Appendix C

T Building Rooms with Special ICs

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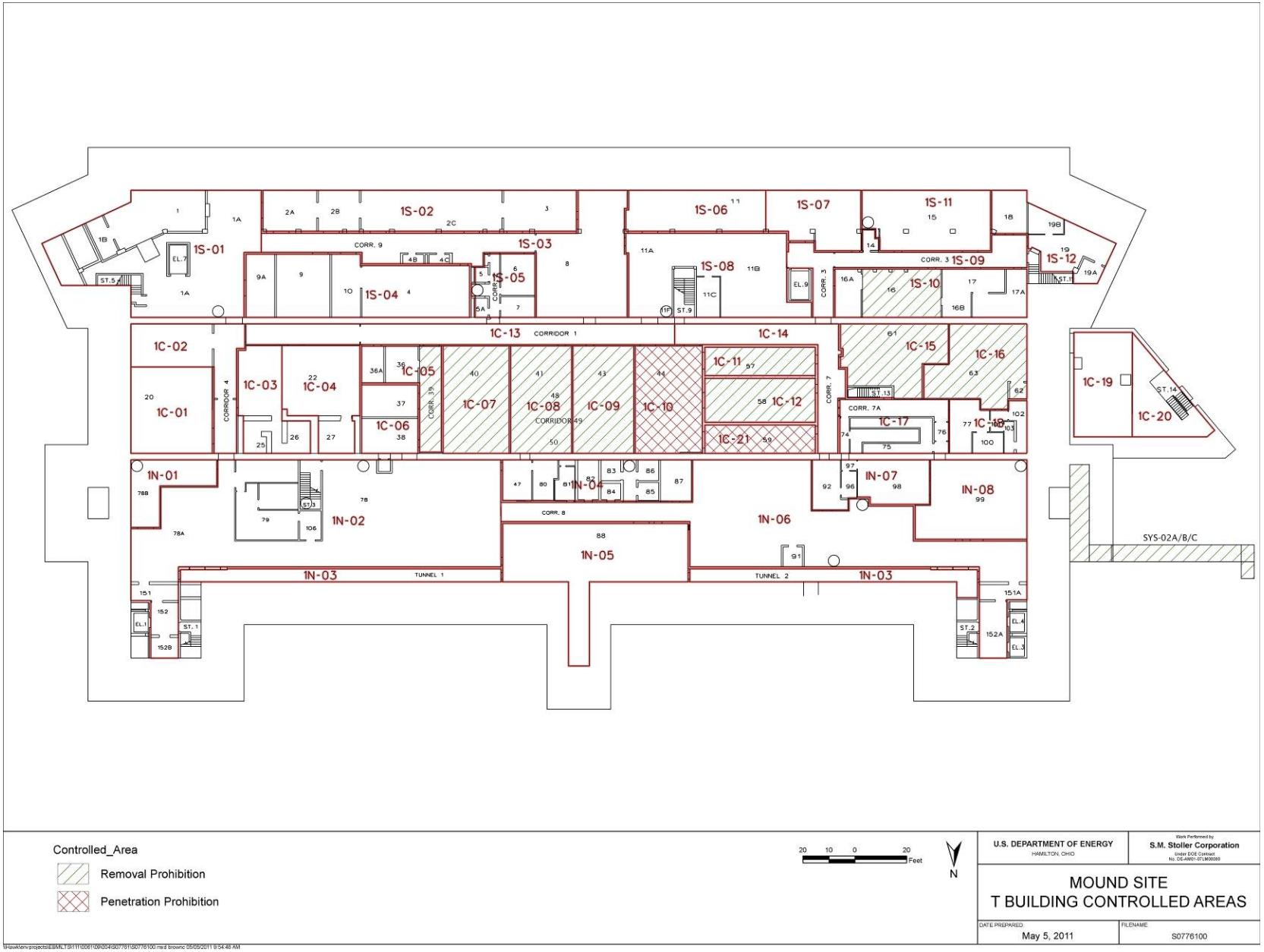

Figure 1. T Building Rooms with Special ICs

T Building Rooms with Special ICs

In addition to the ICs for the entire site, T Building has the following additional IC restrictions as described in the Parcel 6, 7, and 8 Record of Decision.

