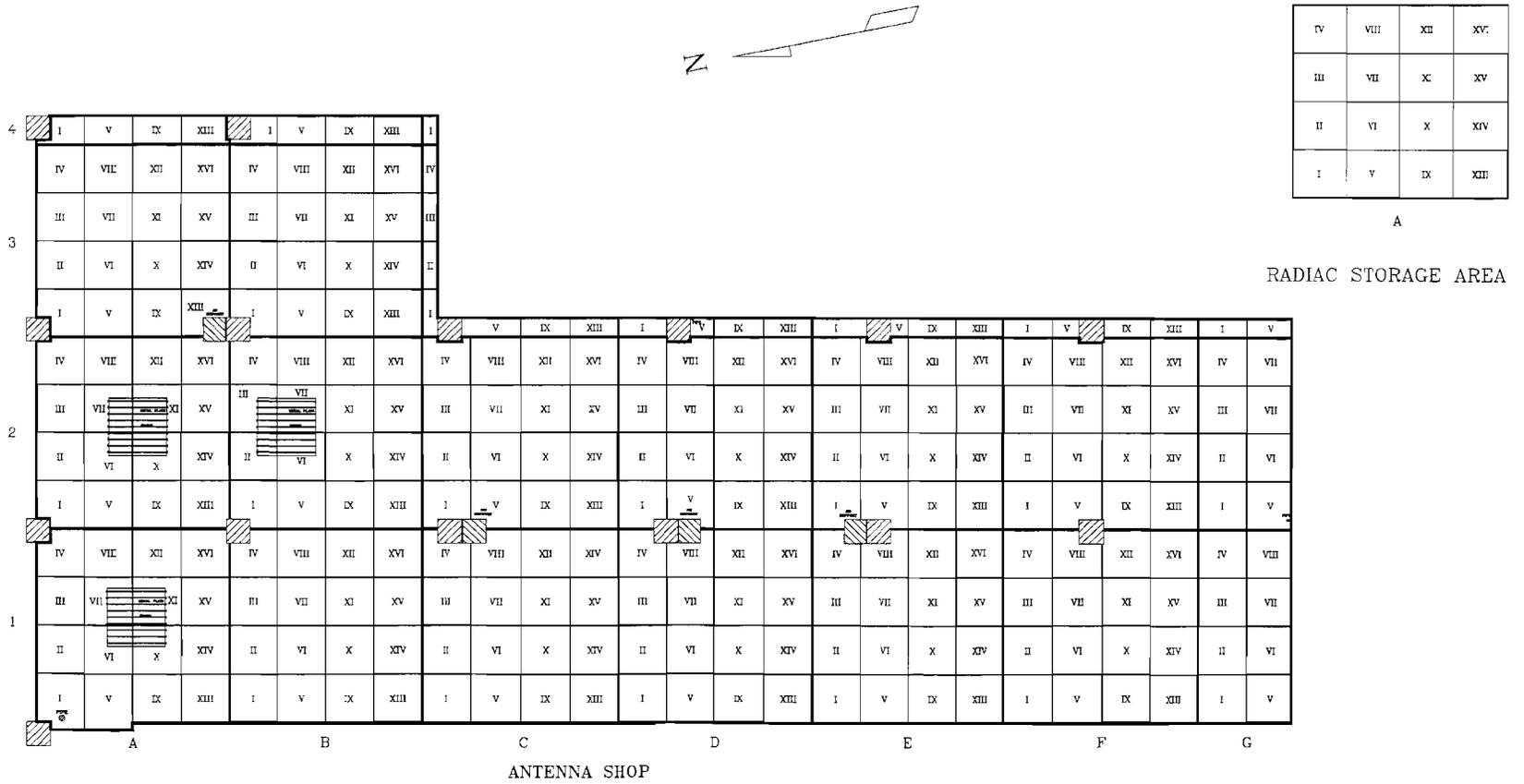
d. Overall Grid Map, Class A



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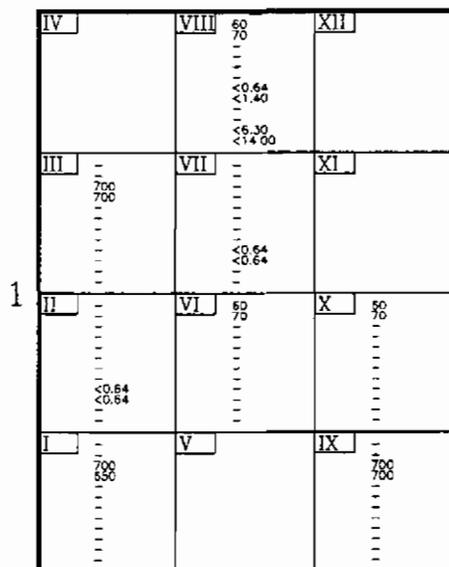
d. Overall Grid Map, Class A



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d. Localized Grid Map



A

FLOOR  
RADIAC EQUIPMENT  
RECEIVING AND  
STORAGE AREA

Note:  
Entries 5 and 6 are not required for Class 'A' Localized  
Grid Map pages. See the Discussion paragraph.

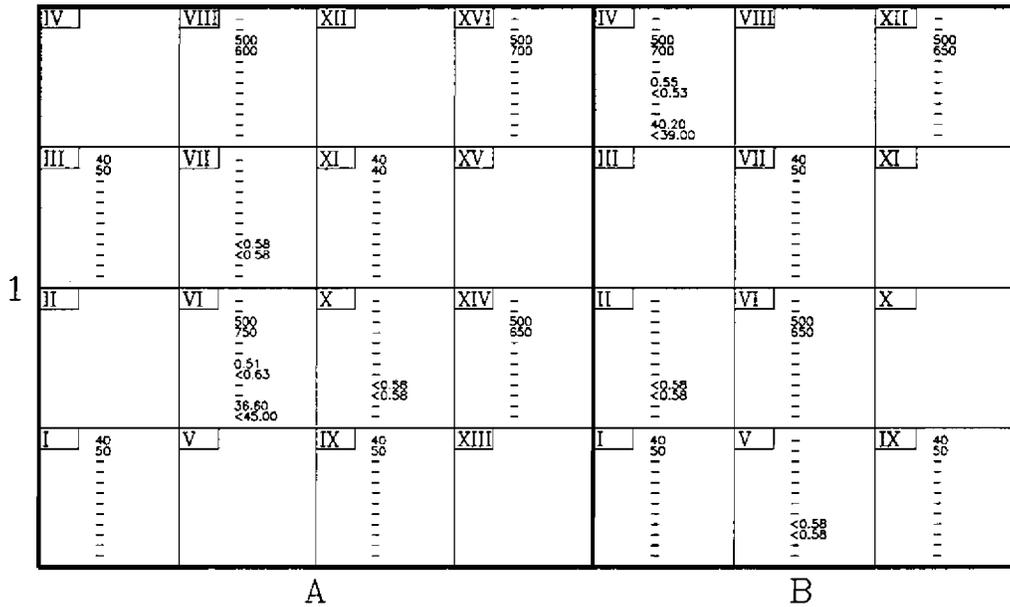
Data Legend:

- |                                   |  |
|-----------------------------------|--|
| 1 - IM-247/PD [bkg.]              | 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g |
| 2 - IM-247/PD [cpm]               | 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g |
| 3 - IM-253/PD (HV-1 PHA) [bkg.]   | 9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9          |
| 4 - IM-253/PD (HV-1 PHA) [cpm]    | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90        |
| 5 - IM-253/PD (HV-2 GROSS) [bkg.] | 11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45          |
| 6 - IM-253/PD (HV-2 GROSS) [cpm]  | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450         |

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d. Localized Grid Map



FLOOR  
ROOM A  
SHOP 51 INSTRUMENT ROOM  
(FORMER)

Note:  
Entries 5 and 6 are not required for Class "A" Localized  
Grid Maps. See the Discussion paragraph.

Data Legend:

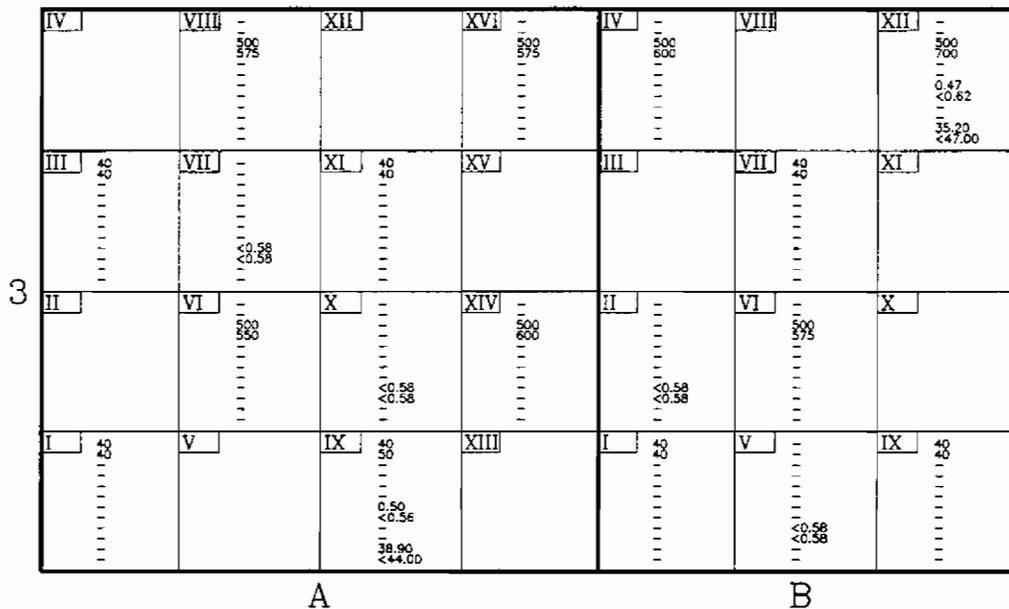
1 - IM-247/PD [bkg.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
2 - IM-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
3 - IM-253/PD (HV-1 PHA) [bkg.]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9
4 - IM-253/PD (HV-1 PHA) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90
5 - IM-253/PD (HV-2 GROSS) [bkg.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45
6 - IM-253/PD (HV-2 GROSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450



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### d. Localized Grid Map



## FLOOR ROOM A SHOP 51 INSTRUMENT ROOM (FORMER)

**Note:**

Entries 5 and 6 are not required for Class "A" Localized Grid Maps. See the Discussion paragraph.

**Data Legend:**

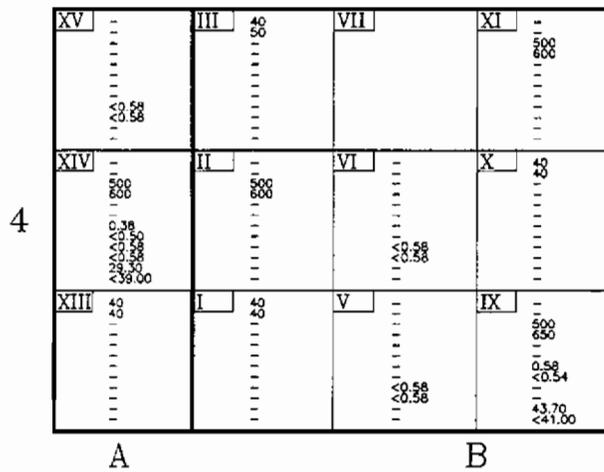
- 1 - IV-247/PD [bkg.]
- 2 - IV-247/PD [cpm]
- 3 - IV-253/PD (HV-1 PHA) [bkg.]
- 4 - IV-253/PD (HV-1 PHA) [cpm]
- 5 - IV-253/PD (HV-2 GROSS) [bkg.]
- 6 - IV-253/PD (HV-2 GROSS) [cpm]

- 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90
- 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

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d. Localized Grid Map



FLOOR  
ROOM A  
SHOP 51 INSTRUMENT ROOM  
(FORMER)

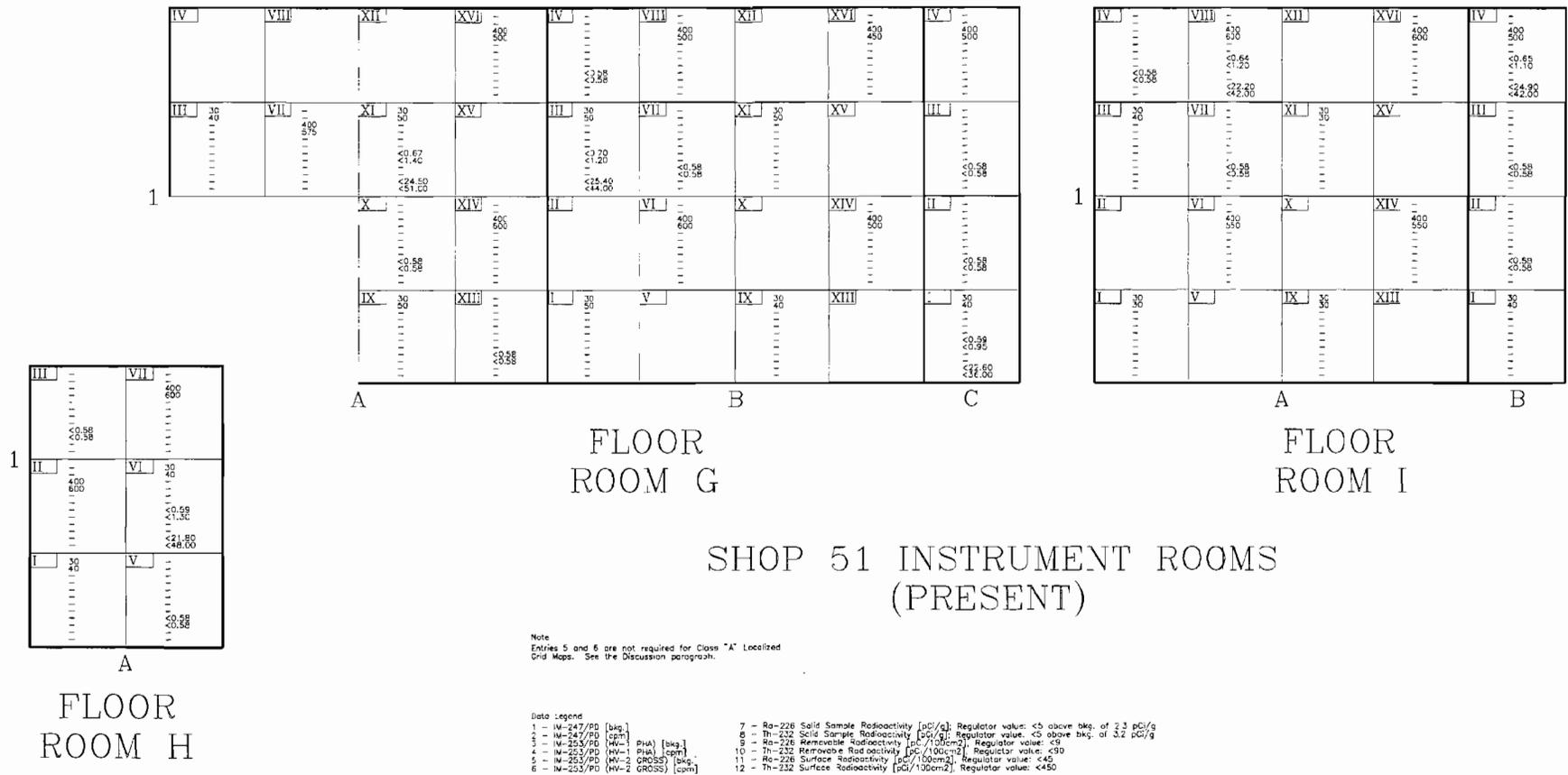
Note:  
Entries 5 and 6 are not required for Class "A" Localized  
Grid Maps. See the Discussion paragraph.

- Data Legend:
- |                                   |  |
|-----------------------------------|--|
| 1 - IM-247/PD [bkg.]              | 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g |
| 2 - IM-247/PD [cpm]               | 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g |
| 3 - IM-253/PD (HV-1 PHA) [bkg.]   | 9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9          |
| 4 - IM-253/PD (HV-1 PHA) [cpm]    | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90        |
| 5 - IM-253/PD (HV-2 GROSS) [bkg.] | 11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45          |
| 6 - IM-253/PD (HV-2 GROSS) [cpm]  | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450         |

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d. Localized Grid Map

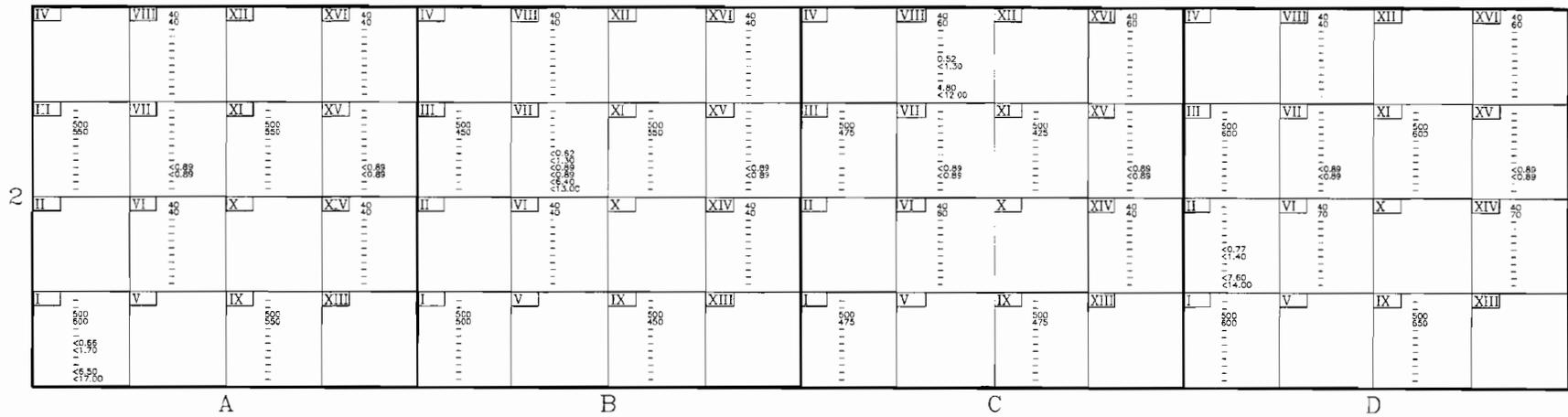




CNSY G-RAM FINAL REPORT

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d. Localized Grid Map



FLOOR  
ANTENNA SHOP

Note:  
Entries 5 and 6 are not required for Class 'A' Localized  
Grid Map pages. See the Discussion paragraph.

Data Legend  
 1 - IM-247/PD [bkg] [cpm]  
 2 - IM-247/PD [cpm]  
 3 - IM-253/PD (HV-1 PHA) [bkg] [cpm]  
 4 - IM-253/PD (HV-1 PHA) [cpm]  
 5 - IM-253/PD (HV-2 GROSS) [bkg] [cpm]  
 6 - IM-253/PD (HV-2 GROSS) [cpm]

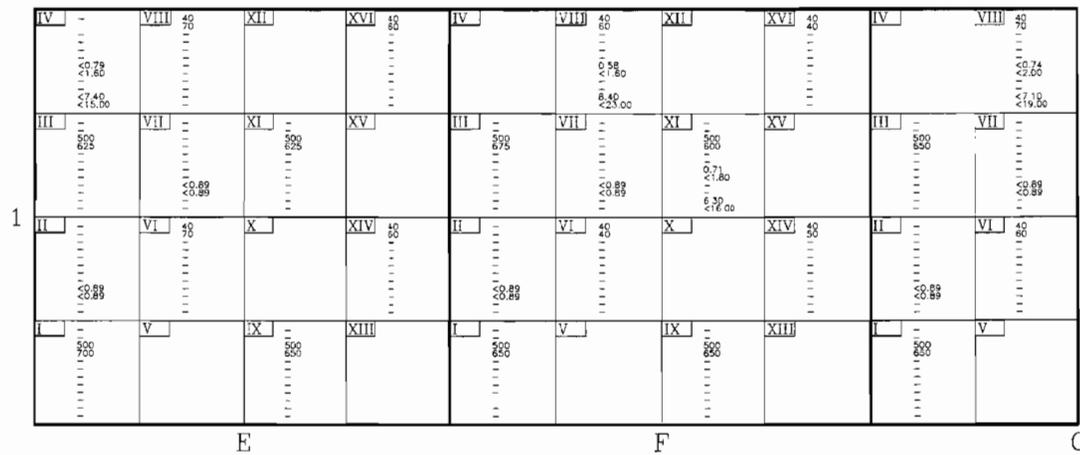
7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <450



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d. Localized Grid Map



FLOOR  
ANTENNA SHOP

Note:  
Entries 5 and 6 are not required for Class 'A' Localized  
Grid Map pages. See the Discussion paragraph.

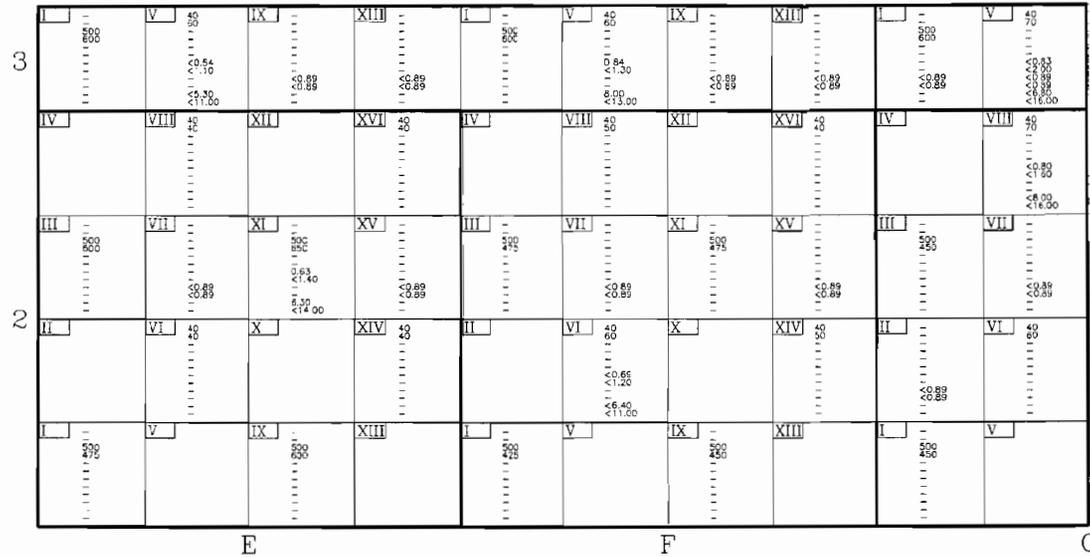
- Data Legend
- 1 - I-247/PD [pkg]
  - 2 - I-247/PD [cpm]
  - 3 - I-253/PD (HV-1 PHA) [pkg]
  - 4 - I-253/PD (HV-1 PHA) [cpm]
  - 5 - I-253/PD (HV-2 GROSS) [pkg]
  - 6 - I-253/PD (HV-2 GROSS) [cpm]

- 7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9
- 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <450

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d. Localized Grid Map



FLOOR  
ANTENNA SHOP

Note:  
Entries 5 and 6 are not required for Class 'A' Localized  
Grid Map pages. See the Discussion paragraph.

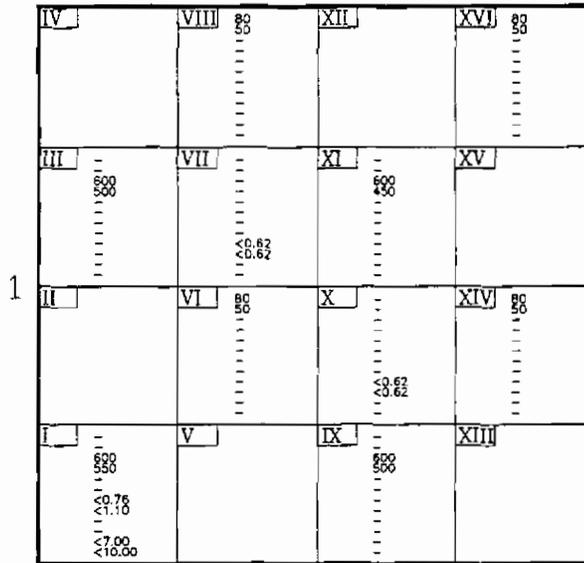
Data Legend:  
1 - I-247/PD [bkg]  
2 - I-247/PO [cpm]  
3 - I-253/PC (HV-1, PHA) [bkg]  
4 - I-253/PO (HV-1, PHA) [cpm]  
5 - I-253/PD (HV-2, GROSS) [bkg]  
6 - I-253/PO (HV-2, GROSS) [cpm]

7 - Ra-226 Solid Sample Radioactivity [ $\mu\text{Ci/g}$ ]. Regulator value: <5 above bkg. of 2.3  $\mu\text{Ci/g}$   
8 - Th-232 Solid Sample Radioactivity [ $\mu\text{Ci/g}$ ]. Regulator value: <5 above bkg. of 3.2  $\mu\text{Ci/g}$   
9 - Ra-226 Removable Radioactivity [ $\mu\text{Ci}/100\text{cm}^2$ ]. Regulator value: <3  
10 - Th-232 Removable Radioactivity [ $\mu\text{Ci}/100\text{cm}^2$ ]. Regulator value: <3  
11 - Ra-226 Surface Radioactivity [ $\mu\text{Ci}/100\text{cm}^2$ ]. Regulator value: <4  
12 - Th-232 Surface Radioactivity [ $\mu\text{Ci}/100\text{cm}^2$ ]. Regulator value: <4

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d. Localized Grid Map



A

FLOOR  
ROOM F  
RADIAC STORAGE ROOM

Note:  
Entries 5 and 6 are not required for Class 'A' Localized  
Grid Map pages. See the Discussion paragraph.

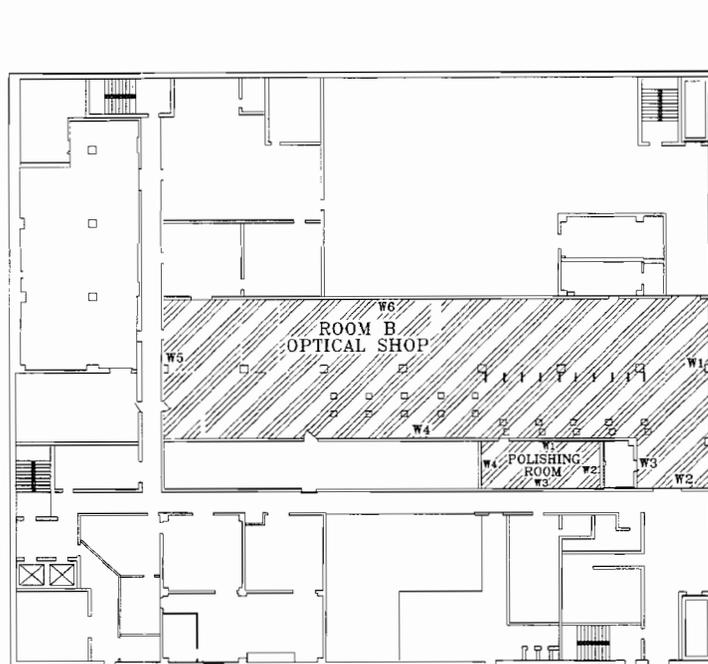
Data Legend:

- |                                   |  |
|-----------------------------------|--|
| 1 - IM-247/PD [bkg.]              | 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <math>\le 5</math> above bkg. of 2.3 pCi/g |
| 2 - IM-247/PD [cpm]               | 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <math>\le 5</math> above bkg. of 3.2 pCi/g |
| 3 - IM-253/PD (HV-1 PHA) [bkg.]   | 9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <math>\le 9</math>          |
| 4 - IM-253/PD (HV-1 PHA) [cpm]    | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <math>\le 9</math>         |
| 5 - IM-253/PD (HV-2 GROSS) [bkg.] | 11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <math>\le 45</math>          |
| 6 - IM-253/PD (HV-2 GROSS) [cpm]  | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <math>\le 450</math>         |

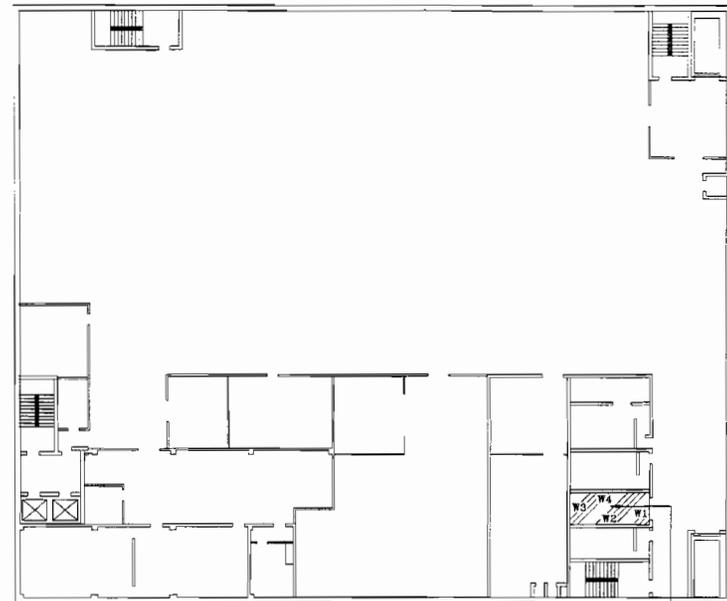
CNSY G-RAM FINAL REPORT

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d. Site Map, Class B



SECOND FLOOR



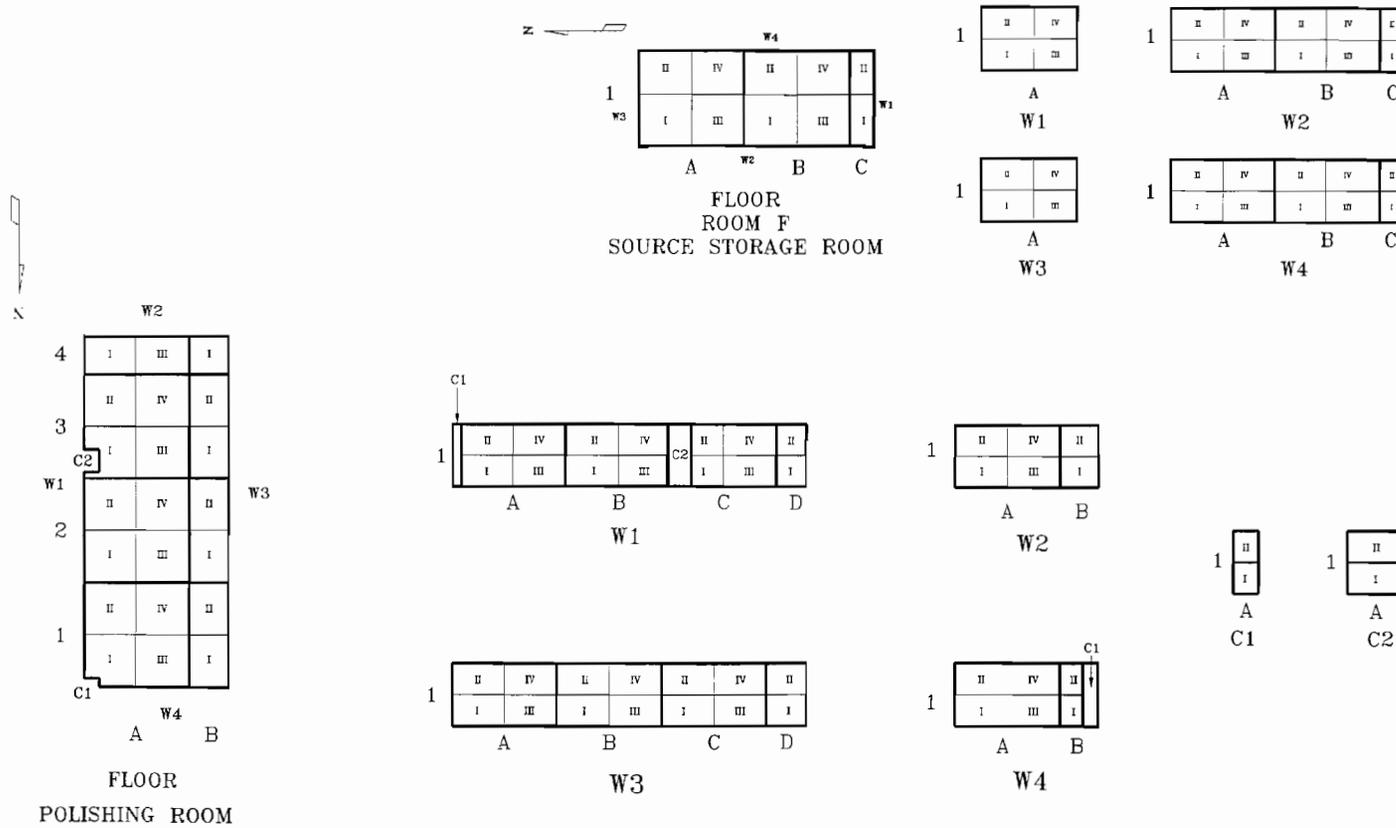
FOURTH FLOOR

ROOM F  
SOURCE STORAGE ROOM

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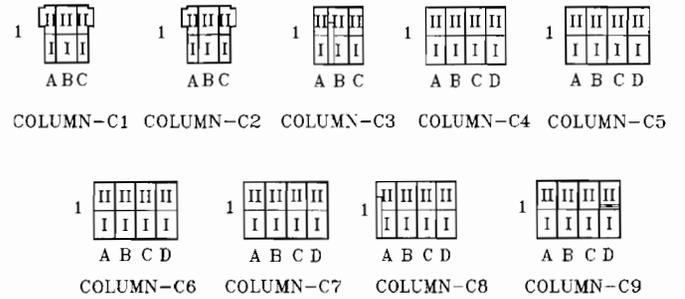
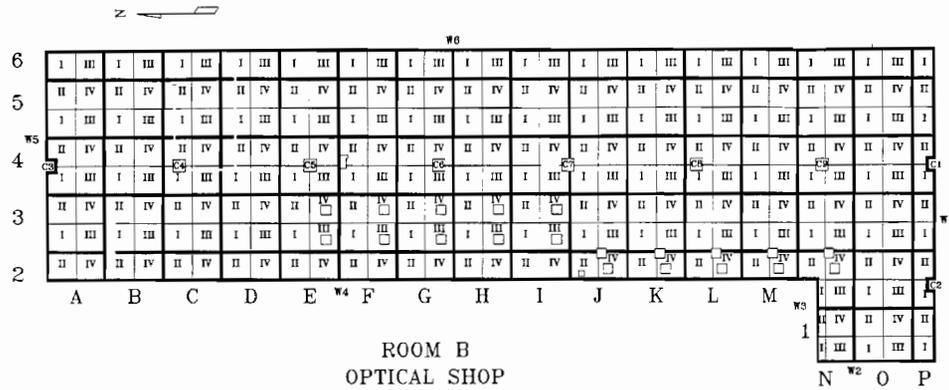
d. Overall Grid Map, Class B



