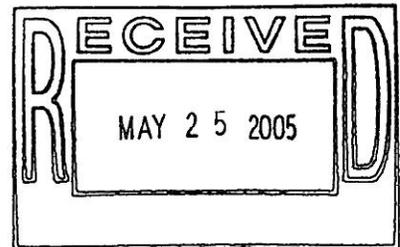


# Building 371 Demolition Plan

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Rev. 0



Reviewed for Classification/UCNI/OUO  
By: Janet Nesheim, Derivative Classifier  
DOE, EMCBC *JAN*  
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Confirmed Unclassified, Not UCNI, *not OUO*

ADMIN RECORD

# Building 371 Demolition Plan

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## **1.0 Introduction**

This demolition work plan has been written to describe the intended project sequence, equipment and management resources, as well as the demolition methodology for Building 371.

### **1.1 Purpose**

This Building 371 Demolition Plan provides a description of the methods that will be used to guide the planning and implementation of demolition activities associated with the B371/374 Closure Project Decommissioning Operations Plan (DOP). Demolition will be performed in the safest, most efficient sequence possible. Building 371/374 has been divided into a 5-phase plan. Phases I-III have been completed. This demolition plan captures the demolition of Phase IV and V only (See Figure 1).

### **1.2 Scope and Policy**

This Demolition Plan addresses the overall methodology to safely manage, plan, perform and control building access for equipment removal, ancillary equipment removal, demolition and other related activities associated with the B371 demolition. The specific requirements are defined in the 371 Demolition Work Control Package (WCP). The following conditions will apply:

- Building 371 Demolition activities will begin only after the Pre-Demolition Survey and associated characterization data has been completed and approval for demolition has been received from DOE and CDPHE.
- Work activities will include removal of concrete, contaminated equipment including plenums, ductwork and appurtenances including roof sections, retaining walls, loading docks, pads, temporary structures, process lines and underground utilities or structures and building demolition in accordance with the B371/374 DOP.
- Following demolition activities, backfill, grading and revegetation of the Project area will be completed in accordance with the B371/374 DOP and the Final Land Configuration Plan.

## **2.0 Management Responsibilities**

### **2.1 Demolition Manager**

The Kaiser-Hill (KH) Demolition Manager (DM) shall ensure that all work activities associated with the project are performed, managed and packaged in accordance with this plan. The DM is responsible for providing the necessary personnel and equipment resources required to safely and compliantly perform the work. The DM is also responsible for organizing project staffing, coordinating the overall operations and directing or delegating responsibilities to project team members, including CDPHE and DOE and subcontractors.

## **2.2 Demolition Superintendent**

The project Demolition Superintendent (DS) reports directly to the Building 371 DM. The DS interfaces with Project Supervision daily to coordinate work activities, schedule future work and maintain status of work performed. The DS organizes, directs, supervises and coordinates construction and demolition activities, in addition to assisting with preparing and reviewing project plans, specifications, drawings and schedules. The DS is accountable for knowledge of all field construction and demolition activities.

## **2.3 Project Engineering**

KH will provide engineering support for this project. Engineering will develop all WCPs for demolition of B371. The Demolition Manager and Superintendent will coordinate daily with Engineering to ensure adequate planning is incorporated into the development of WCP's. KH will provide a qualified structural engineer to analyze building components and enable safe demolition.

## **2.4 Health and Safety Manager**

KH will provide health and safety management for the demolition work. KH will conduct all work in accordance with the Site Occupational Safety and Industrial Hygiene Program manual, applicable federal, state and local regulatory requirements. Health and Safety provisions of the Integrated Safety Management Systems (ISMS) principles and WCP's will be applied to all work activities. Potential hazards will be identified and appropriate control measures will be implemented to ensure that work is conducted in a safe manner. Job Hazard Analysis (JHA) will be prepared and used to communicate potential hazards to personnel associated with the project.

## **2.5 Radiological Safety Manager (RSM)**

KH will provide the necessary Radiological Safety Management and resources to ensure implementation of radiological provisions and As Low As Reasonably Achievable (ALARA) principles is incorporated into all work activities. All construction and demolition activities will be conducted in compliance the Site Radiological Protection Program (including the RFETS Site Radiological Control Manual and applicable RFETS Radiological Safety Practices). All work activities performed in a radiological work environment will be in compliance with the Radiological Work Permit (RWP) pertaining to the Building 371 demolition activities.