1. **Prohibit the removal of concrete floor material** in specified rooms of T Building (Figure 1) to off-site locations without prior approval from EPA, OEPA, and ODH.
2. **Prohibit the penetration of concrete floors** in specified rooms of T Building (Figure 1) without prior approval from EPA, OEPA, and ODH.

On June 29, 2009, the Mound Core Team signed an agreement for the position paper which provided policy guidelines for limited activities in these rooms which should not result in unacceptable risk to workers in the building.

The four-page agreement and position paper, *T Building Special ICs Core Team Agreement and Position Paper, 6-29-09*, are included in the CERCLA administrative record, in this Appendix D, and will be included in subsequent annual IC assessment reports.

Photos of T Building Rooms

The photos in this appendix show the baseline conditions of the rooms in April 2010. No changes have occurred since those photos were taken last year.

The Mound Core Team
P.O. Box 66
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6/29/09

As you know, The Proposed Plan for Parcels 6, 7 and 8 contains a restriction on the use of T Building which prohibits the penetration of concrete floors in rooms 50, 57 and 59 of T Building without prior approval from USEPA, OEPA, and ODH. The Miamisburg Mound Community Improvement Corporation (MMCIC) has asked the Core Team for a "blanket" approval to conduct limited activities in these rooms that should not result in an unacceptable risk to workers in the building.

The Core Team has evaluated this request and hereby grants approval for these activities provided they are conducted in accordance with the following policy guidelines:

1. Any driven penetration (e.g. concrete nails or explosive driven nails) of up to four inches in depth can be conducted without approval. As notification, the Core Team shall be provided a description of the activity, drawing of the room, and location of the proposed penetrations two weeks prior to physical activity.
2. Penetrations that involve removal of concrete shall be filled with concrete or steel. They shall not exceed four inches depth without approval of the Core Team. All penetrations of four inches or less requiring removal of concrete (drilling etc.) will require the submittal of a description of the activity, drawing of the room, and location of the proposed penetrations to the Core Team two weeks prior to the physical activity for notification purposes.
3. Any actions which remove or damage the concrete (including "driven penetrations") shall be filled within 120 days of completion.
4. Routine T Building occupants should be excluded from the area of activity for the duration of the renovation.

For your information, the Core Team has prepared the attached Position Paper which the Core Team used in its evaluation. MMCIC can use this Position Paper and these policy guidelines in determining which future activities may be acceptable to the Core Team in rooms 50, 57 and 59 of T Building. In any event, MMCIC must request approval for any activity not on this approved list.

DOE/MEMP: Paul C Lucas 7/14/09
Paul C. Lucas, Remedial Project Manager

USEPA:
Timothy J. Fischer, Remedial Project Manager

OEPA: 7/14/09
Brian K. Nickel, Project Manager

Position Paper
T Building Cap Areas Renovation Guidelines

Background: T Building (Technical Building) is a massively constructed building on the Mound site with ten foot thick heavily reinforced concrete floors and similarly robust ceilings and walls. During the remediation of the T Building, the contractor encountered bulk contamination of the floor and footings in certain areas. Attempts to complete remediation of the contaminated floor and footer in the west end of room 50 and east end of rooms 57 and 59 were technically and economically difficult to justify. Following an assessment of the risks involved to the building's structural integrity if removal of contaminated concrete continued (attached), a decision was made to leave the contaminated concrete sub floor and footer in place, and to add a cap of color coded (red) concrete to provide a margin of safety from the residual contamination. The Department of Energy (DOE) currently owns the facility and wishes to transfer ownership to the Miamisburg Mound Community Improvement Corporation (MMCIC) for future development. To ensure the health and safety of future workers and occupants of T Building, a deed restriction will be placed on T Building limiting the disturbance of concrete in those areas with residual contamination. This paper outlines some of the technical basis allowing latitude in the disturbance of the concrete cap.

