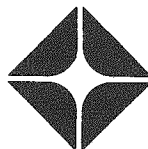


**Atlantic Richfield Hanford Company**  
Richland, Washington 99352

ARH-3070



WORK PLAN FOR REMOVAL OF DIVISION OF  
MILITARY APPLICATION EQUIPMENT  
234-5 Z BUILDING

H. E. Johnson

April 26, 1974

PREPARED FOR THE U.S. ENERGY RESEARCH AND DEVELOPMENT  
ADMINISTRATION UNDER CONTRACT E (45-1) 2130

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WORK PLAN FOR REMOVAL OF DIVISION OF  
MILITARY APPLICATION EQUIPMENT  
234-5 Z BUILDING

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H. E. Johnson

Plant Engineering Section  
Operations Technical Support Department

April 26, 1974

The subject work plan has been reviewed and is approved for adoption of the expense work item entitled, "Removal of Division of Military Equipment 234-5 Z Building."

Approved by:

*William A. Armstrong for W.P. Ingalls* 5/20/74  
Plant Engineering Section Date

*G.R. Nicholas* 5-21-74  
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Project Management Date

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WORK PLAN FOR REMOVAL OF  
DIVISION OF MILITARY APPLICATION EQUIPMENT  
234-5 Z BUILDING

H. E. Johnson

Plant Engineering Section  
Operations Technical Support Department  
Operations Division

April 26, 1974

Operated for the Atomic Energy Commission by  
Atlantic Richfield Hanford Company under Contract AT(45-1)-2130

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WORK PLAN FOR REMOVAL OF  
DIVISION OF MILITARY APPLICATION EQUIPMENT  
234-5 Z BUILDING

OBJECTIVE

This document presents the work plan for accomplishing the removal and burial of fabrication equipment [Division of Military Application (DMA) equipment] in the 234-5 Z Building.

BACKGROUND

The DMA equipment located in the 234-5 Z Building was used for the fabrication of plutonium weapon components from 1949 to 1965. Since 1965, the equipment with certain exceptions has remained in layaway status although tied into building services for contamination control and safety.

WORK TASK RESPONSIBILITIES

The Atlantic Richfield Hanford Company (ARHCO) will:

- . Have overall management of and final responsibility for the program.
- . Assume those responsibilities assigned to it in ARH-3032 (unclassified), April 29, 1974, J. D. Anderson, "Specifications and Standards for the Burial of Richland Operations Solid Wastes," including the surveying of the solid radioactive waste containers as specified in paragraph 4.1.4 of ARH-3032 and detailed in reference 2. Portable equipment furnished by ARHCO will be used.

- . Provide design criteria for any major items to be designed by Vitro Engineering Division of Automation Industries, Inc. (Vitro)
- . Maintain records for property accounting.

Vitro Engineering will be responsible to:

- . Provide design drawings of burial boxes, miscellaneous blanking plates, and shoring.
- . Check the impact on building services of severing the DMA equipment from the building services (primarily ventilation).
- . Maintain sufficient records of changes to the building to allow modification of existing drawings and other pertinent records to reflect the final configuration.

The J. A. Jones Construction Company will be responsible for the physical removal of glove boxes, construction of equipment as requested, transporting and unloading of the burial boxes, and all cleanup work.

#### CRITERIA

The following criteria shall be satisfied in performance of this work:

- . The standards and specifications, including records and accounting for packaging and subsequent burial are to be in accordance with AEC Manual Chapter 0511.
- . Burial boxes will be either of steel construction in accordance with ARH-2239 (unclassified), March 15, 1972, R. A. Kennedy, "Design Criteria - Transuranic Dry Waste Burial Containers," or FRP covered plywood as recommended in ARH-3061.
- . Hydraulic fluid in equipment to be buried will be drained, packaged and buried in separate containers (see reference 2).