## **2.6 Waste Management Specialist**

The KH Waste Specialist (WS) will be the point of contact for all waste issues. The WS will be responsible for waste characterization, packaging, coordination and management of waste items. All waste management activities associated with demolition will be conducted in compliance with the approved Waste Generator Instructions, Waste Management and Transportation Plan, and applicable RFETS Waste Management procedures.

### **3.0 Building 371 Demolition**

#### **3.1 Area Preparation Requirements**

Adequate erosion or run-on/run-off controls will be incorporated into the 371 Demolition WCP. Controls will be established prior to the start of work and monitored throughout the duration of the project. Typical controls include installation of berms, silt fence and/or straw bales. A temporary debris storage area, traffic patterns and specific-loading areas for waste management will be established. All personnel working in Building 371 will be notified of demolition activities as they approach each phase of demolition. Access to affected areas will be taped off and/or barricaded to keep personnel away from ongoing demolition. Communication of the planned work and associated impact will occur during pre-planning meetings, schedule updates, and through the Plan of the Day meetings.

#### **3.2 Groundwater Protection Requirements**

Groundwater sampling wells that exist in the B371/374 Closure Project boundary and have not been abandoned will be protected from damage from demolition activities. These wells will also be identified and flagged to provide added awareness and visibility. Subsurface drains will be disrupted in multiple areas (See Figure 2 – Sub-surface Drain Disruption Locations) prior to Phase IV/V demolition activities. Dust suppression water and incidental water encountered during demolition activities will be managed in accordance with the 371 Demolition WCP.

#### **3.3 Utility Requirements**

All existing features associated with utility systems will be located and marked. All of these systems will be evaluated to determine protection, isolation or abandonment requirements. Utility locations and isolations will be provided by RISS prior to demolition. All uncontaminated utilities shall be removed to at least 3 feet below the final proposed grade. Utilities include but are not limited to steam lines, domestic and fire water lines, sanitary and storm sewers and process waste lines. All utility line termination point locations shall be surveyed and recorded using land-based surveys or Global Positioning Systems. This includes sewer, water, electrical, steam, gas, alarm and process waste lines. The systems will be removed in accordance with the 371 Demolition WCP or Sector 5A Removal Work Package.

Underground process waste pipes and sewer pipes that are at least 3 feet below the final proposed grade may be left in place provided the pipes have been disrupted and grouted. Sewer pipes must be flushed prior to abandonment. Process waste and sewer piping within three feet of the final proposed grade shall be removed.

Protective barriers or fences, and silt fence will be erected around permanent site features designated to remain after completion of demolition and site restoration. Electrical distribution switchgear and area lighting to remain operational in the demolition area will be flagged and protected.

### 3.4 Radiological Screening

A number of systems have been identified which will not be removed from the building until demolition. Verification surveys on accessible areas of the systems/equipment will be conducted in order to ensure there is no unacceptable contamination.

Surveys will be conducted on all systems/equipment in accordance with the Surface Contaminated Objects (SCO) in accordance with PRO-267-RSP09.05, *Radiological Characterization for Surface Contaminated Objects* in order to adequately characterize radiological contamination. During demolition, these items will be removed from the rubble and disposed of as low-level waste. The intent is to minimize the hazards associated with D&D by utilizing heavy equipment to remove these items from the building.

Some examples of systems/equipment that will be left in place to be removed prior to or during demolition are listed below:

- ◆ Plenums and associated ductwork (excluding Zone 1)
- ◆ Supply air units
- ◆ Filter plenums
- ◆ All stairs
- ◆ Elevators (following draining)
- ◆ Door frames embedded in concrete
- ◆ Pipe / Duct supports welded to the building frame
- ◆ Conduit

### 3.5 Demolition Work Package(s)

Prior to the commencement of any demolition activities, the 371 Demolition WCP will be approved and all crewmembers will be properly trained on WCP requirements. This includes the completion of all radiological surveys, the approved Final Status Survey Report (FSSR) and other associated characterization data. Upon completion of this training, mobilization of equipment, personnel, and materials necessary to perform the work will be mobilized to the demolition site at Building 371. Sequencing of the work described below may change during the course of the demolition project; however, all work will be executed as stated.