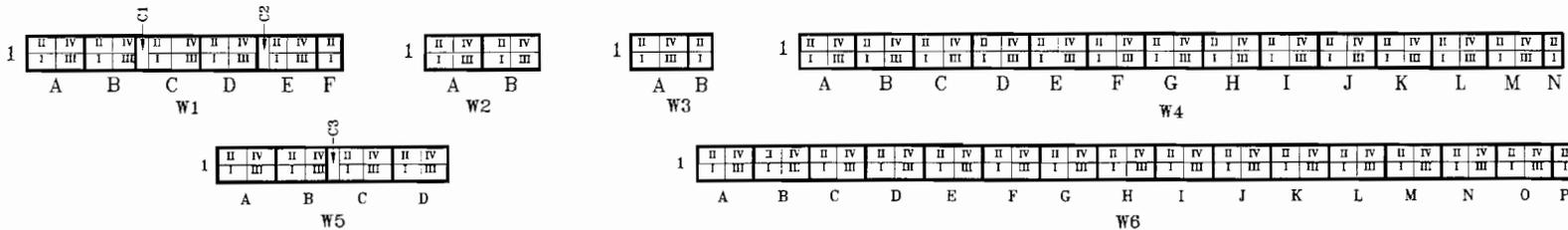
CNSY G-RAM FINAL REPORT

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d. Localized Grid Map, Class B



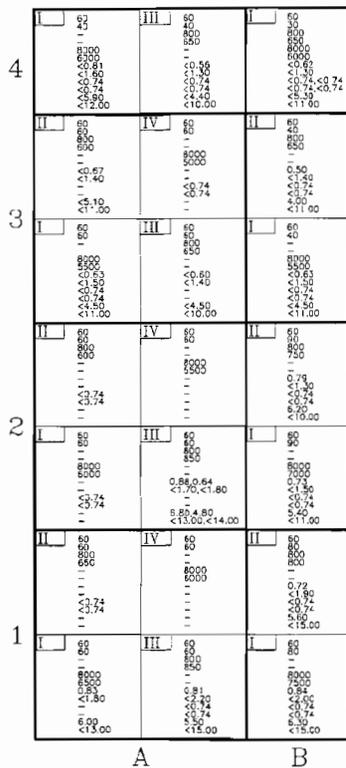
NOTE: GRIDGING BEGINS ON NORTH SIDE OF COLUMNS C4, C5, C6, C7, C8 AND C9.  
(GRID COLUMN A CORRESPONDS TO THE NORTH SIDE OF THESE COLUMNS).



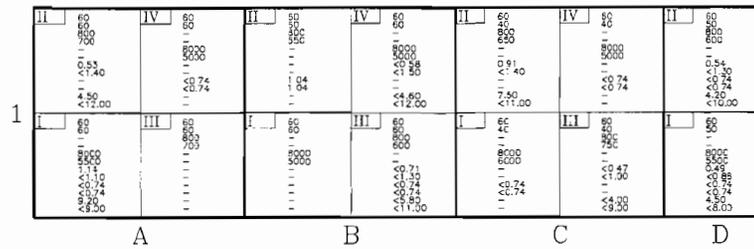
CNSY G-RAM FINAL REPORT

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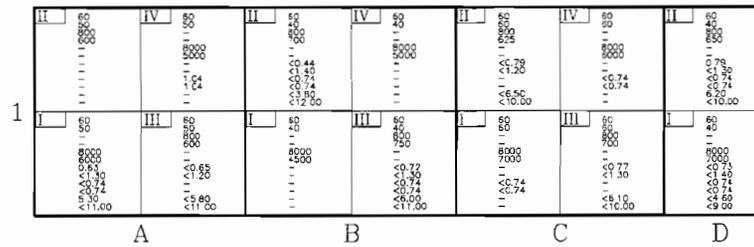
d. Localized Grid Map



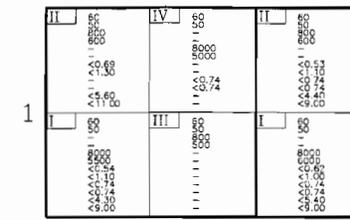
FLOOR  
POLISHING ROOM



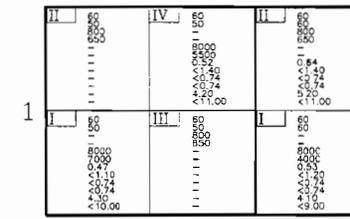
W1



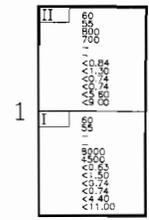
W3



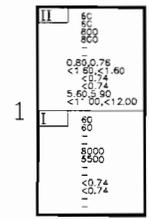
W2



W4



C1



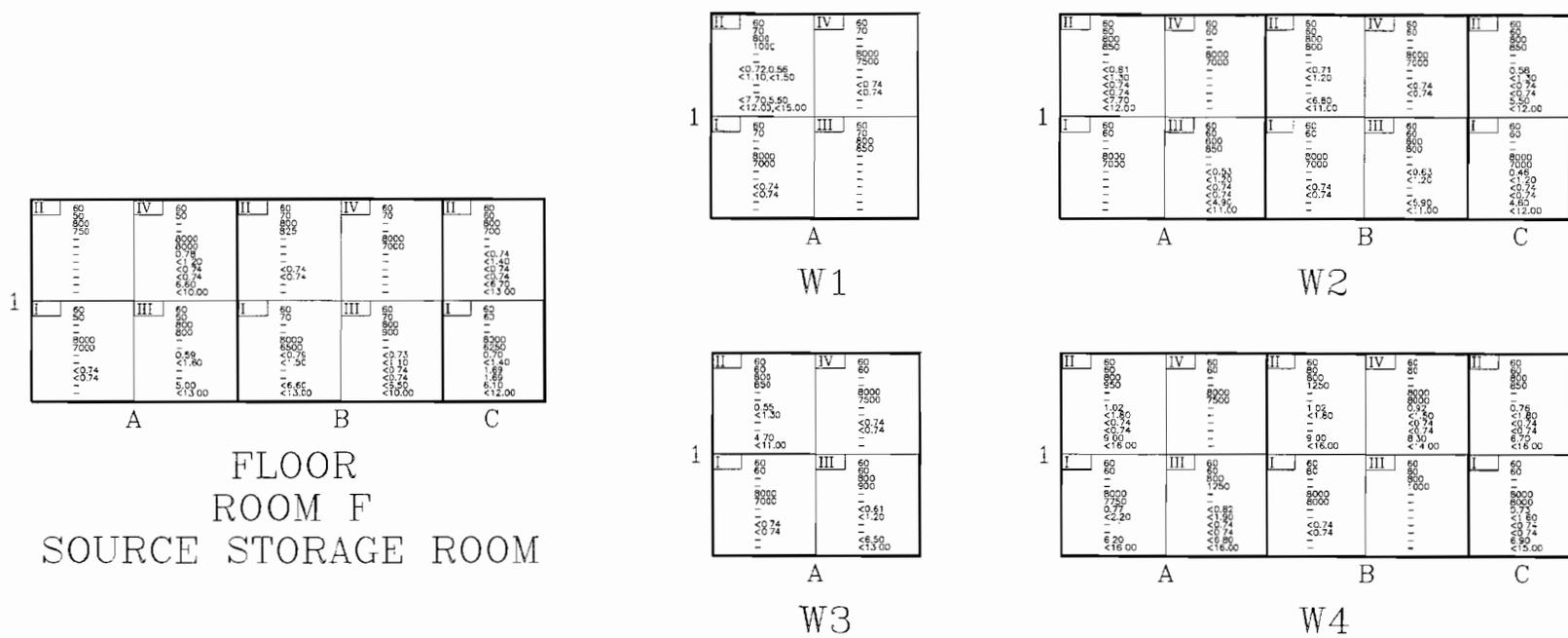
C2

1 - IM-247/PD [Bq.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.3 pCi/g
2 - IM-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g
3 - IM-233/PD [cpm]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <90
4 - IM-233/PD (W-1 PHA) [Bq.]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <90
5 - IM-233/PD (W-2 GROSS) [Bq.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <45
6 - IM-233/PD (W-2 GROSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



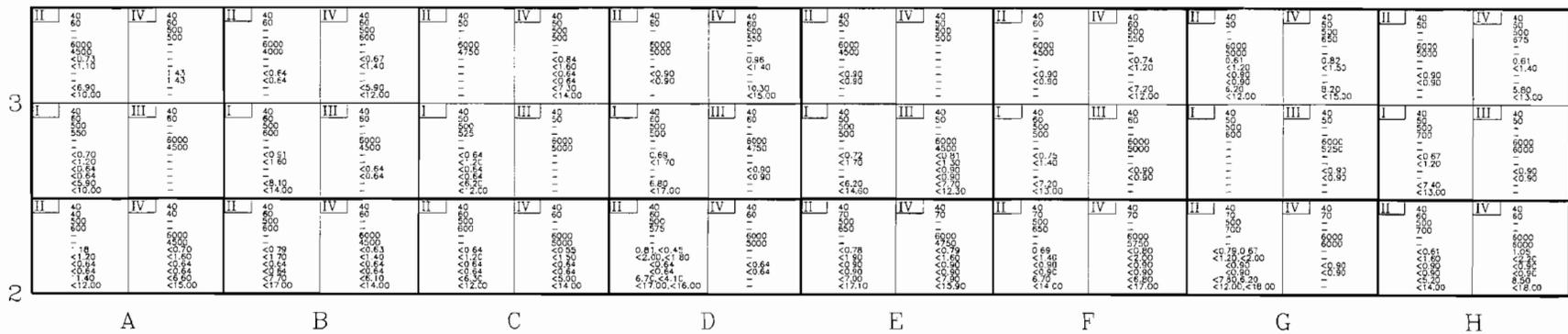
FLOOR  
ROOM F  
SOURCE STORAGE ROOM

Data Legend:  
 1 - IM-247/PD [dkg] 7 - Re-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 2.3 pCi/g  
 2 - IM-247/PD [cpm] 8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g  
 3 - IM-253/PD [HV-1 PHA] [dkg] 9 - Re-226 Removable Radioact vty [pCi/100cm<sup>2</sup>]. Regulator value: <9  
 4 - IM-253/PD [HV-1 PHA] [cpm] 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <9  
 5 - IM-253/PD [HV-2 GROSS] [dkg] 11 - Pa-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45  
 6 - IM-253/PD [HV-2 GROSS] [cpm] 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



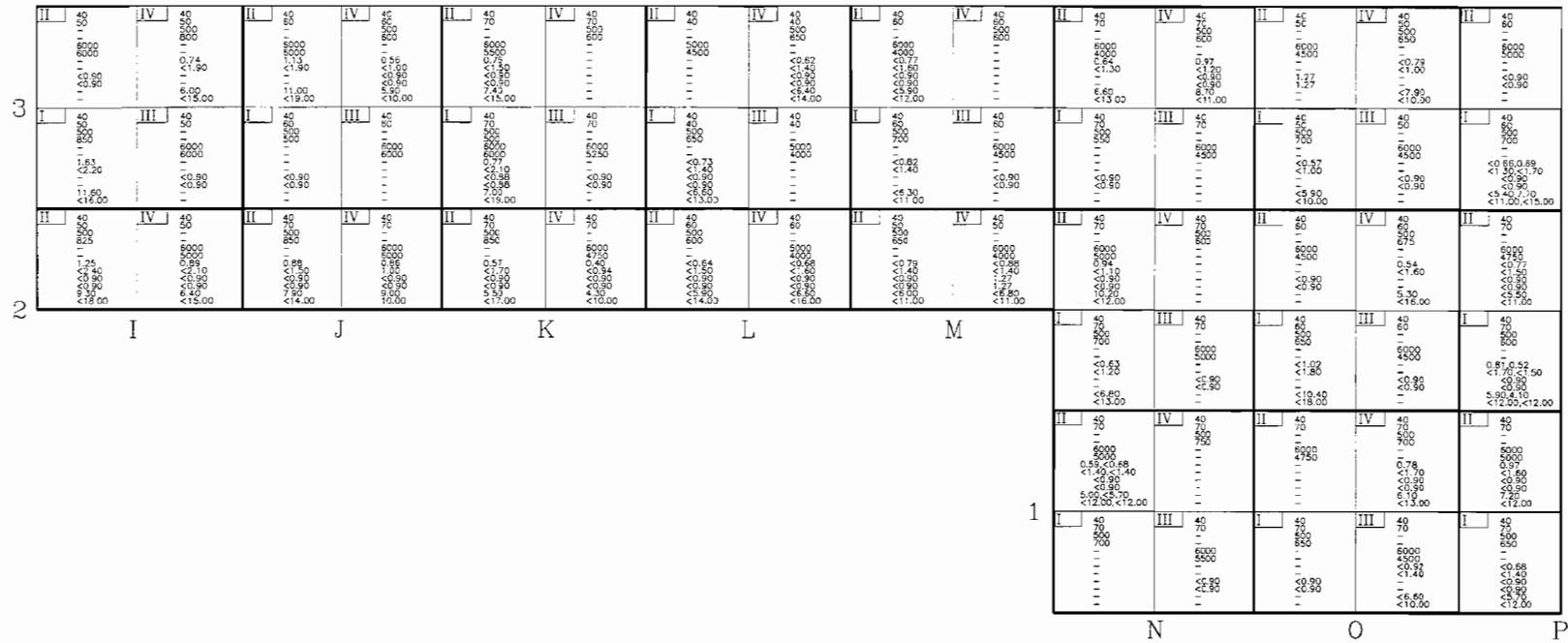
## FLOOR OPTICAL SHOP

- Data Legend:
- 1 - IM-247/PD [pkg.]
  - 2 - IM-247/PD [cpm]
  - 3 - IM-253/PD [pkg.]
  - 4 - IM-253/PD [cpm]
  - 5 - IM-253/PD [HV-1 PHA] [pkg.]
  - 6 - IM-253/PD [HV-2 GROSS] [pkg.]
  - 7 - IM-253/PD [HV-2 GROSS] [cpm]
  - 8 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 2.3 pCi/g
  - 9 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g
  - 10 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <0
  - 11 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <90
  - 12 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45
  - 13 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



FLOOR  
OPTICAL SHOP

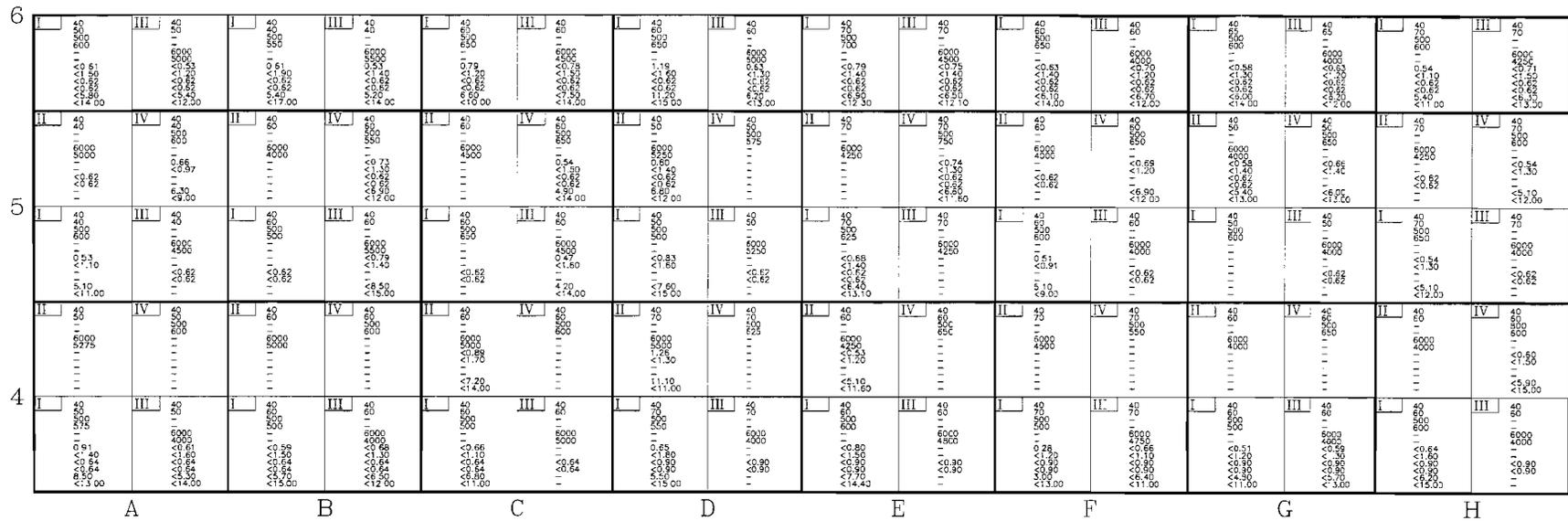
Data Legend:

1 - M-247/PD [bq]	7 - R-228 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 2.3 pCi/g
2 - M-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 3.2 pCi/g
3 - M-253/PD [bq]	9 - R-228 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
4 - M-253/PD [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
5 - M-253/PD [GROSS] [cts]	11 - R-228 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45
6 - M-253/PD [GROSS] [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



FLOOR  
OPTICAL SHOP

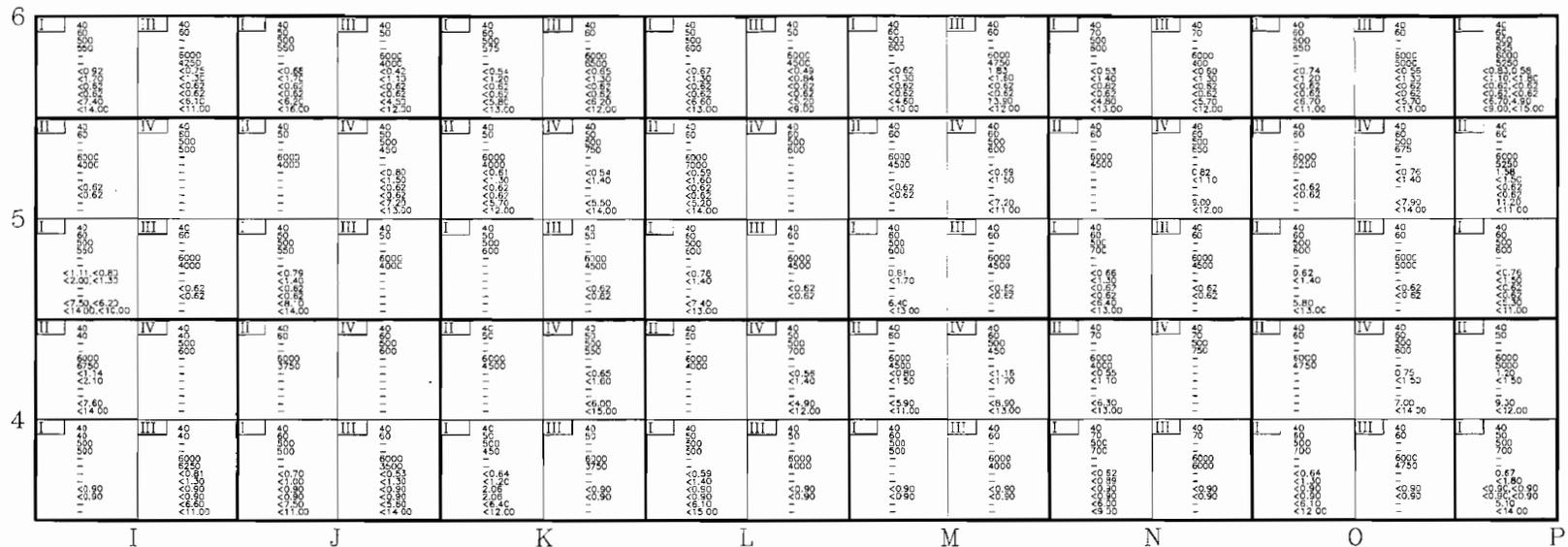
Data Legend:

1 - M-247/PD [bkg.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 2.3 pCi/g
2 - M-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g
3 - M-235/PD (HV-1 PHA) [bkg.]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <9
4 - M-235/PD (HV-1 PHA) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <9
5 - M-235/PD (HV-2 GRSS) [bkg.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <45
6 - M-235/PD (HV-2 GRSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value: <45

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



FLOOR  
OPTICAL SHOP

Data Legend:

- |  |   |
|--|---|
| 1 - M-241/PD [Bq.g <sup>-1</sup> ]             | 7 - Ra-226 Soil Sample Radioactivity [pCi/g]. Regulator value <5 above Bq. of 2.2 pCi/g |
| 2 - M-241/PD [cpm]                             | 8 - Th-232 Soil Sample Radioactivity [pCi/g]. Regulator value <5 above Bq. of 3.2 pCi/g |
| 3 - M-233/PD (V-1) PHA [Bq.g <sup>-1</sup> ]   | 9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value <9        |
| 4 - M-233/PD (V-1) PHA [cpm]                   | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value <90      |
| 5 - M-233/PD (V-2) GROSS [Bq.g <sup>-1</sup> ] | 11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value <45        |
| 6 - M-233/PD (V-2) GROSS [cpm]                 | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]. Regulator value <450       |







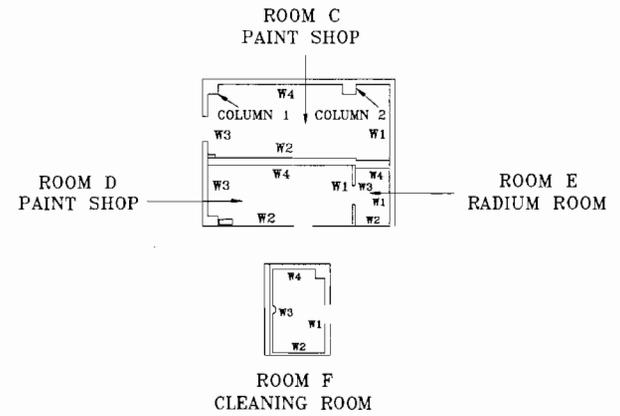
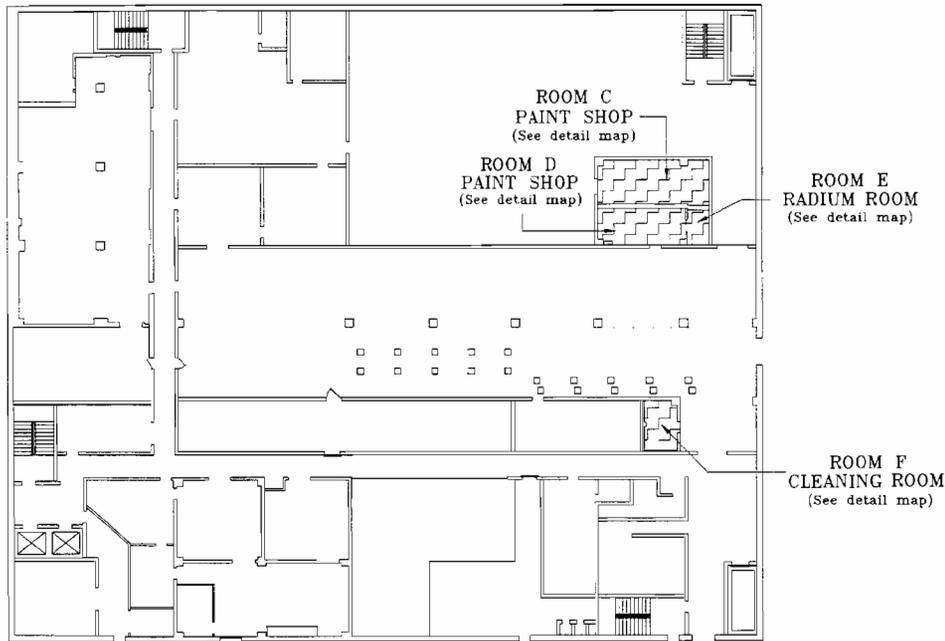




CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Site Map, Class C



PAINT ROOM AND CLEANING ROOM  
DETAIL MAP

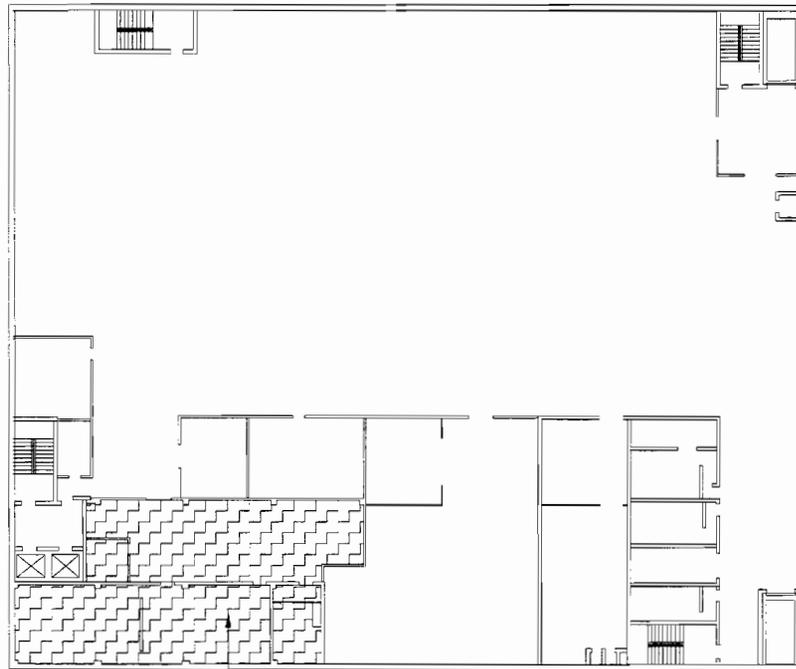
SECOND FLOOR



CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Site Map, Class C

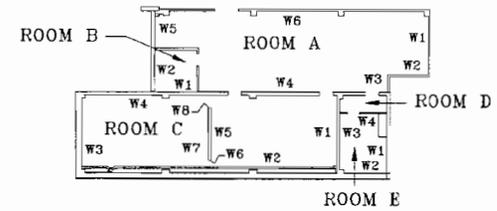


RADIAC CALIBRATION  
LABORATORY  
(See detail map)



CLASS C

FOURTH FLOOR

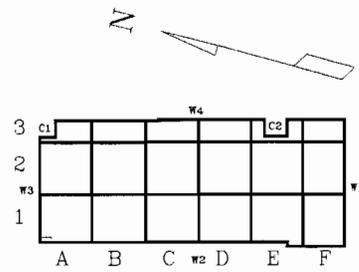


RADIAC CALIBRATION  
LABORATORY  
DETAIL MAP

CNSY G-RAM FINAL REPORT

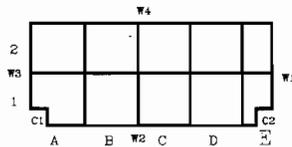
Section 14. Building 177

d. Overall Grid Map



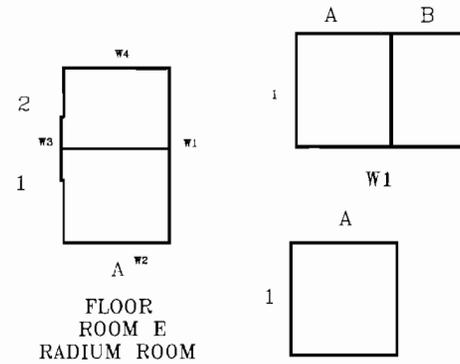
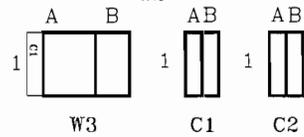
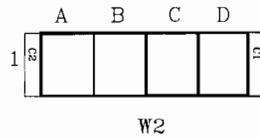
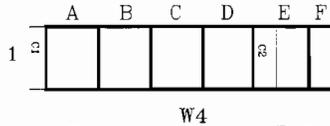
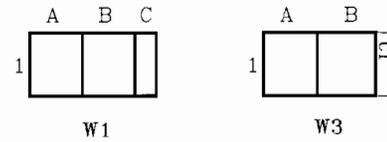
FLOOR  
ROOM C  
PAINT SHOP

NOTE: WALL W2 WAS NOT SURVEYED.



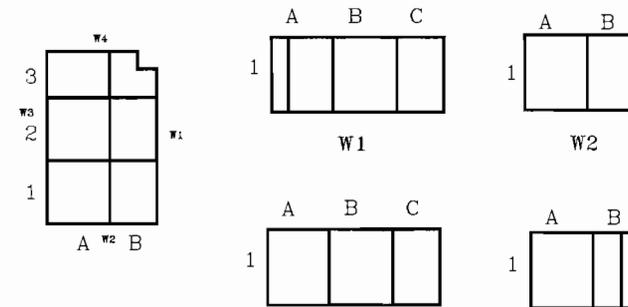
FLOOR  
ROOM D  
PAINT SHOP

NOTE: WALLS W1 & W4 WERE NOT SURVEYED.



FLOOR  
ROOM E  
RADIUM ROOM

NOTE: WALLS W3 & W4 WERE NOT SURVEYED.