- . Loose combustibles, such as glove box gloves and glove box debris will be separated and packaged in 55-gallon drums of an approved type. Exposed ports will be covered with suitable covers.
- . The primary boundary of contamination containment will be the glove box walls.
- . Plastic film necessary for contamination control will be packaged as separate combustibles where practical. Otherwise, the plastic will be left on the glove boxes and packaged with the glove boxes.
- . Room areas will be left in a contamination-free state.
- . Service piping and duct work will be sealed off (blanked) as close to the ceiling or remaining equipment as possible.
- . Electrical services to the equipment will be deactivated.
- . Noncontaminated equipment (if unconditionally released by radiation monitoring) can be salvaged if desired.
- . Glove box packaging into the burial boxes may be performed out of the building to allow maximum use of cranes, but only if in the judgment of supervision, the weather shall be dry, no rain, and the wind velocity shall be less than 15 miles per hour.
- . Glove boxes will not be stored outside. Glove boxes will either be stored within the building (and tied to the building E-4 system if required for contamination control) or placed into a burial box and sealed.
- . Contamination level standards will be those of ARH-3032.
- . Lead, lead glass and other external appurtenances may be removed from the glove boxes and buried in accordance with ARH-3032 or salvaged provided if criteria above are satisfied.

## WORK TASKS

### EQUIPMENT AND SHORING DESIGN

Burial box design will satisfy the general criteria and the following additional criteria:

- . The number of sizes and shapes of burial boxes will be minimized.
- . The burial boxes will contain an intact glove box with associated plumbing and duct work where possible and feasible.
- . Consideration will be given to lifting requirements.
- . Consideration will be given to choosing sizes and shapes to allow the most efficient use of the burial trench when stacking the boxes.
- . The burial boxes will have structural capacity to withstand stacking (where possible) and earth loading.

Blanking plates and gaskets will be designed to cover openings in conveyors, openings in glove boxes created by the removal of ducts, filters and glove ports.

Flooring and ceiling supports will be analyzed to determine the extent of shoring required to support floors during transportation of glove boxes and to support the ceiling when a wall is removed to supply a passageway for the glove boxes.

### ROUTE PREPARATION

Prepare route for glove box removal. Five routes will be used (see Appendix B).

#### "A" Route

The route for removal of the "A" fabrication line will be through door 651, out corridor 13A and outside through the north door between columns 19 and 20.

#### Requirements

- . Install shoring under floor where the route crosses corridor 13.

- . Place floor protection along corridor 13A.
- . Remove the electrical cabinetry supporting HA-31 and eliminate or salvage per the criteria.
- . Supply packaging equipment outside of 234-5 Z Building.
- . Erect a door across 13A (between rows A and B) to provide an air lock.

#### Special Problems

- . None additional to "A" Route above is expected.

#### "B" Route

The route for removal of the inspection line glove boxes will be out of the north door between columns 19 and 20 via corridor 13A.

#### Requirements

- . Remove part of the wall between corridor 13A and the inspection room.
- . Removal of building wall north of HI-74 S&L may be required. This will impose a ventilation problem.

#### Special Problems

- . Water service lines for fire protection may have to be rerouted to allow full height availability of the corridor.

#### "C" Route

A route for removal of the west end of the "C" fabrication line would be through the wall along row E at column 20, west along corridor 7 and out of the building. An air lock exists created by the doors between columns 21 and 22.

The apparent alternate route past glove box HC-46F and out along route D (below) is not considered as it would be hampered by the need to provide floor shoring over a pit between rows D and E and column 22 (reference H-2-16131) and the shallow pipe chase between columns 22 and 23.

### Requirements

- . Provide floor shoring in the underneath tunnel for corridor 7 from the wall penetration at column 20 to outside of the building.
- . Provide floor protection along that portion of corridor 7 used for this passage.
- . Move packaging equipment from outside of corridor 13A to outside (west of) corridor 7.
- . Provide a passageway through the wall between columns 20 and 21 and row E.
- . The concrete pads presently supporting the machining glove boxes (HC-41 through HC-43) will have to be removed to allow passage of the more distant glove boxes through the wall penetration.
- . The floor beneath the path for the removal of the machining glove boxes should be checked for structural capability.

