

FACILITY AUDIT REPORT

CALDWELL LABORATORY  
#026

APRIL 10, 1991

Prepared by:  
The Ohio State University  
Department of Physical Facilities  
Division of Resource Management

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GENERAL BUILDING INFORMATION

Caldwell Laboratory #026

BUILDING ADDRESS: 2024 Neil Avenue

GROSS SQ. FT.: 101,976

NET ASSIGNABLE SQ. FT.: 64,633

MECHANICAL/CUSTODIAL AREA SQ. FT.: 8,848

YEAR OF CONSTRUCTION: 1950

YEAR OF LAST RENOVATION: 1957

NUMBER OF STORIES/BASEMENT: Four stories with a basement

AIR CONDITIONING (Percentage): 65 %

CURRENT USE: Pool classrooms and Department of Electrical Engineering laboratories and offices.

TYPE OF CONSTRUCTION: Steel frame, metal curtain wall and masonry skin.

ESTIMATED REPLACEMENT COST: \$11,942,000

BUILDING APPEARANCE: The exterior and interior are metal panels that give a very institutional appearance. The metal panels are oxidized and dirty and need to be cleaned.

HANDICAPPED ACCESSIBILITY: Limited to the switchback ramp at the Southwest entrance next to the Journalism building. The elevator is located at the opposite end of the of the building (Northeast).

INITIAL CONSTRUCTION QUALITY: Good

OVERALL BUILDING CONDITION: Functionally Satisfactory

NUMBER OF EXIT STAIRWAYS: Four (4)

**BUILDING SYSTEMS INFORMATION**

Caldwell Laboratory #026

**HEATING:**

Source Power plant

Type Heating System Hot water radiation

Steam (Line size, valve location) 4" steam supply, 1 1/4" steam return,

Building Htg Water (line size, valve location) 8" HWS, 8"HWR, Rm 009

**VENTILATION SYSTEM:** 1-DDHV, 1-MULTI ZONE, 2-DX, 13-LC

**COOLING:**

Bldg % 65 % Chillers CARRIER 160 TON CENTRIFIGAL

Window Units 10 Thru-the-wall 1 Direct exp. units 2

**HVAC CONTROL SYSTEM:** JC-80

**ELECTRIC:** Source Size(KVA) Primary/Secondary Switchgear & Main Disc. (Rm)

1.GE M156918 107/307 225 13,200/ 208Y/120 SILICON 800 AMP 070

2.GE M1569170A 107/307 225 13,200/ 240/139 SILICON 800 AMP 070

3.GE M1569228 107/307 500 13,200/ 480Y/277 SILICON 800 AMP 070

4.WARD7-31818 500 13,200/ 480Y/277 DRY 010M

**PLUMBING:**

Water (size, valve location) 3" LINE RM 009, 3" LINE TUNNEL RM 001

Gas (size, valve location) 1 1/2" LINE RM 009

Domestic Hot Water (size, valve location) 1" DHWS, 3/4" DHWR, RM 009

Compressed Air (size, location) 1 1/2" LINE RM 009

**SEWERS:** Storm COMBINATION 1@4", 1@5", 1@6" Sanitary

**METERS:**

Gas (size, location) NONE

Water (size, location) NONE

Electric (size, location) NONE

**ALARM SYSTEMS:**

Fire Alarm YES Panel Location RM # 10

Fire Pump NO Pump Location NO

Sprinklers NO Panel Location NONE

Other Alarms NONE

**ELEVATORS:**

Number ONE Type (passenger, freight) PASSENGER (USED FOR FREIGHT)

Manufacturer WESTINGHOUSE Size 8,000 LB., 100 FPM, SIX STOPS

**EMERGENCY GENERATOR:** Size NONE Location

**KEY BOX LOCATION:** INSIDE THE NORTHWEST ENTRANCE

**ASBESTOS SURVEY (1986):**

ASBESTOS CONTAINING MATERIALS WERE IDENTIFIED IN RM 433M PIPE INSULATION, RM 251, 212 & 359 INSULATION SPRAYED ON STEEL.

## CALDWELL LABORATORY NARRATIVE

### GENERAL

This Building Audit was conducted by Physical Facilities for the purpose of evaluating the present condition of the building for which Physical Facilities has a budgetary responsibility. This audit describes the current physical condition of the facility and identifies existing corrective maintenance and building component system replacement requirements.

It has been assumed that the program needs of the tenant departments are being met by the facility. In addition, this audit does not intend to assess the condition of the portions of this facility, which are the budgetary responsibility of the tenant departments.