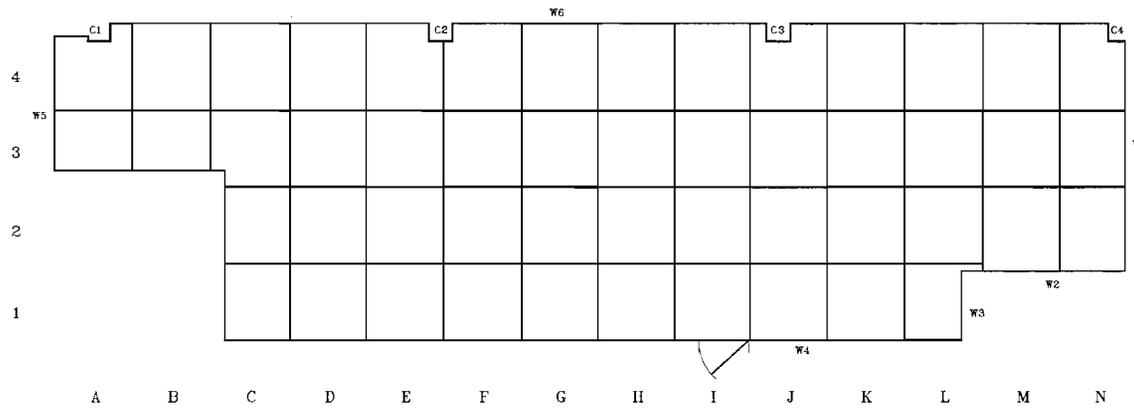


FLOOR  
ROOM F  
CLEANING ROOM

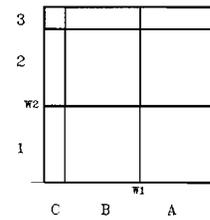
CNSY G-RAM FINAL REPORT

Section 14. Building 177

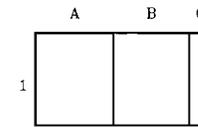
d. Localized Grid Map



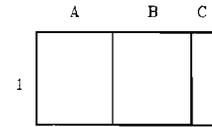
FLOOR  
ROOM A  
FOURTH FLOOR  
(See Wall grid maps next page)



FLOOR  
ROOM B  
FOURTH FLOOR



B-W1

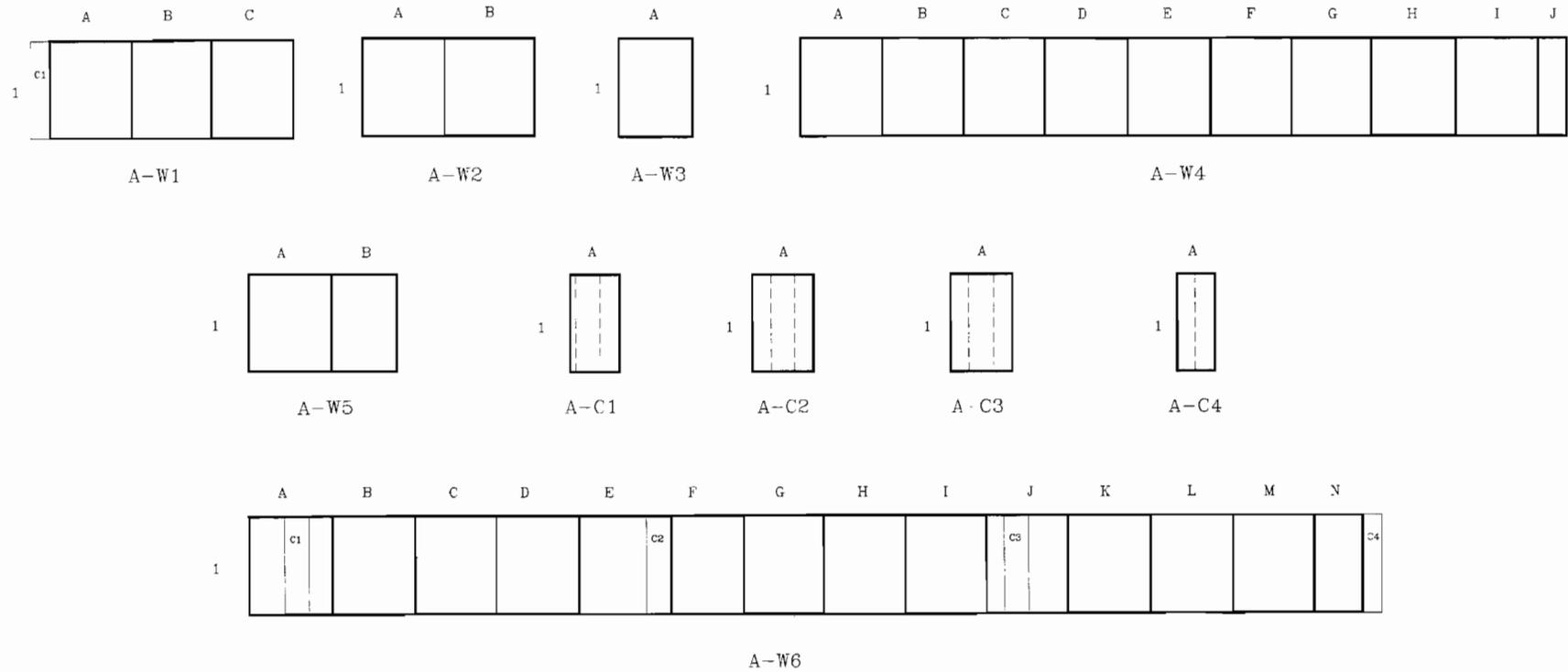


B-W2

CNSY G-RAM FINAL REPORT

Section 14. Building 177

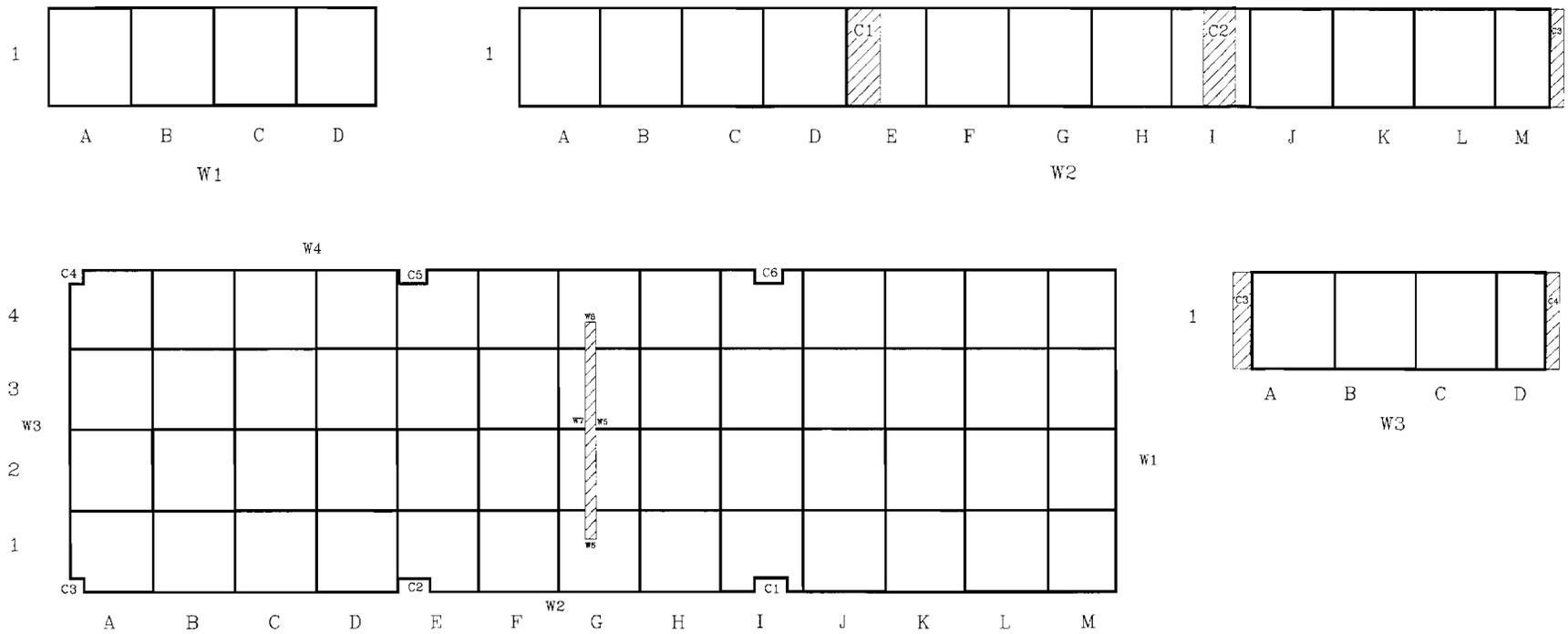
d. Localized Grid Map



CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map

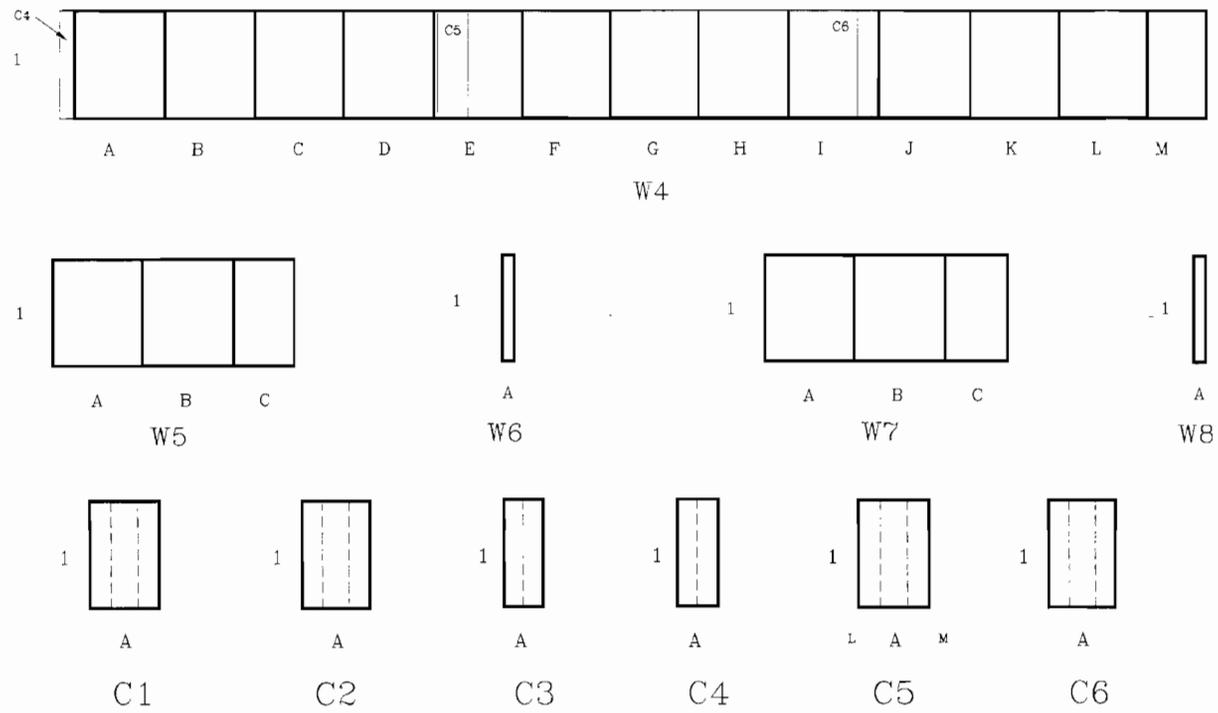


RADIAC CALIBRATION LABORATORY  
 ROOM C  
 FOURTH FLOOR

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map

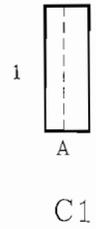
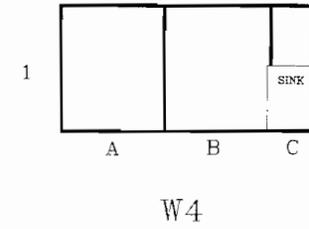
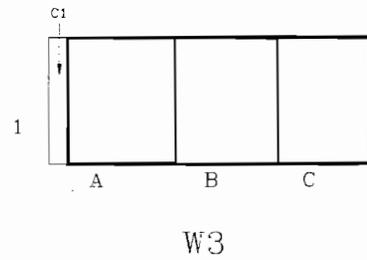
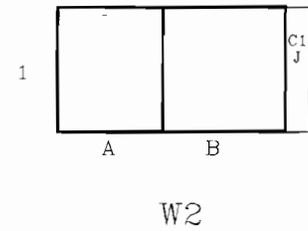
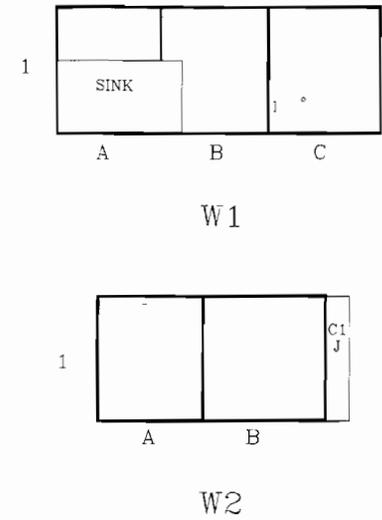
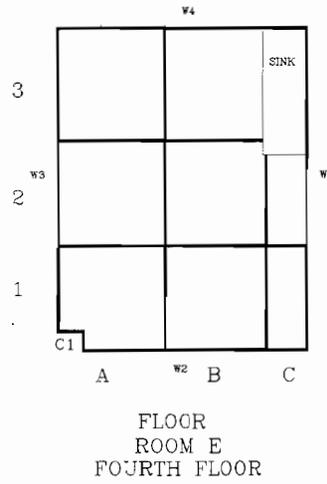
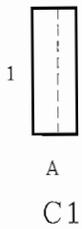
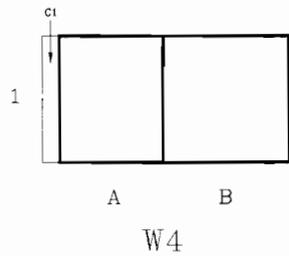
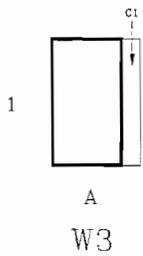
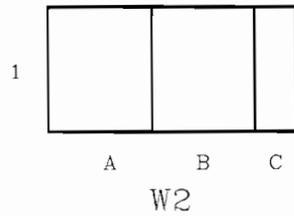
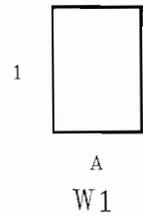
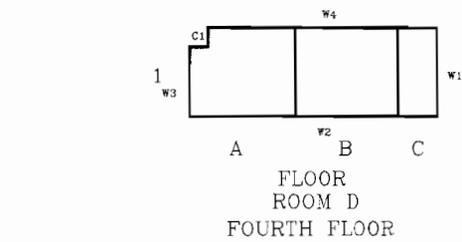


RADIAC CALIBRATION LABORATORY  
ROOM C  
FOURTH FLOOR

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Overall Grid Map



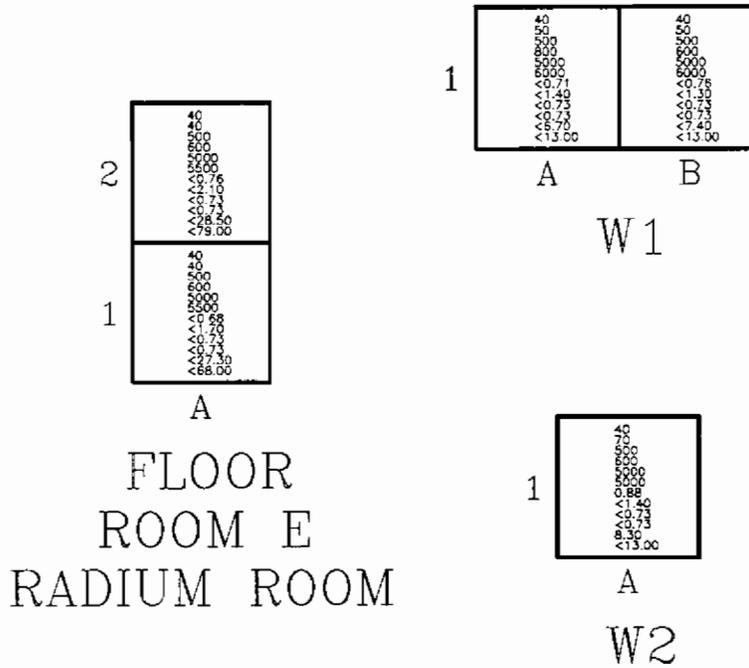




CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



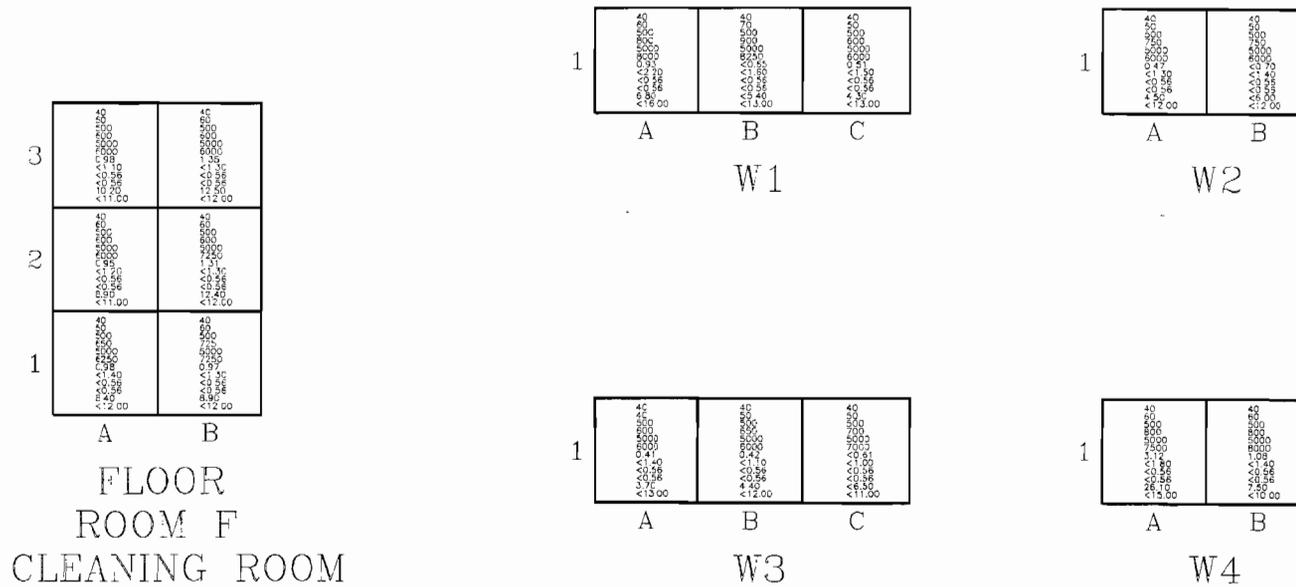
Data Legend:

- |                                   |  |
|-----------------------------------|--|
| 1 - IM-247/PD [bkg.]              | 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g |
| 2 - IM-247/PD [cpm]               | 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g |
| 3 - IM-253/PD (HV-1 PHA) [bkg.]   | 9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9          |
| 4 - IM-253/PD (HV-1 PHA) [cpm]    | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90        |
| 5 - IM-253/PD (HV-2 CROSS) [bkg.] | 11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45          |
| 6 - IM-253/PD (HV-2 CROSS) [cpm]  | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450         |

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



Data Legend:  
 1 - IM-247/HD [bkg]  
 2 - IM-247/HD [cpm]  
 3 - IM-253/HD [bkg] PHA [bkg]  
 4 - IM-253/HD [bkg] PHA [cpm]  
 5 - M-254/HD [bkg] GRC35 [bkg]  
 6 - M-253/HD [bkg] GRC35 [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

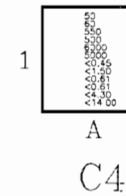
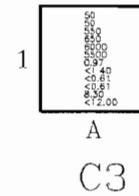
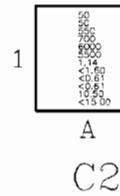
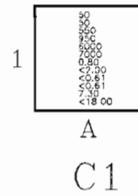
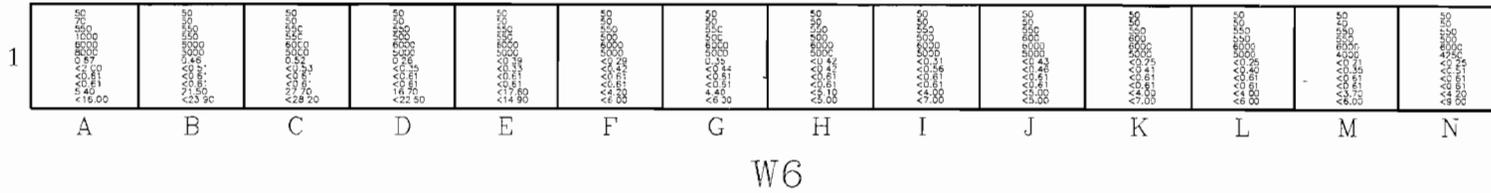
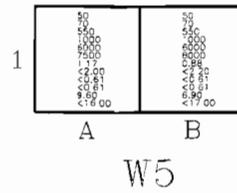




CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map, Room A, Radiac Calibration Laboratory

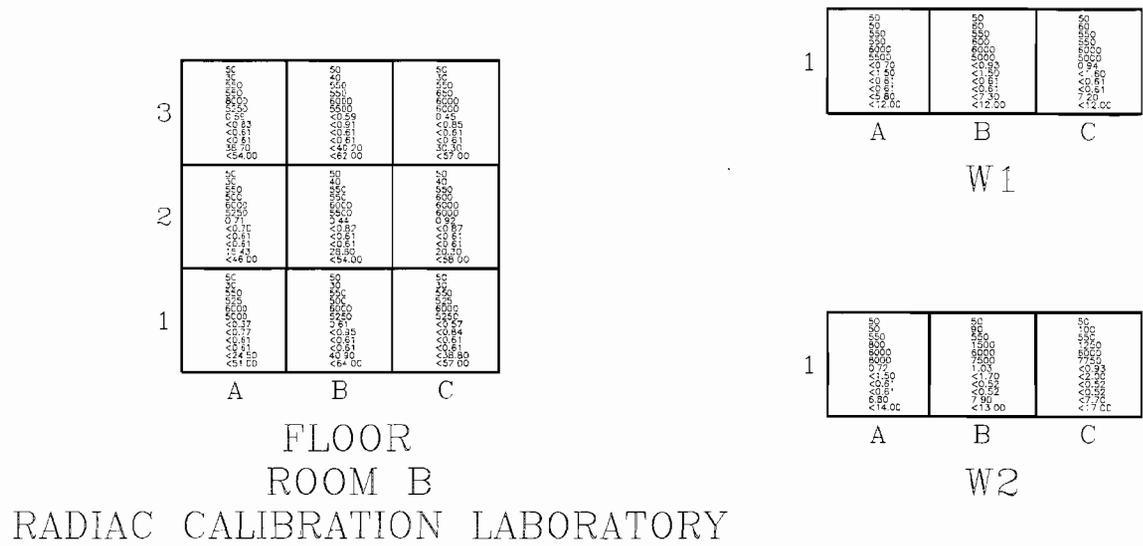


Data Legend:  
 1 - IM-247/PC [Bq]  
 2 - IM-247/PC [cpm]  
 3 - IM-253/PC [Bq-1 PHA] [Bq]  
 4 - IM-253/PC [Bq-1 PHA] [cpm]  
 5 - IM-253/PC [HV-2 CROSS] [Bq]  
 6 - IM-253/PC [HV-2 CROSS] [cpm]  
 7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value <5 above bkg of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value <5 above bkg of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map



Data Legend:  
 1 - M-247/P2 [bkg]  
 2 - M-247/P0 [cpm]  
 3 - M-253/P0 (PHA) [bkg]  
 4 - M-253/P0 (HV-1 PHA) [cpm]  
 5 - M-253/P0 (HV-2 GRSS) [bkg]  
 6 - M-253/P0 (HV-3 GRSS) [cpm]

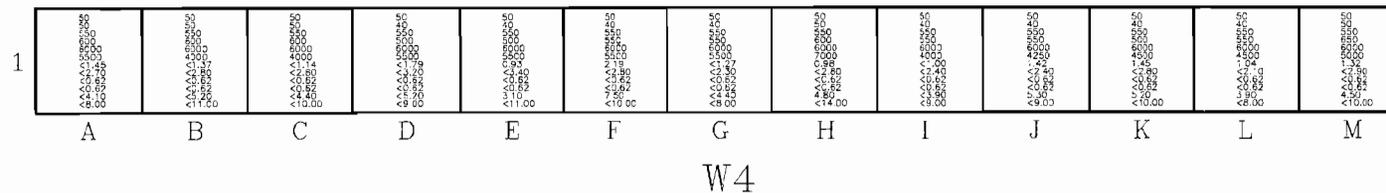
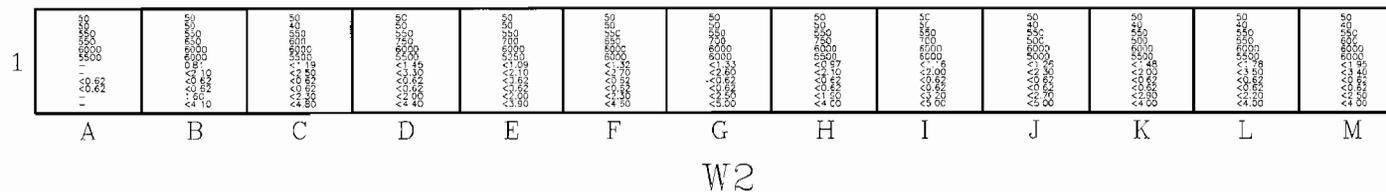
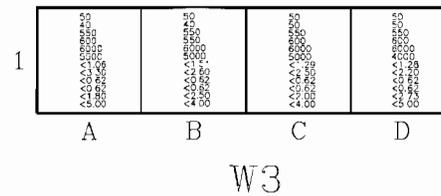
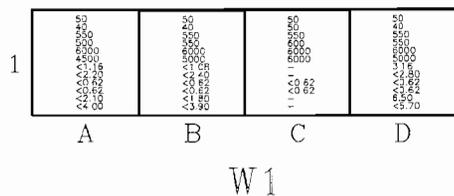
7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value <5 above bkg of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [dC/100cm<sup>2</sup>]; Regulator value: <5  
 10 - Th-232 Removable Radioactivity [dC/100cm<sup>2</sup>]; Regulator value: <50  
 11 - Ra-226 Surface Radioactivity [dC/100cm<sup>2</sup>]; Regulator value: <45  
 12 - Th-232 Surface Radioactivity [dC/100cm<sup>2</sup>]; Regulator value <450



CNSY G-RAM FINAL REPORT

Section 14. Building 177

d. Localized Grid Map, Room C, Radiac Calibration Laboratory



Data Legend:

1 - M-242/PD [Bq]	7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 23 pCi/g
2 - M-242/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 3.2 pCi/g
3 - M-253/PD [dpm] [PHA] [Bq]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
4 - M-253/PD [v-l PHA] [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
5 - M-253/PD [Mv-2 GROSS] [Bq]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45
6 - M-253/PD [Mv-2 GROSS] [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45





CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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Shop 51 Instrument Room, Present, viewing west.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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Antenna Shop, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Instrument Room, viewing west,