As stated above, the DOE and its contractors evaluated the residual contamination to ensure that future worker safety was protected. Specifically future worker doses were modeled to ensure that they would not reasonably be expected to receive an additional 15 mrem of equivalent dose due to occupation in T Building. Samples of the residual contamination were taken. As a conservative measure, the average of the five highest areas of contamination was used as input for the entire area. This data was input into the RESRAD Build dose evaluation code. This code is jointly developed by the DOE and the Nuclear Regulatory Commission (NRC) for just this type of situation.

Under this scenario, two types of workers were evaluated. The first type was an office worker who occupies the building for an entire year. Doses for this type of worker were previously calculated and found to fall within the 15 mrem per year guidelines. The calculations for this type of worker assume that no renovation is occurring while that worker occupies the area, i.e. the concrete cap is intact. A second worker, the renovation worker, was originally modeled using similar physical characteristics of the building, but differing inputs commensurate with the type of work. For example, the breathing rates and occupancy rates for the renovation worker differ from that of an office worker. The original calculations for the renovation worker in T Building were 1.86 mrem. Of that dose, 0.17 mrem is due to direct radiation from the residual contamination under the protective cap. The remainder is from low level residual contamination throughout T Building.

A review of the Final Status Surveys for T Building indicates that the thickness of the cap is nominally 11 inches. It was placed at this thickness to bring the floor elevation level with the adjoining hallway floor surfaces. Based on the very low dose rates cited above (0.17 mrem) for external exposure, there is excess concrete serving as a shielding material for the bulk contamination below. This would allow for temporary removal or penetration of some portion of this concrete to allow for anchoring of equipment and walls of future tenants. It should be noted,

that in order to maintain the integrity of the calculations for the office worker, any floor penetration should be repaired or steel anchors inserted (steel being a better shield than concrete).

Calculations: As implied, records for the original calculations were retrieved from storage. Although it was generally known that excess concrete was placed, there was no known calculation of how much excess existed and none was found during the review of the records. The RESRAD Build calculations that were found used all 11 inches of concrete as shielding to arrive at the 0.17 mrem cited earlier. In addition, due to the presence of the cap, it was assumed that none of the contamination contained in the subsurface concrete and footers becomes airborne.

RESRAD Build continues to be maintained and updated by Argonne National Laboratory. The current version is slightly modified from the version originally used to model these doses. In order to ensure continuity, a baseline calculation was performed using the parameters from the original calculations. With only slight variations, they agreed. The original calculations indicated 1.70 mrem due to other building residual contamination. The new version calculated this same component to be 1.69 mrem. The total for both the cap area and the remainder of the building was 1.86 mrem for both versions, indicating strong agreement between the two.

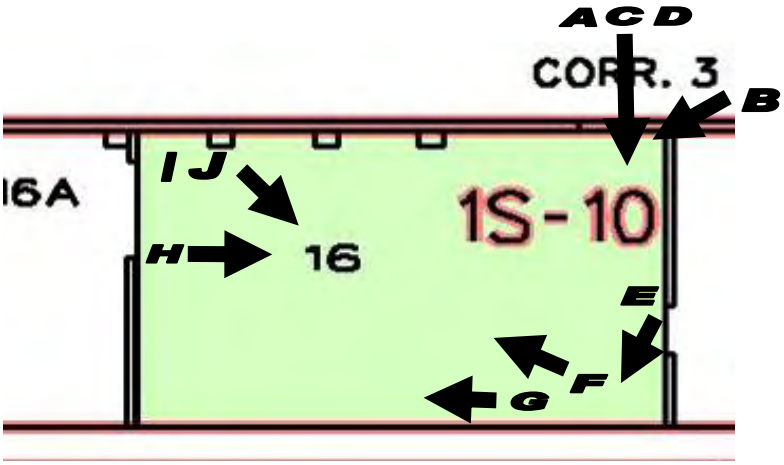
In order to establish a margin of safety another calculation used the same input parameters except that the thickness of the cap was reduced by seven inches (to a nominal four inches total thickness). This further reduced thickness yielded an exposure to the renovation worker of 5.93 mrem. This remains protective of the renovation worker.

