

FACILITY AUDIT REPORT

HOWLETT HALL
#295

JANUARY 29, 1991

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Department of Physical Facilities
Division of Resource Management

Table of Contents

GENERAL BUILDING INFORMATION	3
HOWLETT HALL NARRATIVE	4
REPAIR AND RENOVATION PROJECTS	7
BUILDING EVALUATION SUMMARY	8
FOUNDATIONS	9
COLUMNS AND BEAMS	10
EXTERIOR WALLS	11
EXTERIOR WINDOWS & DOORS	12
ROOFING	13
PARTITIONS & DOORS	14
WALL FINISHES	15
FLOOR FINISHES	16
CEILINGS AND FINISHES	17
CONVEYING	18
MECHANICAL/PLUMBING	19
MECHANICAL/HEATING	20
COOLING & VENTILATING	21
ELECTRICAL/SERVICE & DISTRIBUTION	22
ELECTRICAL/LIGHTING & POWER	23
SAFETY STANDARDS	24
BUILDING AUDIT METHODOLOGY	25
ABBREVIATIONS	27
APPENDIX	28
Reduced Building Floor Plans	28
C-1 Building Space Assignments	28

GENERAL BUILDING INFORMATION

Howlett Hall #295

BUILDING ADDRESS: 2001 Fyffe Court

GROSS SQ. FT.: 61,688

NET ASSIGNABLE SQ. FT.: 43,109

MECHANICAL/CUSTODIAL AREA SQ. FT.: 5,370

YEAR OF CONSTRUCTION: 1969

YEAR OF LAST RENOVATION: N/A

NUMBER OF STORIES/BASEMENT: 4 stories

AIR CONDITIONING (Percentage): 90%

CURRENT USE: Horticulture & Food Industry Center

TYPE OF CONSTRUCTION: Reinforced Concrete with Masonry Skin

ESTIMATED REPLACEMENT COST: \$ 6,953,064 *

BUILDING ENVIRONMENT: Institutional, with concrete block walls and vinyl tile floor.

BUILDING APPEARANCE: Fair, with dirty hallway walls in need of a good cleaning.

HANDICAPPED ACCESSIBILITY: Yes, through the east door that is directly across from elevator that provides access to other floors. Handicap restrooms are on the ground and first floor at the opposite end of the building from the elevator.

INITIAL CONSTRUCTION QUALITY: Good.

OVERALL BUILDING CONDITION: Good.

*Replacement Cost assigned 6/90 by The Office of Campus Planning and Space Utilization without the furnishings and fixed equipment allocation.

HOWLETT HALL 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 repairs 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 this facility, which is 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

Howlett Hall was completed in 1969. No additions have been made to the building or major remodeling projects completed. It was originally built to house the Horticulture and Forestry Departments. It is still used for the Horticulture Department and includes the Food Processing Pilot Plant.

In an interview with Mr. Winston Bash, former building coordinator and occupant of the building for the past nine years it was learned that the major occupant complaint was the custodial service. Other than cleaning of restrooms, floors and emptying of waste containers, very few other housekeeping tasks are performed on a regular basis. He was pleased with the overall building performance but noted that the HVAC system had some inconsistency that is was usually related to repairs being made on the system.

PRIMARY SYSTEMS

The model food processing plant is built on individual footings and piers. There are cracks in the brick veneer on the south exterior wall of the food processing plant that indicate some movement has occurred. These cracks need to be repaired, but are not significant enough to indicate any structural damage. The 3-story classroom building has poured-in-place concrete reinforced exterior walls, columns and floors. There are no indications of any cracks or foundation problems with this section of the building.

The windows are an aluminum awning style with single glazed glass. Some of the hardware for the windows has been damaged making it difficult to open and close certain windows. A project is proposed to replace the windows with a double glazed insulated window. The entry doors are aluminum with the exception of the doors to the loading dock on the east side of the building. These doors are steel service doors and roll-up delivery doors. There is some rust and surface damage to these doors that needs to be repaired and the doors painted.