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Polishing Room, viewing south.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Source Storage Room, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Optical Shop, viewing south.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Room A Fourth Floor, viewing south.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Room B Fourth Floor, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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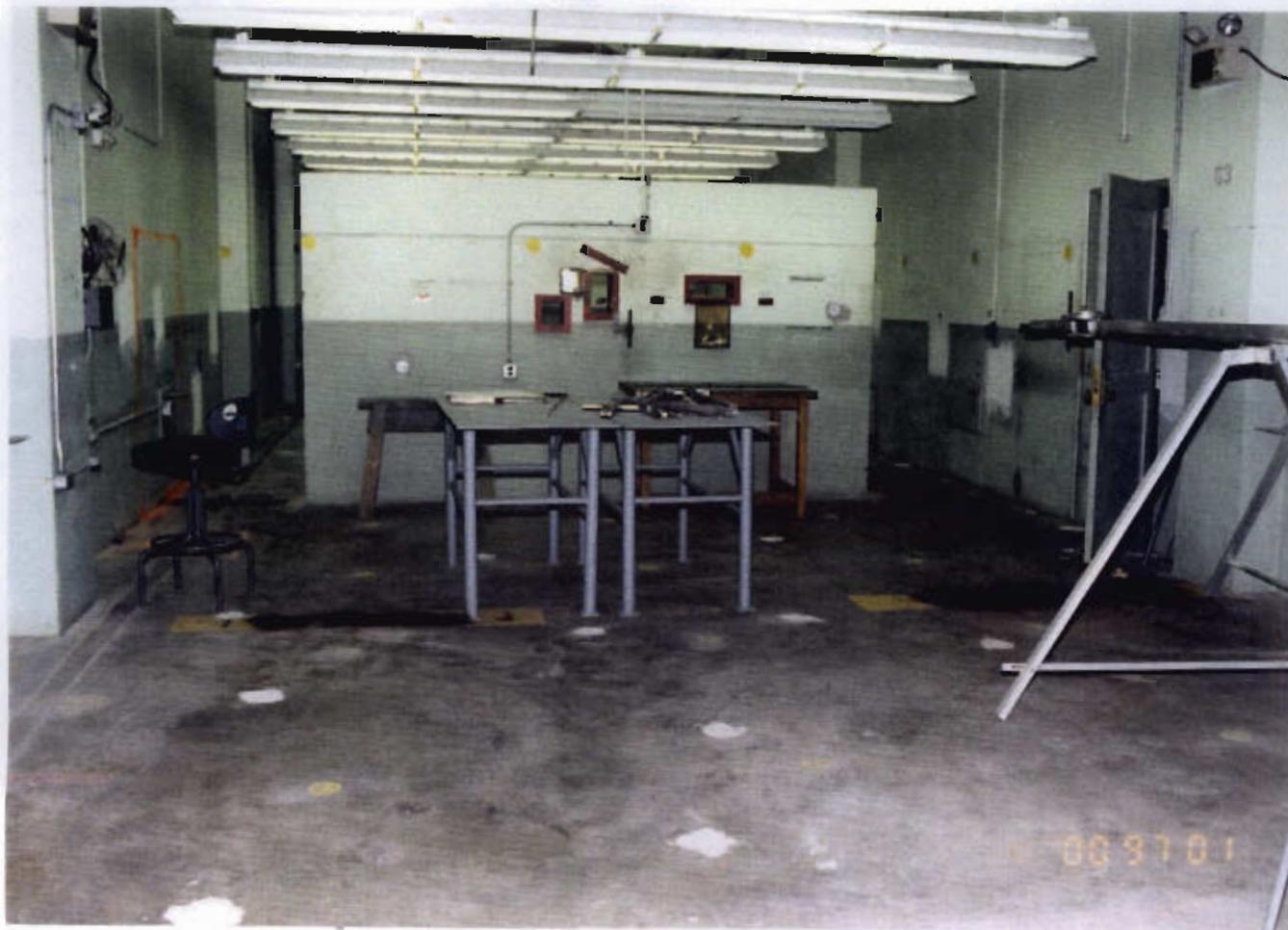
Radiac Calibration Laboratory Room C, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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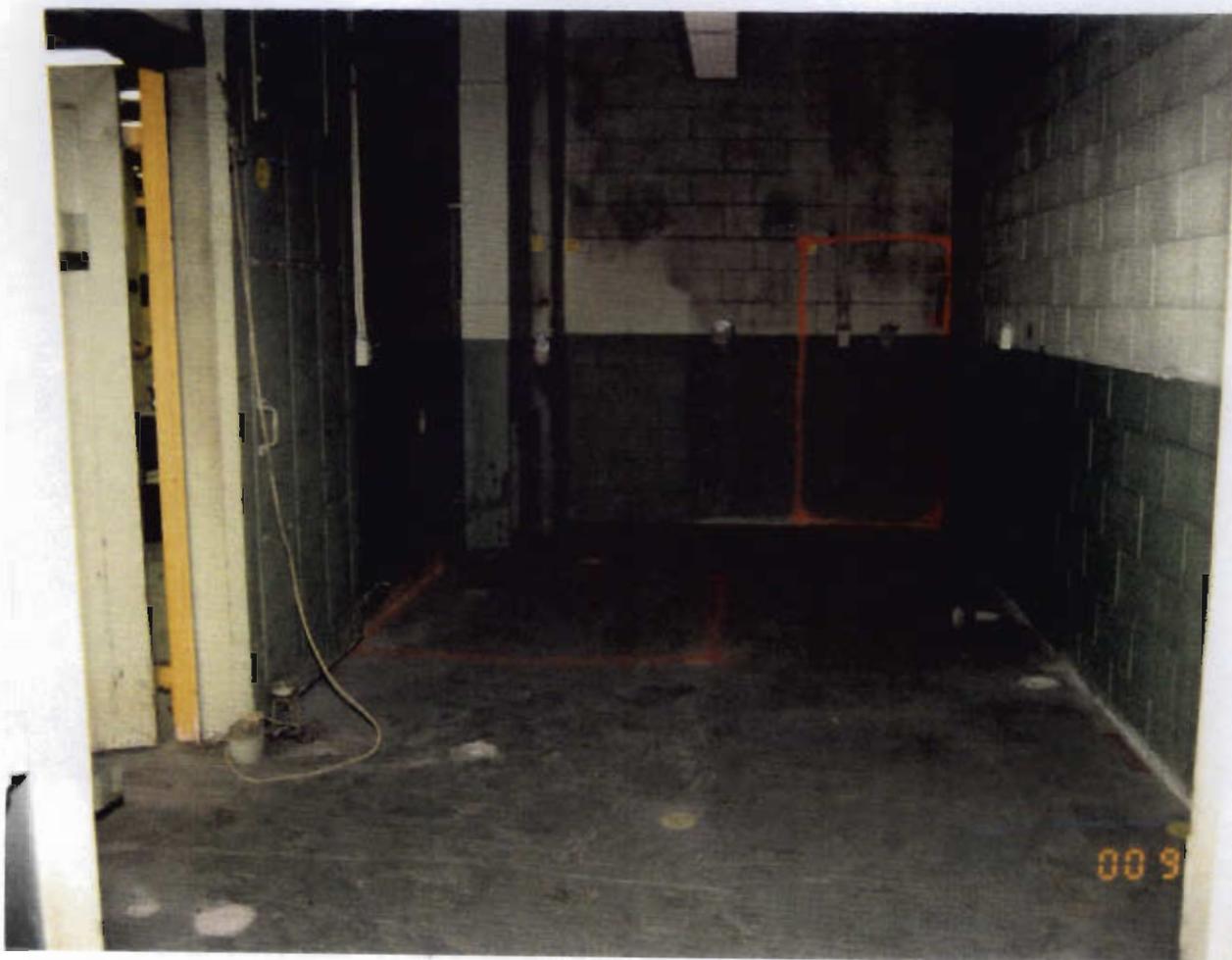
Radiac Calibration Laboratory Room C, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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Room D Fourth Floor, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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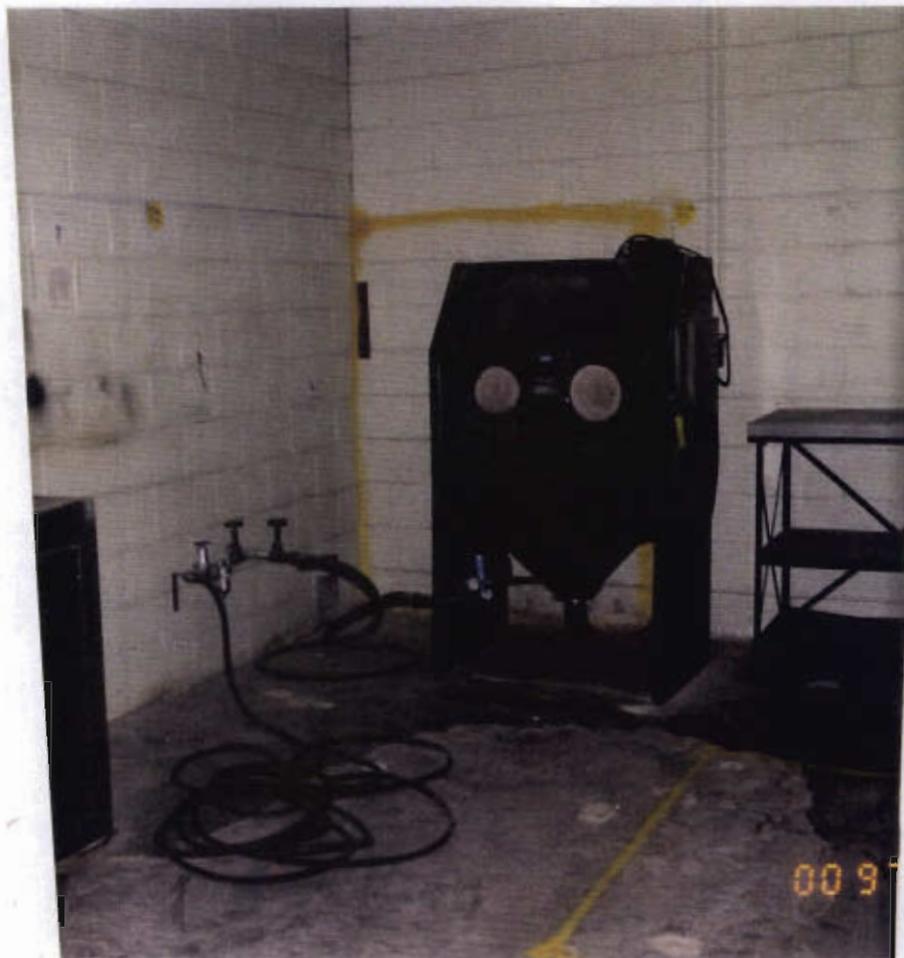
Radium Room E Second Floor, vewing south.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Room E Fourth Floor, viewing east.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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Cleaning Room F Fourth Floor, viewing north.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

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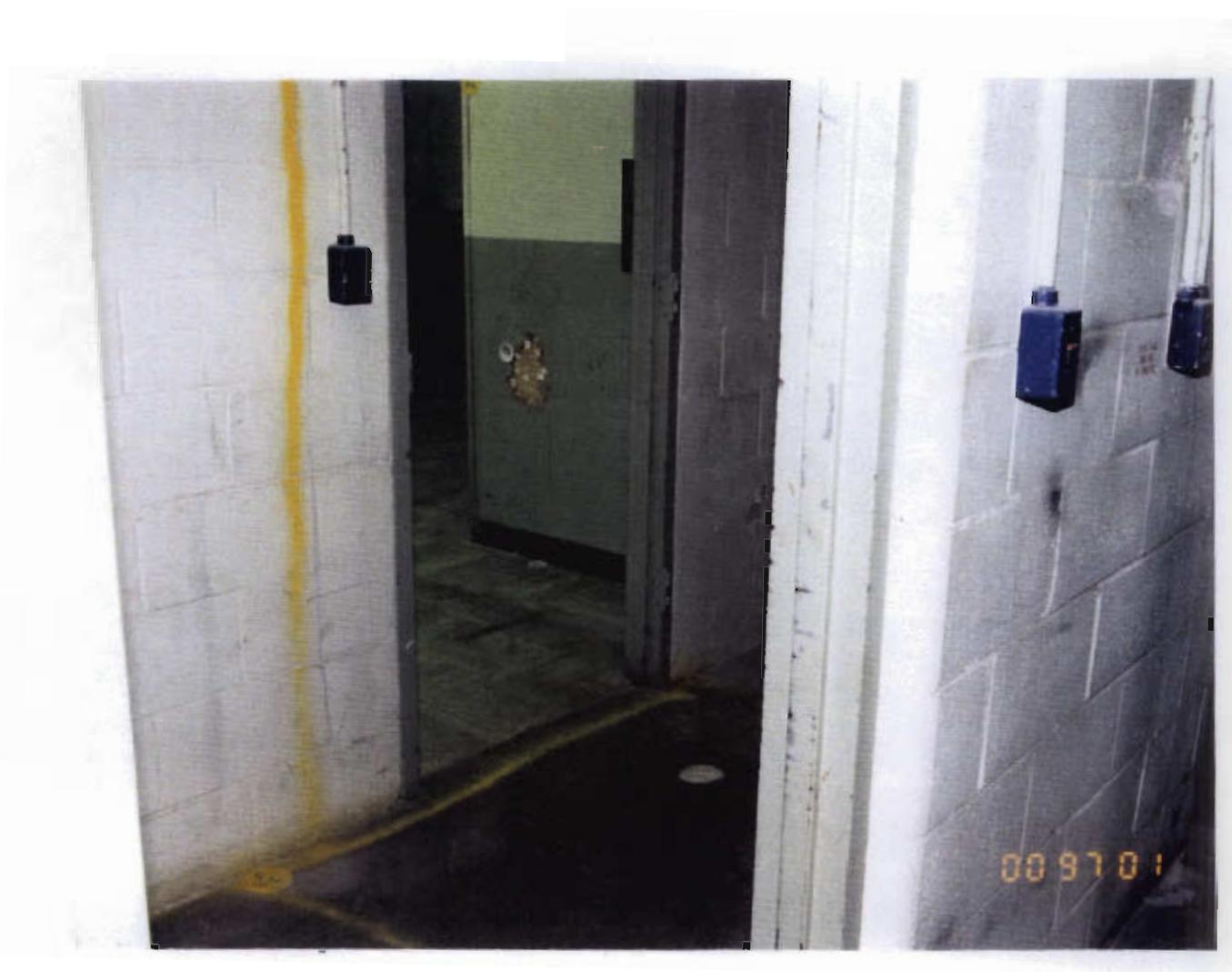
Paint Shop Room C Fourth Floor, viewing south.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Room D Fourth Floor, viewing east.

CNSY G-RAM FINAL REPORT

Section 14. Building 177

e. Photographs

---



Radiac Storage Area, Fourth Floor, viewing north.

## CNSY G-RAM FINAL REPORT

### Section 15. Building 187

#### a. Introduction:

Building 187 was built in 1962 as a Modular Maintenance Facility. It is located on Fifth Street outside the Controlled Industrial Area.

##### (1) Description:

This facility is a single story building consisting of two building masses set parallel to each other with various smaller support facilities surrounding it. It is irregular in shape and encloses various oblique non-weatherproof areas. Building 187 rests on a concrete slab.

##### (2) Brief History:

(a) **Use:** Building 187 was originally constructed as a Modular Maintenance Facility and remains as such.

(b) **Radiological History:** Building 187 has one area that received a G-RAM release survey. Radiological history indicates that radium dial removal operations were performed in the east corner of the electro-mechanical room 108. Radiological history indicates that no spread of loose surface contamination has occurred.

##### (3) Survey Requirements:

(a) Class A release survey.

#### b. Discussion:

The floor of Building 187 was marked with one grid with a maximum size of 20' by 20'. The grid was subdivided into sub-grids with an approximate size of 5' by 5'.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 25% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over at least 25% of the remaining sub-grids in each grid.

A wide gamma energy range scintillation walk-through scan survey with the IM-253/PD (GROSS mode) was performed over the specific site. The walk-through survey is not grid specific therefore entries five and six are not used on the Class "A" localized grid maps. The survey results are reported in the

## CNSY G-RAM FINAL REPORT

### Section 15. Building 187

Summary paragraph.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material sample was removed from the grid location having the highest potential for radioactivity.

Background levels used in Building 187 were determined from similar materials in adjacent areas in Building 187.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels were less than 0.65 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples had a reading of 0.24 pCi/g and Th-232 solid material samples had a reading of less than 0.54 pCi/g.

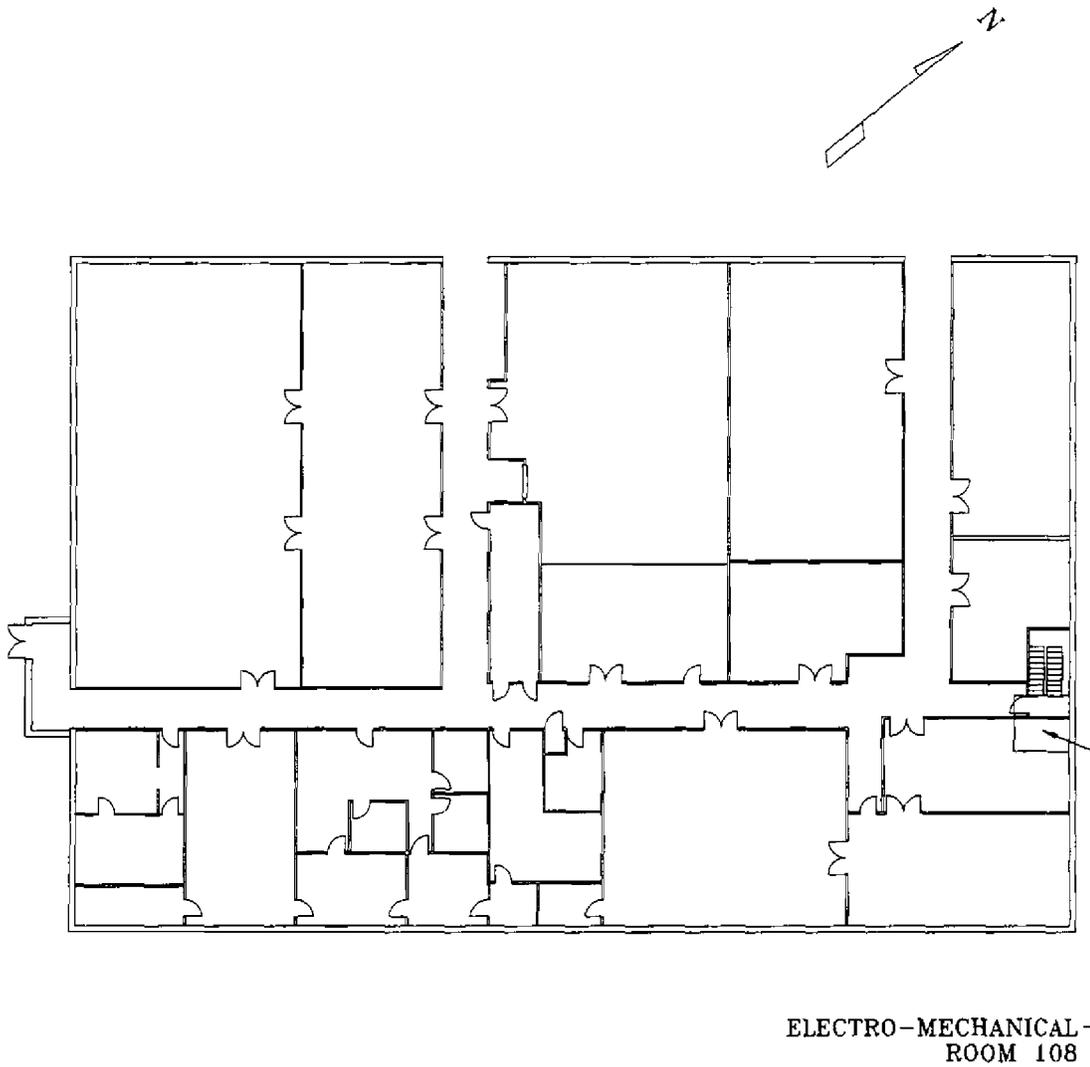
Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than 45 pCi/100 cm<sup>2</sup> and that the surface radioactivity of Th-232 was less than 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels were 16.20 pCi/100 cm<sup>2</sup> and the Th-232 levels were less than 36.00 pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 15. Building 187

d. Site Map

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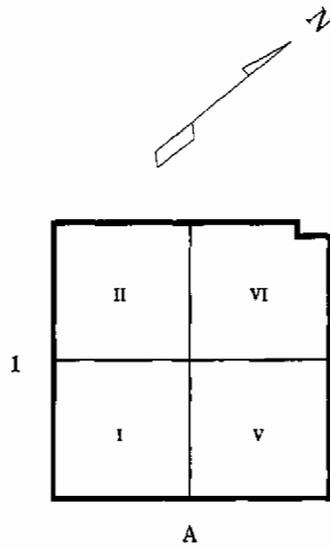


CNSY G-RAM FINAL REPORT

Section 15. Building 187

e. Overall Grid Map

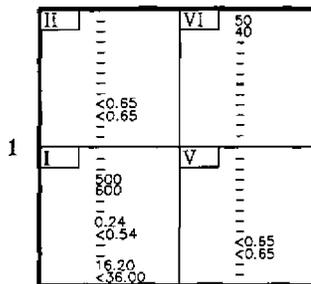
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# CNSY G-RAM FINAL REPORT

## Section 15. Building 187

### e. Localized Grid Map



A  
Floor

Note:  
Entries 3 and 5 are not required for Class 'A' Localized  
Grid Map pages. See the Discussion paragraph.

Data Legend:	
1 - M-247/PD [bkg.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
2 - M-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
3 - M-253/PD (HV-1 PHA) [bkg.]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9
4 - M-253/PD (HV-1 PHA) [cpm]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90
5 - M-253/PD (HV-2 GROSS) [bkg.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45
6 - M-253/PD (HV-2 GROSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 15. Building 187

f. Photographs

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Electro-mechanical Room

# CNSY G-RAM FINAL REPORT

## Section 16. Building 190

### a. Introduction:

Building 190 was built in 1962 and is located on River Road, between Piers H and J; it housed the shipyard and fleet radiological training facilities.

#### (1) Description:

Building 190 is a two story building resting on a concrete slab. It is rectangular in shape with a brick facade.

#### (2) Brief History:

(a) **Use:** This was a training facility, however, RADIACs were stored and issued here.

(b) **Radiological History:** Building 190 has two areas, Rooms 102 and 105/106, where RADIACs were stored and issued. Some of these instruments were equipped with installed sealed sources of Th-230 and Tc-99. Radiological history indicates that no spread of surface contamination has occurred.

#### (3) Survey Requirements:

(a) Class A release survey.

### b. Discussion:

The floor of Building 190 was divided into a total of three grids with a maximum size of 20' by 20'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over at least 25% of the sub-grids in each grid.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over at least 25% of the remaining sub-grids in each grid.

A wide gamma energy range scintillation walk-through scan survey with the IM-253/PD (GROSS mode) was performed over the specific site. The walk-through survey is not grid specific therefore entries five and six are not used on the Class "A" localized grid maps. The survey results are reported in the Summary paragraph.

A minimum of two swipes/smears were taken from each grid.

## CNSY G-RAM FINAL REPORT

### Section 16. Building 190

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 190 were determined from similar materials in Building 664.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas with surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect any areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect any areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels were less than 0.62 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.45 pCi/g to a high of less than 0.50 pCi/g and Th-232 solid material samples ranged from a low of less than 0.62 pCi/g to a high of less than 0.99 pCi/g.

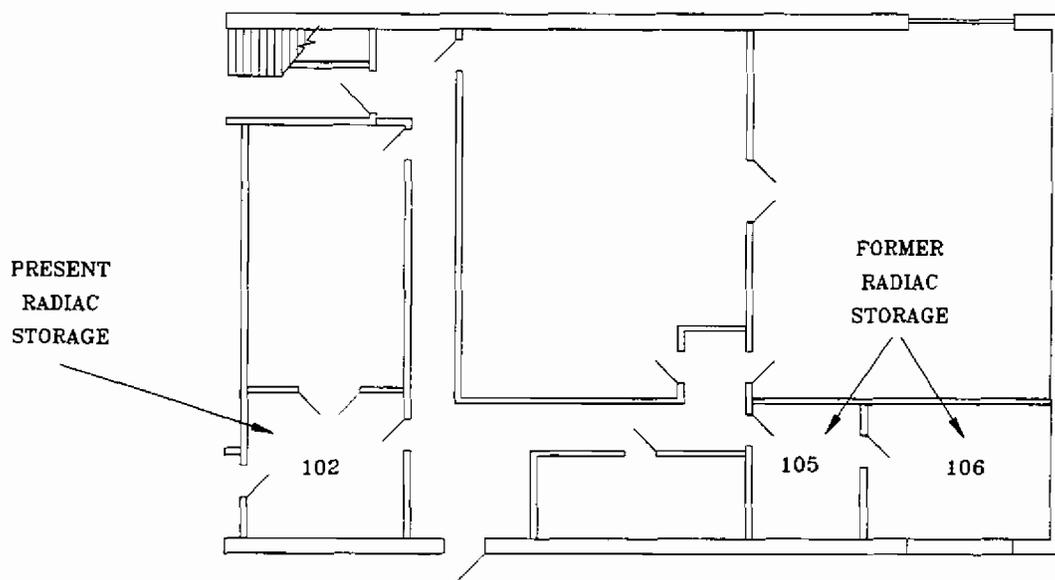
Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 4.60 pCi/100 cm<sup>2</sup> to a high of less than 27.90 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 6.00 pCi/100 cm<sup>2</sup> to a high of less than 56.00 pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 16. Building 190

d. Site Map

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FIRST FLOOR

CNSY G-RAM FINAL REPORT

Section 16. Building 190

e. Overall Grid Map

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	III	VII	XI
1	II	VI	X
	I	V	IX

A

Rm 102

	III	VII
1	II	VI
	I	V

A

Rm 105

	III	VII	XI	XV
1	II	VI	X	XIV
	I	V	IX	XIII

A

Rm 106

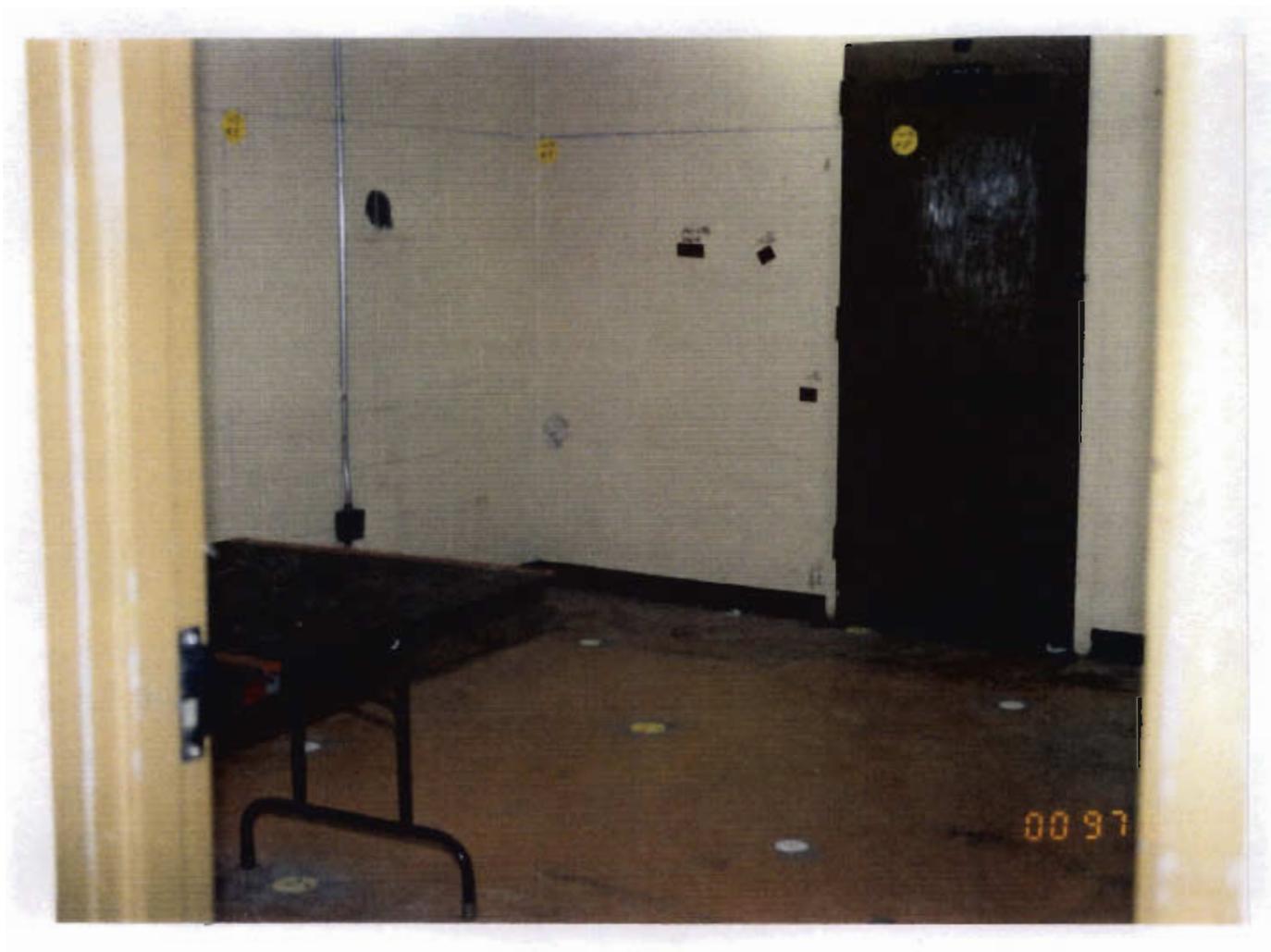


CNSY G-RAM FINAL REPORT

Section 16. Building 190

f. Photographs

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Room 102, viewing northwest.

CNSY G-RAM FINAL REPORT

Section 16. Building 190

f. Photographs

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Room 105, viewing northeast.

CNSY G-RAM FINAL REPORT

Section 16. Building 190

f. Photographs

---



Room 106, viewing southeast.

## CNSY G-RAM FINAL REPORT

### Section 17. Building 217

#### a. Introduction:

Building 217 was built in 1968 as a Neutron Generator House. It is located on the south side of Building 13 off of Dry Dock Avenue.

##### (1) Description:

Building 217 is a single story concrete structure which is rectangular in shape. The building is located between Building 13 and Building 187.

##### (2) Brief History:

(a) **Use:** Building 217 housed a neutron generator used by the Code 134 Laboratory Division. The neutron generator was only used to identify unknown metals; this use was very limited. The generator had an H-3 source which was bombarded with high speed electrons and in turn generated a neutron flux. The neutron generator did not pass the research and development phase and, consequently, was not used for industrial purposes. This building was later used as a radioactive material storage area in the late 1970s and early 1980s, during which time it was controlled as a radiation area and radioactive material storage area. Presently, it is not being used.

(b) **Radiological History:** Radiological history indicates that no spread of surface contamination has occurred.

##### (3) Survey Requirements:

(a) Class B release survey.

#### b. Discussion:

The floor of Building 217 was divided into three grids approximately 10' by 10'. Each of these grids were subdivided into 5' by 5' sub-grids.

The walls were horizontally divided into 12 grids approximately 6' high and 10' wide. Each of these wall grids was subdivided into 3' high by 5' wide sub-grids.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

## CNSY G-RAM FINAL REPORT

### Section 17. Building 217

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over two diagonal quadrants to represent 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other two diagonal quadrants to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 217 were determined from similar materials in Building 1824.

#### c. **Summary:**

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 levels ranged from a low of less than 0.58 pCi/100 cm<sup>2</sup> to a high of 1.30 pCi/100 cm<sup>2</sup> and removable Th-232 levels ranged from a low of less than 0.58 pCi/100 cm<sup>2</sup> to a high of 1.30 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 solid material samples were less than 5 pCi/g and all Th-232 solid material samples were less than 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.77 pCi/g to a high of less than 1.50 pCi/g and Th-232 solid material samples ranged from a low of less than 1.40 pCi/g to a high of less than 2.90 pCi/g.