Audit objectives and methodology are described in greater detail in the "Building Audit Methodology" section of this report.

### HISTORY

Caldwell Laboratory has been built in three phases. The original building was built 1949. The first addition was added in 1958 and the second addition in 1964. Caldwell Laboratory has been used primarily by the Department of Electrical Engineering since the original building was completed in 1950. The building use is as follows: Classrooms 11.5%; Library 17.2%; Laboratory 21.4%; Mechanical 28.3%; and Offices 21.6%.

The laboratories have electric distribution panels at each lab station for use by the students. Several of the classrooms have electric distribution panels at the front of the classroom for use by the instructors.

The library will be vacating its current space in Caldwell when the new science library building is completed in 1993. This will free-up about 11,147 SF of space on the first and second floor of Caldwell. The area is air conditioned and is constructed primarily with the prefabricated metal partitions. This will provide flexibility in sub-dividing the space for future uses.

Many of the major building systems are aging and are nearing the end of their useful expected life, but they continue to function adequately. Detailed descriptions of these systems follows.

### PRIMARY SYSTEMS

The foundation, basement floor, and superstructure all appear to be in good condition. There are no signs of settlement or movement in the building foundation. The exterior closure, which consists of metal panel walls with either brick veneer or insulated aluminum panels, does not show any signs of foundation problems. The caulking in the joints of the stone foundation on the west side of the building is dry and cracking. This caulking should be removed and replaced to keep moisture from entering the building. The exterior should be cleaning and sealed to protect it from moisture penetration.

The windows are aluminum double hung windows with spring balances. Several of the balances are broken making it difficult to open and close some of the windows. The entry doors at the SE and NE corners of the building are steel that are showing some rusting at the bottom of the doors. The entry doors at the NW

and SW corners are aluminum in fair condition.

The roof on Caldwell Laboratory was replaced in 1986 with a single ply rubber membrane. Some damage was done to the single ply membrane when mechanical equipment was moved across the surface, but this has been patched and no leaks were observed. There is a section of built-up roof on the one story section of Caldwell next to the Journalism building that will require some repair and patching as it ages.

#### SECONDARY SYSTEMS

The partitions, doors, walls, and ceilings are very consistent in their condition throughout the building even though they were installed at different times. The metal partitions throughout the building are in very good condition. The color of the paint (gray and dark tan) has been questioned by the occupants, but the panels if cleaned would be in a like new condition.

The building coordinator had requested that consideration be given to changing the key locks for the doors because the same keys have been used for over 20 years. It has been the policy of the Department of Physical Facilities not to change locks that are operating correctly because of keys not being returned when graduate students and professors leave the university. Some departments have paid to have locks changed to combination locks or electronic keypad so that the combinations can be changed from time to time.

The ceilings in the classrooms are 12" x 12" tile that are over 20 years old and are discolored. A cleaning and painting of these tiles would improve the appearance of these rooms. This coordinated with the painting of the metal partitions in a lighter color would be a very positive improvement in the classroom space.

The stairwells are glazed block with metal framed stairs and concrete stair treads. The concrete treads at the street level have had some deterioration from the salt and water carried in and need to be repaired. The NE stairwell was repaired recently, but the new cement coating has come loose and needs to be repaired. The NW entry stairs above Room 001 has a rusted frame that needs to be repaired to stop water from dripping into the woodworking shop below. The first two steps in the SE stairwell also are rusted and need to be reworked. A project is proposed to correct these steps.

#### SERVICE SYSTEMS

The major service systems at Caldwell Lab. are over 35 years old, but continue to function adequately. The elevator is scheduled to be replaced to provide larger freight capacity to the basement and machine shop area. The handicapped access to the elevator is limited to the building entrance at the opposite end (SW) of the building. Access to the second floor is available from Dreese Laboratory by the connecting walkway. Some consideration should be given to providing a separate passenger elevator for handicapped accessibility.

The hot water heating system does a very good job of heating Caldwell Laboratory. The work orders during the winter months primarily resulted from rooms being too hot. We observed that windows are opened in several of the pool classrooms in the winter. The perimeter radiation heating is controlled by manual valves to the radiators or convectors.

The plumbing for the domestic water system is operating adequately. A few of the faucets in the restrooms are old and tattered and should be replaced. The water pressure and supply was adequate at all locations checked. The exhaust ventilation in the interior restrooms did not remove the odors as expected. The decor in the restrooms is very stark. A project to decorate the restrooms and improve the exhaust system is proposed.