### 3.6 Demolition Preparation Activities

Asbestos abatement activities will be completed prior to demolition.

Demolition preparation will be necessary on the interior and exterior of the Building 371 structure. Storm drains and culverts will be modified in order to direct water from the immediate area surrounding Building 371 into the building. Outlets to the environment including subsurface drains will be air gapped/isolated and sealed with grout or other acceptable materials as necessary. Sub-surface drains will be disrupted and grouted in multiple areas as identified in Figure 2 (Sub-surface Drain Disruption Locations).

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Exterior preparations will begin with the removal of any site features that may be required to properly execute building demolition. This includes but is not limited to overhead/underground utilities, process waste lines, and any other obstructions as necessary. Underground utilities and process waste lines will be located with the assistance of the diggers (site utility experts). Once all utilities have been properly located and marked and a Soil Disturbance Permit has been approved, excavation/location will commence. All utilities and process waste lines will be isolated or abandoned. Overhead and other obstructions will be identified and removed where possible as necessary. Any other obstruction that must remain will be properly marked and protected with concrete barriers, caution tape, and signage as applicable.

### **3.7 Demolition Approval**

Prior to facility demolition, K-H will perform a final survey. The final survey is performed to determine if a structure can be approved for demolition in accordance with the DOP and to provide information necessary to prepare an FSSR.

All demolition activities will be executed in accordance with the 371 DOP and 371 Demolition WCP.

### **3.8 Demolition Controls**

#### **3.8.1 Contamination Control**

A radiologically controlled area (i.e., RBA, CA, etc.) will be established and maintained around the demolition area. The controlled area boundaries and personnel protection equipment will be established per the Health and Safety Guidance, Radiological Work Permits (RWP), and Job Hazard Analysis. Project area air sampling and personnel monitoring will be used to verify that the protection factors/controls are effective.

Full-time radiological control technician support will be used during demolition activities to ensure the radiological controls are consistently implemented to minimize the dose to individuals, the environment and the public from radioactive materials.

Contamination and airborne radioactivity surveys will be performed as necessary to document and detect changes in the radiological conditions in the work area. Project-specific air samples will be collected and evaluated as quickly as practical using the appropriate site approved counting techniques and equipment.

Other contaminants of concern (e.g., Beryllium, Asbestos, hazardous constituents) will be removed prior to demolition. The verification data will be provided in the FSSR.

Demolition activities may include remediation of contaminated soils. Control measures provided in the 371 Demolition WCP for the removal of contaminated soils will be implemented as necessary.

### **3.8.2 Dust control**

In accordance with the Colorado Air Quality Control Commission Regulation 1, a dust suppression plan will be prepared before initiation of demolition activities that will describe the specific methods to be used to control fugitive particulates during demolition activities. The dust suppression plan is located in the 371 Demolition WCP. Enhanced control methods will be used to keep fugitive emissions as low as reasonably achievable.

### **3.8.3 Water Quality Management**

Control of water run off from dust suppression shall be implemented using the Site erosion control management system with guidance from RISS Environmental Management. In order to effectively manage water from the B371 demolition and to minimize the amount of water to be treated, a pump and filtration system will be employed along with recycling the water for dust suppression. To prepare the facility prior to Phase IV/V demolition activities, the sub-basement drain lines will be disrupted and the sub-basement will be completely filled to the basement level. A catch basin and pump system will be set up. This system will collect dust suppression water and groundwater and pump it to a large collection basin. The collection basin will be designed to collect the combination of dust suppression water, groundwater, and storm water. The water flowing to the basin will undergo filtration before being pumped back as dust suppression for the demolition. At the end of demolition, water shall be disposed of per the results of the sampling, this may require some type of pre-treatment to meet disposal criteria.

Berms, silt fences, or similar erosion control devices will be used to prevent silt and debris from being washed into surface water drains. Drains and other sub-surface openings will be sealed or plugged prior to demolition. Erosion controls will comply with the Site Erosion Management System Guidance.

### **3.8.4 Air Monitoring**

Environmental air monitoring will be performed in accordance with the requirements of the Site Integrated Monitoring Plan (IMP). The existing RAAMP sampler network will be used for ambient air monitoring during removal activities. Beginning at least one week before the start of demolition, PM-RAD sampling will begin on a weekly filter exchange schedule.

