

FACILITY AUDIT REPORT
BIOLOGICAL SCIENCES BUILDING, Bldg 276
JULY 1995

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**EXECUTIVE SUMMARY AND PROJECT LIST FOR
THE BIOLOGICAL SCIENCES BUILDING**

This is a 25-year-old building that has had no additions or major renovations. The north entrance to the building was altered when The Vernal G.Riffe Jr. building was built in 1994. The Riffe building was wrapped around the north side of the Biological Science building changing the entrance and adding a handicap ramp. The building is in good condition with a few exceptions and is basically functioning as a 25-year-old building. There are some vertical stress fractures in the brick veneer that were repaired in the summer of 1995. There are also stress fractures in the support columns that should be studied and repaired. Parts of the mechanical systems, such as the coils, pipes, pumps and fan motors, are close to the end of their useful life expectancy and will need attention within the next five to ten years. Two projects have been identified by Physical Facilities: first, to replace one chiller and second, to upgrade the elevators. Since the time this audit was done, and engineering study was initiated which identified several other items related to the HVAC system that will improve the air circulation and cooling capacity within the building. These projects are not listed in this audit report but are part of what is known as the Kramer Report.

The HVAC control system will be replaced with a direct digital control system by the Department of Physical Facilities within the next year. The roof was replaced in 1986 and is functioning adequately. The second chiller and the cooling towers are reaching the end of their life expectancies and an additional project is proposed to replace them.

PROPOSED MAINTENANCE PROJECTS:

A. Corrective Maintenance Projects:		Control #
1. Do engineering study and repair column stress fractures	\$ 50,000	2868
Subtotal	\$ 50,000	

B. Building Improvement/Addition Project:
NONE IDENTIFIED

C. Projected (over the next 5 yrs) Component Replacement Projects:		
1. Chiller Replacement.....	\$375,000	2388
2. Elevator Modernization.....	280,000	315-94-905
3. Replace Cooling Tower.....	67,800	2834
Subtotal:	\$722,800	

Total cost for estimated projects = \$772,800

JULY 95

GENERAL BUILDING INFORMATION

BIOLOGICAL SCIENCES #276

BUILDING ADDRESS: 484 W. 12TH AVENUE

GROSS SQ. FT.: 181,640

NET ASSIGNABLE SQ. FT.: 116,994

MECHANICAL/CUSTODIAL AREA SQ. FT.: 26,232

YEAR OF CONSTRUCTION: 1970

YEAR OF LAST RENOVATION: 1991(MINOR)

NUMBER OF STORIES/BASEMENT: 9 STORIES, PLUS PENTHOUSE

AIR CONDITIONING (Percentage): 95 %

CURRENT USE: OFFICES AND LABORATORIES

TYPE OF CONSTRUCTION: STEEL FRAME WITH A MASONRY VENEER

ESTIMATED REPLACEMENT COST: \$29,295,000 *

WHEELCHAIR ACCESSIBILITY: THE NORTH ENTRANCE IS AT GRADE LEVEL AND IS EQUIPPED WITH AN ELECTRIC OPENER. ALL FLOORS ARE ACCESSIBLE BY ELEVATOR

OVERALL BUILDING CONDITION: SATISFACTORY**

NUMBER OF EXIT STAIRWAYS: 3

AREA MAINTENANCE SHOP: SOUTH SHOP

* Replacement Cost assigned November 1991 by The Office of University Resource Planning and Institutional Analysis.

** Office of University Resource Planning and Institutional Analysis C-1 Report Condition Code.

BUILDING SYSTEMS INFORMATION

BIOLOGICAL SCIENCES #276

HEATING:

Source STEAM FROM THE UNIVERSITY POWER PLANT WITH LOCAL BOILERS AS BACKUP
Type Heating System HOT WATER
Steam (Line size, valve location) 4" RM 030
Building Htg Water (line size, valve location) LOCAL STEAM CONVERTORS

VENTILATION SYSTEM: CONSTANT VOLUME, WITH TERMINAL REHEATS AS WELL AS V.A.V.

COOLING:

Bldg % 95 Chillers 420T CARRIER 1979, 514T TRANE 1970
Window Units 0 Thru-the-wall 0 Direct exp. units 1-10T

HVAC CONTROL SYSTEM: DDC- HONEYWELL

ELECTRIC: Source Size(KVA) Primary/Secondary Switchgear & Main Disc. (Rm)
1.BUCKEYE (103/301) 2500 13,200/(480/277) PENTHOUSE

PLUMBING:

Water (size, valve location) 6", RM 030
Gas (size, valve location) 5", RM 030
Domestic Hot Water (size, valve location) 3" , PENTHOUSE
Compressed Air (size, location) 1 1/2" LOCAL COMPRESSOR, PENTHOUSE

SEWERS: Storm 12" Sanitary 6"

METERS:

Gas (size, location) 5" SOUTH OF RM 030
Water (size, location) 6" SOUTH OF RM 030
Electric (location) NORTH/WEST GARAGE AREA

ALARM SYSTEMS:

Fire Alarm YES Panel Location RM 184
Fire Pump YES Pump Location RM 228
Sprinklers N/A Panel Location
Other Alarms SMOKE DETECTORS, FAILURE OF RADIOACTIVE HOODS ALARM

ELEVATORS:

Number 4 Type (passenger, freight) 3-PASSENGER, 1-FREIGHT
Manufacturer HAUGHTON Size 3 @ 72"X 78", 1 @ 60"X 90"

EMERGENCY GENERATOR: Size 437 KVA Location PENTHOUSE

ASBESTOS SURVEY (1986):

ASBESTOS CONTAINING MATERIALS IN PIPE INSULATION IN RMS 550, 030, 405 & 828

THE BIOLOGICAL SCIENCES BUILDING NARRATIVE

HISTORY

This building was occupied in the fall of 1970. The building has received some minor renovation of a few labs but has basically remained the same 9-story structure. In 1994, the Vernal G. Riffe Jr. building added a new 2-story entrance at the north side of the building. This new entrance also added a handicap ramp to the Biological Sciences Building. The building, occupied by the College of Biological Sciences, is mainly a research facility with very little classroom space. Facility use by category is: 63% laboratory, 16% office and office-related use, 19% mechanical and 2% classroom.