Each section of the building has a different type of HVAC system, but based on the occupant comments, they are all performing adequately. The center core of the building where the library is located has a dual duct system that was modified to a variable air volume system in the mid 1970s. Three of the laboratory areas have had separate DX systems installed because of special needs in those areas. The fan coil units on the north side of the building are operating and the occupants commented, "that they were satisfied with their performance." Several of the pool classrooms are not air conditioned, but are located on outside walls and have operative windows.

The main centrifugal chiller located in the penthouse and the cooling tower are over 20 years old. The chiller was overhauled in 1977 and has been reliable in its performance. This chiller should be overhauled again to improve the probability of reliable performance for the next several years. The cooling tower had new bearings and a motor base replaced in April, 1990. If the chiller and tower are maintained, they should provide several more years of service.

#### ELECTRICITY

The building has four transformers. Because of a fire in a section of switchgear and the completion of the PCB project, three of the transformers and two of the switchgear sections are less than one year old. The fourth transformer is used by the electrical engineering department to provide DC current to the laboratories.

The majority of the building has fluorescent lighting. The exception to this is the SE stairwell and the center corridors on the 2nd and 3rd floors. The light meter measured the foot candles to be between 1 and 3 in the areas with incandescent lighting. This is well below the 10 to 20 footcandles recommended by the OSU building standards. These lights should be changed to fluorescent fixtures.

#### SAFETY STANDARDS

Caldwell Laboratory is equipped with a manual fire alarm system. Portable fire extinguishers and hose cabinets are located in the corridors of each floor. There are lighted exit signs at each exit, but they do not have battery pack back-up. The only emergency lighting in the building is located in the library. Emergency lights should be added to provide safe exit from the building during temporary loss of power.

#### BUILDING PERIMETER

Caldwell Laboratory has a very small area outside the building for planting and landscaping. The front (west side) has the largest area that is planted with shrubs and trees. The shrubs are overgrown and blocking part of the sidewalk. There is some erosion of the lawn area at the SW corner of the building that needs to be corrected.

The sidewalks are generally in good condition. There is one area around a manhole cover that needs to be corrected to eliminate a tripping hazard. The driveway at the rear (east side) has some low areas next to the building where water ponds. This should be corrected after the Communications Laboratory is demolished and the driveway resurfaced.

#### CONCLUSION

Caldwell Laboratory is functioning very effectively for a building over 35 years old. The roof is in very good condition and should provide protection for another 20 years. The HVAC systems are old, but performing adequately. The plumbing and electrical systems do not have any major problems that need immediate attention.

The relocation of the engineering library in the next few years will provide the opportunity to rearrange the center core of the building and upgrade the decor that is outdated. The elevator is scheduled to be replaced in the near future, however some consideration must be given to improving the handicapped access in Caldwell Laboratory.

PROPOSED MAINTENANCE PROJECTS

Caldwell Laboratory #026

**A. Corrective Maintenance Projects:**

- 1. Replace incandescent lights on 2nd & 3rd floor and SE stairwell. (24 fixtures).....\$ 5,280
  - 2. Install emergency lights in corridors. (16 fixtures).....7,840
  - 3. Paint pool classrooms and corridors. (10 classrooms & 13 corridors).....35,000
  - 4. Remove existing treads and risers at NW entrance steps and replace with new threads and concrete. (4 steps).....2,000 \*
  - 5. Remove rust and paint exterior metal doors.....300
  - 6. Clean fluorescent light fixtures throughout building.....1,600
  - 7. Inspect and repair Carrier chiller. The unit was last overhauled in 1977.....21,000 \*
  - 8. Cut out all stone-to-stone and stone-to-brick joints and reseal with a two part sealant. Clean the masonry surface with high pressure wash and waterproof.....25,000
- Sub Total \$ 98,020

**B. Building Improvement/Addition Projects:**

- 1. Replace elevator with a new passenger/freight elevator.....\$ 105,000 \*
  - 2. Replace single glazed windows with insulated double glazed windows. (232 windows).....89,000
- Sub Total \$194,000

**C. Building Component Replacements expected within the next 5 years:**

- 1. Replace restroom fixtures and decorate restrooms.....\$ 33,880
- Sub Total \$ 33,880

Total Cost of all Projects = \$ 325,900

\* These projects are currently on our departmental project list as either proposed or funded projects.