Recommendation: If the core team decides to allow penetration of the "red" concrete cap, it would be prudent to allow for some margin of safety to preclude accidental penetration to depths greater than currently analyzed. Note that the cap penetrations should be restored or replaced with anchors that provide similar or greater shielding capabilities. Recall also that one of the major assumptions is that the cap prevents the contamination below it from becoming airborne, so that the integrity of the cap must be maintained. Consideration must be given to the ability to ensure that recommendations are followed (i.e. penetrations are not greater than depth specified etc.). Also note that additional work could be carried out safely but may require additional analysis.

Policy Guidelines: As discussed, some guidelines should be established to administer penetration of the concrete in these areas. Such guidelines could be as follows:

1. Any driven penetration (e.g. concrete nails or explosive driven nails) of up to four inches in depth can be conducted without approval. As notification, the Core Team should be provided a description of the activity, drawing of the room, and location of the proposed penetrations two weeks prior to physical activity.
2. Penetrations that involve removal of concrete shall be filled with concrete or steel. They shall not exceed four inches depth without approval of the Core Team. All penetrations of four inches or less requiring removal of concrete (drilling etc.) will require the submittal of a description of the activity, drawing of the room, and location of the proposed penetrations to the Core Team two weeks prior to the physical activity for notification purposes.
3. Any actions which remove or damage the concrete (including "driven penetrations") shall be filled within 120 days of completion.
4. Routine T Building occupants should be excluded from the area of activity for the duration of the renovation.