### Special Problems

- . Water service lines for fire protection may have to be rerouted to allow full height utilization of corridor 7.

### "D" Route

The route for removal of glove box HC-48V will be out the door at column 24 via corridor 239A.

### Requirements

- . No special preparation is needed.

### Special Problems

- . None is anticipated.

### "E" Route

The route for removal of the east end of the "C" fabrication line will be via the south door between columns 12 and 13 via corridor 6 and 7 out through room 170. Note that this route need only be used for the large pieces of equipment which would minimize disturbance with normal traffic through room 170.

### Requirements

- . Install shoring under corridor 6 and 7 flooring as required.
- . Provide floor protection as required.
- . Make passageways through the walls as required.
- . Move the packaging equipment from the west side of the building to the area outside of room 170.

### Special Problems

- . The packaging equipment must be coordinated to have no impact on normal shipping through this area (loading dock).
- . Water service lines for fire protection may have to be rerouted to allow full height availability of corridor 6 and 7.

## GLOVE BOX PREPARATION

### General Requirements

- . If supervision deems it necessary, connect a portable E-4 line to the glove box that will maintain a vacuum, one-half to one-inch of water, in the glove box.
- . Isolate the glove box from the adjoining glove box and seal off both exposed ports with gasketed blanking plates.
- . Disconnect the ducting and seal the ends with blanking plates. Make each piece a primary barrier to contamination.
- . Disconnect the services as indicated in "criteria." If the lines penetrate the glove box, drain the lines and package the fluids in 55-gallon drums as combustible as indicated in ARH-3032 and reference 2. Package plumbing for removal from the building with the glove box.
- . Refrigerant equipment and lines will probably be free of contamination but this must be verified. This equipment can be removed but need not be buried (if verified as clean).

- . Hydraulic equipment distant from, but supporting, the glove box must be drained, and the fluid handled as instructed in ARH-3032 and detailed in reference 2.

### Special Problems

#### "A" Fabrication Line Glove Boxes and Equipment

- . None is anticipated.

#### "C" Fabrication Line Glove Boxes (West End) and Equipment, Except HC-48V

- . The glove boxes containing lathes must be removed from the concrete pads upon which the glove boxes rest (M1 and M2 series above).
- . Storage glove box HC-45 may be split horizontally and sealed with metal blanking plates to allow removal.

#### Inspection Line Glove Boxes

- . The conveyor lines to the surrounding glove boxes do not (generally) have joints coinciding with the glove box flanges. The conveyor lines thus will have to be cut to provide convenient packages.
- . Glove box HI-74 S&L are two separate glove boxes located one above the other. Separating these would allow removal out through corridor 13A.

#### "C" Fabrication Line Glove Boxes and Equipment (East End)

- . Glove box HC-22S may have to be separated similar to HC-45S (west end).
- . Glove box HC-19-A and B will have to be subdivided into smaller packages to allow removal.
- . Glove box HC-20 does not appear to be capable of subdividing into smaller packages. Some investigation must be made to determine if attitude alteration will allow passage through to the outside of the building.
- . Glove box HC-24BX presents the same problem as HC-20. Glove box HC-24BX can be separated but whether this will lower the overall profile adequately must be determined.

Glove Box HC-48V

- . No problem is anticipated.

TRANSPORTATION AND PACKAGING

Each glove box will be removed from the E-4 ventilation system, placed in its burial box, sealed, and transported to the burial ground without undue delay. If an overnight delay (or longer) is anticipated, retain the glove box inside the building and sealed off until the above sequences can be continuous.

Special Problems

- . HI-68X may require removal of the door labyrinth to allow passage out of room 192A wherein the glove boxes are located.
- . HI-74 S&L may have to be removed north through the building wall.