**BUILDING EVALUATION SUMMARY**

**I. BUILDING INFORMATION**

FAC # 026 FACILITY NAME: CALDWELL LABORATORY  
 DATE: 4-08-91 INSPECTOR: RDL  
 YEAR CONSTRUCTED: 1950, RENOVATED 1957  
 GROSS SQ FT: 101,976 NET SQ FT: 83,699  
 REPLACEMENT COST \$ 11,942,000 \*

**II. COMPONENT RATING**

COMPONENT	BUILDING COMPONENT PERCENTAGE OF TOTAL COST **	BUILDING COMPONENT REPLACEMENT COST	CONDITION VALUE MULTIPLIER FOR BLDG. COMPONENT	BUILDING COMPONENT CURRENT VALUE
Bldg. Perimeter	2.45	292,579	0.85	248,692
Foundation	3.05	364,231	0.95	346,019
Columns and Beams	10.95	1,307,649	0.90	1,176,884
Exterior Walls	6.49	775,036	0.95	736,284
Windows & Doors	3.18	379,756	0.60	227,854
Roofing	2.09	249,588	0.95	237,109
Partitions & Drs.	8.36	998,351	0.93	928,466
Wall Finishes	4.22	503,952	0.90	453,557
Floor Finishes	4.71	562,468	0.85	478,098
Ceilings & Finish	5.60	668,752	0.90	601,877
Conveying	1.31	156,440	0.20	31,288
Plumbing	17.22	2,056,412	0.80	1,645,130
Heating	6.84	816,833	0.80	653,466
Cooling & Vent.	7.85	937,447	0.75	703,085
Elec. Ser. & Dist	1.35	161,217	0.98	157,993
Lighting & Power	9.10	1,086,722	0.75	815,042
Safety Standards	5.23	624,567	0.70	437,197
TOTALS	100.00	11,942,000		8,701,167

**III. BUILDING RATING SUMMARY**

Overall Building Rating = 72.9%

\* Replacement Cost assigned June 1990 by The Office of Campus Planning and Space Utilization without the furnishings and fixed equipment allocation.

\*\* Percent allocation of each building component is calculated from The Means Standard Construction Cost data for College Classroom Buildings.



**FOUNDATIONS**

FAC # 026      DATE 4-08-91      INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

	<u>N/A</u>	<u>SAT</u>	<u>ATT</u>
<b>a. Footings:</b>			
Individual Footings & Piers <u>AT THE INTERIOR COLUMNS</u>	[ ]	[X]	[ ]
Continuous Footings <u>AT THE EXTERIOR WALLS</u>	[ ]	[X]	[ ]
Grade Beams _____	[X]	[ ]	[ ]
Piles _____	[X]	[ ]	[ ]
Caissons _____	[X]	[ ]	[ ]
<b>b. Foundation Wall Materials:</b>			
Steel _____	[X]	[ ]	[ ]
Concrete Cast-in-place <u>12" CONCRETE WALLS</u>	[ ]	[X]	[ ]
Concrete Block _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]
<b>c. Waterproofing and Underdrain:</b>			
Coating _____	[X]	[ ]	[ ]
Membrane <u>UNDER CONCRETE SLAB IN BASEMENT</u>	[ ]	[X]	[ ]
Board _____	[X]	[ ]	[ ]
Drain Tile <u>LOCATED IN WINDOW WELLS</u>	[ ]	[X]	[ ]
Sump Pump _____	[X]	[ ]	[ ]
<b>d. Slab on Grade (floor):</b>			
Plain <u>BASEMENT FLOOR SLAB</u>	[ ]	[X]	[ ]
Reinforced _____	[X]	[ ]	[ ]
<b>e. Special Substructures:</b>			
_____	[X]	[ ]	[ ]

**B. COMMENTS:**

1. THERE ARE A FEW CRACKS IN THE CAST-IN-PLACE FOUNDATION WALLS OF THE 1949 SECTION.
2. CAULKING IN JOINTS OF STONE FOUNDATION ON THE WEST SIDE IS DRY AND CRACKING. THIS NEEDS TO BE REPLACED.

**C. COMPONENT RATING:**    ( \$364,231 ) x ( 95% ) = \$346,019

Possible	Condition	Component
Rating	Value Multiplier	Rating

**COLUMNS AND BEAMS**

FAC # 026      DATE 4-08-91      INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

<b>a. Columns and Beams:</b>	<u>N/A</u>	<u>SAT</u>	<u>ATT</u>
Concrete-in-place _____	[X]	[ ]	[ ]
Precast Concrete _____	[X]	[ ]	[ ]
Steel _____	[X]	[ ]	[ ]
Steel Fireproofing <u>STEEL FRAME BUILDING</u>	[ ]	[X]	[ ]
Wood _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]
<b>b. Floors:</b>			
Concrete Slab <u>BASEMENT FLOOR</u>	[ ]	[X]	[ ]
Precast Slab _____	[X]	[ ]	[ ]
Metal Deck _____	[X]	[ ]	[ ]
Metal Deck w/concrete fill <u>ALL FLOORS EXCEPT BASEMENT</u>	[ ]	[X]	[ ]
Wood _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]