Table C–1. T Building Baseline Photos Taken in 2010



T Bldg. Room 16 View A

T Bldg. Room 16 View B

T Bldg. Room 16 View C

T Bldg. Room 16 View D

Table C–1 (continued). T Building Baseline Photos Taken in 2010

T Bldg. Room 16 View E

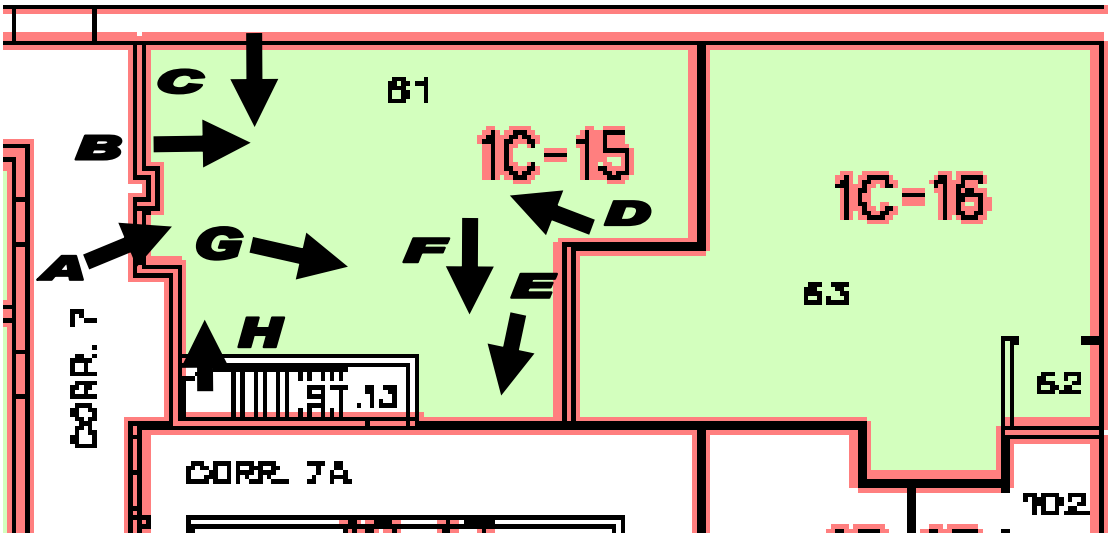
T Bldg. Room 16 View F

T Bldg. Room 16 View G

T Bldg. Room 16 View H

T Bldg. Room 16 View I

T Bldg. Room 16 View J



T Bldg. Room 61 View A

T Bldg. Room 61 View B

T Bldg. Room 61 View C

T Bldg. Room 61 View D

Table C–1 (continued). T Building Baseline Photos Taken in 2010

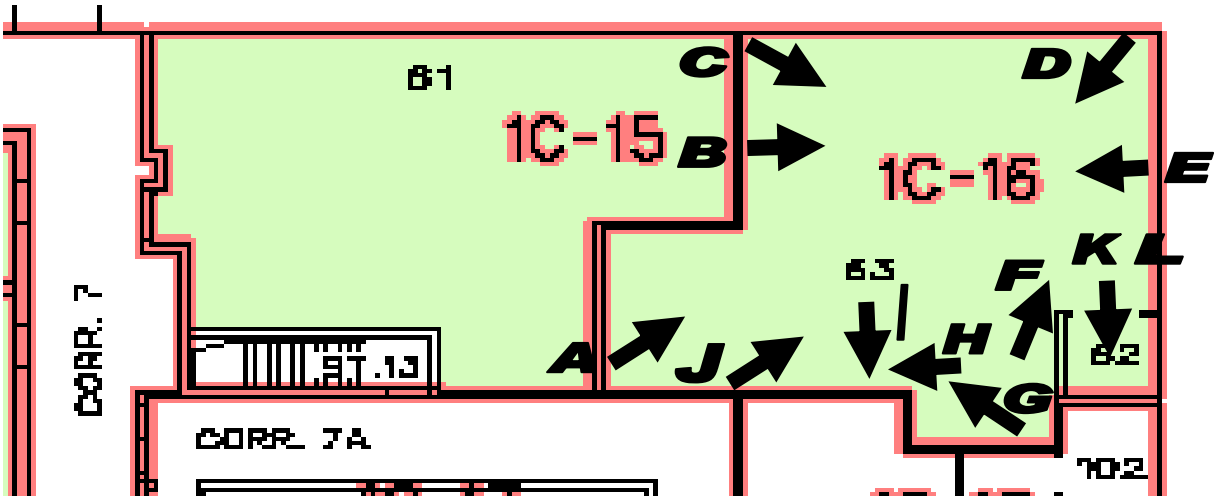
T Bldg. Room 61 View E

T Bldg. Room 61 View F

T Bldg. Room 61 View G

T Bldg. Room 61 View H