MOVE THE BURIAL BOX TO THE BURIAL TRENCH AND BURY THE ASSEMBLY

The procedure and required records used to accomplish this burial are documented in the references under "criteria." Several burial boxes will require special permission because the burial boxes are larger than the units allowed. The machining glove boxes will require special handling equipment at the burial trench because of weight. No handling equipment of that capacity is available at the trenches.

CLEANUP AND REMOVE COLD EQUIPMENT

A decision will be made by ARHCO regarding the disposition of the electrical consoles and switch boxes associated with the to be removed glove boxes and the shielding walls associated with glove box HI-74 S&L. The shielding walls surrounding glove boxes HC-45 and HC-22S should be moved to room 221.

All the areas formerly occupied by the removed glove boxes will be decontaminated, surveyed and rendered contamination free.

Contaminated flooring should be removed by cutting away the plastic floor covering (if existant) and chipping away the

concrete beneath to a maximum depth of two inches (if removal of the floor covering has not eliminated the contamination). Restore the concrete and flooring with new materials to be in harmony with the old flooring. All contaminated material will be packaged in 55-gallon drums and eliminated in accordance with ARH-3032.

#### SPECIAL NOTATION

The entire area should be painted in accordance with building requirements.

Note that the philosophy of removal has been to contain contamination within existing boundaries. Thus, contamination cleanup should be minimal.

The walls will be replaced where special passageways were formed, using plasterboard construction. Holes formed by the removal of conveyors will be walled in, using plasterboard construction except between rooms 192A and 192B and between 192A and 192D where holes will be filled with concrete. All shoring under the floors will be removed.

The conveyor within room 192B shall be removed first and the hole blanked as defined above.

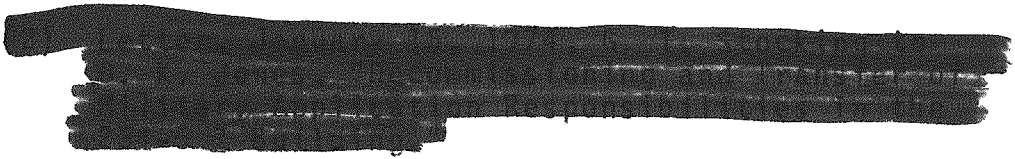
#### PRODUCTION INTERFERENCES

No production interferences are anticipated. By removing most of the equipment through the north door at corridor 13A, interference with passage along corridor 6 and 7 is minimized. The remaining equipment that must be moved across this busy corridor can be scheduled.

#### REFERENCES

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]





The following drawings are also pertinent to this document.

1. H-2-25030, March 29, 1966, M. E. Borgeson,  
"234-5 Z Building Key Dwg [sic], List."
2. SK-2-2869, "Z Plant Floor Plan."