The roof deck is concrete. The built-up roof is the original cover that was installed in 1969. The roof over the main building is functioning satisfactory, but is expected to need replaced in the near future because of its age. The roof cover on the canopies and elevator shaft have some areas that are leaking and need to be replaced. The joints of the precast cap on the parapet need to be

sealed to stop any water from entering.

SECONDARY SYSTEMS

The interior partitions are predominantly painted concrete block, with some drywall partitions where graduate student offices have been constructed. The walls are in good condition except in the stairwells where some cracking has occurred in the corners. The finishes on the corridors and stairwells are very dirty and need to be washed or painted.

The ceilings are exposed painted concrete in the laboratories and are in good condition. The classrooms and offices have had 2' X 4' ceiling tiles installed that need to be cleaned. The corridors have ceiling tiles that have some damage from water leaks and should be replaced.

SERVICE SYSTEMS

The major service systems all appeared to be functioning moderately well. The elevator operation was satisfactory. There isn't a telephone installed for emergency communications and the interior of the cab is showing its age, but no deficiencies were observed in the operation of the elevator.

The domestic hot water is rusty in color. The building occupants indicated that they do not wash their laboratory equipment with the domestic hot water because of the rust in the water. The galvanized pipe used for the domestic water piping appears to be corroding and cause the rust color since this has not been observed at any other places on mid-west campus.

The cooling and ventilation system is generally considered adequate by most building occupants. The third floor has been reported by some occupants as not having adequate ventilation and cooling. Temperatures are currently being monitored to evaluate these concerns. The absorption chiller located in the Howlett Greenhouse originally served Howlett Hall, but it is non-functional and not repairable. The chilled water for Howlett Hall is currently coming from the chiller in nearby Kottman Hall. A proposed project has been established to replace the absorption chiller in Howlett greenhouse to provide back-up chiller capacity for both Kottman and Howlett Halls.

The heating system for Howlett Hall consists of hot water convectors on the exterior walls and a modified dual duct ventilation system. The hot water is supplied from a steam converter in the greenhouse. There are also eight boilers in the greenhouse that are available as a backup if central power plant steam would not be available. Howlett Hall has a thermostatic control system in each room that controls the mixing box as well as the flow valve on each convector. The heating hot water lines have experienced leaks and have had sections of pipe replaced due to corrosion. Both mechanical rooms have signs of rusty water leaks at the connections to the air handlers.

ELECTRICITY

The building transformers are 1500 KVA each with a primary voltage of 13,200 volts. The secondary voltage is 208Y/120 for one transformer and 480Y/277 for the other transformer. We did not observe any electrical outlet overload conditions. No problems were observed with the building electrical distribution system.

The majority of the building has fluorescent light fixtures. These fixtures are dirty and need to be cleaned to provide the desired brightness. The incandescent lights that hang from the front canopy are difficult to clean and to change bulbs. We have proposed a project to replace these lights with a ceiling mounted high pressure sodium fixture.

SAFETY STANDARDS

The building is equipped with a manual fire alarm system and an exit lighting system. There is an emergency generator that provides power for emergency lighting.

The handrail on the front steps was loose and needed to be properly secured. The handicapped accessibility is provided by a ramp from the parking area east of the building. An automatic opener on the east entry door opens into the elevator lobby. The elevator provides access to the other 3 floors. Restrooms on the ground floor and the first floor are handicapped accessible.

CONCLUSIONS

Howlett Hall does not have its own chiller or a boiler system. It receives its heating hot water from a steam converter located in the greenhouse and its chilled water from Kottman Hall. The absorption chiller located in Howlett Greenhouse has been taken out of service and cannot be repaired.

A project has been proposed to replace the absorption chiller so that a back-up source of chilled water will be available to Howlett Hall. The direct digital control system has been installed to regulate the HVAC system from the campus central control system.

The greatest concern for systems failures are the roof and the piping of the domestic, chilled and heating water systems. All of these piping systems are experiencing more rapid corrosive deterioration than normal, causing extra maintenance for replacement of piping.

The electrical system appears to be more than adequate to handle the current needs. Detailed descriptions of each of the building systems are included on the attached evaluation sheets.