**B. COMMENTS:**

1. BASEMENT FLOOR HAS A FEW CRACKS THAT SHOULD BE CAULKED.

**C. COMPONENT RATING:**     $\left( \frac{\$1,307,649}{\text{Possible Rating}} \right) \times \left( \frac{98\%}{\text{Condition Value Multiplier}} \right) = \frac{\$1,281,496}{\text{Component Rating}}$

**EXTERIOR WALLS**

FAC #026 \_\_\_\_\_ DATE 3-19-91 \_\_\_\_\_ INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

**a. Walls:**

	N/A	Sat	Att
Concrete _____	[X]	[ ]	[ ]
Masonry EAST & WEST ELEVATIONS HAVE BRICK VENEER _____	[ ]	[X]	[ ]
Metal Siding NRTH & STH ELEVATIONS HAVE ALUMINUM PANELS _____	[ ]	[X]	[ ]
Wood Siding _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]

**b. Finishes:**

Stone _____	[X]	[ ]	[ ]
Brick VENEER ON TWO SIDES _____	[ ]	[X]	[ ]
Stucco _____	[X]	[ ]	[ ]
Paint _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]

**B. COMMENTS:**

1. MASONRY HAS BEEN TUCK POINTED RECENTLY.
2. CAULKING AT WINDOWS & CONTROL JOINTS NEEDS REPLACED.
3. ALUMINUM PANELS ARE OXIDIZED AND DIRTY, NEEDS A GOOD CLEANING.
4. STONE ON FRONT IS DIRTY AND STAINED, NEEDS TO BE WASHED.

C. COMPONENT RATING: 
$$\frac{(\$775,036)}{\text{Possible Rating}} \times \frac{(95\%)}{\text{Condition Value Multiplier}} = \frac{\$736,284}{\text{Component Rating}}$$

**EXTERIOR WINDOWS & DOORS**

FAC # 026      DATE 3-19-91      INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

<b>a. Windows type &amp; number:</b>	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
Wood _____	[X]	[ ]	[ ]
Steel _____	[X]	[ ]	[ ]
Alum <u>232 WINDOWS/DOUBLE HUNG</u>	[ ]	[ ]	[X]
Other _____	[X]	[ ]	[ ]
<b>b. Window glazing:</b>			
Single pane _____	[ ]	[X]	[ ]
Double pane _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]
<b>c. Doors type &amp; number:</b>			
Wood _____	[X]	[ ]	[ ]
Steel <u>SE &amp; NW ENTRANCE DOORS</u>	[ ]	[ ]	[X]
Alum <u>NW &amp; SW ENTRANCE DOORS</u>	[ ]	[X]	[ ]
Other _____	[X]	[ ]	[ ]
<b>d. Shading Devices:</b>			
Types <u>VENETIAN BLINDS</u>	[ ]	[ ]	[X]

**B. COMMENTS:**

1. WINDOWS ARE VERY DIFFICULT TO OPEN. TRACKS ARE DIRTY, BALANCES NOT ADJUSTED EQUALLY, AND INSTALLATION OF BLINDS INTERFERES.
2. THE METAL ENTRANCE DOORS ARE RUSTED AND NEED PAINTED.

**C. COMPONENT RATING:**    ( \$379,756 ) x ( 60% ) = \$227,854

Possible	Condition	Component
Rating	Value Multiplier	Rating







**FLOOR FINISHES**

FAC # 026      DATE 3-29-91      INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

	N/A	Sat	Att
<b>a. Carpet:</b>			
Glued <u>ROOMS 135 AND 133</u>	[ ]	[X]	[ ]
Tacked _____	[X]	[ ]	[ ]
Tiled _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]
<b>b. Concrete Topping:</b>			
Abrasive _____	[X]	[ ]	[ ]
Epoxy _____	[X]	[ ]	[ ]
Aggregate <u>STAIRWELL STEPS (NE)</u>	[ ]	[ ]	[X]
Sealed <u>BASEMENT FLOOR</u>	[ ]	[ ]	[X]
<b>c. Resilient:</b>			
Vinyl Tile <u>CORRIDORS AND POOL CLASS ROOMS</u>	[ ]	[X]	[ ]
Linoleum _____	[X]	[ ]	[ ]
Vinyl _____	[X]	[ ]	[ ]
Rubber _____	[X]	[ ]	[ ]
Cork _____	[X]	[ ]	[ ]
<b>d. Ceramic Tile</b> <u>FLOOR IN ROOMS 206 AND 210 RESTROOMS</u>	[ ]	[X]	[ ]
<b>e. Masonry</b> _____	[X]	[ ]	[ ]
<b>f. Terrazzo</b> <u>STAIRWELL STEPS AND LANDINGS (SE &amp; NW)</u>	[ ]	[X]	[ ]
<b>g. Wood</b> _____	[X]	[ ]	[ ]
<b>h. Metal</b> _____	[X]	[ ]	[ ]