PRIMARY SYSTEMS

The 9-story building is supported by concrete piles and caps with concrete columns up to the first floor. Steel columns and steel beams support concrete floors throughout. The exterior consists of a brick veneer and precast concrete panels. The roof deck is composed of six-inch thick pre-cast concrete with vermiculite insulating concrete supported by steel I-beams.

The built-up roofing cover was replaced in 1986. The roof covering appears to be in good condition and is functioning adequately.

The exterior of the building shows stress fractures in the bricks at the southeast and the southwest corners. These fractures were being repaired at the writing of this report. There are a number of black accent panels on the west face of the building that have cracked and need to be replaced.

The number of windows in the building is limited. The windows on the east and north face are fixed. There are no windows on the south or west side of the building.

The windows are sealed and appear to be in good condition. While the windows are all single pane, the total surface area is limited and does not warrant replacement as an energy conservation project.

SECONDARY SYSTEMS

Interior partitions are composed mainly of concrete block with brick at the north entrance and limited use of metal stud and drywall walls. Surface finishes are generally in good condition except for the south corridor on the first floor. Finishes consist primarily of paint. The diffusers and vents should be cleaned throughout.

The primary floor covering in the building is vinyl tile. The restroom floors consist of ceramic tile and are generally in good condition. The first floor entrance and corridors have terrazzo floors. Carpeting is used on a limited basis in some private offices and in the conference room.

Ceilings are predominantly suspended acoustical tile. The restroom ceilings are drywalled. There is a metal tile ceiling in the garage area. There are stained tiles throughout the building, but the ceilings are generally in good condition.

SERVICE SYSTEMS

The building has three passenger elevators and one freight elevator. These elevators are scheduled for improvements in 1996 and maintenance history reports

indicate frequent problems with stuck elevators.

There are two large variable volume air handlers that serve most of the building, while two smaller systems serve the first floor. The unit serving rooms 116, 120, 127 and 129 was replaced in July of 1995. There is a small DX unit that serves room 580 on the fifth floor. The HVAC systems have terminal reheats. The system will be on DDC in the summer of 1996.

Chilled water is supplied by one 514-ton Trane absorption chiller and one 420 ton Carrier centrifugal chiller. The centrifugal chiller was installed in 1979. The absorption chiller was installed in 1970 and has been identified to be replaced with a 500 ton screw unit. The cooling tower, installed in 1970, is original equipment and should be replaced within the next five to ten years. There were no cooling problems identified by the occupants or the maintenance personnel at the time of this audit. A report by Ralph J. Kramer & Associates, dated 2-9-96, has identified a number of problems with the ventilation and cooling systems of the building. This report lists seven projects totaling \$ 674,600 that were needed to improve the air flow and to increase the cooling capacity of the systems.

Heating hot water is provided by local steam converters to the terminal reheats in the systems and to the limited radiant heating system. Cabinet heaters supply heat at the dock and in the mechanical room on the second floor while unit heaters are used in the penthouse.

Domestic hot water is supplied two local hot water heaters. Supply is adequate and the system is functioning satisfactorily at this time. No problems were observed with the restroom fixtures.

ELECTRICITY

The building is equipped with two 1000 KVA each transformers and one 500 KVA transformer. The transformers' primary voltage is 13,200 volts and secondary voltage is 480/277 volts. There are several step down transformers to provide 208/120 volt current throughout the building. The transformers were installed in 1989 during the PCB elimination project. There is adequate power supply to the building and sufficient distribution panels.

The building lighting and electrical distribution systems are original equipment. The majority of the lights are fluorescent. A few incandescent lights are employed as spotlights in the north entrance area. As a conservation measure, every other light fixture is without light bulbs. The fixtures are clean and in good condition throughout. There is an adequate supply and distribution of convenience outlets throughout the building.

SAFETY STANDARDS

The building is equipped with portable fire extinguishers, fire hose cabinets and standpipes at the three stairways. There is a sprinkler in the first floor trash room. There is a fire pump in the second floor mechanical room and an outside connection is available for firefighters on the south side of the Riffe building. The fire alarm panel is located in room 184M. Smoke detectors are located in the HVAC ductwork. The building has lighted exit signs and an emergency lighting system.

The entrance on the north side of the building is at grade level and is equipped with an electric opener. The entrance at the garage level has a handicap ramp and is equipped with an electric opener as well. The approaches to the building

are well-lit. All floors are handicapped-accessible from the elevators.

ASBESTOS

The Ohio Board of Regents Facilities Asbestos Inspection and Risk Assessment Program's report: Inventory of Friable Asbestos-Containing Materials in Buildings of the Ohio State University (Main and Branch Campuses) and Recommendations for Corrective Action by PEI Associates, September 1986, identifies asbestos containing materials in the pipe insulation in the Penthouse and rooms 550, 526, 405, 822, 828 and 030. The asbestos has since been removed from the Penthouse as well as rooms 030 and 822.

BUILDING PERIMETER

There are four entrances to this building. One at the garage level, one at the dock, one off the east parking lot and the main entrance on the north side. The entrance on the east side consists of steps leading from the parking lot to a bridge walkway which leads to the east entrance. The concrete bridge at this entrance has deteriorated on the under side and will need to be patched. There are bare spots on the south and west side of the building and several shrubs in this area are either dead or dying. Bedding material is needed around these shrubs. The entrances and building approaches were adequately lighted. The only exterior signage was on the east side of the building and there was no address identification on 12th Avenue.