Additional air monitoring requirements will be identified in the applicable Radiological Work Permit. Monitoring requirements will include the use of air monitors for workers in the immediate area and fixed air head/low-vol samplers around the perimeter of the demolition area.

### **3.8.5 Demolition Debris Disposal**

Facility debris will be loaded into approved waste containers. These containers will be covered as required. Debris generated for offsite disposal by demolition activities will

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be packaged and managed according to the Waste Management and Transportation Plans.

All debris streams generated from demolition activities will be segregated, evaluated, characterized (as necessary), sized, staged and released for final disposition in accordance with Waste Generator Instructions. Debris requiring off-site disposal will include but is not limited to scrap metals, concrete, and demolition debris such as wood, plastic and glass. Demolition debris/trash will be shipped as specified in the Site Specific Waste Management Plan to an approved offsite facility. The material will be managed on-site and loaded according to the receiving facility's Waste Acceptance Criteria or Waste Acceptance Guidelines.

### **3.9 Demolition Equipment**

This section describes various types of equipment that may be used. Demolition will be accomplished using a variety of mechanized equipment. Tracked excavators fitted with hydraulic attachments such as shears, "live" thumbs, processors and hammers may be used to accomplish the demolition requirements of this contract. Excavators and loaders may be used to place backfill material into the basement of the structure. All debris intended for off site disposal will be loaded into appropriate waste containers. The primary demolition steps and mechanical techniques for dismantling, segmenting and demolishing will be provided in the 371 Demolition WCP.

### **4.0 Demolition Execution**

Demolition will commence after the following conditions/criteria are met:

- Areas scheduled for demolition meet the requirements of the DOP.
- The Structural Engineer has performed a structural survey and the structure has been declared safe for demolition per 29 CFR 1926.850 (a).
- Air monitoring requirements have been met.
- An adequate supply of water for dust control activities is readily available.
- A State of Colorado certified Building Asbestos Inspector has declared structures scheduled for demolition to be consistent with the requirements of the specific B371 Demolition Permit approved by the Colorado Department of Public Health and Environment (CDPHE).
- The appropriate State of Colorado demolition permit has been obtained.

### **4.1 Demolition Sequence**

Demolition will be performed in the safest, most efficient sequence possible. Building 371/374 has been divided into a 5-phase plan. Phases I-III have been completed (with the exception of the Phase III floor). Figure 3 – Overhead View of Work Area Building 371, illustrates the demolition work area for Phase IV/V including the approximate location of the retention basin and size reduction areas. The general demolition sequence is as follows:

- Mobilization
- Interior demolition and strip out as needed prior to demolition

- Preparations for water management (including retention pond installation and drain disruptions)
- A "cold and dark" walkdown
- Core boring and the use of expandable grout in the former canyon areas, as necessary
- Saw cutting of slabs, as necessary
- Ramp into basement
- Remove plenum duct, piping, conduit, equipment, etc.
- Demolish first floor from select column lines within the building
- Backfill south portion of basement
- Demolish north section of first floor from select column lines
- Demolish first floor portion from select column lines
- Backfill north portion of basement
- Demolish middle section of building from north to south
- Demolish middle section of first floor
- Backfill middle section of basement north & south of Central Storage Vault (CSV)
- Demo top of CSV
- Back fill selected portion of CSV
- Demo top of foundation walls, columns, and beams
- Back fill selected portion of building

Demolition of Phase IV/V includes the basement, main floor (including the canyon areas), central storage vault (within 6' of final grade) and attic, and all the remaining systems/equipment. Demolition of the Phase III floor will also occur during Phase IV/V demolition activities. All remaining systems and equipment will be dispositioned as low-level waste during demolition activities unless the equipment can be released in accordance with Site waste disposition requirements. All of the concrete that is within 6' of final grade, will be dispositioned as low-level waste.