**B. COMMENTS**

1. BASEMENT FLOOR NEEDS CLEANED AND SEALER APPLIED.
2. NORTHEAST STAIRWELL HAS HAD STAIR TREADS REPAIRED, BUT COATING IS COMING LOOSE AND NEEDS TO BE CORRECTED.
3. TILE FLOOR IS SHOWING SIGNS OF WEAR, BUT IS STILL FUNCTIONING ADEQUATELY.

**C. COMPONENT RATING:**     $\left( \frac{\$562,468}{\text{Possible Rating}} \right) \times \left( \frac{85\%}{\text{Condition Value Multiplier}} \right) = \frac{\$478,098}{\text{Component Rating}}$



**CONVEYING**

FAC # 026      DATE 3-29-91      INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

**a. Elevators:**

Number ONE IN NORTHEAST CORNER OF THE BUILDING, 6 LANDINGS  
 Type PASSENGER, USED FOR BOTH PASSENGERS AND FREIGHT (WESTINGHOUSE)  
 Speed 100 FPM  
 Capacity (lbs) 8,000 LBS.  
 Dimensions 6' X 8' CAB

Door Operation:	N/A	SAT	ATT
Center _____	[X]	[ ]	[ ]
To Side <u>HAS FRONT AND REAR DOOR</u>	[ ]	[X]	[ ]
Flooring <u>BATTLESHIP LINOLEUM</u>	[ ]	[ ]	[X]
Ceiling _____	[ ]	[X]	[ ]
Walls <u>PAINTED METAL NEEDS REFURBISH</u>	[ ]	[ ]	[X]
Lighting <u>MEASURED 3 TO 5 FOOT CANDLES (2 INCANDESCENT)</u>	[ ]	[ ]	[X]
Controls <u>HANDICAPPED &amp; REGULAR</u>	[ ]	[X]	[ ]

**b. Lifts and Hoists:**

Number ONE (DUMB WAITER)      [ ]      [X]      [ ]  
 Type CAPITAL 200 LBS., 50 FPM, 3 LANDINGS      [ ]      [X]      [ ]

**c. Moving Stairs and Walks:**

Number \_\_\_\_\_      [X]      [ ]      [ ]  
 Type \_\_\_\_\_      [X]      [ ]      [ ]

**d. Conveyors:**

Number \_\_\_\_\_      [X]      [ ]      [ ]  
 Type \_\_\_\_\_      [X]      [ ]      [ ]

**e. Pneumatic Tubes:**

Number \_\_\_\_\_      [X]      [ ]      [ ]  
 Type \_\_\_\_\_      [X]      [ ]      [ ]

**B. COMMENTS:**

1. ELEVATOR IS BEING REPLACED WITH A LARGER CAPACITY, TO PROVIDE MECHANICAL ENGINEERING WITH BETTER ELEVATOR CAPACITY TO BASEMENT. IT HAS BEEN SUGGESTED THAT HANDICAPPED ACCESS BE IMPROVED BY THE ADDITION OF A NEW PASSENGER ELEVATOR AT SW STAIRWELL.

**C. COMPONENT RATING:**       $( \underline{\$156,440} ) \times ( \underline{20\%} ) = \underline{\$31,288}$

Possible                      Condition                      Component  
 Rating                      Value Multiplier                      Rating