During heavy rain storms, soil erodes into the garage area on the west side of the building, clogging the storm drains. A loading dock is located on south end of the west side of the building. It is accessible via an asphalt driveway connected to 12th Avenue. Concrete sidewalks are adjacent to the south, east and the north sides of the building. The walkways are in good condition.

Maintenance Projects (LESS THAN \$5000)

1. Remove dead and/or dying shrubs on the west side of the building.
Workorder # 01-5063-014397-55
2. Correct erosion problem on the west side of the building.
Workorder # 01-5063-014400-52
3. Repaint south corridor walls on the first floor and repair the base boards.
Workorder # 01-5064-177684-67
4. Replace stained ceiling tiles.
Workorder # 01-5064-177684-67
5. Repair walkway bridge at the east entrance.
Workorder # 01-5063-014507-51
6. Install an identification sign with address at 12th ave.
Workorder # 01-5064-177690-72
7. Replace door to room 312.
Workorder # 01-5064-177689-71
8. Clean and paint stairway doors.
Workorder # 01-5064-177684-67
9. Repair settlement cracks in stairways
Workorder # 01-5063-014507-51
10. Repair cracks in parapet wall.
Workorder # 01-5064-177684-67
11. Repair accent strip in west wall.
Workorder # 01-5064-177684-67
12. Recaulk parapet/Riffe counter flashing.
Workorder # 01-5064-177684-67

July 1995

BUILDING EVALUATION SUMMARY

I. BUILDING INFORMATION

FAC # 276 FACILITY NAME: BIOLOGICAL SCIENCES BUILDING
 DATE: 7/95 INSPECTOR: AUGUSTUS J. VAN BUREN
 YEAR CONSTRUCTED: 1970
 GROSS SQ FT: 181,640 NET SQ FT: 116,994
 REPLACEMENT COST \$ 29,295,000 *

II. COMPONENT RATING

COMPONENT	BUILDING COMPONENT PERCENTAGE OF TOTAL COST **	BUILDING COMPONENT REPLACEMENT COST	CONDITION VALUE MULTIPLIER FOR BLDG. COMPONENT	BUILDING COMPONENT CURRENT VALUE
Foundation	13.2	3,866,940	.87	3,364,238
Columns and Beams	7.4	2,167,830	.87	1,886,012
Exterior Walls	4.5	1,318,275	.85	1,120,534
Windows & Doors	2.0	585,900	.79	462,861
Roofing	2.2	644,490	.91	586,486
Partitions & Drs.	7.4	2,167,830	.84	1,820,977
Wall Finishes	2.7	790,965	.79	624,862
Floor Finishes	5.1	1,494,045	.79	1,180,296
Ceilings & Finish	6.1	1,786,995	.73	1,304,506
Conveying	2.0	585,900	.66	386,694
Plumbing	18.6	5,448,870	.79	4,304,607
Heating	7.4	2,167,830	.77	1,669,229
Cooling & Vent.	8.5	2,490,075	.76	1,892,457
Elec. Ser. & Dist	1.4	410,130	.80	328,104
Lighting & Power	8.7	2,548,665	.80	2,038,932
Safety Standards	2.8	820,260	.78	639,803
TOTALS	100.00	29,295,000		23,610,598

III. BUILDING RATING SUMMARY

Overall Building Rating = 80 %

* Replacement Cost assigned September 1994 by The Office of University Resource Planning and Institutional Analysis 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 # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
a. Footings:			
Individual Footings & Piers <u>UNDER COLUMNS</u>	[]	[X]	[]
Continuous Footings _____	[X]	[]	[]
Grade Beams _____	[]	[X]	[]
Piles <u>UNDER CAPS FOR COLUMN FOOTINGS</u>	[]	[X]	[]
Caissons _____	[X]	[]	[]
b. Foundation Wall Materials:			
Steel _____	[X]	[]	[]
Concrete Cast-in-place _____	[]	[X]	[]
Concrete Block _____	[X]	[]	[]
Other _____	[X]	[]	[]
c. Waterproofing and Underdrain:			
Coating _____	[X]	[]	[]
Membrane _____	[X]	[]	[]
Board _____	[X]	[]	[]
Drain Tile <u>WITH SUMP</u>	[]	[X]	[]
d. Slab on Grade (floor):			
Plain _____	[X]	[]	[]
Reinforced _____	[]	[X]	[]
e. Special Substructures:			
_____	[X]	[]	[]

B. COMMENTS:

THE FOUNDATION AND SLABS ARE IN GOOD CONDITION.

C. COMPONENT RATING: (3,866,900) X (87 %) = \$3,364,200
 Possible Condition Component
 Value Value Multiplier Value

COLUMNS AND BEAMS

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Columns and Beams:

	N/A	Sat	Att
Concrete-in-place _____	[]	[]	[X]
Precast Concrete _____	[X]	[]	[]
Steel <u>BEAMS AND COLUMNS THROUGHOUT FROM FIRST FLOOR UP</u>	[]	[X]	[]
Steel Fireproofing <u>BEAMS AND COLUMNS ARE COATED</u>	[]	[X]	[]
Wood _____	[X]	[]	[]
Other _____	[X]	[]	[]

b. Floors:

Concrete Slab _____	[]	[X]	[]
Precast Slab <u>ROOF DECK</u>	[]	[X]	[]
Metal Deck _____	[X]	[]	[]
Metal Deck w/concrete fill _____	[X]	[]	[]
Wood _____	[X]	[]	[]
Other _____	[X]	[]	[]

c. Roof System:

Flat <u>SLIGHT PITCH IN SEVERAL SECTIONS</u>	[]	[X]	[]
Pitched _____	[X]	[]	[]
Concrete <u>LIGHTWEIGHT INSULATING CONCRETE</u>	[]	[X]	[]
Steel <u>GALVANIZED STEEL DECK UNDER THE CONCRETE</u>	[]	[X]	[]
Wood _____	[X]	[]	[]
Other _____	[X]	[]	[]

B. COMMENTS:

THE CONCRETE COLUMNS IN THE GARAGE AREA SHOW VERTICAL STRESS FRACTURES. EACH COLUMN EXHIBITS THE SAME KIND OF FRACTURES.