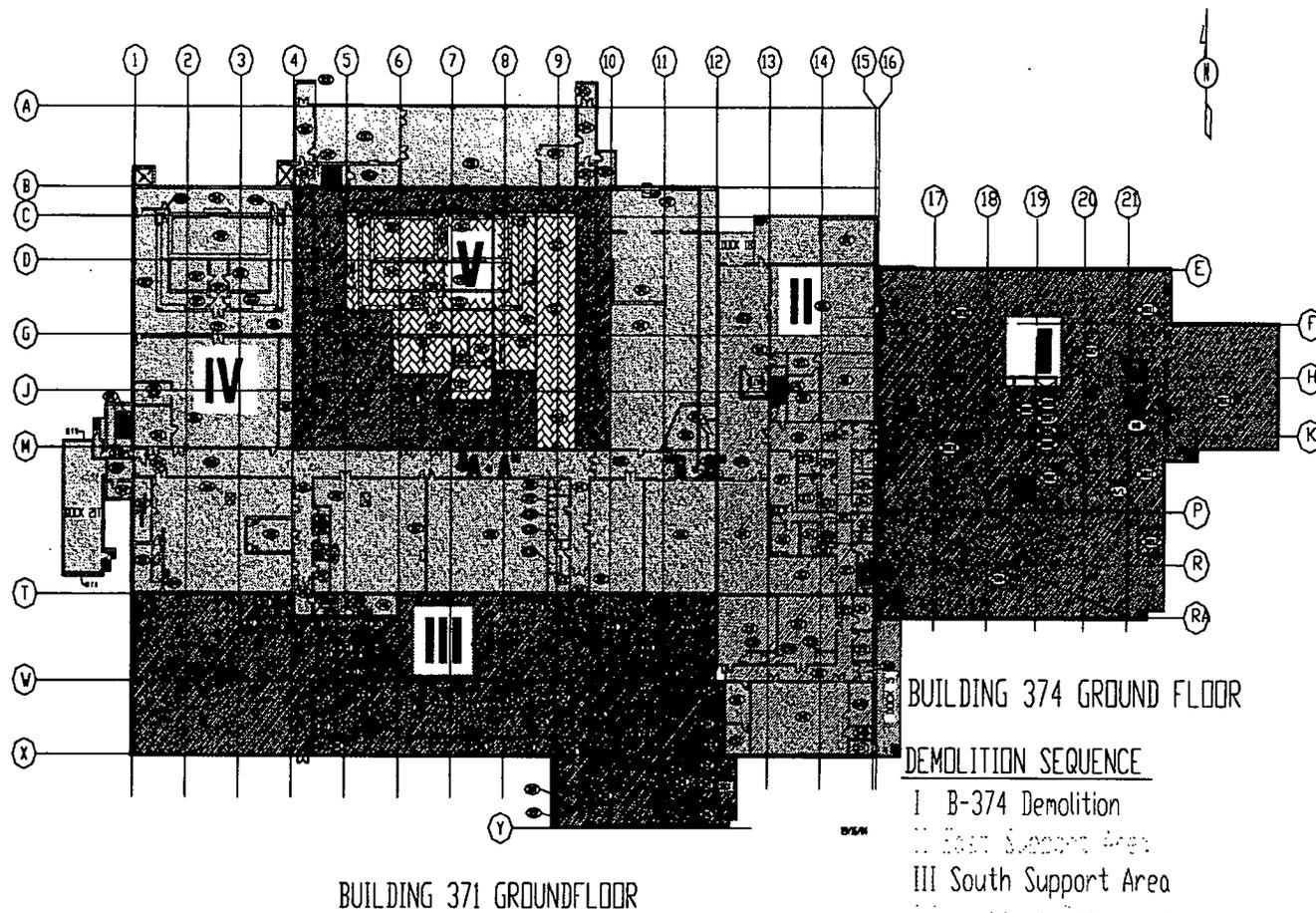
The sequences to be used for specific demolition activities will be addressed in the 371 Demolition WCP prior to the commencement of any demolition activities. Lessons learned will be applied to succeeding demolition planning and WCD development.

#### **4.2 Backfill**

Backfill will commence during Phase IV demolition activities provided the 371/374 DOP criteria has been met and the FSSR has been approved for the areas greater than 6' below final grade. Final material to grade will be placed and compacted in compliance with the Earthwork Specification. It is anticipated that 4' of fill will be placed over the Building 371 footprint (approximately 40,000 yds<sup>3</sup>).