## CNSY G-RAM FINAL REPORT

### Section 17. Building 217

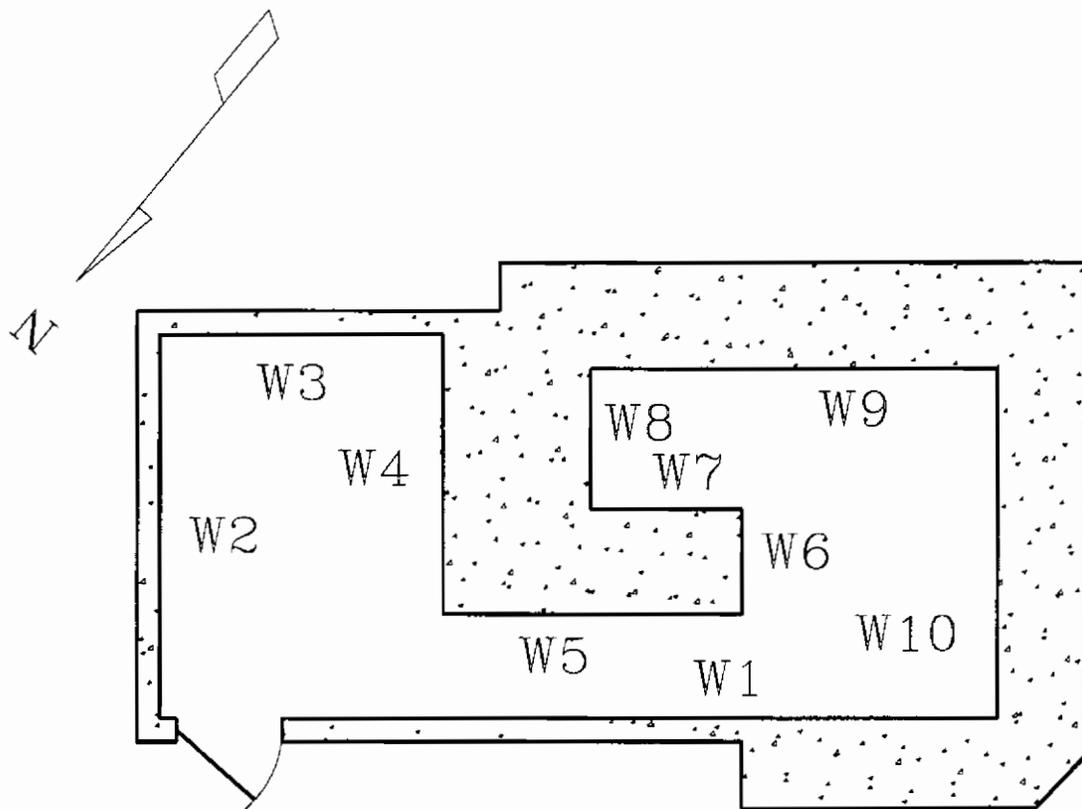
Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 5.80 pCi/100 cm<sup>2</sup> to a high of 11 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 12.00 pCi/100 cm<sup>2</sup> to a high of less than 22.00 pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 17. Building 217

d. Site Map

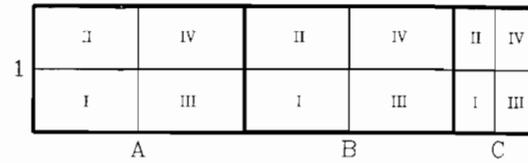
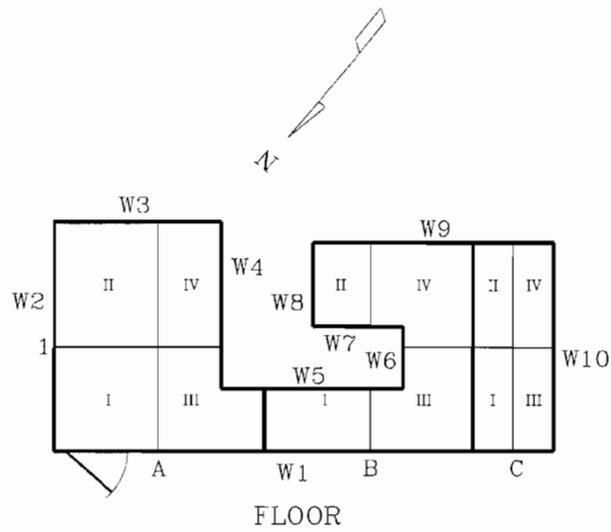
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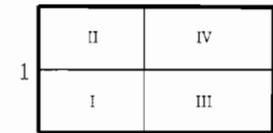
CNSY G-RAM FINAL REPORT

Section 17. Building 217

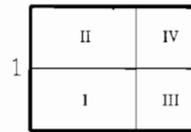
e. Overall Grid Map



W1



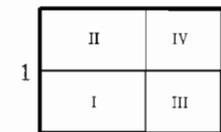
W2



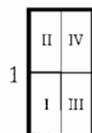
W3



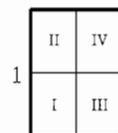
W4



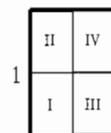
W5



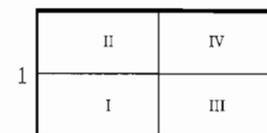
W6



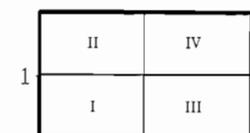
W7



W8



W9



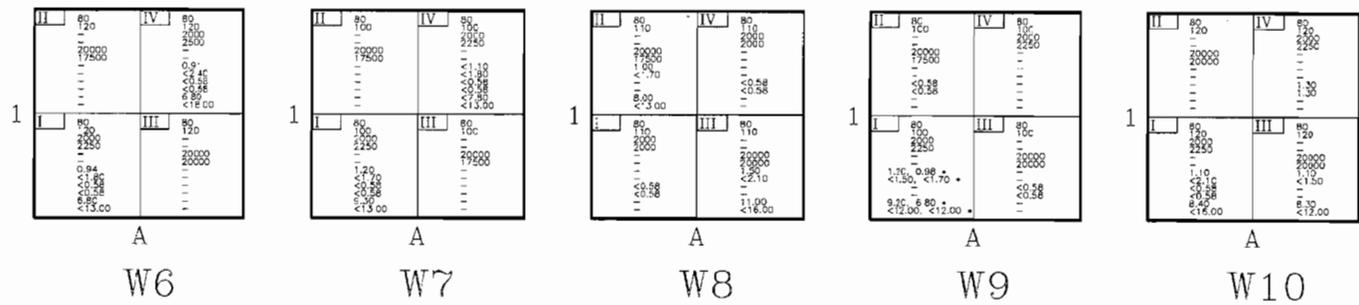
W10



CNSY G-RAM FINAL REPORT

Section 17. Building 217

e. Localized Grid Maps



Note:  
 • Two solid material samples were taken from this subgrid

Date Legend:  
 1 - Iw-247/PD [pki]  
 2 - Iw-247/PD [cpm]  
 3 - Iw-253/PD (HV-1 P4A) [pki]  
 4 - Iw-253/PD (HV-1 P4A) [cpm]  
 5 - Iw-253/PD (HV-2 GROSS) [pki]  
 6 - Iw-253/PD (HV-2 GROSS) [cpm]  
 7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 2.3 pCi/g  
 8 - Tl-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5 above bkg. of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <9  
 10 - Tl-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <45  
 12 - Tl-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 17. Building 217

f. Photographs

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Building 217 Entrance

CNSY G-RAM FINAL REPORT

Section 17. Building 217

f. Photographs

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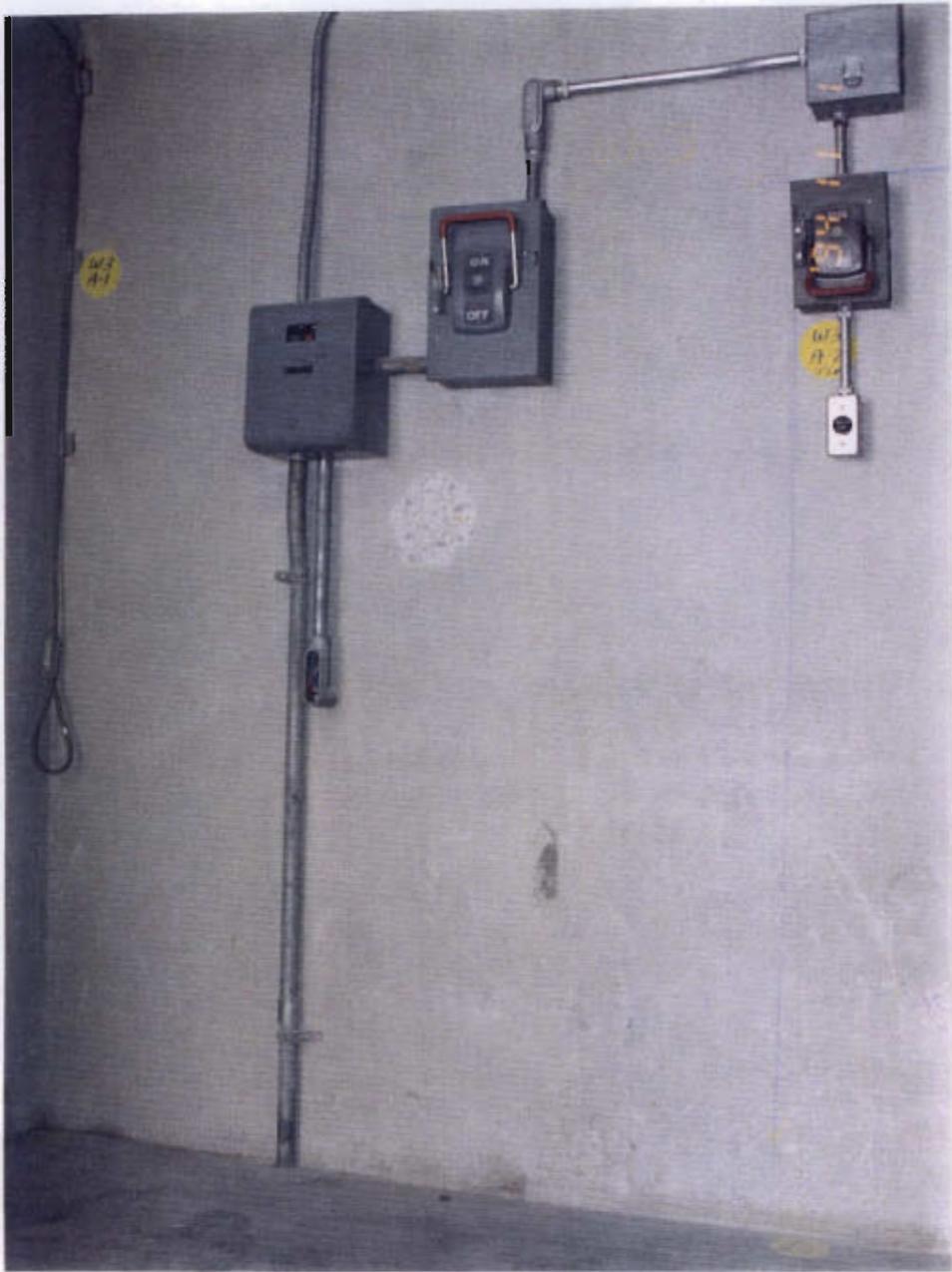
Hallway

CNSY G-RAM FINAL REPORT

Section 17. Building 217

f. Photographs

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Viewing Wall 3

## CNSY G-RAM FINAL REPORT

### Section 18. Building 218

#### a. Introduction:

Building 218 was built in 1969 as the Outside Machinist Marine Shop and is located on Necessary Lane, west of Building 79, inside the CIA.

##### (1) Description:

Building 218 is a single story rectangular structure. The building rests on a concrete slab.

##### (2) Brief History:

(a) **Use:** Building 218 has two areas that received a G-RAM release survey, the Instrument Storage Cage and the Instrument Issue Cage.

(b) **Radiological History:** Radium dials and other radium products were stored in the Instrument Storage Cage and the Instrument Issue Cage, located along the north wall near the east roll-up door. Radiological history indicates that no spread of surface contamination has occurred.

##### (3) Survey Requirements:

(a) Class A release survey.

#### b. Discussion:

The Building 218 Storage and Issue Cages were divided into a total of six grids with a maximum size of 20' by 20'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over at least 25% of the sub-grids in each grid.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over at least 25% of the remaining sub-grids in each grid.

A wide gamma energy range scintillation walk-through scan survey with the IM-253/PD (GROSS mode) was performed over the specific site. The walk-through survey is not grid specific therefore entries five and six are not used on the Class "A" localized grid maps. The survey results are reported in the Summary paragraph.

## CNSY G-RAM FINAL REPORT

### Section 18. Building 218

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 218 were determined from similar materials in Building 1079.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

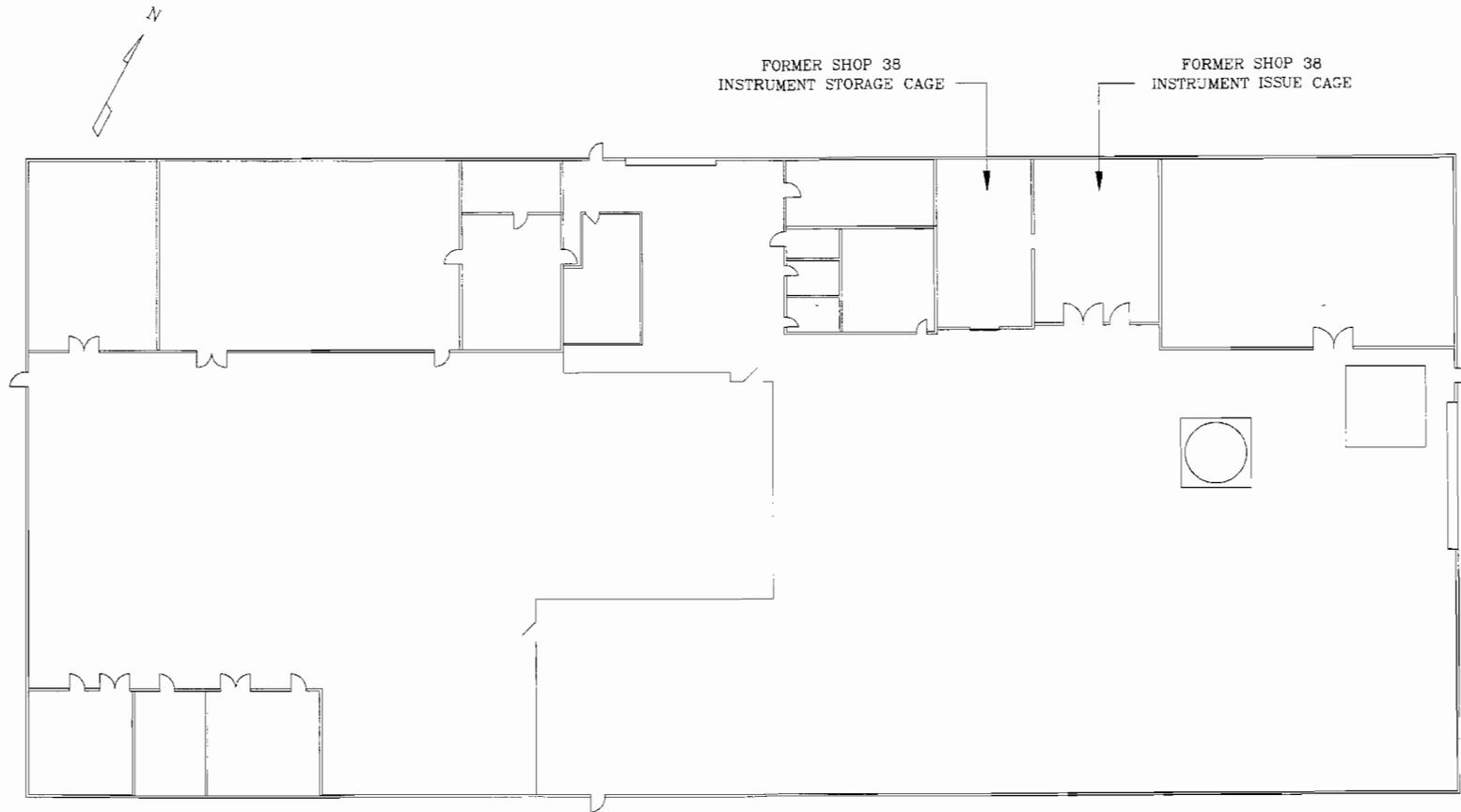
Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels were all less than 0.67 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.39 pCi/g to a high of less than 0.80 pCi/g and Th-232 solid material samples ranged from a low of less than 0.80 pCi/g to a high of less than 1.30 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 4.80 pCi/100 cm<sup>2</sup> to a high of less than 7.90 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 10.00 pCi/100 cm<sup>2</sup> to a high of less than 13.00 pCi/100 cm<sup>2</sup>.

Section 18. Building 218

d. Site Map



CNSY G-RAM FINAL REPORT

Section 18. Building 218

e. Overall Grid Maps

	III	VII	XI	XV
2	II	VI	X	XIV
	I	V	IX	XIII
	IV	VIII	XII	XVI
1	III	VII	XI	XV
	II	VI	X	XIV
	I	V	IX	XIII

A

FORMER SHOP 38  
INSTRUMENT STORAGE CAGE

	III	VII	XI	XV	III
2	II	VI	X	XIV	II
	I	V	IX	XIII	I
	IV	VIII	XII	XVI	IV
1	III	VII	XI	XV	III
	II	VI	X	XIV	II
	I	V	IX	XIII	I

A

B

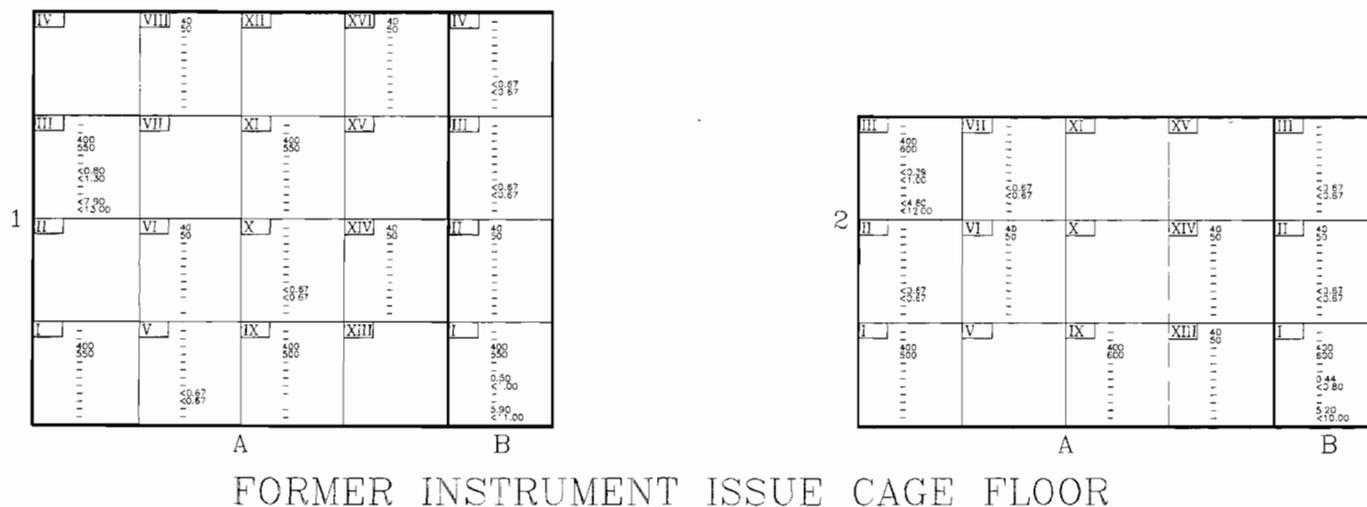
FORMER SHOP 38  
INSTRUMENT ISSUE CAGE



CNSY G-RAM FINAL REPORT

Section 18. Building 218

e. Localized Grid Map



FORMER INSTRUMENT ISSUE CAGE FLOOR

Note  
 Entries 5 and 6 are not required for Class "A" Localized  
 Grid Maps. See the Discussion paragraph.

Data Legend:

1 - M-247/PD [Bq.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value <5 above bkg of 2.3 pCi/g
2 - M-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value <5 above bkg of 3.2 pCi/g
3 - M-252/PD [cpm]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <9
4 - M-252/PD HV-1 PkA [Bq.]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <9
5 - M-252/PD HV-2 PKBSS [Bq.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <45
6 - M-252/PD HV-2 GROSS [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <450

CNSY G-RAM FINAL REPORT

Section 18. Building 218

f. Photographs

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Building 218 Issue Cage

**CNSY G-RAM FINAL REPORT**

**Section 18. Building 218**

**f. Photographs**

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**Building 218 Storage Cage**

## CNSY G-RAM FINAL REPORT

### Section 19. Building 247

#### a. Introduction:

Building 247 was constructed in 1986 as an administrative and office facility used to support production work in Dry Dock 5.

#### (1) Description:

Building 247 is a two story, rectangular shaped building. It is located immediately adjacent to Dry Dock 5. It served as a waterfront support facility with administrative offices and production spaces. The area in Building 247 of G-RAM concern was the welding shop's remote rod storage, issue, and preparation room. This room was typically referred to as the "rod room".

#### (2) Brief History:

(a) **Use:** In the rod room, tungsten electrodes were handled, stored, and prepared.

(b) **Radiological History:** Radiological history indicates that no loose surface contamination, above the limit, has been detected. No other radiological work operations were performed in this area.

#### (3) Survey Requirements:

(a) Class B release survey.

#### b. Discussion:

The floor of the rod room in Building 247 was divided into nine grids approximately 10' by 10'. Each of these grids were sub-divided into 5' by 5' sub-grids.

The walls were horizontally divided into 17 grids approximately 6' high and 10' wide. Each of these wall grids was subdivided into 3' high by 5' wide sub-grids.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over two diagonal quadrants to represent 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other two diagonal quadrants to represent the remaining 50% of the grid surface.

## CNSY G-RAM FINAL REPORT

### Section 19. Building 247

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in the rod room of Building 247 were determined from similar materials of the ground floor room located in the northeast corner of Building 247.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect areas with surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than 9 pCi/100cm<sup>2</sup> and removable Th-232 levels were less than 90 pCi/100cm<sup>2</sup>. The removable Ra-226 and Th-232 levels did not exceed 0.56 pCi/100cm<sup>2</sup>.

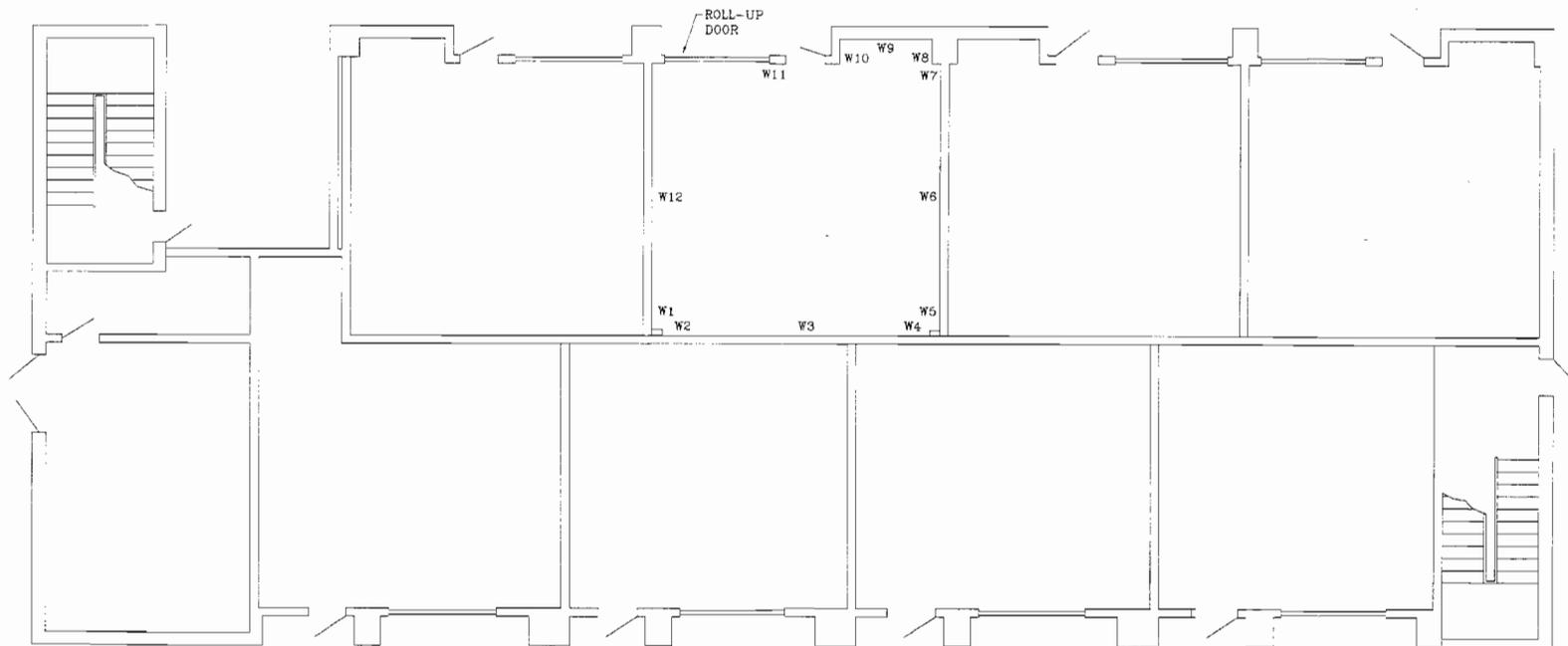
Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 solid material samples were less than 5 pCi/g and all Th-232 solid material samples were less than 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.59 pCi/g to a high of less than 1.70 pCi/g and Th-232 solid material samples ranged from a low of less than 1.30 pCi/g to a high of less than 2.90 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than 45 pCi/100cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than 450 pCi/100cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 5.20 pCi/100 cm<sup>2</sup> to a high of less than 40.80 pCi/100cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 10.00 pCi/100 cm<sup>2</sup> to a high of less than 83.00 pCi/100cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 19. Building 247

d. Site Map

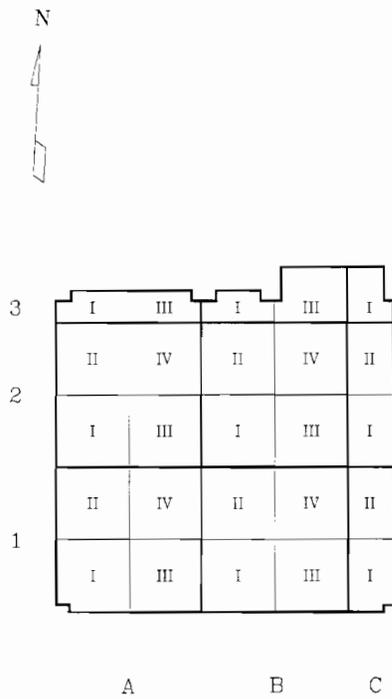


FIRST FLOOR

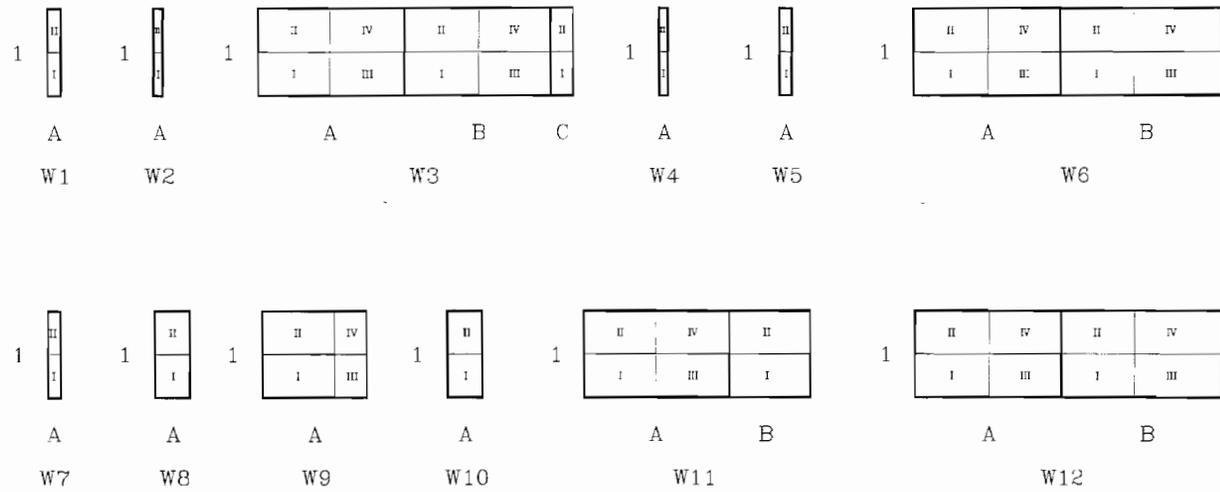
CNSY G-RAM FINAL REPORT

Section 19. Building 247

e. Overall Grid Map



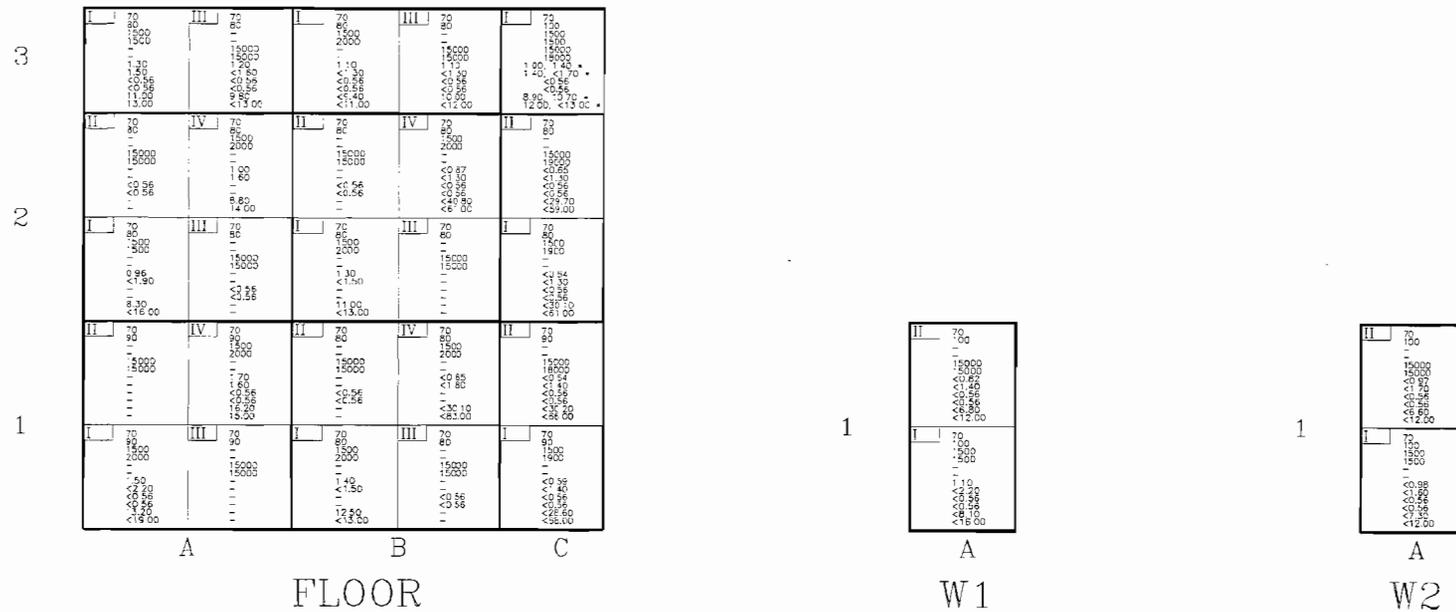
ROD ROOM FLOOR



CNSY G-RAM FINAL REPORT

Section 19. Building 247

e. Localized Grid Map



Note:  
 • Two solid material samples were taken from this subgrid

Data Legend  
 1 - M-247/PD [Bq]  
 2 - M-247/PD [cpm]  
 3 - M-253/PD [cpm] PHA [Bq]  
 4 - M-253/PD [cpm] PHA [cpm]  
 5 - M-253/PD [W-2 GRSS] [Bq]  
 6 - M-253/PD [W-2 GRSS] [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg of 2.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450





CNSY G-RAM FINAL REPORT

Section 19. Building 247

f. Photographs

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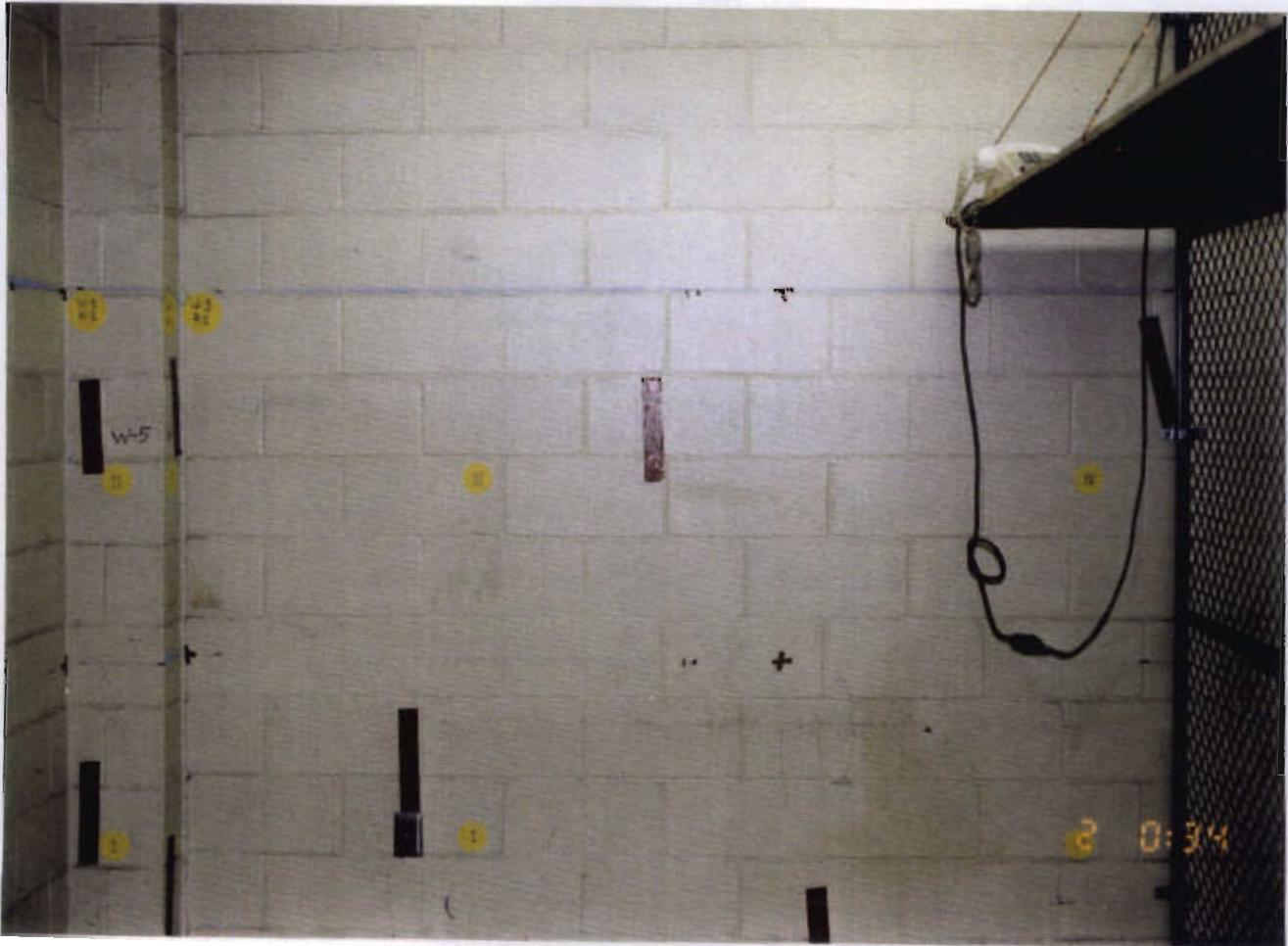
BLDG 247 ROD ROOM

CNSY G-RAM FINAL REPORT

Section 19. Building 247

g. Photographs

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BLDG 247 ROD ROOM

CNSY G-RAM FINAL REPORT

Section 19. Building 247

h. Photographs

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BLDG 247 ROD ROOM

## CNSY G-RAM FINAL REPORT

### Section 20. Building 1173

#### a. Introduction:

Building 1173 was constructed during a time of major expansion for the shipyard. It is located along Ramsey Street inside the Shipyard's Controlled Industrial Area.