APPENDIX A

## SUMMARY OF REMOVAL OF THE MAJOR PIECES OF DMA EQUIPMENT

<u>Sequence of Removal</u>	<u>Route</u>	<u>Size</u>		
		<u>Length</u>	<u>Width</u>	<u>Height</u>
<u>"A" Line</u>				
HA-31 TT	A	10	x 4 1/2	x 8
HA-30	A	9 1/2	x 4 1/2	x 6
HA-29 BP	A	15 1/2	x 4	x 7 1/2
HA-27 FT	A	14 1/2	x 5	x 10
HA-26 DB	A	8 1/2	x 4	x 8
<u>Hydraulic Units</u>				
HA-29 #1	A	4	x 5	x 6
HA-29 #2	A	included		
HA-27	A	4	x 5	x 6
HA-31 (two items)	A	4	x 4	x 4
<u>"C" Line - West End</u>				
HC-42 M1	C	4 1/2	x 9 1/2	x 6 1/2
HC-43 M1	C	4 1/2	x 9 1/2	x 6 1/2
HC-42 M2	C	4 1/2	x 9 1/2	x 6 1/2
HC-43 M2	C	4 1/2	x 9 1/2	x 6 1/2
HC-42 Conveyor and M3	C	4 1/2	x 16	x 7
HC-42 M1 Hyd. Unit	C	4 1/2	x 4 1/2	x 4
HC-42 M2 Hyd. Unit	C	4 1/2	x 4 1/2	x 4
HC-43 E )	C	4 1/2	x 6	x 6
HC-43 MX) on balcony		4 1/2	x 4	x 6
HC-43 C	C	4 1/2	x 16	x 7
HC-43 M1 Hyd. Unit		4 1/2	x 4 1/2	x 4
HC-43 M2 Hyd. Unit		4 1/2	x 4 1/2	x 4
HC-41 C and M3	C	4 1/2	x 16	x 7
Hyd. Unit M1		3	x 5	x 6
HC-41 M1	C	4 1/2	x 9 1/2	x 6 1/2
HC-41 E	C	4 1/2	x 6	x 5
HC-42 E	C	4 1/2	x 6	x 6
HC-41 MX	C	4 1/2	x 4	x 6
HC-42 MX	C	4 1/2	x 4	x 6
HC-44 C and M3	C	4 1/2	x 16	x 7
HC-40 DB	C	6	x 15	x 10
HC-45 S	C	17	x 5	x 7
<u>Inspection Line</u>				
HI-74 S&L	B	4 1/2	x 17	x 15
HI-64 GR	B	16 1/2	x 5	x 7 1/2
HI-71 NC	B	6	x 4 1/2	x 10
HI-67 G	B	14 1/2	x 5 1/2	x 8
HI-65 S	B	9	x 7	x 5 1/2
HI-73 E	B	14	x 5	x 8
HI-61 B	B	3 1/2	x 2 1/2	x 6

<u>Sequence of Removal</u>	<u>Route</u>	<u>Length</u>	<u>Size</u>		
			<u>Width</u>	<u>Height</u>	
HI-68	B				
1,2,3,4		8	x	4	x 7
5,6,7		8	x	4	x 7
HI-52 Conveyor	B				
1,2,3,4		12	x	4	x 7
5,6,7,8		12	x	4	x 7
HI-51 Conveyor	B				
1,2,3,4		12	x	4	x 7
5,6,7,8		16	x	4	x 7
accessories		4	x	5	x 6
HI-53 Conveyor	B				
1,2,3,4		10	x	4	x 7
5,6,7,8		8	x	4	x 7
Inspection Accessories	B	14	x	4	x 6

"C" Line - East End

HC-19A	E	16	x	5	x 8
Vac unit	E	10	x	4	x 3
Hyd unit	E	included			
HC-19 AGC	E	7 1/2	x	5	x 4 1/2
HC-19B	E	16	x	5	x 6
Vac unit	E	10	x	4	x 3
Hyd unit	E	included			
HC-19 BGC	E	7 1/2	x	5	x 4 1/2
HC-20	E	10	x	4	x 3
Vac pump included		7	x	7 1/2	x 12
HC-22 SR	E	17	x	5	x 7
HC-23 CTR	E or C	16	x	6	x 6 1/2
HC-24B	E	14	x	8	x 6
Hyd units (two items)	E or C	5	x	3	x 3
HC-25	E or C	6	x	6	x 6
		3	x	3	x 6
HC-26	E or C	6 1/2	x	3 1/2	x 6
HC-27	E or C	8 1/2	x	4	x 6