Figure 1

BUILDING 371/374



BUILDING 374 GROUND FLOOR

DEMOLITION SEQUENCE

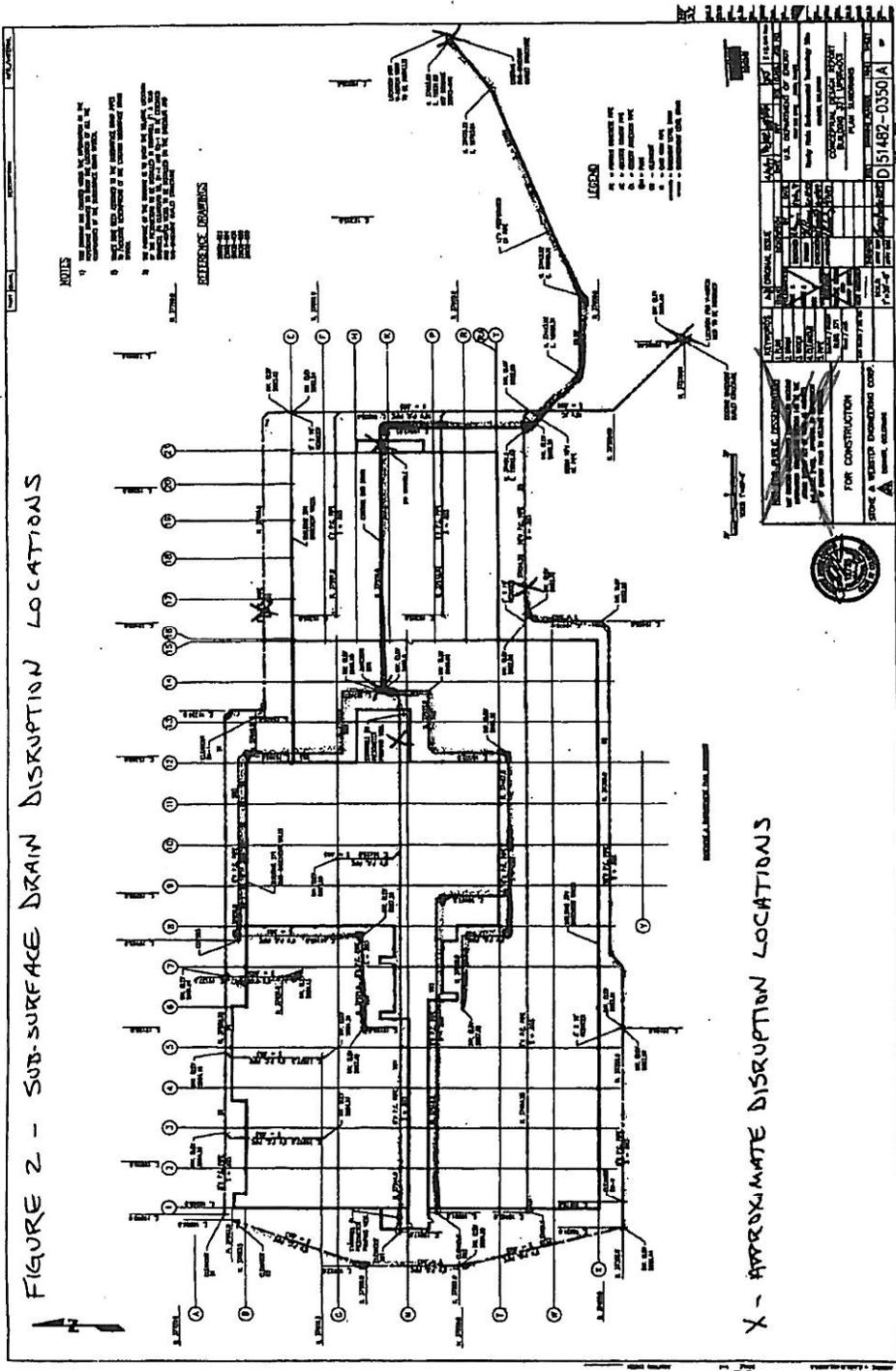
- I B-374 Demolition
- II East Support Area
- III South Support Area
- IV Numbers Structure
- V Contaminated Canyon Areas