C. COMPONENT RATING: (\$2,167,800) x (87 %) = \$1,886,000

Possible	Condition	Component
Value	Value Multiplier	Value

EXTERIOR WALLS

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Walls:

	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
Concrete <u>CONCRETE BLOCKS BACKING</u>	[]	[X]	[]
Masonry <u>BRICK AND CONCRETE PANELS</u>	[]	[]	[X]
Metal Siding _____	[X]	[]	[]
Wood Siding _____	[X]	[]	[]
Other _____	[X]	[]	[]

b. Finishes:

Stucco _____	[X]	[]	[]
Paint _____	[X]	[]	[]
Other _____	[X]	[]	[]

B. COMMENTS:

THE MASONRY HAS NUMEROUS VERTICAL CRACKS NEAR THE CORNERS OF THE BUILDING. DEPARTMENT OF PHYSICAL FACILITIES HAS A PROJECT IDENTIFIED TO CORRECT THIS PROBLEM AND IS BEING CORRECTED AS OF THE WRITING OF THIS REPORT.

C. COMPONENT RATING: (\$1,318,300) X (85 %) = \$1,120,500
 Possible Condition Component
 Value Value Multiplier Value

EXTERIOR WINDOWS & DOORS

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Windows type & number:	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
Wood _____	[X]	[]	[]
Steel _____	[X]	[]	[]
Alum <u>70 FIXED</u>	[]	[X]	[]
Other _____	[X]	[]	[]
b. Window glazing:			
Single pane _____	[]	[X]	[]
Double pane _____	[X]	[]	[]
Other _____	[X]	[]	[]
c. Doors type & number:			
Wood _____	[X]	[]	[]
Steel <u>1 ROLL-UP, 1 DOUBLE, 1 SINGLE</u>	[]	[X]	[]
Alum <u>1 DOUBLE</u>	[]	[X]	[]
Other <u>ROLL-UP FIRE DOOR IN NORTH ENTRANCE LOBBY</u>	[]	[X]	[]
d. Shading Devices:			
Types <u>DRAPES</u>	[]	[X]	[]

B. COMMENTS:

THE ALUMINUM WINDOWS WERE INSTALLED IN 1970. THE BUILDING HAS NO WINDOWS ON THE WEST OR SOUTH SIDE. THE WINDOWS ARE IN GOOD CONDITION.

C. COMPONENT RATING: (\$585,900) X (79 %) = \$462,900

Possible	Condition	Component
Value	Value Multiplier	Value

ROOFING

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Roof Covering:

	N/A	Sat	Att
Built-up _____	[X]	[]	[]
Built-up w/gravel <u>45,369 SQ.FT. INSTALLED IN 1986</u>	[]	[X]	[]
Asphalt Shingle _____	[X]	[]	[]
Copper _____	[X]	[]	[]
Glass (Skylight) _____	[X]	[]	[]
Slate _____	[X]	[]	[]
Spanish Tile _____	[X]	[]	[]
Metal _____	[X]	[]	[]
Other _____	[X]	[]	[]

c. Flashing:

Base & Counter _____	[]	[X]	[]
Cap _____	[X]	[]	[]
Through Wall _____	[X]	[]	[]
Valley & Ridge _____	[X]	[]	[]

d. Gravel Stop & Edge Strips:

Type _____	[X]	[]	[]
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e. Drainage:

Gutters w/ Exterior Downspouts _____	[X]	[]	[]
Scuppers w/ Exterior Downspouts <u>NO DOWNSPOUTS</u>	[]	[X]	[]
Drains w/ Interior Storm Drains _____	[]	[X]	[]

f. Parapets:

Concrete _____	[]	[X]	[]
Brick <u>CRACKS</u>	[]	[]	[X]
Block _____	[X]	[]	[]
Precast <u>COPING</u>	[]	[X]	[]
Other _____	[X]	[]	[]

g. Insulation:

Type <u>ISOCYANURATE WITH PERLITE INSULATION</u>	[]	[X]	[]
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B. COMMENTS

THE ROOF IS 9 YEARS OLD AND IS IN GOOD CONDITION. THE BRICK PARAPET ON THE NORTH SIDE HAS SOME CRACKS AND IS OUT OF PLUMB BY 1" TO 2".