**MECHANICAL/HEATING**

FAC # 026

DATE: 4-2-91

INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

**a. Heat Source:**

Central Plant Steam USED IN PENTHOUSE CONVERTER FOR HOT WATER

Central Plant Hot Water USED FOR PERIMETER RADIATION

Boilers: Type NONE  
Size

Furnace: Type NONE  
Size

Heat Pump: Type CARRIER, MODEL #50QD606500DA  
Size ROOMS 320, 320A, B, C, & D

Burners: gas NONE  
oil

**b. System Type:**

Steam IS CONVERTED TO HOT WATER FOR HOT DECK

Hot Water PERIMETER RADIATION

Air N/A

Electric N/A

Solar N/A

Other N/A

**c. Space Equipment:**

	<u>N/A</u>	<u>SAT</u>	<u>ATT</u>
Radiators <u>POOL CLASSROOMS</u>	[ ]	[X]	[ ]
Convectors <u>NEWER SECTIONS OF BUILDING</u>	[ ]	[X]	[ ]
Finned Tube _____	[X]	[ ]	[ ]
2-Pipe Fan Coil <u>BASEMENT LABS ROOM 71 &amp; ROOMS 200 &amp; 221</u>	[ ]	[X]	[ ]
Unit Heater <u>BASEMENT PERIMETER ROOMS</u>	[ ]	[X]	[ ]
Multizone <u>SECOND ADDITION (1958)</u>	[ ]	[X]	[ ]
Double Duct <u>ORIGINAL BLDG &amp; LIBRARY (1949)</u>	[ ]	[X]	[ ]
Terminal Reheat _____	[X]	[ ]	[ ]
Other <u>LIEBERT DX INSTALLED 11/80 FOR ROOM 400 &amp; 400B</u>	[ ]	[X]	[ ]

**d. Control Type:**

Pneu <u>JC-80 SYSTEM</u>	[ ]	[X]	[ ]
Electric _____	[X]	[ ]	[ ]
Electronic _____	[X]	[ ]	[ ]
DDC _____	[X]	[ ]	[ ]
Manual Values <u>ON RADIATORS</u>	[ ]	[X]	[ ]

**B. COMMENTS:**

1. SOME SECTIONS OF THE HEATING HOT WATER PIPING HAVE BEEN REPAIRED TO STOP LEAKS.
2. THE SYSTEM IS FUNCTIONING ADEQUATELY.

C. COMPONENT RATING:    ( \$816,833 ) X ( 80% ) = \$653,466

Possible                      Condition                      Component  
Rating                      Value Multiplier                      Rating







**SAFETY STANDARDS**

FAC # 026                      DATE: 4-2-91                      INSPECTOR: RDL

**A. SYSTEM DESCRIPTION**

**a. Exits:**

Stair Construction:  
 concrete N/A  
 steel FRAME WITH CONCRETE TREADS  
 wood N/A  
 Number of exits FOUR (4) STAIRWELLS

**b. Fire Rating:**

Construction Type: I X    II        III        IV        V        VI      
 Building Height: 60 FEET                      ft., FOUR (4) stories

**c. Extinguishing Systems:**

	<u>N/A</u>	<u>SAT</u>	<u>ATT</u>
Portable _____	[ ]	[X]	[ ]
Standpipe _____	[X]	[ ]	[ ]
Hose Cabinets _____	[ ]	[X]	[ ]
Sprinklers _____	[X]	[ ]	[ ]
Suppression _____	[X]	[ ]	[ ]
Other _____	[X]	[ ]	[ ]

**d. Detection & Alarm Systems:**

Manual Alarm _____	[ ]	[X]	[ ]
Annunciator _____	[ ]	[X]	[ ]
Smoke Detectors _____	[X]	[ ]	[ ]

**e. Lighting Systems:**

Exit Signs <u>YES, AT EACH EXIT DOOR</u>	[ ]	[X]	[ ]
Exit Lighting _____	[ ]	[ ]	[X]
Emergency Lighting _____	[ ]	[ ]	[X]
Emergency Generator _____	[X]	[ ]	[ ]

**B. COMMENTS:**

1. TUESDAY, MARCH 26, 1991, DURING THE POWER OUTAGE, CALDWELL LAB HAD ONLY 3 BATTERY OPERATED LIGHTS, WHICH WERE ALL LOCATED THE LIBRARY. THE CORRIDORS WERE TOTALLY WITHOUT LIGHT. EMERGENCY LIGHTING AND EXIT SIGNS SHOULD BE INSTALLED.

C. COMPONENT RATING:    ( \$624,567 ) x ( 70% ) = \$437,197  
    Possible                      Condition                      Component  
    Rating                      Value Multiplier                      Rating

**The Ohio State University  
Department of Physical Facilities  
BUILDING AUDIT METHODOLOGY**

1. BUILDING AUDIT PROGRAM OBJECTIVE

To provide a building-by-building inventory, including maintenance deficiencies that currently exist, for the 172 OSU buildings that the Department of Physical Facilities is budgetarily responsible. These audits will be used to establish repair and renovation projects, budget cost estimates for these projects, and overall levels of required maintenance funding.