Miscellaneous

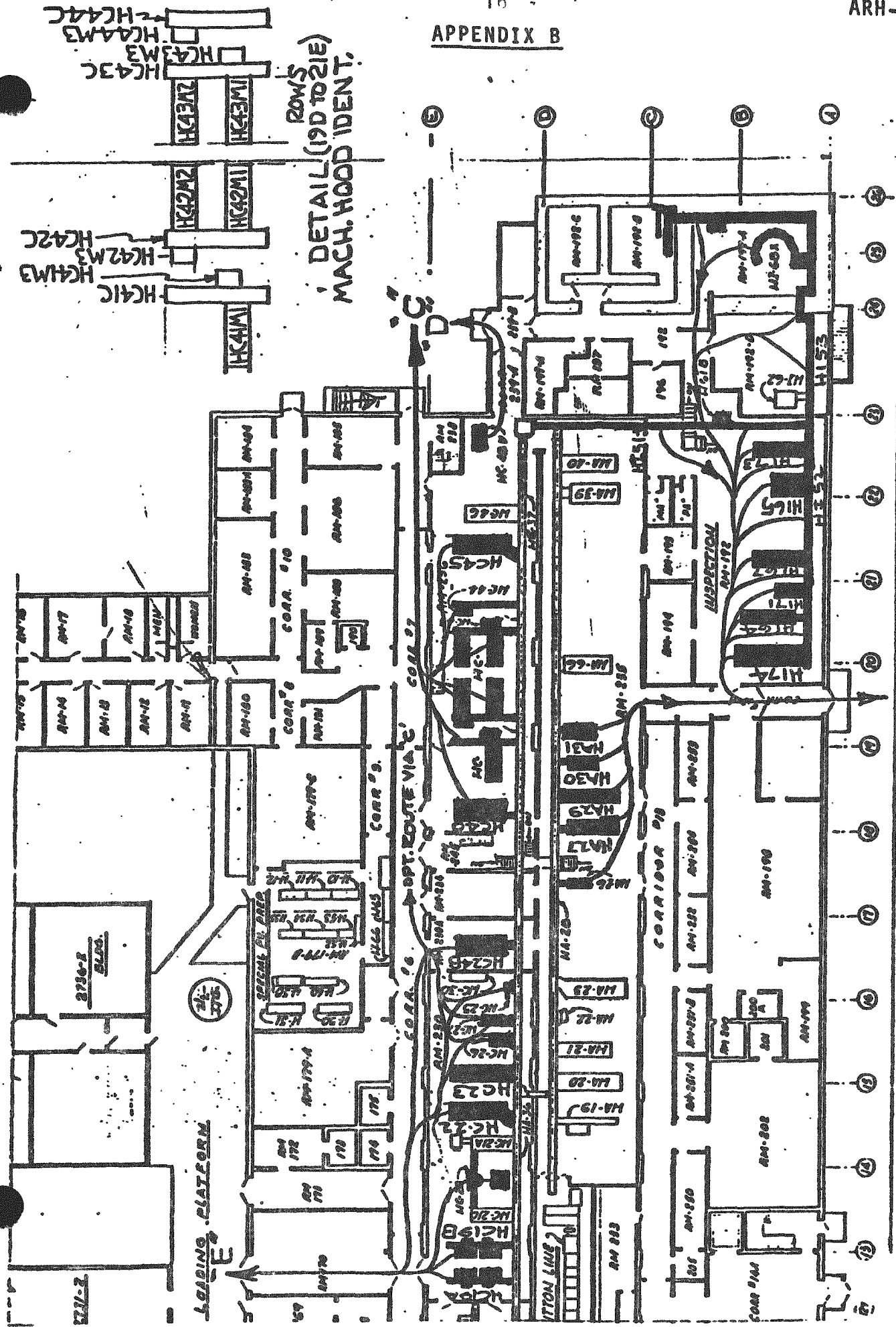
HC-48 VC	D	6 1/2	x	4	x 6
Non-combustibles	Any	20 drums			
Combustibles	Any	20 drums			

This listing is not all inclusive. Minor pieces of support equipment that would require continued surveillance if not removed, should be removed if on the first and balcony floors. Duct level equipment is intended to be retained unless specially otherwise designated.

APPENDIX B

ROUTING FOR REMOVAL OF DMA EQUIPMENT

A&B  
234-5 BLDG-FIRST FLOOR PLAN



ROWS  
'DETAIL (19D TO 21E)  
MACH. HOOD IDENT.