C. COMPONENT RATING: (\$644,500) X (91 %) = \$586,500
 Possible Condition Component
 Value Value Multiplier Value

PARTITIONS & DOORS

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Partition Framing:	N/A	Sat	Att
Concrete Block <u>PREDOMINANTLY</u>	[]	[X]	[]
Glazed Block <u>IN ANIMAL AREA</u>	[]	[X]	[]
Wood Stud _____	[X]	[]	[]
Metal Stud <u>USED WITH DRYWALL IN LIMITED AREAS</u>	[]	[X]	[]
Structural Tile _____	[X]	[]	[]
Rated _____	[X]	[]	[]
Other <u>ORIGINAL BRICK WALLS AT THE NORTH ENTRANCE</u>	[]	[X]	[]
b. Special partitions and Walls:			
Toilet <u>METAL</u>	[]	[X]	[]
Screen Walls _____	[X]	[]	[]
Gate _____	[X]	[]	[]
Other _____	[X]	[]	[]
c. Wall Material:			
Plaster _____	[X]	[]	[]
Plaster Board <u>USED WITH METAL STUDS-LIMITED USE</u>	[]	[X]	[]
Glass <u>STORE FRONT IN FIRST FLOOR OFFICE AREA</u>	[]	[X]	[]
Plywood _____	[X]	[]	[]
Paneling <u>LOBBY AREA AND CONFERENCE RM 212</u>	[]	[X]	[]
Trim & Wainscot _____	[X]	[]	[]
Tile/Glazed <u>IN ANIMAL AREA</u>	[]	[X]	[]
Other _____	[X]	[]	[]
d. Interior Doors & Frames:			
Met Door/Met Frame <u>FIRE DOORS, RESTROOMS AND MECH. ROOMS</u>	[]	[X]	[]
Wood Door/Wood Frame _____	[X]	[]	[]
Wood Door/Metal Frame <u>PREDOMINANT</u>	[]	[X]	[]
Glazing <u>LIMITED USE</u>	[]	[X]	[]
Rollup <u>FIRE DOOR AT THE NORTH ENTRANCE</u>	[]	[X]	[]
Sliding _____	[X]	[]	[]
Other _____	[X]	[]	[]
e. Hardware:			
Door Closers _____	[]	[X]	[]
Lock Sets _____	[]	[X]	[]
Kick/Push Plates _____	[]	[X]	[]
Thresholds _____	[]	[X]	[]
Panic Devices _____	[]	[X]	[]
Security & Detection <u>LIMITED TO SOME LABS</u>	[]	[X]	[]
Automatic Openers <u>HANDICAP ENTRANCES</u>	[]	[X]	[]
Other _____	[X]	[]	[]

B. COMMENTS:

NO MAJOR PROBLEMS OBSERVED, HOWEVER, THE CONCRETE BLOCKS IN THE STAIRWAYS HAVE SETTLEMENT CRACKS AND ARE SEPARATING.

C. COMPONENT RATING: (\$2,167,800) x (84 %) = \$1,821,000
 Possible Condition Component
 Value Value Multiplier Value

WALL FINISHES

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
a. Paint _____	[]	[]	[X]
b. Wall Coating _____	[X]	[]	[]
c. Wall Coverings _____	[X]	[]	[]
d. Paneling			
Prefinished IN ROOM 212	[]	[X]	[]
Plank IN ENTRANCE AREA	[]	[X]	[]
e. Cork _____	[X]	[]	[]
f. Wallpaper _____	[X]	[]	[]
g. Ceramic Tile RESTROOM WALLS AND JANITOR CLOSETS	[]	[X]	[]
h. Trim & Wainscot _____	[X]	[]	[]
i. Decoration _____	[X]	[]	[]
j. Glass _____	[X]	[]	[]
k. Other _____	[X]	[]	[]

B. COMMENTS

WALL SURFACES ARE GENERALLY IN GOOD CONDITION. THE PAINTED CONCRETE BLOCK WALLS IN THE FIRST FLOOR CORRIDOR SHOULD BE REPAINTED.

C. COMPONENT RATING: (\$791,000) X (79 %) = \$624,900
 Possible Condition Component
 Value Value Multiplier Value

FLOOR FINISHES

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

	N/A	Sat	Att
a. Carpet:			
Rolled <u>LIMITED TO SOME OFFICES</u>	[]	[X]	[]
Tile _____	[X]	[]	[]
b. Composition:			
Epoxy _____	[X]	[]	[]
Synthetic _____	[X]	[]	[]
Other _____	[X]	[]	[]
c. Concrete Topping:			
Clear Sealant <u>MAINTENANCE ROOMS</u>	[]	[X]	[]
Abrasive _____	[X]	[]	[]
Epoxy <u>IN THE ANIMAL AREA</u>	[]	[X]	[]
Aggregate _____	[X]	[]	[]
d. Resilient:			
Vinyl Tile <u>PREDOMINANT</u>	[]	[X]	[]
Linoleum _____	[X]	[]	[]
Vinyl _____	[X]	[]	[]
Rubber _____	[X]	[]	[]
Cork _____	[X]	[]	[]
e. Ceramic Tile <u>RESTROOMS</u>	[]	[X]	[]
f. Masonry _____	[X]	[]	[]
g. Terrazzo <u>FIRST FLOOR ENTRANCES AND CORRIDORS</u>	[]	[X]	[]
h. Wood _____	[X]	[]	[]
i. Metal _____	[X]	[]	[]

B. COMMENTS

OVERALL THE FLOOR FINISHES ARE IN GOOD CONDITION.

C. COMPONENT RATING: $(\$1,494,000) \times (79\%) = \$1,180,300$

Possible	Condition	Component
Value	Value Multiplier	Value

CEILING AND FINISHES

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. System Type:	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
Exposed <u>MAINTENANCE ROOMS</u>	[]	[X]	[]
Applied to Structure _____	[X]	[]	[]
Suspended <u>PREDOMINANT</u>	[]	[X]	[]

b. Materials:			
Drywall <u>RESTROOMS</u>	[]	[X]	[]
Plaster _____	[X]	[]	[]
Mineral Fiber Board <u>STAINED TILES THROUGHOUT</u>	[]	[]	[X]
Metal Pan <u>IN THE GARAGE AREA</u>	[]	[X]	[]
Luminous Panels _____	[X]	[]	[]
Other _____	[X]	[]	[]

c. Finishes:			
Paint _____	[]	[X]	[]
Fabric _____	[X]	[]	[]
Prefinished <u>SUSPENDED TILES</u>	[]	[]	[X]
Other _____	[X]	[]	[]

d. Openings & Inserts:			
Air Distribution _____	[]	[X]	[]
Lighting Fixtures _____	[]	[X]	[]
Access Panels _____	[X]	[]	[]
Skylights _____	[X]	[]	[]
Fire Protection _____	[X]	[]	[]
Other _____	[X]	[]	[]