##### (1) Description:

Building 1173 is a single-story structure with a rectangular plan. The wood frame building sits on a concrete slab foundation.

##### (2) Brief History:

(a) **Use:** Building 1173 served as a nuclear material warehouse. However, it has very little radiological significance with respect to the G-RAM survey. No radiological work operations were performed in Building 1173.

(b) **Radiological History:** On occasion, radioactive material was received and inspected in this warehouse-type structure. Radiological surveys were performed on the newly received radioactive material to ensure radiation levels were consistent with those listed on the invoice, or other shipping documents, and to ensure that no loose surface contamination was present. Radiological history indicates that no spread of surface contamination has occurred.

##### (3) Survey Requirements:

(a) Class A release survey.

#### b. Discussion:

The floor of Building 1173 was divided into 21 grids with a maximum size of 20' by 20'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over at least 25% of the sub-grids in each grid.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over at least 25% of the remaining sub-grids in each grid.

A wide gamma energy range scintillation walk-through scan survey with the IM-

## **CNSY G-RAM FINAL REPORT**

### **Section 20. Building 1173**

253/PD (GROSS mode) was performed over the specific site. The walk-through survey is not grid specific therefore entries five and six are not used on the Class "A" localized grid maps. The survey results are reported in the Summary paragraph.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 1173 were determined from similar materials in 1st floor parking garage Building 400.

#### **c. Summary:**

Surveys performed with the IM-247/PD detected two areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) detected two areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) detected two areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable levels of both Ra-226 and Th-232 ranged from a low of less than 0.53 pCi/100 cm<sup>2</sup> to a high of 1.84 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.58 pCi/g to a high of 1.17 pCi/g and Th-232 solid material samples ranged from a low of 0.87 pCi/g to a high of less than 2.10 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 5.40 pCi/100 cm<sup>2</sup> to a high of 11.80 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of 11.00 pCi/100 cm<sup>2</sup> to a high of 23.00

**CNSY G-RAM FINAL REPORT**

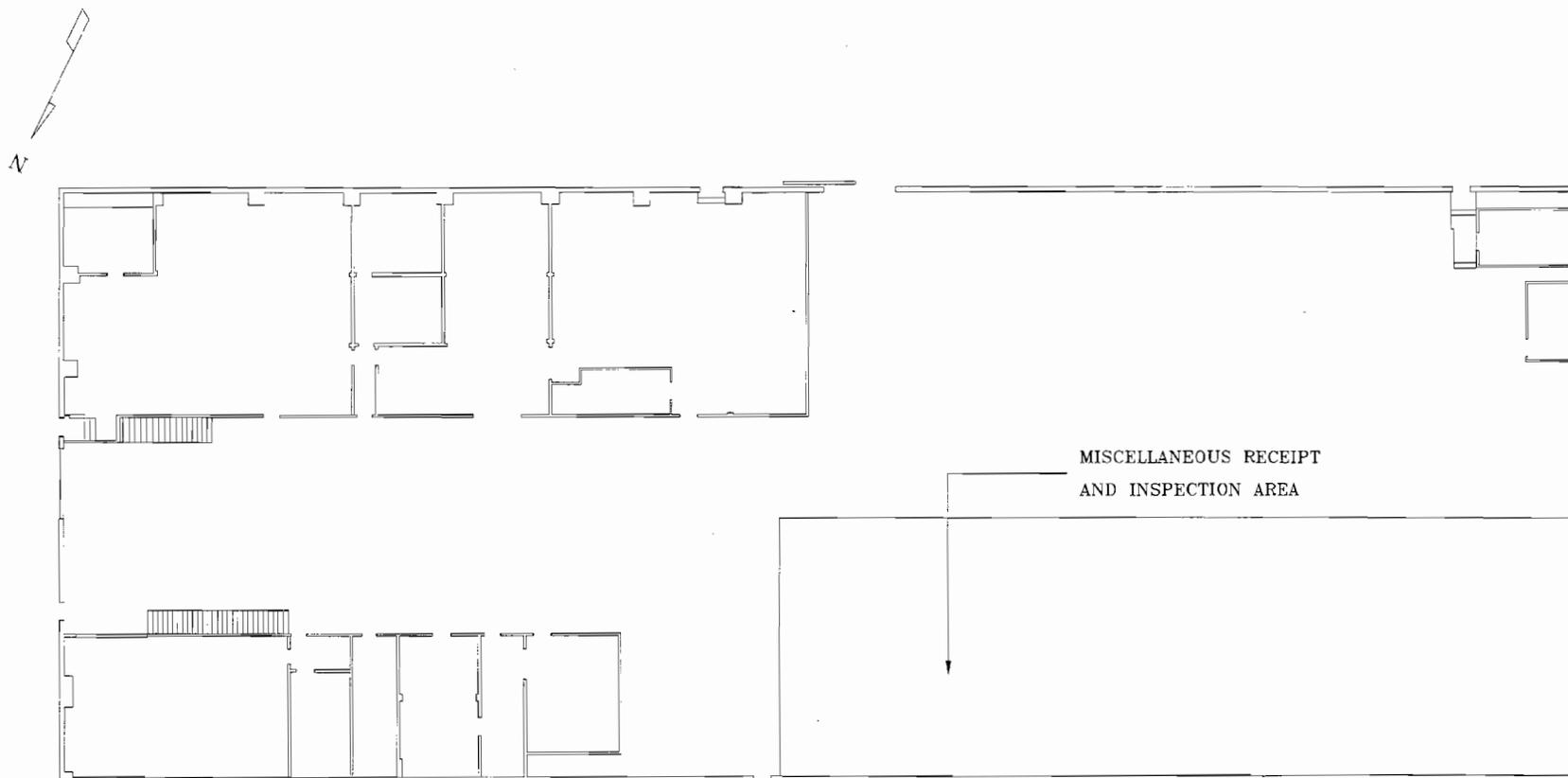
**Section 20. Building 1173**

pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 20. Building 1173

d. Site Map



CNSY G-RAM FINAL REPORT

Section 20. Building 1173

e. Overall Grid Map



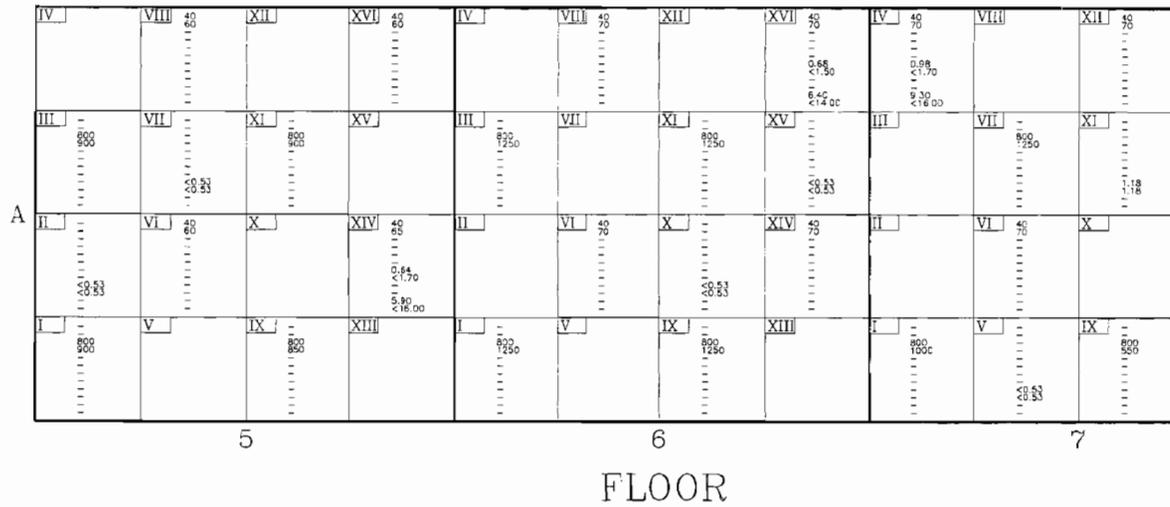
C	I	V	IX	XIII																								
	IV	VIII	XII	XVI																								
B	III	VII	XI	XV																								
	II	VI	X	XIV																								
A	I	V	IX	XIII																								
	IV	VIII	XII	XVI																								
	III	VII	XI	XV																								
	II	VI	X	XIV																								
	I	V	IX	XIII																								
	1				2				3				4				5				6				7			



CNSY G-RAM FINAL REPORT

Section 20. Building 1173

e. Localized Grid Map



Note:  
 Entries 5 and 6 are not required for Class "A" Localized  
 Grid Maps. See the Discussion paragraph.

Data Legend:  
 1 - M-247/PD [bkg.]  
 2 - M-247/PD [cpm]  
 3 - M-253/PD HV-1 (PHA) [bkg.]  
 4 - M-253/PD HV-1 (PHA) [cpm]  
 5 - M-253/PD HV-2 (GROSS) [bkg.]  
 6 - M-253/PD HV-2 (GROSS) [cpm]  
 7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <math><5</math> above bkg of 1.3 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <math><3</math> above bkg of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <math><3</math>  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <math><30</math>  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <math><45</math>  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <math><450</math>





CNSY G-RAM FINAL REPORT

Section 20. Building 1173

f. Photographs

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Facing East, North side.

**CNSY G-RAM FINAL REPORT**

**Section 20. Building 1173**

**f. Photographs**

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Facing East, South side.

CNSY G-RAM FINAL REPORT

Section 20. Building 1173

f. Photographs

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Cracks and crevices.

## CNSY G-RAM FINAL REPORT

### Section 21. Building 1174

#### a. Introduction:

Building 1174 was built in 1942 and originally used as a utility shop. It is located at the corner of River Road and Eleventh Street.

#### (1) Description:

Building 1174 is a one story, 61,079 square foot wooden warehouse with a concrete slab foundation and truss roof covered by sheet metal.

#### (2) Brief History:

(a) **Use:** Past uses include a supply warehouse and a lay down area for uncontaminated submarine refueling equipment. The most recent use was a facility to train submarine and ship technical personnel.

(b) **Radiological History:** TIG welding operations and grinding/preparation of tungsten welding rods were performed in a small area in the southwest corner of the facility. TIG welding operations were also performed within welding trailer # SUR-TF-578 located in the north end of Building 1174. No other radiological work operations were performed in this area. Radiological history indicates that no contamination above the limit has been detected.

Class A release surveys were performed in Building 1174 welding area and the entire welding trailer # SUF-TF-578.

Class B release survey was performed in Building 1174 grinding/preparation area.

#### (3) Survey Requirements:

- (a) Class A release survey.
- (b) Class B release survey.

#### b. Discussion:

#### (1) Class A:

The floors of Building 1174 welding area and welding trailer # SUR-TF-578 were divided into a total of four grids with a maximum size of 20' by 20'. Each of these grids were subdivided into sub-grids with an approximate size of 5' by 5'.

## CNSY G-RAM FINAL REPORT

### Section 21. Building 1174

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over at least 25% of the sub-grids in each grid.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over at least 25% of the remaining sub-grids in each grid.

A wide gamma energy range scintillation walk-through scan survey with the IM-253/PD (GROSS mode) was performed over the specific site. The walk-through survey is not grid specific therefore entries five and six are not used on the Class "A" localized grid maps except for areas where investigative surveys were performed. The survey results are reported in the Summary paragraph.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material sample was taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity. No solid material sample was taken from the welding trailer grid B1 because the surface was stainless steel.

Background levels used in Building 1174 and welding trailer #SUR-TF-578 were determined from similar materials in Building 1170.

#### (2) **Class B:**

The floor of Building 1174 grinding area was divided into a total of two grids with a maximum size of 10' by 10'. Each of these grids were subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into two grids with a maximum size of 6' high and 10' wide. Each of these wall grids were subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD survey is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid. Solid samples for greater than twice background surveys are taken only in the sub-grids that contain the twice background areas.

## CNSY G-RAM FINAL REPORT

### Section 21. Building 1174

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 1174 were determined from similar materials in Building 1170.

#### c. **Summary:**

##### (1) **Class A:**

Surveys performed with the IM-247/PD detected three areas having surface radioactivity greater than or equal to twice background. Solid material sampling verified no regulator limits were exceeded.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Th-232 levels were less than the regulator value of 90 pCi/100 cm<sup>2</sup>. The removable Th-232 levels were less than 24.00 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.62 pCi/g to a high of 2.00 pCi/g and Th-232 solid material samples ranged from a low of less than 0.89 pCi/g to a high of less than 2.80 pCi/g.

Mathematical computation of the specific radioactivity of the solid

## CNSY G-RAM FINAL REPORT

### Section 21. Building 1174

material samples confirmed that the surface radioactivity of Ra-226 was less than 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 6.70 pCi/100 cm<sup>2</sup> to a high of 17.20 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 10.00 pCi/100 cm<sup>2</sup> to a high of less than 24.00 pCi/100 cm<sup>2</sup>.

Small pieces of thoriated tungsten welding rods were found embedded in the asphalt in the welding area. The asphalt was removed in the affected area to ensure that all the remnants of the thoriated welding rods were removed.

#### (2) **Class B:**

Surveys performed with the IM-247/PD detected two grids having surface radioactivity greater than or equal to twice background. Solid material sampling verified no regulator limits were exceeded.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect any sub-grids greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect any sub-grids greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Th-232 levels were less than the regulator value of 90 pCi/100 cm<sup>2</sup>. The removable Th-232 levels indicated were less than 24.00 pCi/100 cm<sup>2</sup>.

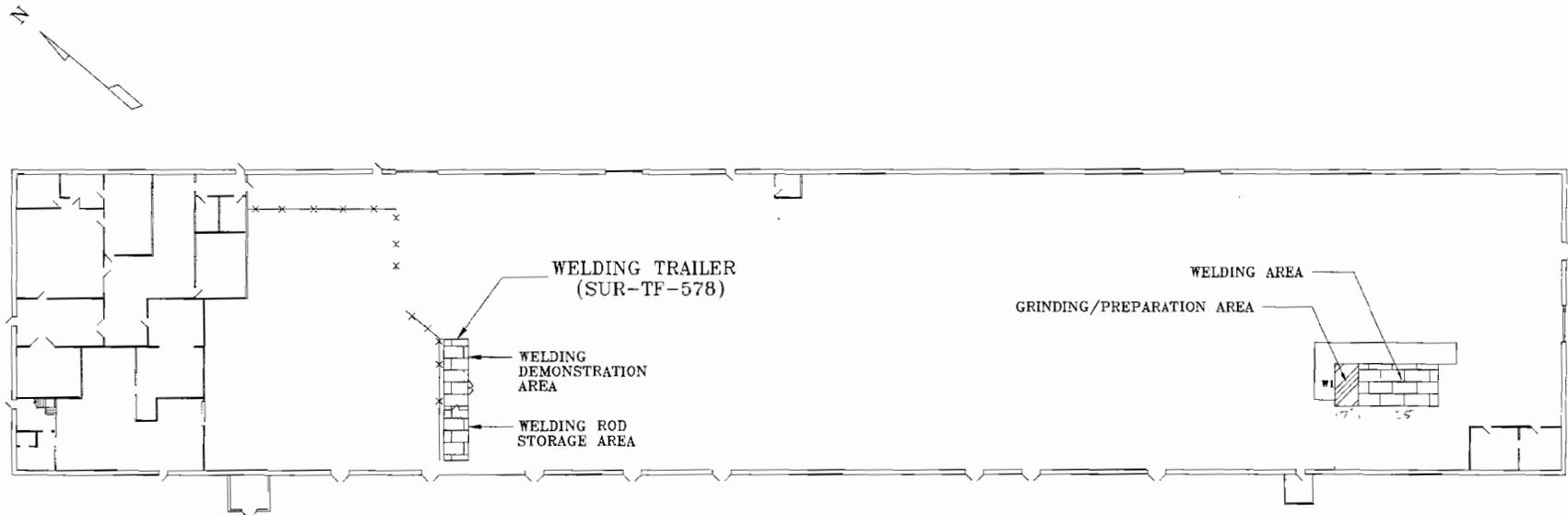
Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 1.20 pCi/g to a high of 2.37 pCi/g and Th-232 solid material samples ranged from a low of less than 1.20 pCi/g to a high of 3.40 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 4.60 pCi/100 cm<sup>2</sup> to a high of 21.90 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 10.00 pCi/100 cm<sup>2</sup> to a high of 31.00 pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 21. Building 1174

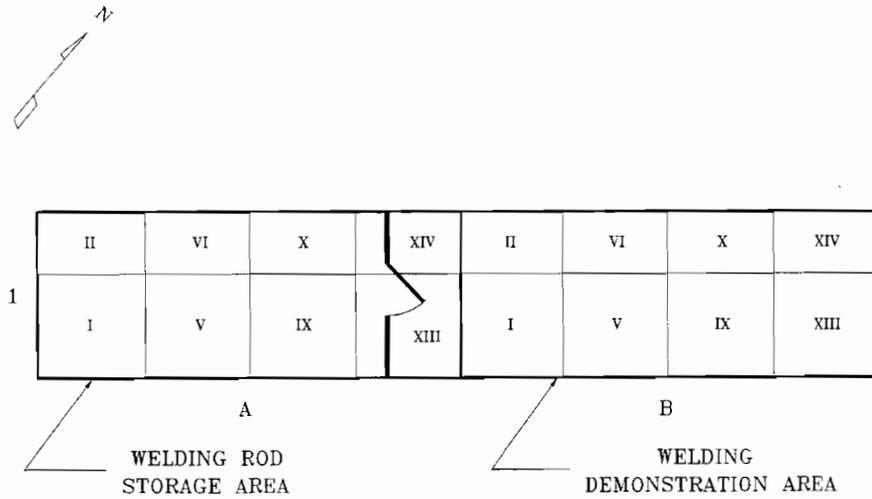
d. Site Map



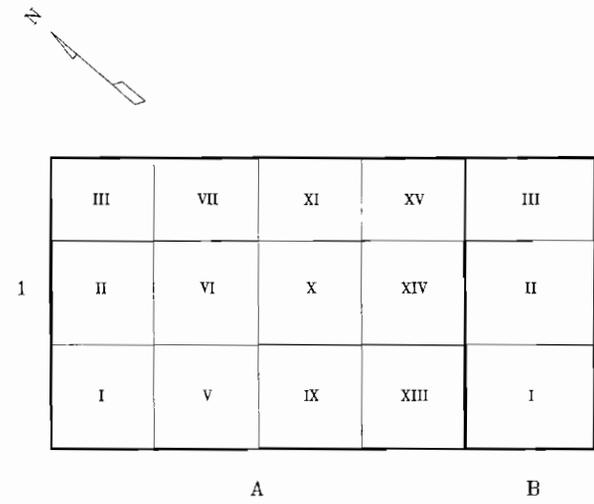
CNSY G-RAM FINAL REPORT

Section 21. Building 1174

e. Overall Grid Map, Class A



FLOOR  
WELDING TRAILER

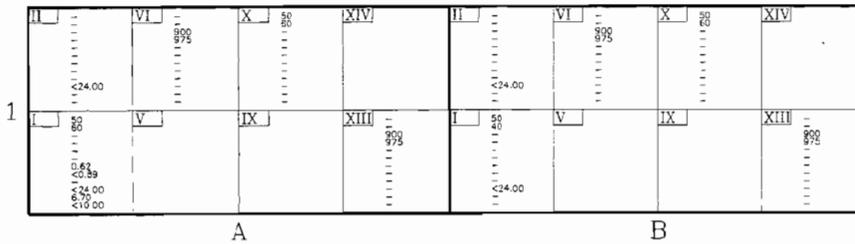


FLOOR  
WELDING AREA

CNSY G-RAM FINAL REPORT

Section 21. Building 1174

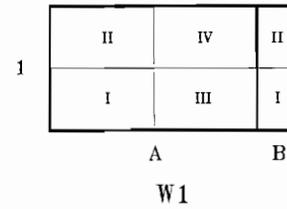
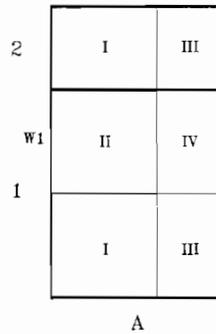
e. Localized Grid Map



CNSY G-RAM FINAL REPORT

Section 21. Building 1174

e. Overall Grid Map, Class B



FLOOR  
GRINDING/PREPARATION AREA



CNSY G-RAM FINAL REPORT

Section 21. Building 1174

f. Photographs

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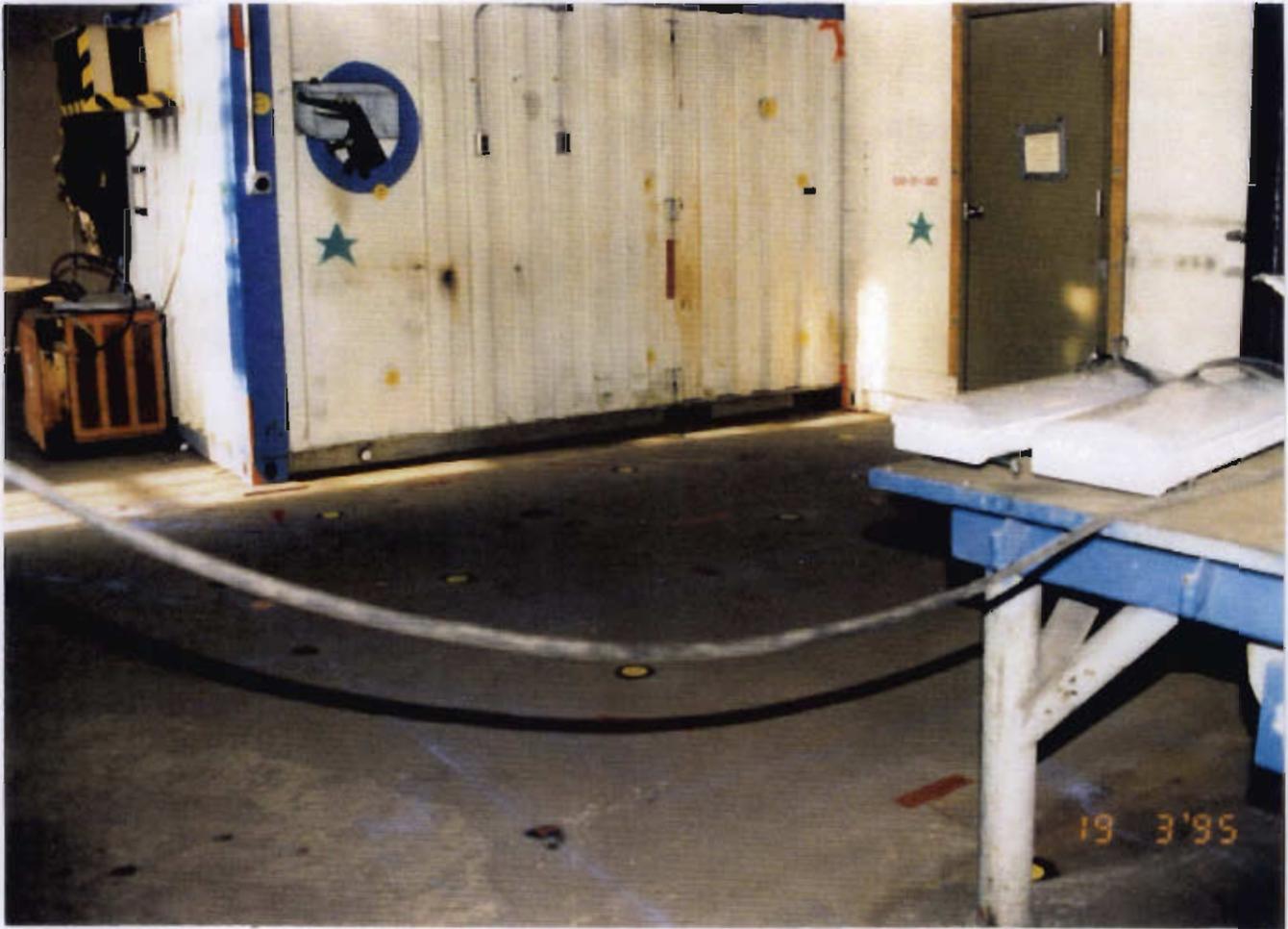
Welding Area

CNSY G-RAM FINAL REPORT

Section 21. Building 1174

f. Photographs

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Grinding Area

CNSY G-RAM FINAL REPORT

Section 21. Building 1174

f. Photographs

---



Welding Trailer

## CNSY G-RAM FINAL REPORT

### Section 22. Building 1175

for radioactivity.

Background levels used in Building 1175 were determined from similar materials located in a wire fenced storage cage along the southeast wall of the building.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect any areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect any areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The alpha/beta analyzer results indicated Ra-226 and Th-232 levels did not exceed 0.58 pCi/100 cm<sup>2</sup>.

Analysis performed on the solid material sample with the multi-channel analyzer (MCA) indicated Ra-226 and Th-232 levels were less than the limit of 5 pCi/g. The MCA analysis results indicated Ra-226 was less than 0.77 pCi/g and Th-232 was less than 1.50 pCi/g.

Mathematical computation of the specific radioactivity of the solid material sample confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed results indicated Ra-226 was less than 6.70 pCi/100 cm<sup>2</sup> and Th-232 was less than 13.00 pCi/100 cm<sup>2</sup>.

## CNSY G-RAM FINAL REPORT

### Section 22. Building 1175

#### a. Introduction:

Building 1175 was constructed during a time of major expansion for the shipyard. It is located on Ramsey Street outside the shipyard CIA.

(1) **Description:** Building 1175 is a single-story structure with a rectangular plan. The wood frame building sits on a concrete slab foundation.

(2) **Brief History:**

(a) **Use:** Within a wire cage, along the southwest wall of Building 1175 was an area designated for a drum which was used for disposal of electron tubes.

(b) **Radiological History:** Building 1175 has very little radiological significance. No radiological work operations were performed in Building 1175, and there is no history of the spread of loose surface contamination.

(3) **Survey Requirements:**

(a) Class A release survey.

#### b. Discussion:

The floor of Building 1175 consisted of one grid, approximately 20' by 20'. This grid was subdivided into approximately 5' by 5' sub-grids.

The grid and sub-grids were identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over the pre-determined 5' by 5' sub-grids to represent 25% of the total grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over the pre-determined sub-grids to represent 25% of the total grid surface.

A wide gamma energy range scintillation walk-through scan survey with the IM-253/PD (GROSS mode) was performed over the specific site.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

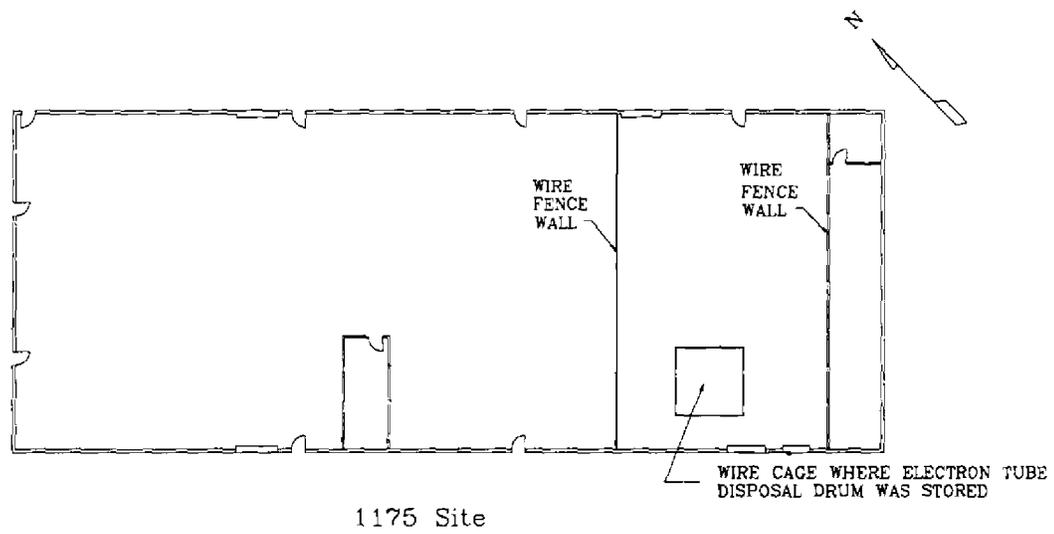
A minimum of one solid material sample was taken from the grid. The solid material sample was removed from the grid location having the highest potential

CNSY G-RAM FINAL REPORT

Section 22. Building 1175

d. Site Map

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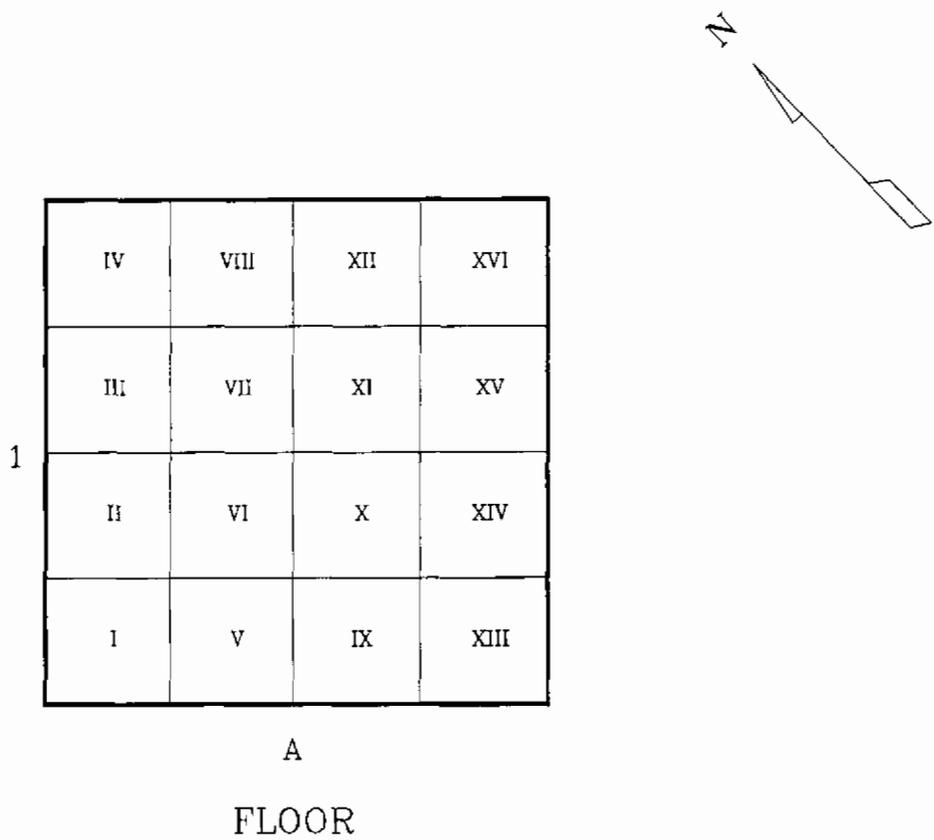


CNSY G-RAM FINAL REPORT

Section 22. Building 1175

e. Overall Grid Map

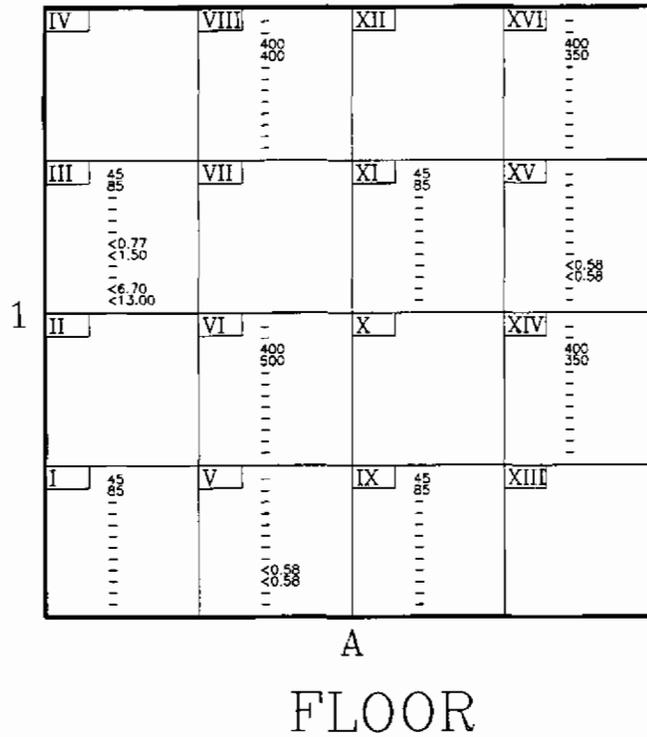
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CNSY G-RAM FINAL REPORT

Section 22. Building 1175

e. Localized Grid Map



Data Legend:

- |                                   |  |
|-----------------------------------|--|
| 1 - IM-247/PD [bkg.]              | 7 - Rn-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g |
| 2 - IM-247/PD [cpm]               | 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g |
| 3 - IM-253/PD (HV-1 PHA) [bkg.]   | 9 - Rn-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <9          |
| 4 - IM-253/PD (HV-1 PHA) [cpm]    | 10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <90        |
| 5 - IM-253/PD (HV-2 GROSS) [bkg.] | 11 - Rn-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <45          |
| 6 - IM-253/PD (HV-2 GROSS) [cpm]  | 12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value: <450         |

CNSY G-RAM FINAL REPORT

Section 22. Building 1175

f. Photographs

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BLDG 1175

CNSY G-RAM FINAL REPORT

Section 22. Building 1175

g. Photographs

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BLDG 1175

CNSY G-RAM FINAL REPORT

Section 22. Building 1175

h. Photographs

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BLDG 1175

## CNSY G-RAM FINAL REPORT

### Section 23. Building 1267

#### a. Introduction:

Building 1267 was initially located on a concrete slab on the east side of Building 35 on Avenue "B." In 1978, it was moved to a concrete slab on the south side of Building 69. In 1987, it was again relocated to the north side of Building 69 to facilitate the expansion of Building 69 over the slab on the south side. The 1987 expansion of Building 69 over the former south-side site made that concrete slab inaccessible for survey purposes.