REPAIR AND RENOVATION PROJECTS

A. Corrective Maintenance Projects:

- 1. Repair cracks in masonry exterior. Clean exterior brick and seal with a water repellent coating to protect brick from moisture penetration.....\$48,000
 - 2. Repair roof covering on 1720 sq. ft. of roof area (north and west canopies and mechanical penthouses) and seal parapet connectors. Replace mastic on roof flashing.....14,000
 - 3. Repair masonry cracks in stairwells and repaint stairwells and hallways.....15,000
 - 4. Re-fasten convectors to wall in rooms 365 and 371. Clean fan coil units in hallways and replace filters.....750
 - 5. Add telephone to elevator for emergency communication.....1,000
 - 6. Level front steps and secure handrail into steps.....700
 - 7. Adjust door closures and panic hardware on stairway doors and at loading dock door.....350
 - 8. Clean ceiling tile, grid system, registers and fluorescent light fixtures through-out the entire building..... 11,000
- Sub Total \$ 90,800**

B. Building Improvement/Addition Projects:

- 1. Replace 138 single glazed windows with insulated thermal-break windows.....\$85,000
 - 2. Replace main entrance light fixtures..... 1,760
- Sub Total \$ 86,760**

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

- 1. Replace roof covering.....\$160,000
 - 2. Replace domestic water system piping.....185,000
 - 3. Replace absorption chiller in greenhouse..... 350,000
- Sub Total \$695,000**

Total Cost for all Projects = **\$ 872,560.00**

BUILDING EVALUATION SUMMARY

I. BUILDING INFORMATION

FAC # 295 FACILITY NAME: HOWLETT HALL
 DATE: 10/90 INSPECTOR: RDL
 YEAR CONSTRUCTED: 1969
 GROSS SQ FT: 61,688 NET SQ FT: 43,109
 REPLACEMENT COST \$ 6,953,064 *

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	5.19	360,864	1.00	360,864
Columns and Beams	10.07	700,174	1.00	700,174
Exterior Wall	2.93	203,725	0.90	183,353
Windows & Doors	4.01	278,818	0.69	192,384
Roofing	6.43	447,082	0.50	223,541
Partitions & Drs.	8.71	605,612	0.99	599,556
Wall Finishes	2.60	180,780	0.93	168,125
Floor Finishes	5.10	354,606	1.00	354,606
Ceilings & Finish	7.13	495,753	0.98	485,838
Conveying	1.66	115,421	1.00	115,421
Plumbing	8.07	561,112	0.44	246,889
Heating	7.51	522,175	0.56	292,418
Cooling & Vent.	11.71	814,204	0.56	455,954
Elec. Ser. & Dist	1.68	116,811	1.00	116,811
Lighting & Power	11.10	771,790	0.99	764,072
Safety Standards	6.10	424,137	1.00	424,137
TOTALS	100.00	6,953,064		5,684,143

III. BUILDING RATING SUMMARY

Overall Building Rating = 81.8

* 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.

EXTERIOR WALLS

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a)Walls:

Concrete REINFORCED
Masonry BRICK VENEER
Metal Siding N/A
Wood Siding N/A
Other N/A

(b)Finishes:

Stucco N/A
Paint N/A
Other N/A

B. COMMENTS:

1. CRACKS IN THE EXTERIOR MASONRY (SE AND SW CORNERS) NEED TO BE REPAIRED. MASONRY SEALANT SHOULD BE APPLIED TO PROTECT THE BRICKFROM DETERIORATION BECAUSE OF MOISTURE PENETRATION.
2. THE MASONRY ON THE FRONT OF THE BUILDING IS DIRTY AND SHOULD BE CLEANED (POWER WASHED).

C. COMPONENT RATING: (2.93) x (0.90) = 2.64

Possible Condition Component

Rating Value Multiplier Rating

EXTERIOR WINDOWS & DOORS

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a)Windows type & number:

Wood NO
Steel NO
Alum YES, AWNING STYLE
Other NO

(b)Doors type & number:

Wood NO
Steel YES, THE SERVICE DOOR ON THE LOWER LEVEL.
Alum YES, THE MAIN ENTRANCE DOORS.
Other YES, ROLL-UP DELIVERY DOOR FOR FOOD LABORATORY.