B. COMMENTS:
CEILING ARE GENERALLY IN GOOD CONDITION EXCEPT FOR SOME STAINED AND BROKEN TILES.

C. COMPONENT RATING: (\$1,787,000) X (73 %) = \$1,304,500
 Possible Condition Component
 Value Value Multiplier Value

CONVEYING

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Elevators:

	N/A	Sat	Att
Number <u>4</u>	[]	[]	[X]
Type <u>HAUGHTON, 1 FREIGHT AND 3 PASSENGER, INSTALLED: 1970</u>	[]	[X]	[]
Speed <u>350 FPM</u>	[]	[X]	[]
Capacity (lbs) <u>4000 LBS</u>	[]	[X]	[]
Dimensions <u>1 - 60"X 90" AND 3 - 72" X 78"</u>	[]	[X]	[]
Door Operation:			
Center <u>THREE</u>	[]	[X]	[]
To Side <u>ONE</u>	[]	[X]	[]
Handicapped-accessible controls _____	[]	[X]	[]

b. Lifts and Hoists:

Number _____	[X]	[]	[]
Type _____	[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:

THE ELEVATOR MAINTENANCE SHOP HAS IDENTIFIED A PROJECT TO UPGRADE ALL ELEVATORS IN THE BUILDING. THE ESTIMATED COST IS \$ 280,000.

C. COMPONENT RATING: (\$585,900) X (66 %) = \$386,700

Possible	Condition	Component
Value	Value Multiplier	Value

MECHANICAL/PLUMBING

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

a. Services Available:	N/A	Sat	Att
Cold Water <u>6" SUPPLY LINE IN ROOM 030</u>	[]	[X]	[]
Hot Water <u>LOCAL STEAM CONVERTORS</u>	[]	[X]	[]
Acid Waste <u>3" WITH ACID PIT ON EAST SIDE</u>	[]	[X]	[]
Oxygen <u>BOTTLES IN LABS AS NEEDED</u>	[]	[X]	[]
Natural Gas <u>5" ROOM 030</u>	[]	[X]	[]
Vacuum _____	[X]	[]	[]
Distilled Water <u>LOCAL STILL IN PENTHOUSE</u>	[]	[X]	[]
Compressed Air <u>LOCAL COMPRESSORS IN THE PENTHOUSE</u>	[]	[X]	[]
Other _____	[X]	[]	[]
b. Piping & Fittings:			
Cast Iron <u>WASTE LINES AND VENTS</u>	[]	[X]	[]
Copper Tubing <u>DOMESTIC SUPPLY LINES AND COMPRESSED AIR</u>	[]	[X]	[]
Plastic <u>DEIONIZED WATER</u>	[]	[X]	[]
Steel <u>STEAM, HEATING HOT WATER</u>	[]	[X]	[]
Glass <u>ACID WASTE LINE 3"</u>	[]	[X]	[]
Other _____	[X]	[]	[]
c. Water Heaters:			
Electric _____	[X]	[]	[]
Gas _____	[X]	[]	[]
Oil _____	[X]	[]	[]
Steam Converter <u>STEAM HOT WATER HEATERS</u>	[]	[X]	[]
Other _____	[X]	[]	[]
d. Drainage:			
Storm Drains <u>12"</u>	[]	[X]	[]
Sanitary Drainage <u>6" AND 8" LINES</u>	[]	[X]	[]
Combined Storm/San. _____	[X]	[]	[]
Floor Drains <u>MECHANICAL AND RESTROOMS</u>	[]	[X]	[]
e. Fixtures:			
Water Closets <u>37</u>	[]	[X]	[]
Urinals <u>18</u>	[]	[X]	[]
Lavatories <u>37</u>	[]	[X]	[]
Showers _____	[X]	[]	[]
Kitchen Sinks <u>1</u>	[]	[X]	[]
Service Sinks <u>9</u>	[]	[X]	[]
Drinking Fountains _____	[X]	[]	[]
Electric Water Coolers <u>18</u>	[]	[X]	[]
f. Sprinkler Systems:			
Wet _____	[X]	[]	[]
Dry _____	[X]	[]	[]
g. Standpipe Systems:			
Wet <u>STANDPIPES IN STAIRWAYS</u>	[]	[X]	[]
Dry _____	[X]	[]	[]
Valves _____	[]	[X]	[]
Hose Cabinets <u>20 CABINETS THROUGHOUT</u>	[]	[X]	[]

B. COMMENTS:

MAINTENANCE PERSONNEL REPORTED THAT THE PLUMBING SYSTEM IS FUNCTIONING ADEQUATELY.

C. COMPONENT RATING: $(\$5,448,900) \times (\underline{79} \%) = \underline{\$4,304,600}$

Possible	Condition	Component
Value	Value Multiplier	Value

MECHANICAL/HEATING

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

	N/A	Sat	Att
Heat Source:			
Central Plant Steam <u>4"</u>	[]	[X]	[]
Central Plant Hot Water _____	[X]	[]	[]
Boilers: Type <u>CLEAVER BROOKS</u>	[]	[X]	[]
Size <u>2 @ 12.5 MBTU/HR</u>	[]	[X]	[]
Furnace: Type _____	[X]	[]	[]
Size _____	[X]	[]	[]
Heat Pump: Type _____	[X]	[]	[]
Size _____	[X]	[]	[]

b. System Type:

Steam _____	[X]	[]	[]
Hot Water <u>HEATING HOT WATER STEAM CONVERTER</u>	[]	[X]	[]
Air _____	[]	[]	[]
Multizone _____	[X]	[]	[]
Dual Duct _____	[X]	[]	[]
Terminal Reheat <u>HOT WATER REHEATS</u>	[]	[X]	[]
Variable Volume _____	[X]	[]	[]
Other <u>CONSTANT VOLUME</u>	[]	[X]	[]

c. Space Equipment:

Radiators <u>LIMITED USE ON FLOORS 1, 3, 5 AND 7</u>	[]	[X]	[]
Convectors _____	[X]	[]	[]
2-Pipe Fan Coil _____	[X]	[]	[]
Unit Heaters <u>IN PENTHOUSE, RM 184 AND AT THE WEST WALL</u>	[]	[X]	[]
Other <u>CABINET HEATERS AT ENTRANCES AND RM 228M</u>	[]	[X]	[]

d. Control Type:

Pneu _____	[]	[X]	[]
Electric _____	[X]	[]	[]
DDC _____	[X]	[]	[]
Manual Valves _____	[X]	[]	[]

B. COMMENTS:

MAINTENANCE PERSONNEL DID NOT IDENTIFY ANY PROBLEMS WITH THE HEATING. THE BOILERS ARE MAINTAINED FOR STAND-BY PURPOSE ONLY.