2. BUILDING AUDIT APPROACH

A five-step procedure is used to meet the program objectives:

1. Collect Historical and Inventory Data on each building.
2. Interview Building Occupants.
3. Perform a Building Inspection.
4. Complete Building Evaluation Forms.
5. Issue Written Report.

3. DATA ORGANIZATION

The data collected is stored by hard copy with field notes in a building file established for each building. The report data is being stored in a database program that allows retrieval of specific data as it is needed. The "Building Evaluation" forms contain ratings for the condition of each building component and a description of any deficiencies for those components. The "Building Information" sheets provide data on the utilities to the buildings and the type of systems in each building.

4. COST ESTIMATES

Costs are for budgeting purposes only and are based on The Means Standard Construction Cost data, auditor experience, industry sources and OSU project cost data. Costs are reported current to the year of the audit. The building component values assigned in the "Building Evaluation" forms are not cost estimates. These values are calculated from the replacement cost provided by The Office of Campus Planning and Space Utilization for each OSU building. This building replacement cost is allocated to each building component to provide an estimated value for each component. Project cost estimates will exceed the building component values in most situations because of tear-out, handling and site limitations that occur in building component replacement projects.

5. DATA USAGE

**Repair and Renovation Projects:** provided to assist in the budgeting process for the Department of Physical Facilities.

**Building Evaluation:** provided to give a numerical rating for each building on campus quantifying its percentage of deficiency.

6. LIMITATIONS

(1) All inspections are visual and do not include physical tests, instrumentation or metering measurements, sampling, or monitoring.

(2) Only random typical offices or laboratories are entered. Typical spaces are deemed to be representative of average conditions throughout each building.

(3) The scope of the analysis does not include complete OSHA, energy, or physical impaired access study. Buildings and components are inspected for condition and general safety requirements rather than specialized code conformance.

(4) It is assumed that the buildings inspected were approved by the State of Ohio Division of Factory and Building Inspection at the time of construction. The recommendations listed in the reports are not an attempt to bring these existing buildings up to present day code standards. Rather, the intent is to eliminate obvious problems and to upgrade the buildings in a reasonable manner in regard to occupant safety.

(5) Cost estimates are in current year dollars and include contractor mark-ups, construction administration costs, and architectural/engineering costs where applicable. Escalation factors must be applied for future work. Combining of projects should serve to decrease costs. These estimates are strictly for purposes of budgeting, and final pricing will be required when the specific scope of work for the project is defined.

(6) The building inspections are defined to include the following:

(a) Includes general repainting and redecorating, wholesale replacement of building and system components. Ongoing maintenance, replacement and renovation projects are not included.

(b) Includes exterior building walls and attached items.

(c) Includes the steps up at all entries. Ramps and sidewalks outside the buildings are included.

(d) Blinds, drapes, light bulbs, and movable furniture are not included.

(e) Fixed equipment inside the buildings that is installed and maintained by a specific academic department or using agency is not included.

(f) Utility lines supplying the buildings are not included.

(g) The program needs of the using department are assumed to be satisfied. No consideration has been given to anticipate any changes in current occupant space needs.

## ABBREVIATIONS

BLDG.....	BUILDING
BUR.....	BUILT UP ROOF
DD.....	DUAL DUCT AIR HANDLING SYSTEM
DDHV.....	DUAL DUCT HIGH VELOCITY
DHWR.....	DOMESTIC HOT WATER RETURN
DHWS.....	DOMESTIC HOT WATER SUPPLY
DX.....	DIRECT EXPANSION AIR CONDITIONER
FPM.....	FEET PER MINUTE
HID.....	HIGH INTENSITY DISCHARGE LIGHT
HVAC.....	HEATING, VENTILATING AND AIR CONDITIONING SYSTEM
KV.....	KILOVOLTS
KVA.....	KILOVOLTS AMPS
KW.....	KILOWATTS
LC.....	LIQUID COOLED
MZ.....	MULTIZONE AIR HANDLING SYSTEM
N/A.....	NOT APPLICABLE
PSI.....	POUNDS PER SQUARE INCH
RM.....	ROOM
SR.....	STEAM RETURN LINE
SS.....	STEAM SUPPLY LINE
TR.....	TERMINAL REHEAT AIR HANDLING SYSTEM
V.....	VOLTS
VAV.....	VARIABLE AIR VOLUME SYSTEM

**APPENDIX**

**Building Floor Plans  
C-1 Building Space Assignments**