Table C–1 (continued). T Building Baseline Photos Taken in 2010



T Bldg. Room 63 View A

T Bldg. Room 63 View B

T Bldg. Room 63 View C

T Bldg. Room 63 View D

T Bldg. Room 63 View E

T Bldg. Room 63 View F

T Bldg. Room 63 View G

T Bldg. Room 63 View H

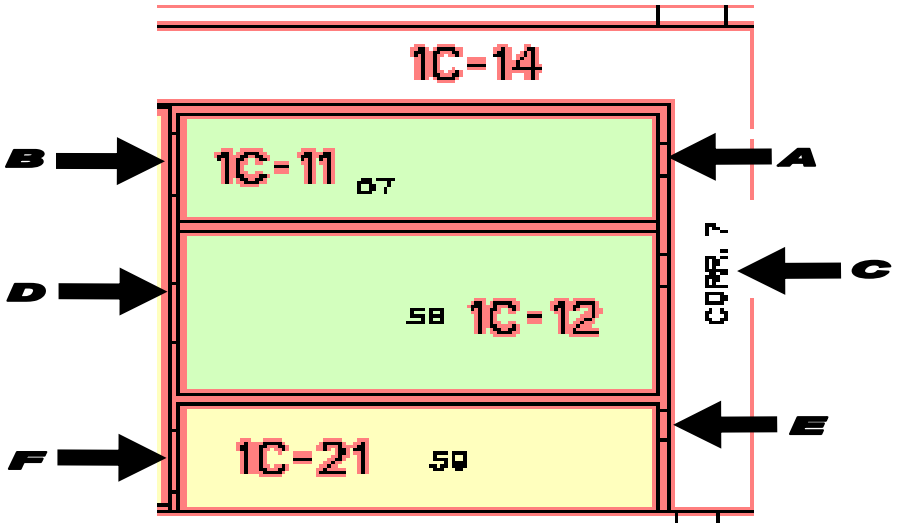
T Bldg. Room 63 View I

T Bldg. Room 63 View J

Table C–1 (continued). T Building Baseline Photos Taken in 2010

T Bldg. Room 62 View K

T Bldg. Room 62 View L



T Bldg. Room 57 View A

T Bldg. Room 57 View B

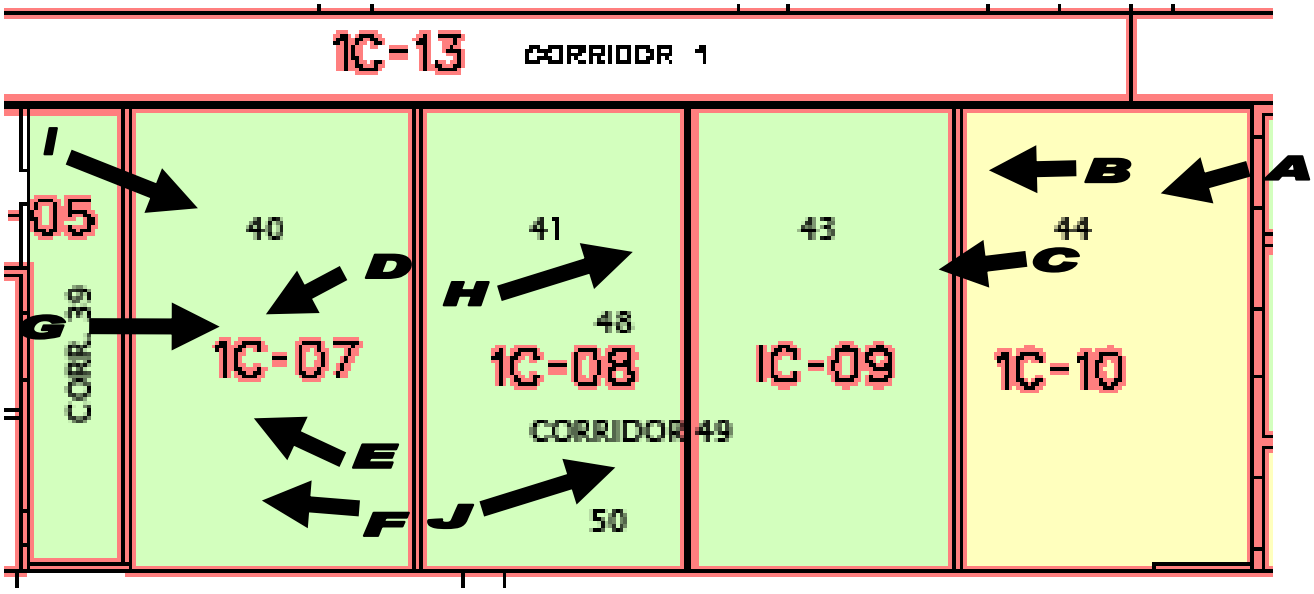
T Bldg. Room 58 View C

T Bldg. Room 58 View D

T Bldg. Room 59 View E

T Bldg. Room 59 View F

Table C–1 (continued). T Building Baseline Photos Taken in 2010