(c)Shading Devices:

Types VENETIAN BLINDS ON THE SOUTH SIDE OF THE BUILDING.

B. COMMENTS:

- 1. THREE WINDOWS HAVE HARDWARE THAT IS BROKEN. THESE WINDOWS NEED TO BE REPAIRED. THEY ARE LOCATED AT THE END OF THE HALLWAYS ON 2ND & 3RD FLOORS.
- 2. THE 138 SINGLE GLAZED WINDOWS ARE VERY ENERGY INEFFICIENT AND SHOULD BE REPLACED TO IMPROVE OCCUPANT COMFORT AND TO SAVE ENERGY. IT IS ESTIMATED THAT IT WOULD COST ABOUT \$85,000 TO REPLACE THE WINDOWS WITH DOUBLE GLAZED THERMAL-BREAK WINDOWS.

C. COMPONENT RATING: $(\underline{4.01}) \times (\underline{0.69}) = \underline{2.77}$

Possible	Condition	Component
Rating	Value Multiplier	Rating

PARTITIONS & DOORS

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a) Partition Framing:

- Concrete Block YES
- Glazed Block NO
- Wood Stud NO
- Metal Stud NO
- Structural Tile NO
- Rated N/A
- Other N/A

(b) Special partitions and Walls:

- Toilet YES, PAINTED STEEL
- Screen Walls NO
- Gate NO
- Other N/A

(c) Wall Material:

- Plaster NO
- Plaster Board YES, WHERE OFFICES HAVE BEEN ADDED.
- Glass NO
- Plywood NO
- Paneling NO
- Trim & Wainscot NO
- Tile/Glazed NO
- Other N/A

(d) Interior Doors & Frames:

- Met Door/Met Frame NO
- Wood Door/Wood Frame NO
- Wood Door/Metal Frame YES
- Glazing YES AT FIRST FLOOR CONFERENCE ROOM (RM 139)
- Roll up NO
- Sliding NO
- Other

(e) Hardware:

- Door Closers YES, AT SPECIFIC LOCATIONS
- Lock Sets YES, MOST DOOR ON HALLWAYS
- Kick/Push Plates N/A
- Thresholds N/A
- Panic Devices YES
- Security & Detection N/A
- Automatic Openers NONE ON INTERIOR DOORS EXCEPT ELEVATOR
- Other N/A

B. COMMENTS:

1. THE SERVICE DOOR AT THE LOWER LEVEL NEXT TO THE ELEVATOR DOES NOT CLOSE PROPERLY. THE CLOSER NEEDS REPAIRED OR REPLACED. THE DOOR IS RUSTED AND NEEDS TO BE PAINTED.

C. COMPONENT RATING: (8.71) x (0.99) = 8.63

Possible	Condition	Component
Rating	Value Multiplier	Rating

WALL FINISHES

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

- (a)Paint YES,
- (b)Wall Coating NONE
- (c)Wall Coverings NONE
- (d)Paneling
 Prefinished N/A
 Plank N/A
- (e)Cork N/A
- (f)Wallpaper N/A
- (g)Ceramic Tile YES, RESTROOM WALLS
- (h)Trim & Wainscot NO
- (i)Decoration N/A
- (j)Glass N/A
- (k)Other N/A

B. COMMENTS

- 1. THE RESTROOMS AND MOST OF THE CLASSROOMS HAVE BEEN PAINTED RECENTLY. THE HALLWAYS ARE DIRTY AND SHOULD BE CLEANED AND REPAINTED.
- 2. THE STAIRWELLS HAVE CRACKS (1/4" WIDE) IN THE MASONRY WALLS AT THE CORNERS THAT NEED TO BE REPAIRED AND REPAINTED. NEXT TO THE ELEVATOR IS A CRACK THAT ALSO NEEDS TO BE REPAIRED AND THE WALL PAINTED.

C. COMPONENT RATING: $\left(\frac{2.60}{\text{Possible Rating}} \right) \times \left(\frac{0.93}{\text{Condition Value Multiplier}} \right) = \frac{2.42}{\text{Component Rating}}$

FLOOR FINISHES

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a) Carpet:

Rolled N/A
Tile N/A

(b) Composition:

Epoxy N/A
Synthetic N/A
Other N/A

(c) Concrete Topping:

Abrasive N/A
Epoxy N/A
Aggregate YES, IN LABORATORIES AND CLASSROOMS.