C. COMPONENT RATING: $(\$2,167,800) \times (77\%) = \$1,669,200$

Possible	Condition	Component
Value	Value Multiplier	Value

COOLING & VENTILATING

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

	N/A	Sat	Att
a. System:			
Type <u>CONSTANT VOLUME WITH TERMINAL REHEATS & V.A.V.</u>	[]	[]	[X]
Capacity <u>934 TONS</u>	[]	[]	[X]
b. Chillers:			
Centrifugal <u>420-TON CARRIER UNIT INSTALLED IN 1979</u>	[]	[X]	[]
Reciprocating _____	[X]	[]	[]
Absorption <u>514-TON TRANE UNIT INSTALLED IN 1970</u>	[]	[]	[X]
c. Cooling Towers:			
Type <u>MARLEY WATER COOLED INSTALLED IN 1970</u>	[]	[X]	[]
Capacity <u>APPROXIMATELY 820 TON</u>	[]	[X]	[]
d. Condensers: _____	[X]	[]	[]
e. Space Equipment:			
Direct Expansion -			
Window units _____	[X]	[]	[]
Thru-the-wall _____	[X]	[]	[]
Single zone <u>TEN TON UNIT FOR THE WOOD SHOP</u>	[]	[X]	[]
Single zone con. vol. <u>5 UNITS</u>	[]	[X]	[]
Other <u>ONE DX LIEBERT UNIT FOR ROOM 580</u>	[]	[X]	[]
Air/Water -			
2-pipe fan coil _____	[X]	[]	[]
Terminal reheat _____	[]	[X]	[]
Variable volume _____	[X]	[]	[]
Dual Duct _____	[X]	[]	[]
Multizone _____	[]	[X]	[]
f. Special Systems:			
Type <u>LAB EXHAUSTS THROUGHOUT</u>	[]	[X]	[]
Capacity _____	[X]	[]	[]
g. Control Systems:			
Pneu _____	[]	[X]	[]
Electric _____	[X]	[]	[]
Electronic _____	[]	[X]	[]
h. Fans:			
Exhaust <u>22</u>	[]	[X]	[]
Recirculating <u>4 AIR HANDLERS</u>	[]	[X]	[]

B. COMMENTS:

MAINTENANCE PERSONNEL HAVE IDENTIFIED THE ABSORPTION CHILLER FOR REPLACEMENT BECAUSE OF ITS AGE. THE COOLING TOWER IS ALSO REACHING IT EXPECTED LIFE. THE PREVIOUS MENTIONED KRAMER REPORT IDENTIFIED CAPACITY PROBLEMS WITH COOLING AND VENTILATING.

C. COMPONENT RATING: $(\$2,490,100) \times (76\%) = \$1,892,500$

Possible	Condition	Component
Value	Value Multiplier	Value

ELECTRICAL/SERVICE & DISTRIBUTION

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

(a) Service:

Substation BUCKEYE (103/301)
Primary Voltage 13,200 VOLTS
Transformer:

Manufacture	Type	KVA	Secondary Voltages
<u>GENERAL ELECTRIC</u>	<u>SILICONE</u>	<u>1000</u>	<u>480/277</u>
<u>GENERAL ELECTRIC</u>	<u>SILICONE</u>	<u>1000</u>	<u>480/277</u>
<u>GENERAL ELECTRIC</u>	<u>DRY</u>	<u>500</u>	<u>480/277</u>

(b) Distribution System:

Panelboard (type) CIRCUIT BREAKER
Voltage 480/277 WITH STEP DOWN TRANSFORMERS TO 208/120
Amperage 3200 AMPS
Conduit ALUMINUM AND GALVANIZED STEEL
Conductor COPPER
Wire (type) VARIES
Armored Cable LIMITED USE
Other N/A

(c) Emergency System:

General or (type & capacity) KATOLIGHT, GAS, 437 KVA

B. COMMENTS:

THE TRANSFORMERS WERE REPLACED IN 1989 AS A PART OF THE PCB PROJECT. THERE IS NO MAXIMUM DEMAND METER READING FOR THE TRANSFORMERS. HOWEVER THE SIZE OF THE TRANSFORMERS ARE ADEQUATE TO MEET THE BUILDING'S POWER REQUIREMENTS.