BUILDING 371 GROUND FLOOR



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FIGURE 2 - SUB-SURFACE DRAIN DISRUPTION LOCATIONS



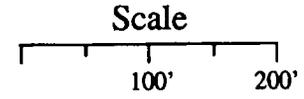
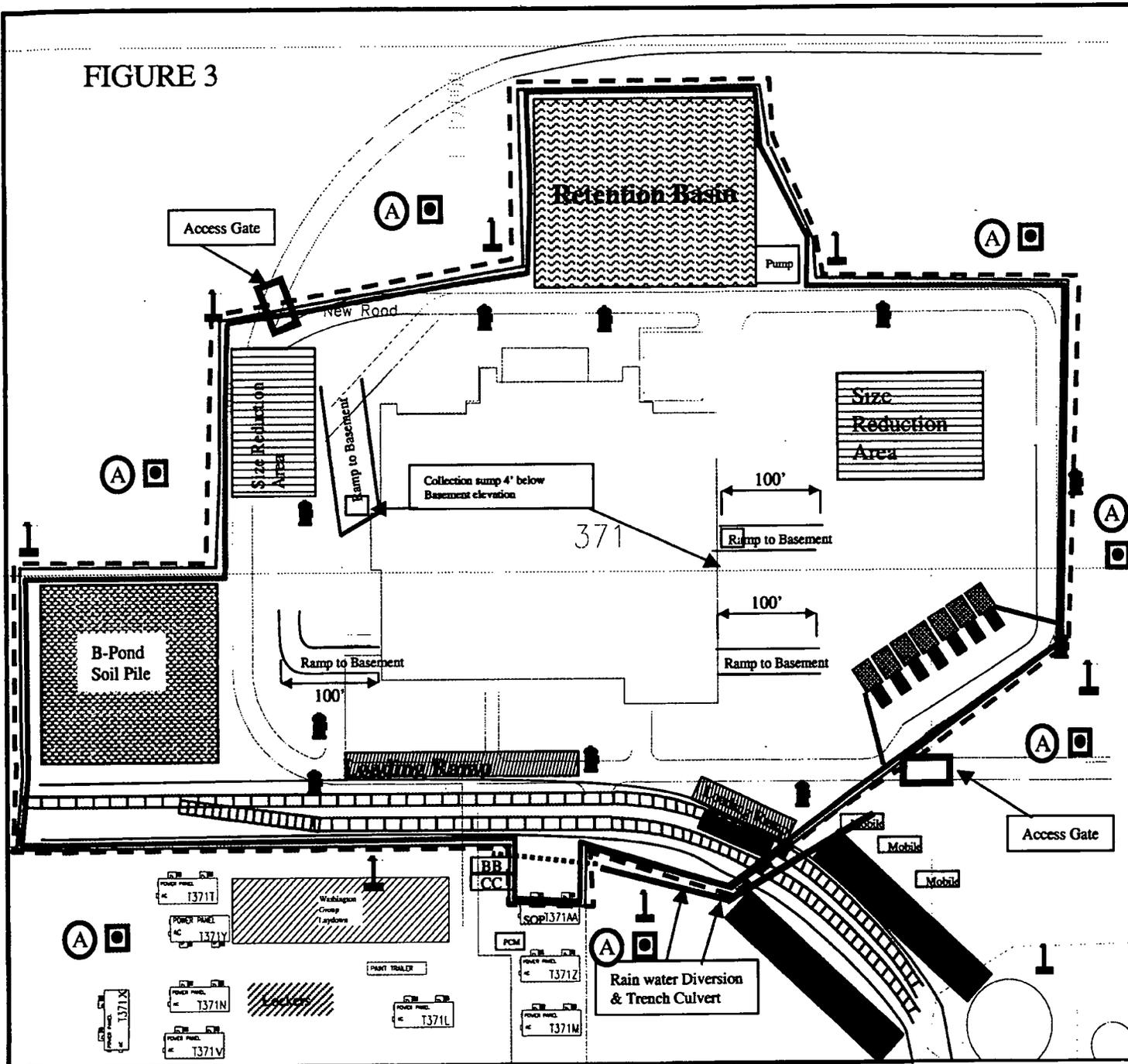
X - APPROXIMATE DISRUPTION LOCATIONS

DOES NOT CONTAIN UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION

Reviewed J. A. NESHEM  
Official EMCCO Cleanroom Office  
Date: 10-09-08

13/13

FIGURE 3



**LEGEND**

- Secondary Berm
- Fenced Boundary
- RBA
- Air Sampling
- Deposition Plate

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