(d) Resilient:

Vinyl Tile YES, MOST OF THE HALLWAYS AND OFFICES.
Linoleum N/A
Vinyl N/A
Rubber N/A
Cork N/A

(e) Ceramic Tile N/A

(f) Masonry QUARRY TILE WAS USED IN THE FOOD PROCESSING LAB.

(g) Terrazzo N/A

(h) Wood N/A

(i) Metal N/A

B. COMMENTS

1. SEVERAL OF THE CLASSROOMS AND LABORATORIES FLOORS HAVE EXPOSED CONCRETE WITH SEALER AS THE FINISH FLOOR. THE SEALER HAS BEEN MAINTAINED AND THE FLOORS ARE IN GOOD CONDITION.

C. COMPONENT RATING: $(\underline{5.10}) \times (\underline{1.00}) = \underline{5.10}$

Possible	Condition	Component
Rating	Value Multiplier	Rating

CEILINGS AND FINISHES

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a) System Type:

Exposed YES, CONCRETE PAINTED IN RESTROOMS & LABORATORIES.
Applied to Structure N/A
Suspended YES, HALLWAYS, CLASSROOMS AND OFFICES

(b) Materials:

Drywall N/A
Plaster N/A
Mineral Fiber Board YES, TILES IN SUSPENDED CEILING
Metal Pan N/A
Luminous Panels N/A
Other N/A

(c) Finishes:

Paint YES, ON EXPOSED CEILING AREAS
Mineral Fiber YES, TILES IN SUSPENDED CEILING
Fabric N/A
Prefinished N/A
Other N/A

(d) Openings & Inserts:

Air Distribution YES
Lighting Fixtures YES
Access Panels N/A
Skylights N/A
Fire Protection N/A
Other N/A

B. COMMENTS:

1. CEILING TILES IN THE 3RD FLOOR HALLWAY NEED TO BE INSTALLED AFTER REPLACEMENT OF WATER LINE.
2. CEILING TILE THROUGH-OUT THE BUILDING SHOULD BE CLEANED.

C. COMPONENT RATING: (7.13) x (0.98) = 6.99

Possible	Condition	Component
Rating	Value Multiplier	Rating

CONVEYING

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a)Elevators:

Number ONE

Type OTIS

Speed 300 FPM

Capacity (lbs) 5,000 LB

Dimensions N/A

Door Operation:

Center N/A To Side YES

(b)Lifts and Hoists:

Number N/A

Type N/A

(c)Moving Stairs and Walks:

Number N/A

Type N/A

(d)Conveyors:

Number N/A

Type N/A

(e) Pneumatic Tubes:

Number N/A

Type N/A

B. COMMENTS:

- 1. THE ELEVATOR DOES NOT HAVE ANY TELEPHONE COMMUNICATION.
- 2. NO DEFICIENCIES WERE OBSERVED IN THE OPERATION OF THE ELEVATOR.

C. COMPONENT RATING: $(\underline{1.66}) \times (\underline{1.00}) = \underline{1.66}$

Possible	Condition	Component
Rating	Value Multiplier	Rating

MECHANICAL/PLUMBING

FAC # 295 DATE 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a) Services Available:

- Cold Water YES
Hot Water YES
Acid NO
Waste YES
Oxygen NO
Natural Gas YES, IN THE GREENHOUSE
Vacuum N/A
Distilled Water YES
Compressed Air YES
Other N/A

(b) Piping & Fittings:

- Cast Iron YES, USED FOR WASTE SYSTEM
Copper Tubing NO
Plastic NO
Steel NO
Other GALVANIZED PIPE WAS USED FOR DHW & DCW

(c) Water Heaters:

- Electric NO
Gas NO
Oil NO
Steam Converter YES, IN THE GREENHOUSE

(d) Drainage:

- Storm Drains YES
Sanitary Drainage YES
Floor Drains YES

(e) Fixtures:

- Water Closets YES, 17 IN THE BUILDING
Urinals YES, 11 IN THE BUILDING
Lavatories YES, 16 IN THE BUILDING
Showers YES, 4 IN THE LOWER LEVEL OF THE BUILDING
Kitchen Sinks YES
Service Sinks YES
Drinking Fountains YES
Electric Water Coolers YES

(f) Sprinkler Systems:

- Wet NO
Dry NO

(g) Standpipe Systems:

- Wet NO
Dry YES
Valves YES
Hose Cabinets YES

B. COMMENTS:

- 1. SEVERAL OF THE FAUCETS ON THE LABORATORY SINKS WERE DRIPPING.
2. THE DHW IS RUSTY IN COLOR. A NEW HEAT EXCHANGER TUBE BUNDLE WAS BEING INSTALLED DURING THE INSPECTION.
3. CORROSION CONTINUES TO BE A PROBLEM WITH DHW LINES. ABNORMAL MAINTENANCE OF THESE LINES WILL CONTINUE UNTIL THE COMPLETE SYSTEM IS REPLACED.

C. COMPONENT RATING: (8.07) x (0.44) = 3.55
Possible Condition Component
Rating Value Multiplier Rating

MECHANICAL/HEATING

FAC # 295

DATE: 10/90

INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a)Heat Source:

Central Plant Steam YES, CONVERTED TO HHW AT THE GREENHOUSE.

Central Plant Hot Water NO

Boilers: Type GREENHOUSE HAS BOILERS AS BACK-UP.

Size

Furnace: Type N/A

Size

Heat Pump: Type YES, ONE ON ROOF FOR LABORATORY (CARRIER)

Size

Burners: gas N/A

oil

(b)System Type:

Steam NO

Hot Water YES

Air YES

Electric NO

Solar NO

Other N/A

(c)Space Equipment:

Radiators NO

Convectors YES, ON OUTSIDE WALLS

Finned Tube NO

Baseboard NO

2-Pipe Fan Coil YES, IN ENTRANCE AREAS AND STAIRWELLS

4-Pipe Fan Coil N/A

Unit Ventilators N/A

Multizone N/A

Radiant Panels N/A

Double Duct YES, MODIFIED TO WORK AS VAV.

Terminal Reheat N/A

Other N/A

(d)Control Type:

Pneu YES, FOR BUILDING CONTROLS

Electric NO

Electronic NO

DDC YES, TO CONTROL SYSTEM FROM ENERGY MANAGEMENT.

B. COMMENTS:

1. UNIT CONVECTORS ARE FALLING OFF OF THE WALL IN 365 & 371.

2. SIX (6) FAN COIL UNITS IN THE STAIRWAY ENTRANCES ARE VERY DIRTY. PREVENTATIVE MAINTENANCE OF THESE UNITS NEEDS TO BE PERFORMED.

C. COMPONENT RATING: $(\underline{7.51}) \times (\underline{0.56}) = \underline{4.21}$
Possible Condition Component
Rating Value Multiplier Rating

COOLING & VENTILATING

FAC # 295

DATE: 10/90

INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a) System:

Type CHILLED WATER IS SUPPLIED BY KOTTMAN HALL.

Capacity N/A

(b) Chillers:

Centrifugal N/A

Reciprocating N/A

Absorption N/A

(c) Cooling Towers:

Type N/A

Capacity N/A

(d) Condensers:

N/A

(e) Space Equipment:

Direct Expansion -

Window units YES, TWO UNITS

Thru-the-wall NO

single zone NO

all-air multizone N/A

single zone con. vol. N/A

Air/Water -

2-pipe fan coil YES, IN ENTRANCE AREAS

unit ventilators NO

induction NO

4-pipe fan coil NO

terminal reheat NO

self contained NO

variable volume YES, A MODIFIED DUAL DUCT SYSTEM

var. vol. reheat NO

(f) Special Systems:

Type N/A Capacity

(g) Control Systems:

Pneu YES, FOR THERMOSTATS AND BUILDING CONTROLS

Electric NO

Electronic NO

(h) Fans:

Exhaust YES

Recirculating YES

B. COMMENTS:

1. THE ABSORPTION CHILLER IN THE GREENHOUSE HAS BEEN SHUT DOWN FOR SEVERAL YEARS. CHILLED WATER IS SUPPLIED TO HOWLETT FROM A CENTRIFUGAL CHILLER IN KOTTMAN HALL.