#### (1) Description:

Building 1267 was built in 1969 as a semi-permanent structure consisting of a wood frame over which corrugated steel sheets are affixed to comprise the walls and roof. The building sat on concrete slabs in both the original and present locations.

#### (2) Brief History:

- (a) **Use:** Building 1267 was used as a temporary storage area for radioactive materials to be radiologically surveyed prior to transfer to the shipyard.
- (b) **Radiological History:** Radiological surveys were performed to ensure radiation levels were consistent with those listed on the invoice or other shipping documents and to ensure that no loose surface contamination was present. Radiological history indicates that no spread of surface contamination has occurred.

#### (3) Survey Requirements:

- (a) Class B release survey.

#### b. Discussion:

Building 1267 floor was divided into two grids, in both the original and present locations, with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into four grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

## CNSY G-RAM FINAL REPORT

### Section 23. Building 1267

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each floor grid. No samples were taken from the wall grids since the walls were covered with unpainted metal. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in the original Building 1267 were determined from similar materials in Building 1800. Background levels used in the present Building 1267 were determined from similar materials in Building 665.

#### c. Summary:

Building 1267 original location surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels were all less than 0.52 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-233 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.49 pCi/g to a high of less than 0.67 pCi/g and Th-232 solid material samples ranged from a low of less than 1.10 pCi/g to a high of less than 1.20 pCi/g.

Mathematical computation of the specific radioactivity of the solid material

## CNSY G-RAM FINAL REPORT

### Section 23. Building 1267

samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 4.90 pCi/100 cm<sup>2</sup> to a high of less than 6.70 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 11.00 pCi/100 cm<sup>2</sup> to a high of less than 13.00 pCi/100 cm<sup>2</sup>.

Building 1267 Material Storage Shed present location surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels all indicated less than 0.82 pCi/100 .

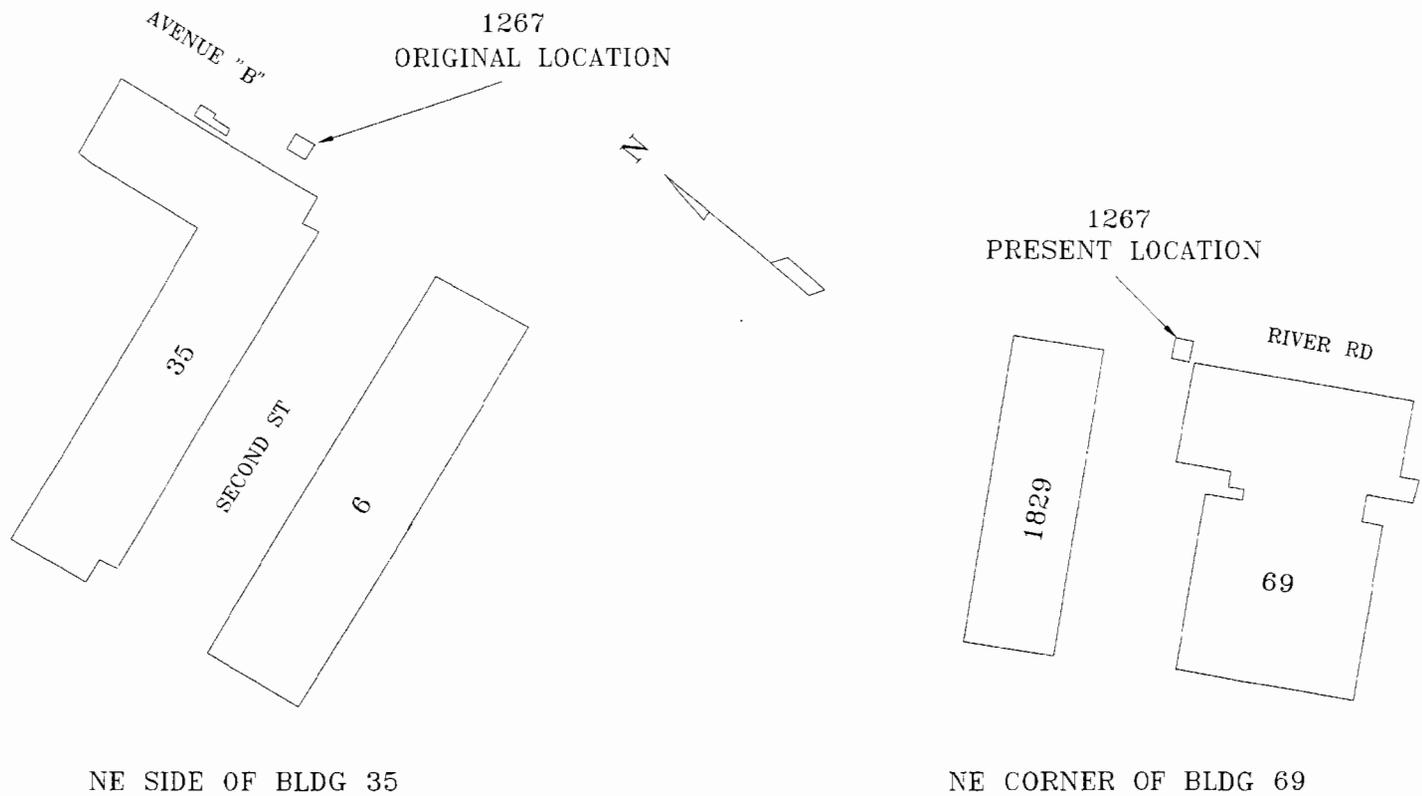
Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-233 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.52 pCi/g to a high of less than 0.90 pCi/g and Th-232 solid material samples ranged from a low of less than 1.10 pCi/g to a high of less than 1.40 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 5.60 pCi/100 cm<sup>2</sup> to a high of 8.50 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 10.00 pCi/100 cm<sup>2</sup> to a high of less than 14.00 pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 23. Building 1267

d. Site Map



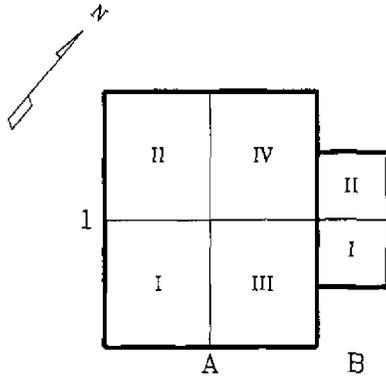
NE SIDE OF BLDG 35

NE CORNER OF BLDG 69

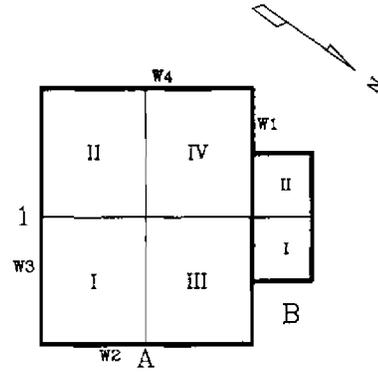
**CNSY G-RAM FINAL REPORT**

**Section 23. Building 1267**

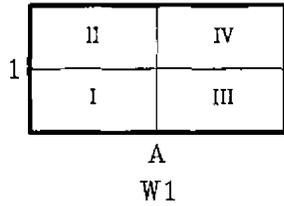
**e. Overall Grid Maps**



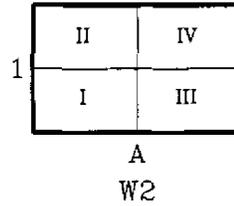
ORIGINAL SITE  
FLOOR ONLY  
NE SIDE OF BLDG 35



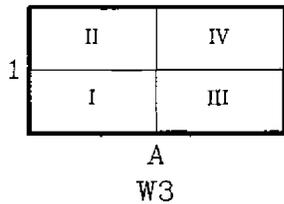
PRESENT LOCATION  
FLOOR  
AT NE CORNER OF BLDG 69



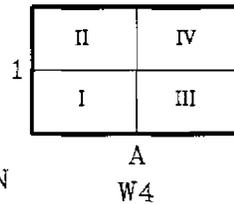
W1



W2



W3



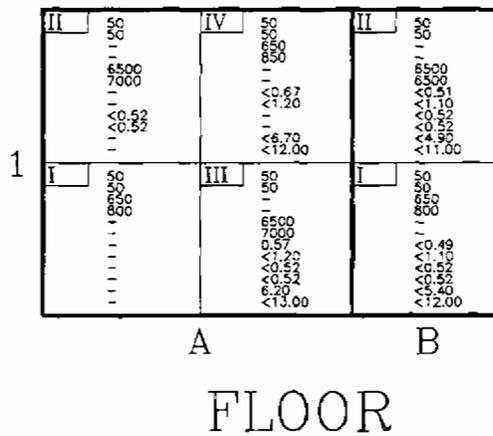
W4

PRESENT LOCATION  
WALLS

# CNSY G-RAM FINAL REPORT

## Section 23. Building 1267

### e. Localized Grid Map, Original Location



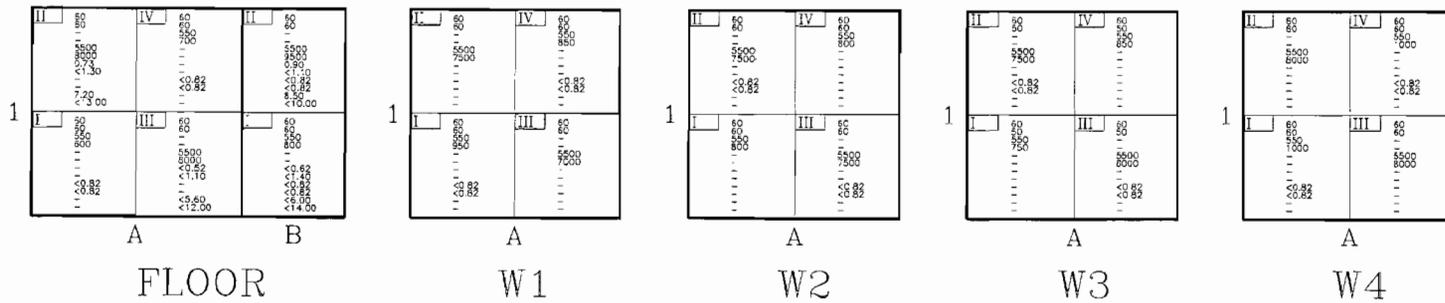
Data Legend:

- 1 - IM-247/PD [bkg.]
- 2 - IM-247/PD [cpm]
- 3 - IM-253/PD (HV-1 PHA) [bkg.]
- 4 - IM-253/PD (HV-1 PHA) [cpm]
- 5 - IM-253/PD (HV-2 GROSS) [bkg.]
- 6 - IM-253/PD (HV-2 GROSS) [cpm]

- 7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <50
- 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

Section 23. Building 1267

e. Localized Grid Map, Present Location



Note:  
No solid samples were taken from the wall grids since the walls were covered with unpainted metal

Data Legend:  
1 - IM-247/PD [bkg.]  
2 - IM-247/PD [cpm]  
3 - IM-253/PD (HV-1) PHA [bkg.]  
4 - IM-253/PD (HV-1) PHA [cpm]  
5 - IM-253/PD (HV-2) GROSS [bkg.]  
6 - IM-253/PD (HV-2) GROSS [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 2.3 pCi/g  
8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value: <5 above bkg. of 3.2 pCi/g  
9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <9  
10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <90  
11 - Ra-226 Surface Radioactivity [pCi/50cm<sup>2</sup>]; Regulator value: <45  
12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]; Regulator value: <450

CNSY G-RAM FINAL REPORT

Section 23. Building 1267

f. Photographs

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Bldg 1267 Original Slab.

CNSY G-RAM FINAL REPORT

Section 23. Building 1267

f. Photographs

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Present Bldg 1267.

CNSY G-RAM FINAL REPORT

Section 23. Building 1267

f. Photographs

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Looking into the present Bldg 1267.

## CNSY G-RAM FINAL REPORT

### Section 24. Building 26-13

#### a. Introduction:

Facility 26-13 was used by the Welding Shop as an Electrode Issue and Storage Station.

##### (1) Description:

Facility 26-13 is a temporary structure used for various industrial support purposes. It was constructed of metal walls and a metal floor except for the grinding area, which is a detached metal shed with asphalt floor. This facility is presently located between Pier C and Pier D.

##### (2) Brief History:

(a) **Use:** Facility 26-13 was an area where thoriated tungsten welding rods were handled, stored, and prepared.

(b) **Radiological History:** No other radiological work operations were performed in this area. Radiological history indicates that no contamination above the limit was detected prior to shipyard closure survey and sampling operations.

##### (3) Survey Requirements:

(a) Class B release survey.

#### b. Discussion:

The floor of Building 26-13 was divided into a total of 12 grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into 22 grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD survey is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid. Solid samples for greater than or equal to twice background surveys are taken only in the sub-grid(s) that contain the twice background area(s).

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50%

## CNSY G-RAM FINAL REPORT

### Section 24. Building 26-13

of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity. Grinding areas, grids GAW3-A1-I, GAW3-A1-II and GAW4-A1-IV had no post remediation solid samples as all paint was removed by remediation.

Background levels used in Building 26-13 were determined from similar materials in Building 1884.

#### c. **Summary:**

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels both ranged from a low of less than 0.65 pCi/100 cm<sup>2</sup> to a high of 2.26 pCi/100 cm<sup>2</sup>.

Initial solid material samples consisting of paint from small portions of the Grinding Room walls 2 and 3, and Office Area wall 4, were found to be in excess of the allowable limit for Thorium 232. The elevated readings indicated a maximum level of 156.6 pCi/g for wall 2, 10.9 pCi/g for wall 3, and 5.3 pCi/g for wall 4. The extent of the affected areas was identified by taking additional solid material samples from the surrounding vicinity. These areas were remediated and the post remediation results are indicated in the following summary and localized grid maps.

Analysis performed on solid material samples with the multi-channel analyzer

## **CNSY G-RAM FINAL REPORT**

### **Section 24. Building 26-13**

(MCA) indicated that all Ra-226 and Th-232 solid material samples were less than 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.32 pCi/g to a high of less than 1.72 pCi/g and Th-232 solid material samples ranged from a low of less than 0.65 pCi/g to a high of less than 3.90 pCi/g.

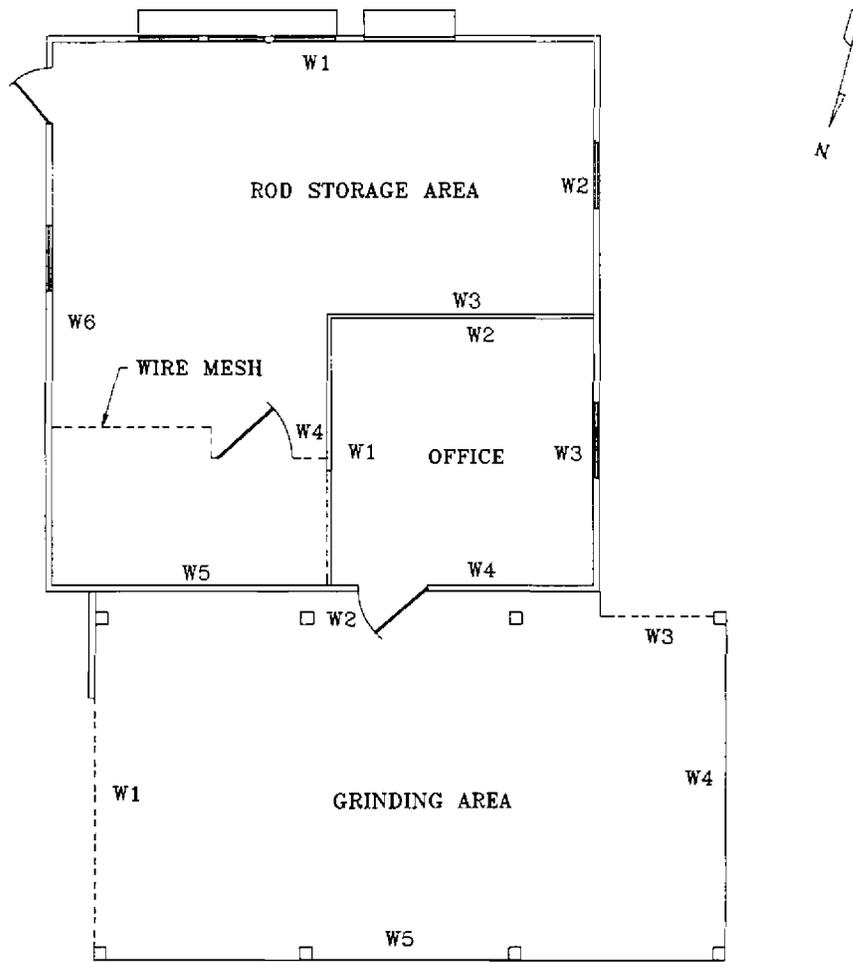
*Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 3.00 pCi/100 cm<sup>2</sup> to a high of 35.80 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 6.00 pCi/100 cm<sup>2</sup> to a high of less than 83.00 pCi/100 cm<sup>2</sup>.*

CNSY G-RAM FINAL REPORT

Section 24. Building 26-13

d. Site Map

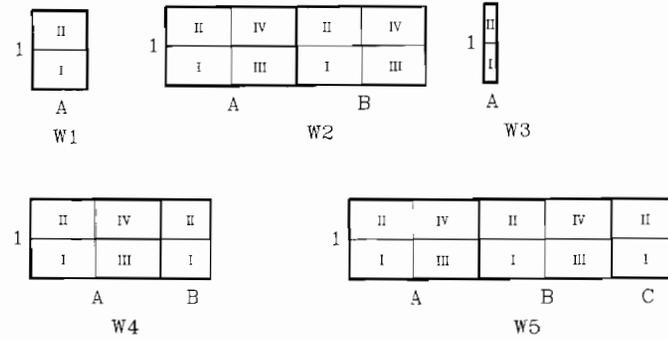
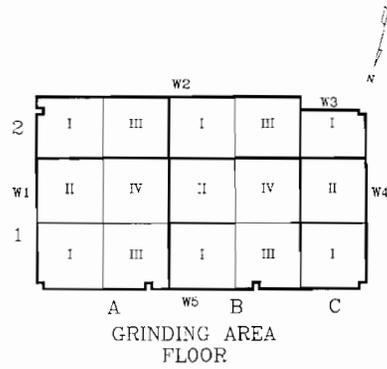
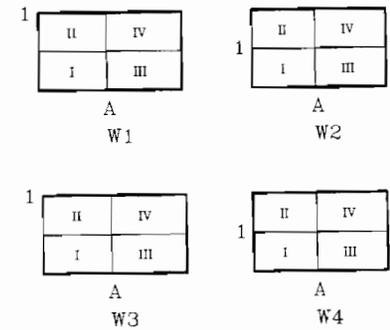
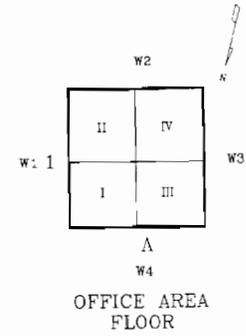
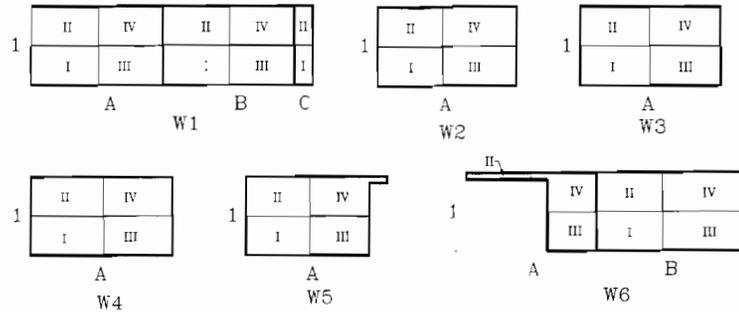
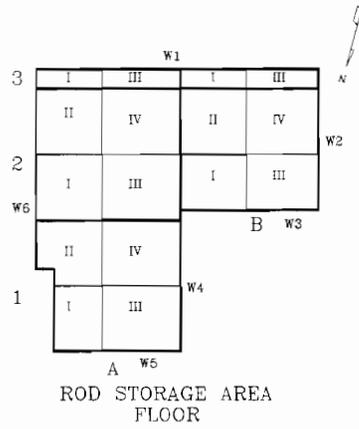
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FLOOR PLAN

Section 24. Building 26-13

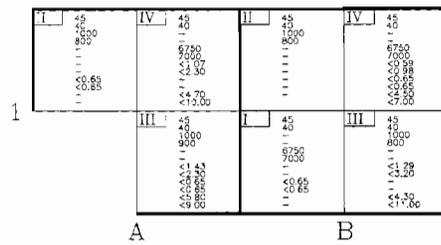
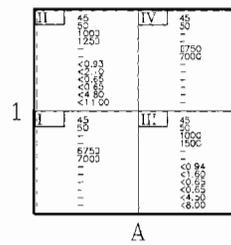
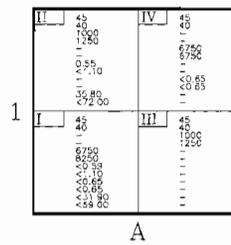
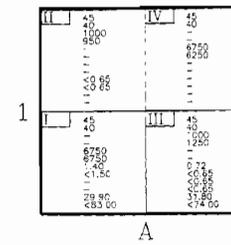
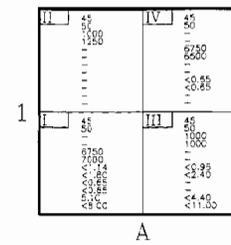
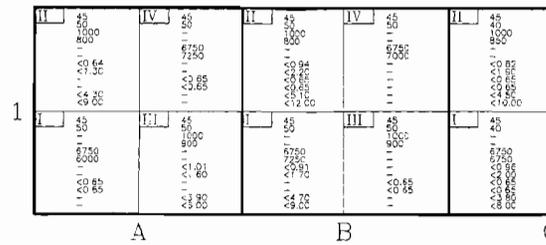
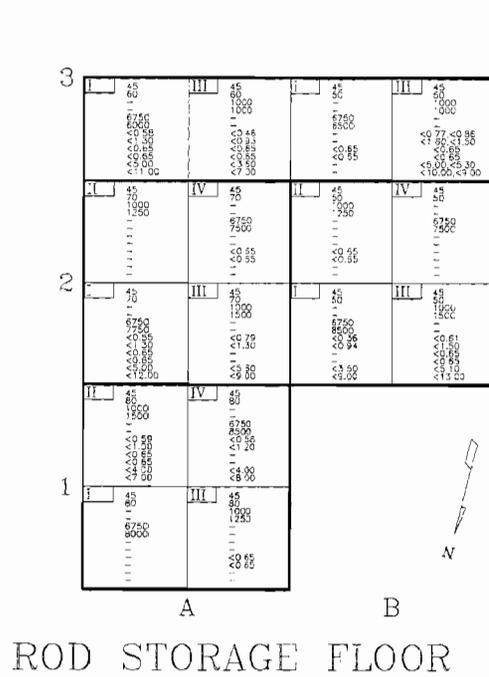
e. Overall Grid Map



CNSY G-RAM FINAL REPORT

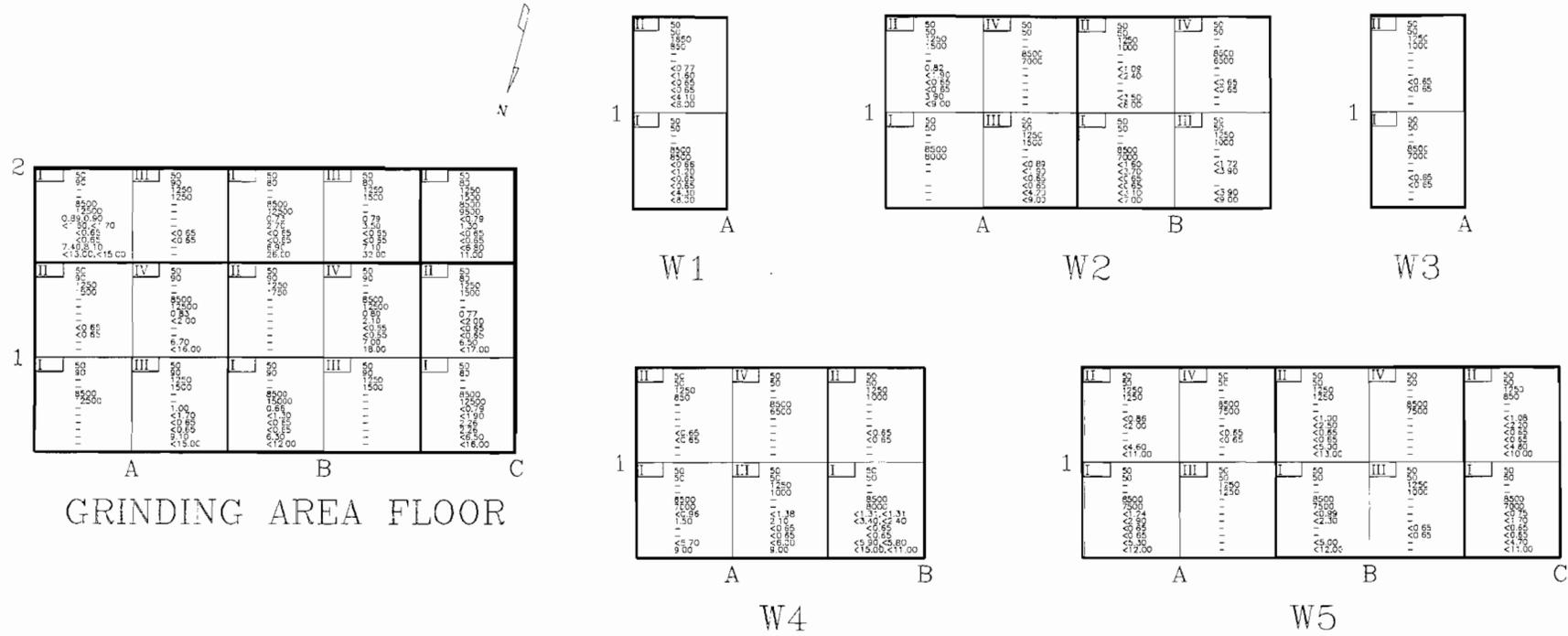
Section 24. Building 26-13

e. Overall Grid Map



- Data Legend:
- 1 - IM-241/PO [Bq]
  - 2 - IM-241/PD [cpm]
  - 3 - IM-233/PD (V=1, BHA) [Bq]
  - 4 - IM-233/PD (V=1, BHA) [cpm]
  - 5 - IM-232/PD (V=2, GROSS) [Bq]
  - 6 - IM-233/PD (V=2, GROSS) [cpm]
  - 7 - Re-228 Solid Sample Radioactivity [pCi/g], Regulator value <5 above bag of 23 pCi/g
  - 8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value <5 above bag of 32 pCi/g
  - 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <9
  - 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <90
  - 11 - Re-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <45
  - 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <450

e. Localized Grid Map



Data Legend:

1 - M-249/PD [Bq]	7 - Ra-226 Solid Sample Radioactivity [pCi/g]; Regulator value <5 above bkg of 2.3 pCi/g
2 - M-249/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g]; Regulator value <5 above bkg of 3.2 pCi/g
3 - M-253/PD [Bq]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <9
4 - M-253/PD [Bq]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <9
5 - M-253/PD [Bq]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <45
6 - M-253/PD [Bq]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ]; Regulator value <45



CNSY G-RAM FINAL REPORT

Section 24. Building 26-13

f. Photographs

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Grinding Area

CNSY G-RAM FINAL REPORT

Section 24. Building 26-13

f. Photographs

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Office Area

CNSY G-RAM FINAL REPORT

Section 24. Building 26-13

f. Photographs

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Rod Storage Area

## CNSY G-RAM FINAL REPORT

### Section 25. Building 4000

#### a. Introduction:

Facility 4000 is a two-story brick structure located on the southern end of Sullivan's Island.

(1) **Description:**

Constructed in 1970, Building 4000 contains 5010 square feet. This building was utilized as a radar testing and communications center for Navy ships.

(2) **Brief History:**

(a) **Use:** Building 4000 indicated a heavy use and storage of electronic and ionization commodities including electron tubes. The areas of interest in Building 4000 are the two Storage Areas in the tunnel and the Shop Area.

(b) **Radiological History:** Radiological history of this building is incomplete, however, TIG welding operations were performed in this facility. These operations included preparation, storage and use of thoriated tungsten welding rods.

(3) **Survey Requirements:**

- (a) Class B release survey.
- (b) Class C release survey.

#### b. Discussion:

The floor in the Class B area of Building 4000 was divided into a total of five grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into eight grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid. Solid samples for greater than or equal to twice background surveys are taken only in the sub-grid(s) that contain the highest potential area(s).

A narrow gamma energy range scintillation scan survey with the IM-253/PD

## **CNSY G-RAM FINAL REPORT**

### **Section 25. Building 4000**

(PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

The floors in the Class C areas of Building 4000 were divided into eight grids with a maximum size of 5' by 5'.

The walls were horizontally divided into 14 grids with a maximum size of 6' high and 5' wide.

Each grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface.

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over 100% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over 100% of the grid surface.

A minimum of one swipe/smear was taken in each grid.

A minimum of 25% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of one solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building 4000 were determined from similar materials in the Fort Moultrie Bunkers.

## CNSY G-RAM FINAL REPORT

### Section 25. Building 4000

#### c. Summary:

Surveys performed in the Class B area of Building 4000 with the IM-247/PD did not detect any grids having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect sub-grids greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect sub-grids greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 and Th-232 levels were all less than 0.64 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 solid material samples ranged from a low of 0.13 pCi/g to a high of 1.50 pCi/g and Th-232 solid material samples ranged from a low of less than 0.22 pCi/g to a high of less than 2.20 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of 3.90 pCi/100 cm<sup>2</sup> to a high of less than 24.20 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 9.00 pCi/100 cm<sup>2</sup> to a high of less than 46.00 pCi/100 cm<sup>2</sup>.