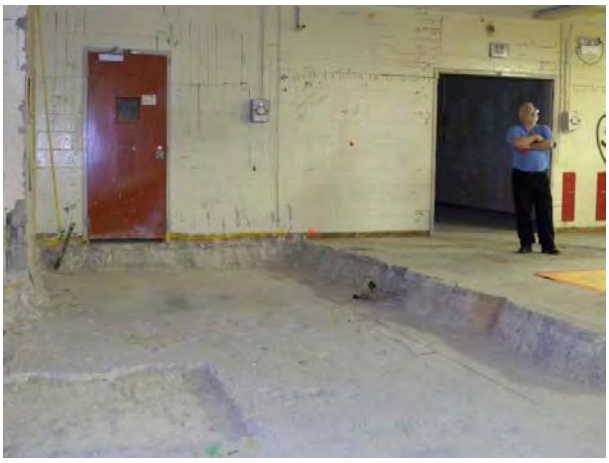
T Bldg. Rooms 39-44, 48-50 View A

T Bldg. Rooms 39-44, 48-50 View B

T Bldg. Rooms 39-44, 48-50 View C

T Bldg. Rooms 39-44, 48-50 View D

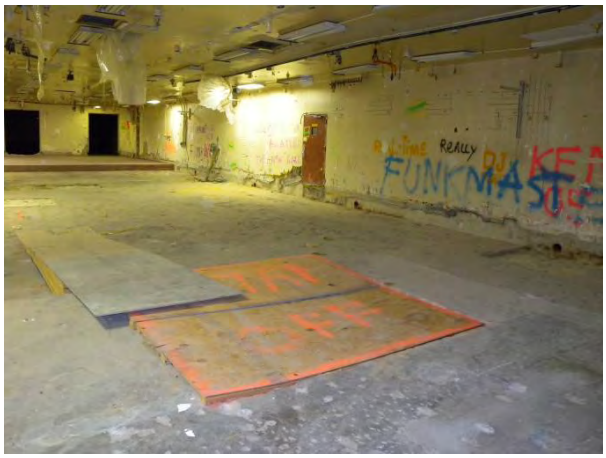
T Bldg. Rooms 39-44, 48-50 View E



T Bldg. Rooms 39-44, 48-50 View F

T Bldg. Rooms 39-44, 48-50 View G

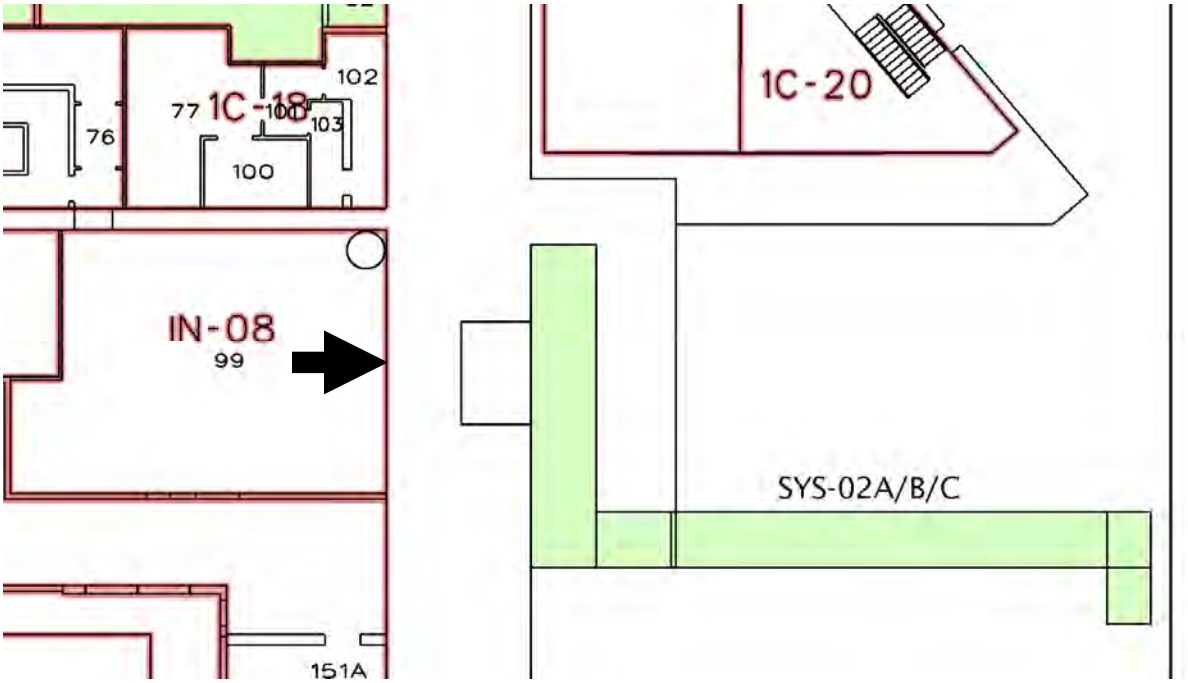
T Bldg. Rooms 39-44, 48-50 View H



T Bldg. Rooms 39-44, 48-50 View I

T Bldg. Rooms 39-44, 48-50 View J

Table C–1 (continued). T Building Baseline Photos Taken in 2010



T Bldg. Room 99 - Access door to airshaft with special ICs leading to west head house

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