C. COMPONENT RATING: (\$410,100) x (80%) = \$328,100

Possible	Condition	Component
Value	Value Multiplier	Value

SAFETY STANDARDS

FAC # 276 DATE 7/95/ INSPECTOR: AJR

A. SYSTEM DESCRIPTION

	<u>N/A</u>	<u>Sat</u>	<u>Att</u>
(a) Exits:			
Stair Construction:			
concrete _____	[X]	[]	[]
steel <u>WITH CONCRETE PANS</u>	[]	[X]	[]
wood _____	[X]	[]	[]
Number of exits <u>4</u>	[]	[X]	[]
(b) Fire Rating:			
Construction Type: I _____ II <u>X</u> III _____ IV _____ V _____ VI _____			
Building Height: <u>157</u> ft., <u>9</u> & PENT. _____ stories			
(c) Extinguishing Systems:			
Portable <u>ABC AND CO-2 THROUGHOUT</u>	[]	[X]	[]
Standpipe <u>LOCATED AT STAIRWAYS</u>	[]	[X]	[]
Hose Cabinets <u>20 UNITS THROUGHOUT</u>	[]	[X]	[]
Sprinklers _____	[X]	[]	[]
Suppression _____	[X]	[]	[]
Other _____	[X]	[]	[]
(d) Detection & Alarm Systems:			
Manual Alarm _____	[]	[X]	[]
Annunciator <u>RM 184</u>	[]	[X]	[]
Smoke Detectors <u>IN DUCTS AND AT NORTH ENTRANCE</u>	[]	[X]	[]
(e) Lighting Systems:			
Exit Signs _____	[]	[X]	[]
Exit Lighting _____	[]	[X]	[]
Emergency Lighting <u>STAIRWAYS AND CORRIDORS</u>	[]	[X]	[]
Emergency Generator <u>KATOLIGHT, GAS, 437 KVA</u>	[]	[X]	[]

B. COMMENTS:
NO PROBLEMS OBSERVED.

C. COMPONENT RATING: (\$820,300) x (78 %) = \$639,800
 Possible Condition Component
 Value Value Multiplier Value

BUILDING PERIMETER EVALUATION

FAC # 276 DATE 7/95 INSPECTOR: AJR

A. SYSTEM DESCRIPTION

	N/A	Sat	Att
1. Building Access:			
Driveway <u>ACCESSES LOADING DOCK ON WEST SIDE</u>	[]	[X]	[]
Loading Dock <u>WEST SIDE OF THE BUILDING</u>	[]	[X]	[]
Sidewalks			
Front _____	[]	[X]	[]
Side _____	[]	[X]	[]
Rear _____	[]	[X]	[]
Steps			
Front _____	[X]	[]	[]
Side <u>FROM EAST PARKING AREA</u>	[]	[]	[X]
Rear <u>AT THE LOADING DOCK</u>	[]	[X]	[]
Handicap Ramp <u>IN GARAGE AREA</u>	[]	[X]	[]
2. Lawn and Landscaping:			
Lawn <u>BARE SPOTS WITH EROSION ON THE WEST AND SOUTH</u>	[]	[]	[X]
Shrubs <u>SOME DEAD SHRUBS</u>	[]	[]	[X]
Trees _____	[]	[X]	[]
Undesirable Insect _____	[X]	[]	[]
Bedding Material <u>THE WEST SIDE NEEDS ATTENTION</u>	[]	[]	[X]
Watering System _____	[X]	[]	[]
3. General Site Information:			
Signage <u>NO SIGNAGE ON 12TH AVE</u>	[]	[]	[X]
Address Identification <u>NONE</u>	[]	[]	[X]
Security Lights <u>ON PARAPET AND AT ALL ENTRANCES</u>	[]	[X]	[]
Street Lights <u>LOCATED ON 12TH AVE</u>	[]	[X]	[]
Drainage <u>SOIL DRAINS INTO THE GARAGE AREA</u>	[]	[]	[X]
Storm Drains <u>COVERED WITH DIRT AND LEAVES IN GARAGE</u>	[]	[]	[X]

B. COMMENTS:

THERE ARE BARE SPOTS ON THE WEST AND SOUTH SIDE OF THE BUILDING AS WELL AS DYING SHRUBS IN THIS AREA. THERE ARE NO ADDRESS IDENTIFICATION SIGNS ON 12TH AVE. TO DIRECT DELIVERIES TO THIS BUILDING. THE DRAINS IN THE GARAGE AREA UNDER THE BUILDING NEED TO BE CLEANED AND SOIL EROSION INTO THIS AREA SHOULD BE CONTAINED.

**The Ohio State University
Department of Physical Facilities**

BUILDING AUDIT METHODOLOGY

1. BUILDING AUDIT PROGRAM OBJECTIVE

The primary objective of this program is to provide a building-by-building inventory and current list of building maintenance deficiencies. This analysis is limited to the buildings for which the Department of Physical Facilities has budgetary responsibility. These audits will be used to establish corrective maintenance projects and budget cost estimates.

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" forms 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.

5. 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 regarding 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) General repainting, redecorating, wholesale replacement of building and system components, on-going maintenance, replacement, and renovation projects.
- (b) Exterior building walls and attached items.
- (c) Entrance steps at all entries, ramps outside the buildings, and a limited evaluation of plantings around the building exterior.

(7) The building inspections do not include:

- (a) Movable furniture.
- (b) Fixed equipment inside the buildings that is installed and maintained by a specific academic department or using agency.
- (c) Utility lines supplying the buildings.

(8) 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

ATT.....	ATTENTION
BLDG.....	BUILDING
BUR.....	BUILT UP ROOF
COND.....	CONDENSATE WATER
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
HPS.....	HIGH PRESSURE STEAM (125 PSI)
HVAC.....	HEATING, VENTILATING AND AIR CONDITIONING SYSTEM
KV.....	KILOVOLTS
KVA.....	KILOVOLTS AMPS
KW.....	KILOWATTS
LC.....	LIQUID COOLED
LPS.....	LOW PRESSURE STEAM (15 PSI)
MPS.....	MEDIUM PRESSURE STEAM (50 PSI)
MZ.....	MULTIZONE AIR HANDLING SYSTEM
N/A.....	NOT APPLICABLE
PSI.....	POUNDS PER SQUARE INCH
RM.....	ROOM
SAT.....	SATISFACTORY
SR.....	STEAM RETURN LINE
SS.....	STEAM SUPPLY LINE
TR.....	TERMINAL REHEAT AIR HANDLING SYSTEM
V.....	VOLTS
VAV.....	VARIABLE AIR VOLUME SYSTEM

APPENDIX
Reduced Scale Building Floor Plans
C-1 Building Space Assignments