Surveys performed in the Class C area of Building 4000 with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The alpha/beta analyzer results indicated Ra-226 and Th-232 levels ranged from a low of less than 0.64 pCi/100 cm<sup>2</sup> to a high of 1.44 pCi/100 cm<sup>2</sup>.

## CNSY G-RAM FINAL REPORT

### Section 25. Building 4000

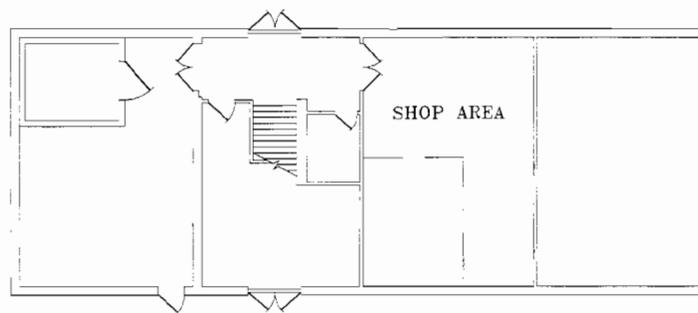
Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 were less than the limit of 5 pCi/g. MCA analysis performed on Ra-226 ranged from a low of less than 0.50 pCi/g to a high of 1.08 pCi/g and Th-232 ranged from a low of less than 0.93 pCi/g to a high of less than 1.90 pCi/g.

Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed results indicated Ra-226 ranged from a low of less than 4.50 pCi/100 cm<sup>2</sup> to a high of 10.60 pCi/100 cm<sup>2</sup> and the Th-232 ranged from a low of less than 9.00 pCi/100 cm<sup>2</sup> to a high of less than 19.00 pCi/100 cm<sup>2</sup>.

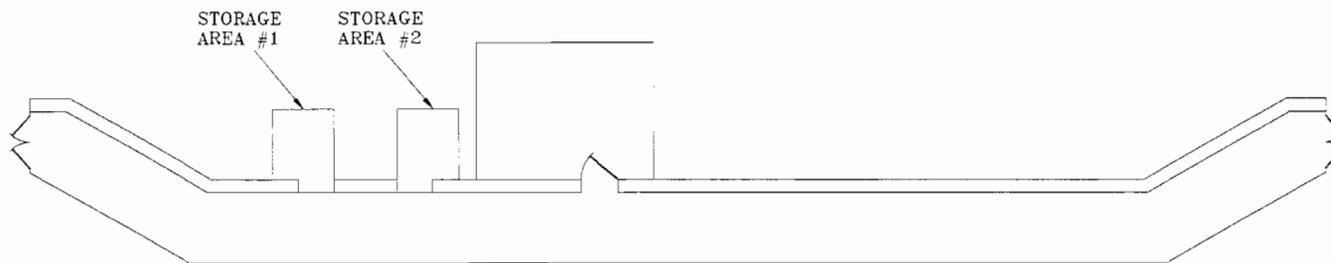
CNSY G-RAM FINAL REPORT

Section 25. Building 4000

d. Site Map



FIRST FLOOR

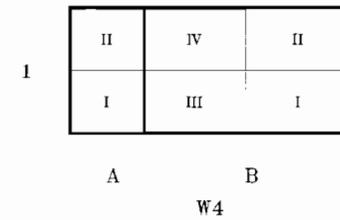
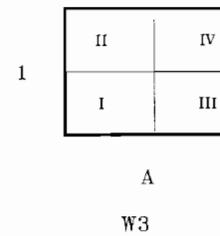
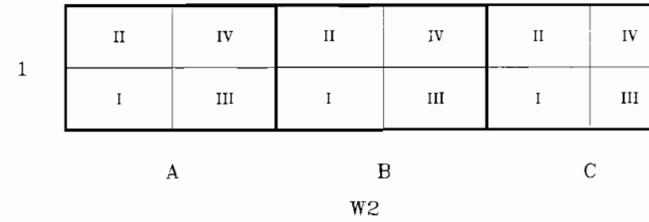
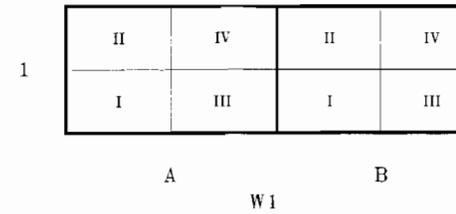
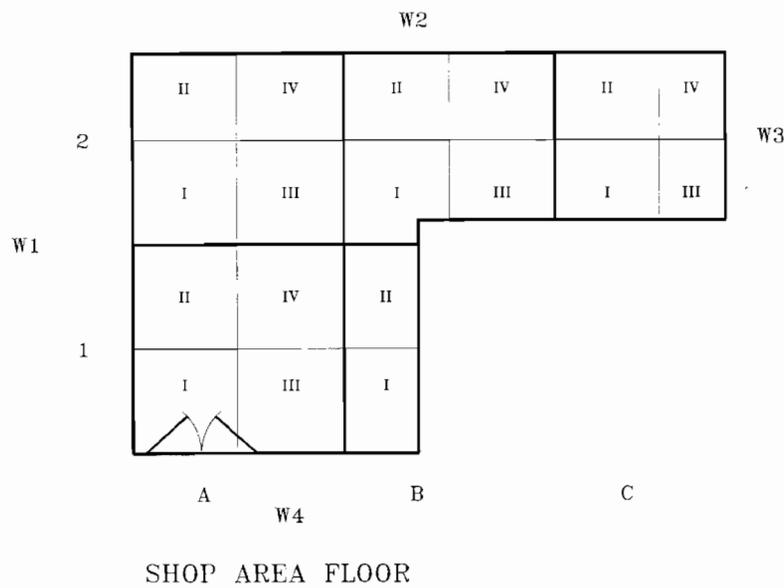


STORAGE FACILITIES

CNSY G-RAM FINAL REPORT

Section 25. Building 4000

e. Overall Grid Map

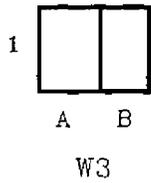
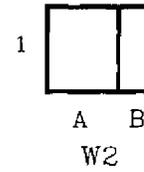
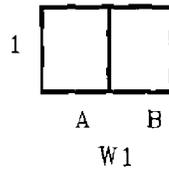
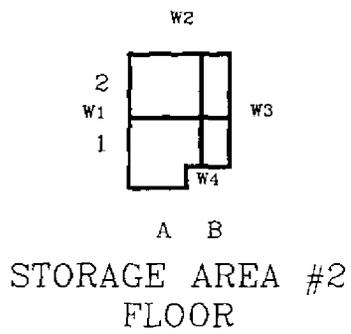
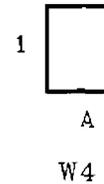
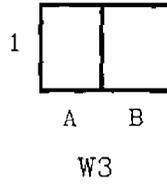
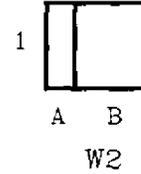
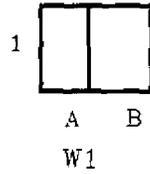
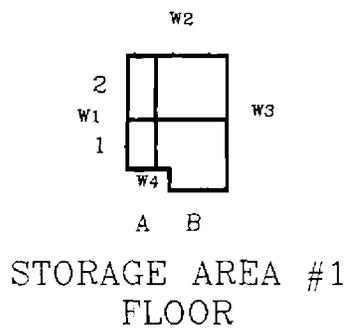


CNSY G-RAM FINAL REPORT

Section 25. Building 4000

e. Overall Grid Map

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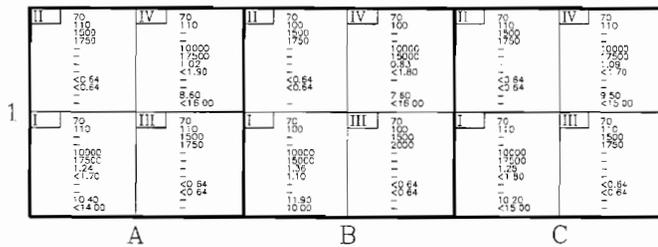




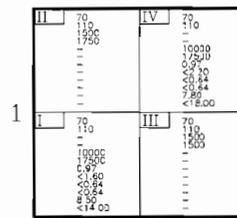
CNSY G-RAM FINAL REPORT

Section 25. Building 4000

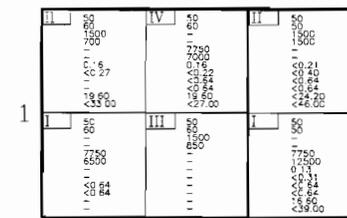
e. Localized Grid Map



W2



W3



W4

Date Legend:

1 - IM-247/PD [bq.]	7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value: <5
2 - IM-247/PD [cpm]	8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value: <5
3 - IM-252/PD [cpm]	9 - Ra-226 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
4 - IM-252/PD (HV-1 Pk) [bq.]	10 - Th-232 Removable Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <9
5 - IM-253/PD (HV-2 GROSS) [pk.]	11 - Ra-226 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45
6 - IM-253/PD (HV-2 GROSS) [cpm]	12 - Th-232 Surface Radioactivity [pCi/100cm <sup>2</sup> ], Regulator value: <45



CNSY G-RAM FINAL REPORT

Section 25. Building 4000

f. Photographs

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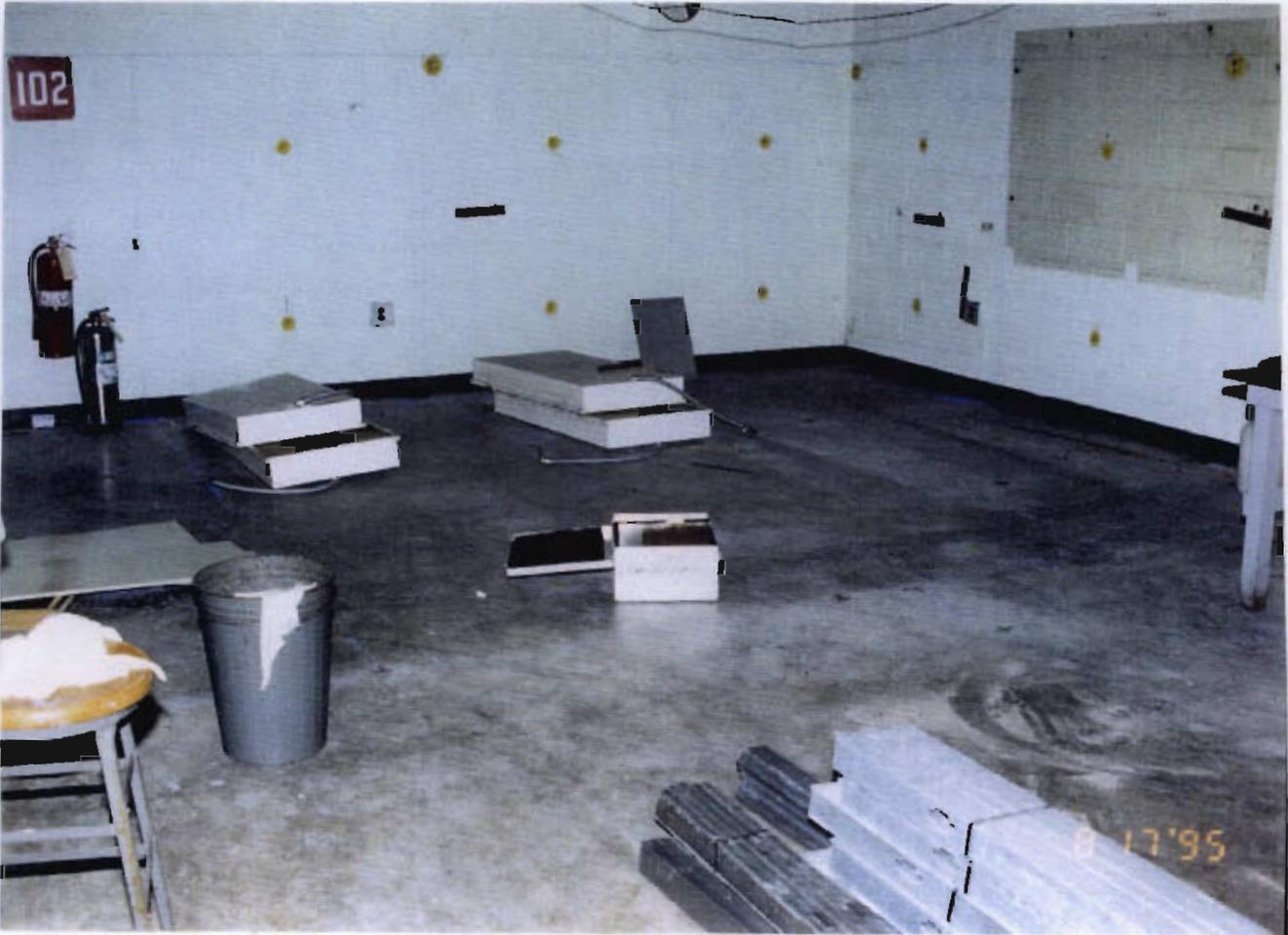
Building 4000 Class B Area

CNSY G-RAM FINAL REPORT

Section 25. Building 4000

f. Photographs

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Building 4000 Class B Area

CNSY G-RAM FINAL REPORT

Section 25. Building 4000

f. Photographs



Building 4000 Class C Area

## CNSY G-RAM FINAL REPORT

### Section 26. Building J-22

#### a. Introduction:

Building J-22 is a small calibration laboratory for Mobile Training Unit Ten (MOTU-10). Building J-22 can be found on the northeast side of Building 1167 in grid E-35 of CNSY PW Dwg. No. H606-282/283.

##### (1) Description:

Building J-22 is constructed of three, interconnected freight containers with a common metal roof.

##### (2) Brief History:

(a) **Use:** This facility was used as a calibration laboratory

(b) **Radiological History:** Building J-22 facility contained electron tubes.

##### (3) Survey Requirements:

(a) Class B release survey.

#### b. Discussion:

The floor of Building J-22 was divided into a total of 9 grids with a maximum size of 10' by 10'. Each of these grids was subdivided into sub-grids with an approximate size of 5' by 5'.

The walls were horizontally divided into 28 grids with a maximum size of 6' high and 10' wide. Each of these wall grids was subdivided into sub-grids with an approximate size of 3' high by 5' wide.

Each grid and sub-grid was identified with its own unique designator.

A beta-gamma scan survey with the IM-247/PD was performed over 100% of the grid surface. The IM-247/PD survey is grid specific, not sub-grid specific. The data shown on the localized grid map in each sub-grid indicates the highest potential for the entire grid. Solid samples for greater than or equal to twice background surveys are taken only in the sub-grid(s) that contain the twice background area(s).

A narrow gamma energy range scintillation scan survey with the IM-253/PD (PHA mode) was performed over diagonal sub-grids to represent at least 50% of the grid surface.

A wide gamma energy range scintillation scan survey with the IM-253/PD (GROSS mode) was performed over the other diagonal sub-grids to represent

## CNSY G-RAM FINAL REPORT

### Section 26. Building J-22

the remaining 50% of the grid surface.

A minimum of two swipes/smears were taken from each grid.

A minimum of 10% of accessible cracks and crevices in the specific site were surveyed via swab surveys.

A minimum of two solid material samples were taken from each grid. The solid material samples were removed from the grid locations having the highest potential for radioactivity.

Background levels used in Building J-22 were determined from similar materials in Connex Box 105298.

#### c. Summary:

Surveys performed with the IM-247/PD did not detect any areas having surface radioactivity greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-1 PHA) did not detect areas greater than or equal to twice background.

Surveys performed with the IM-253/PD (HV-2 GROSS) did not detect areas greater than or equal to twice background.

Analysis of swipes/smears and swab surveys with the alpha/beta analyzer indicated that removable Ra-226 levels were less than the limit of 9 pCi/100 cm<sup>2</sup> and removable Th-232 levels were less than the limit of 90 pCi/100 cm<sup>2</sup>. The removable Ra-226 levels ranged from a low of less than 0.64 pCi/100 cm<sup>2</sup> to a high of 2.29 pCi/100 cm<sup>2</sup> and removable Th-232 levels ranged from a low of less than 0.64 pCi/100 cm<sup>2</sup> to a high of 2.29 pCi/100 cm<sup>2</sup>.

Analysis performed on solid material samples with the multi-channel analyzer (MCA) indicated that all Ra-226 and Th-232 solid material samples were less than the limit of 5 pCi/g above background. MCA analysis performed on Ra-226 solid material samples ranged from a low of less than 0.34 pCi/g to a high of 4.00 pCi/g and Th-232 solid material samples ranged from a low of less than 0.61 pCi/g to a high of less than 4.60 pCi/g.

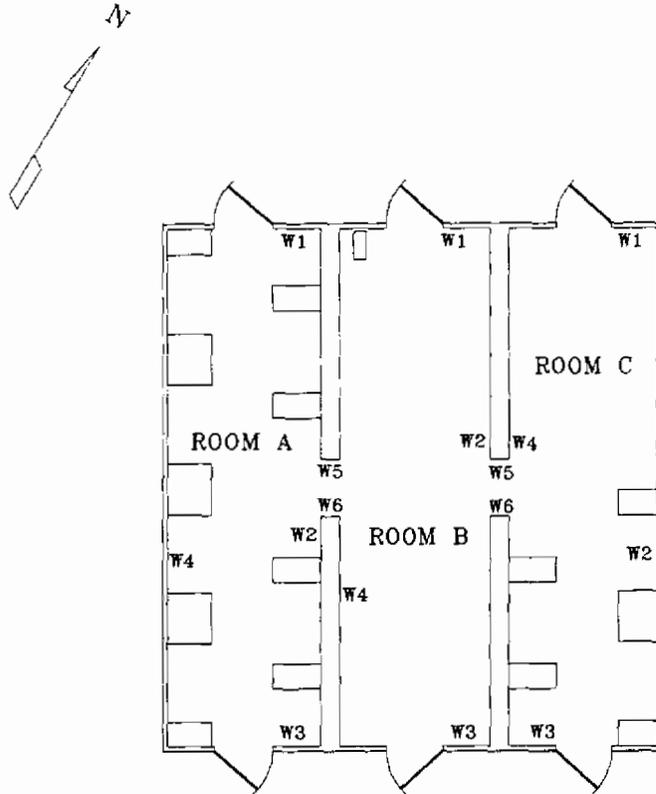
Mathematical computation of the specific radioactivity of the solid material samples confirmed that the surface radioactivity of Ra-226 was less than the limit of 45 pCi/100 cm<sup>2</sup>, and that the surface radioactivity of Th-232 was less than the limit of 450 pCi/100 cm<sup>2</sup>. The mathematically computed Ra-226 levels ranged from a low of less than 0.60 pCi/100 cm<sup>2</sup> to a high of less than 35.40 pCi/100 cm<sup>2</sup> and the Th-232 levels ranged from a low of less than 0.20 pCi/100 cm<sup>2</sup> to a high of less than 61.00 pCi/100 cm<sup>2</sup>.

CNSY G-RAM FINAL REPORT

Section 26. Building J-22

d. Site Map

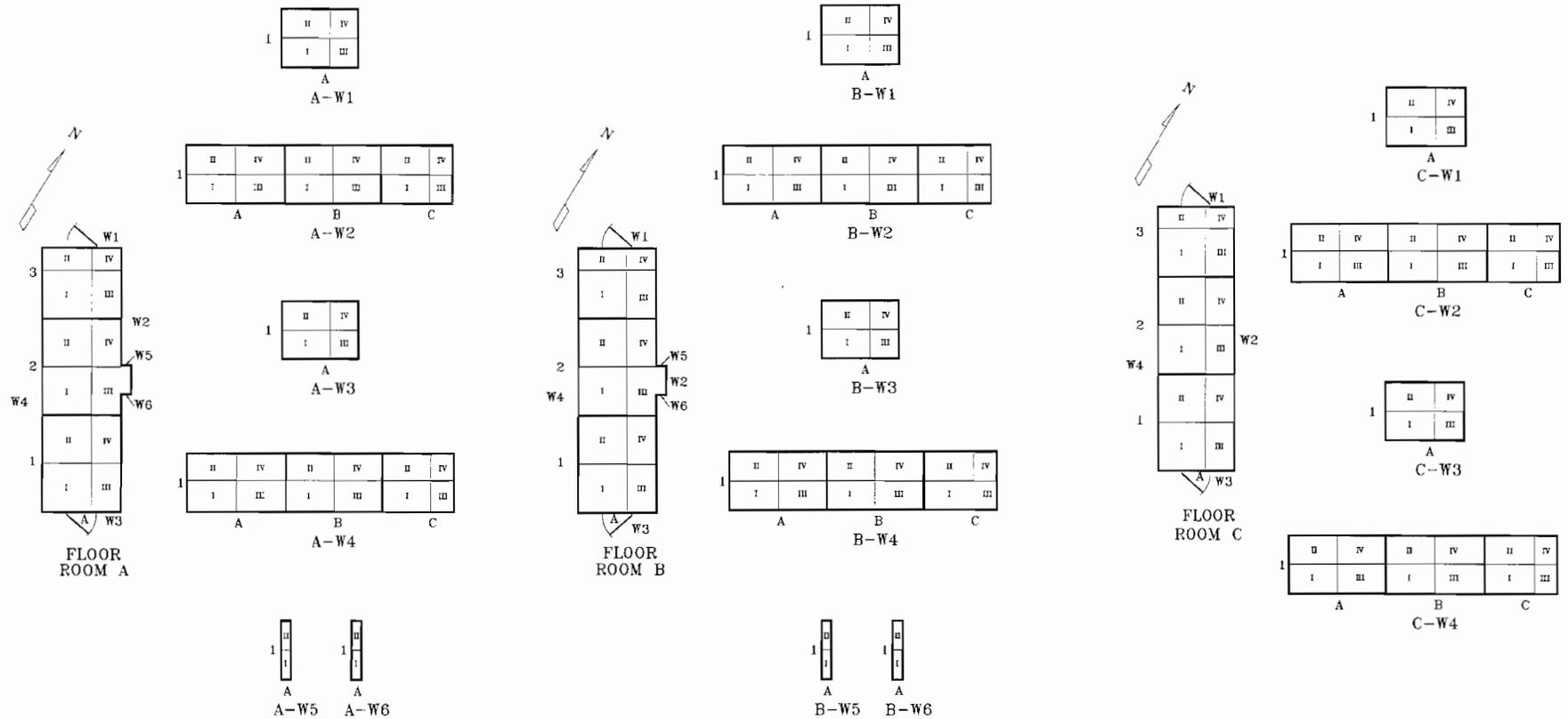
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CNSY G-RAM FINAL REPORT

Section 26. Building J-22

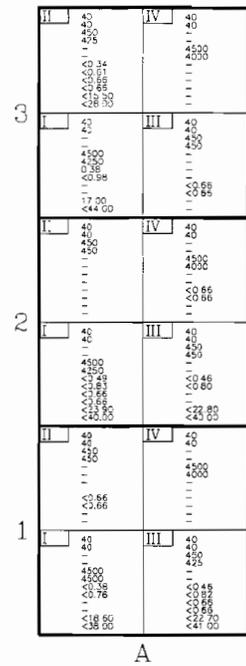
e. Overall Grid Map



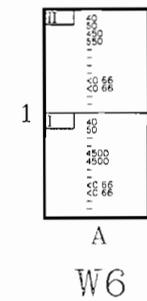
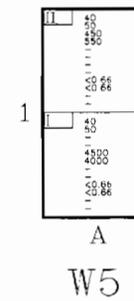
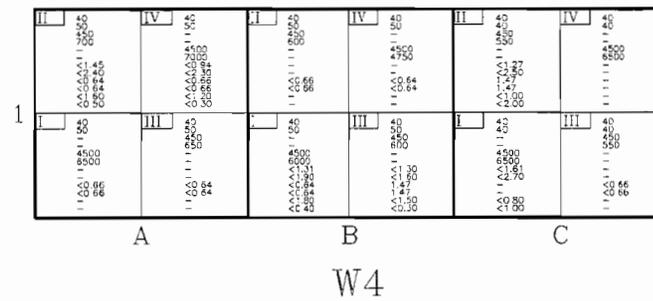
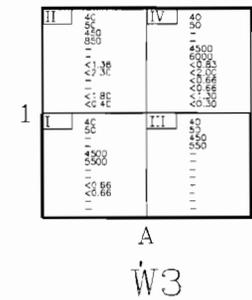
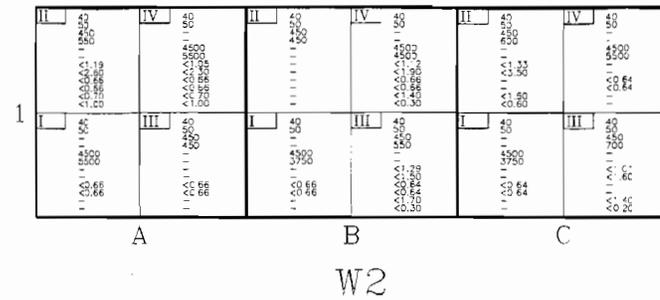
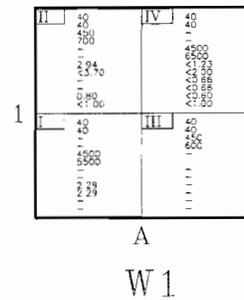
CNSY G-RAM FINAL REPORT

Section 26. Building J-22

e. Localized Grid Map



FLOOR ROOM A



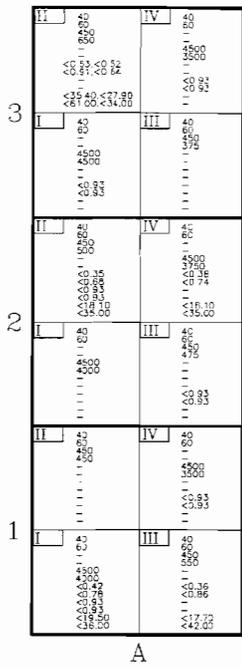
Data Legend:  
 1 - I-247/PD [Bq]  
 2 - I-247/PD [cpm]  
 3 - I-247/PD [cpm], PHA [Bq]  
 4 - I-253/PD [cpm], PHA [cpm]  
 5 - I-253/PD [Bq-2 GROSS] [Bq]  
 6 - I-253/PD [Bq-2 GROSS] [cpm]

7 - Ra-226 Solid Sample Radioactivity [pCi/g], Regulator value <5 above bkg of 23 pCi/g  
 8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value <5 above bkg of 3.2 pCi/g  
 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <9  
 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <90  
 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <45  
 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <450

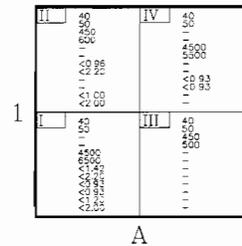
CNSY G-RAM FINAL REPORT

Section 26. Building J-22

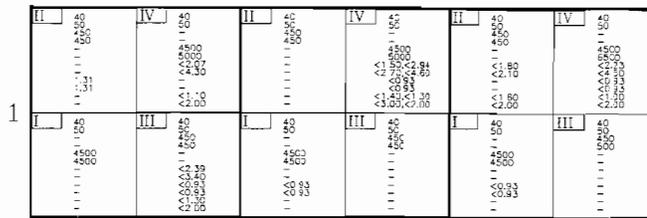
e. Localized Grid Map



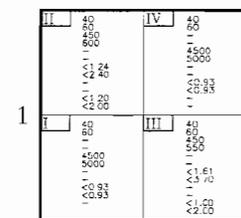
FLOOR ROOM B



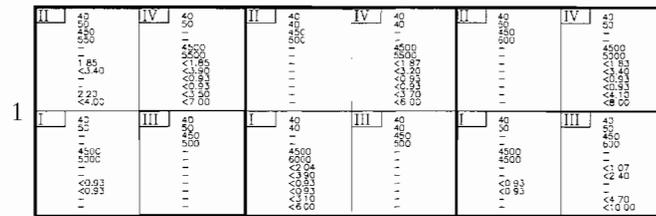
W1



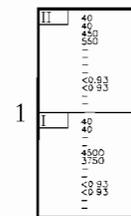
W2



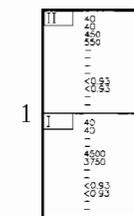
W3



W4



W5



W6

Data Legend:

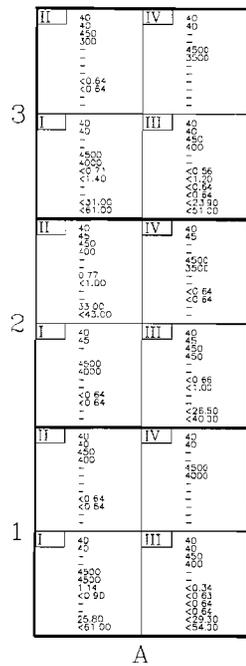
- 1 - IM-247/PD [mg]
- 2 - IM-247/PD [cpm]
- 3 - IM-233/PD (W-1 P4A) [kg]
- 4 - IM-233/PD (W-1 P4A) [cpm]
- 5 - IM-233/PD (W-2 GROSS) [kg]
- 6 - IM-233/PD (W-2 GROSS) [cpm]

- 7 - Ra-226 Solid Sample Radioactivity [pCi/g]. Regulator value: <3 above bkg. of 2.3 pCi/g
- 8 - Th-232 Solid Sample Radioactivity [pCi/g]. Regulator value: <5 above bkg. of 3.2 pCi/g
- 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <3
- 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <30
- 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <45
- 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>]. Regulator value: <450

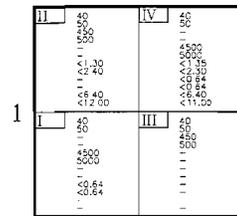
CNSY G-RAM FINAL REPORT

Section 26. Building J-22

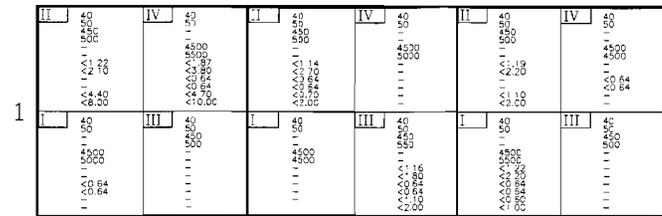
e. Localized Grid Map



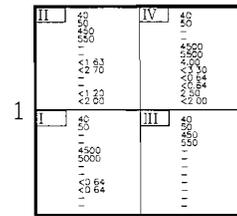
FLOOR  
ROOM C



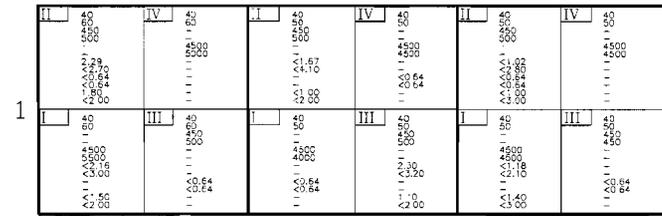
W1



W2



W3



W4

- Data Legend:
- 1 - IM-247/SD [Bq]
  - 2 - IM-247/SD [cpm]
  - 3 - IM-251/PD (HV-1 PHA) [Bq]
  - 4 - IM-251/PD (HV-1 PHA) [cpm]
  - 5 - IM-251/SD (HV-2 GROSS) [Bq]
  - 6 - IM-251/SD (HV-2 GROSS) [cpm]
  - 7 - Ra-228 Solid Sample Radioactivity [pCi/g], Regulator value <5 above bkg of 23 pCi/g
  - 8 - Th-232 Solid Sample Radioactivity [pCi/g], Regulator value <5 above bkg of 32 pCi/g
  - 9 - Ra-226 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <9
  - 10 - Th-232 Removable Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <9
  - 11 - Ra-226 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <45
  - 12 - Th-232 Surface Radioactivity [pCi/100cm<sup>2</sup>], Regulator value <450

CNSY G-RAM FINAL REPORT

Section 26. Building J-22

f. Photographs

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Room A, viewlng south.

CNSY G-RAM FINAL REPORT

Section 26. Building J-22

f. Photographs

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Room B, viewing north.

CNSY G-RAM FINAL REPORT

Section 26. Building J-22

f. Photographs

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Room C, viewing south.