2. THE CHILLED WATER PIPING IS SHOWING SIGNS OF CORROSION AND HAS BEEN REPAIRED SEVERAL TIMES OVER THE PAST FEW YEARS TO STOP WATER LEAKS. THIS PIPING SYSTEM IS GOING TO HAVE CONTINUED INCREASES IN MAINTENANCE COSTS AS THE SYSTEM AGES.

C. COMPONENT RATING: (11.71) x (0.56) = 6.56
Possible Condition Component
Rating Value Multiplier Rating

ELECTRICAL/SERVICE & DISTRIBUTION

FAC # 295 DATE: 10/90 INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a)Service:

Substation UNIVERSITY CIRCUIT 201/306

Primary Voltage 13.2 KV

Transformer:

Manufacture	Type	KVA	Secondary Voltages
<u>G.E. M156914</u>	<u>Silicone</u>	<u>1500</u>	<u>208Y/120</u>
<u>G.E. M156915</u>	<u>Silicone</u>	<u>1500</u>	<u>480Y/277</u>

Switchgear (type and capacity)

(b)Distribution System:

Panel (type)	<u>DB-100</u>	<u>DB-75</u>
Voltage	<u>208/120</u>	<u>480/277</u>
Amperage	<u>4000 AMPS</u>	<u>2000 AMPS</u>
Conduit	<u>YES</u>	
Conductor	<u>N/A</u>	
Wire (type)	<u>N/A</u>	
Armored Cable	<u>N/A</u>	
Other	<u>N/A</u>	

(c)Emergency System:

General or (type & capacity) EMERGENCY GENERATOR AT THE GREENHOUSE

B. COMMENTS:

1. THE DEMAND METER INDICATED THAT THE MAXIMUM AMPERAGE DRAWN AS OF 10-24-90 WAS 825 AMPS. THIS IS LESS THAN 25% OF THE TRANSFORMER CAPACITY.

C. COMPONENT RATING: $(\underline{1.68}) \times (\underline{1.00}) = \underline{1.68}$

Possible	Condition	Component
Rating	Value Multiplier	Rating

ELECTRICAL/LIGHTING & POWER

FAC # 295

DATE: 10/90

INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a)Lighting (lamp type):

Fluor YES, CLASSROOMS, HALLWAYS, LABORATORIES & OFFICES

Incand YES, IN THE ENTRANCE LOBBY & CONFERENCE ROOM

HID NO

Other N/A

(b)Emergency Lighting:

Battery Pack(#) NO

In Fixture(#) NO

Exit Lights(#) YES

Lights on Emergency Power(#) YES, STANDBY GENERATOR

(c)Motors and Starters:

Type and Capacity YES, SEVERAL FOR FANS, ELEVATOR & ETC.

(d)Receptacles & Switches:

Type & Capacity N/A

(e)Special:

Baseboard Heat NO

Lightning Protection YES, ON THE ROOF PARAPET

Communication & Alarm N/A

Data Systems N/A

B. COMMENTS:

1. THE EXTERIOR LIGHTS AT THE FRONT ENTRANCE HANG FROM THE CANOPY AND SWING IN THE WIND. THESE FIXTURES ARE DIFFICULT TO CHANGE BULBS AND TO KEEP CLEAN. THE REPLACEMENT OF THESE FIXTURES WITH WITH A CEILING MOUNTED HIGH PRESSURE SODIUM FIXTURE WOULD REDUCE ENERGY CONSUMPTION AND WOULD BE AN IMPROVEMENT TO THE OVERALL APPEARANCE OF THE FRONT ENTRANCE TO THE BUILDING.

2. THE FLUORESCENT FIXTURES THROUGH OUT THE BUILDING SHOULD BE CLEANED TO IMPROVE APPEARANCE AND LIGHT BRIGHTNESS.

C. COMPONENT RATING: $(\underline{11.10}) \times (\underline{0.99}) = \underline{10.99}$

Possible	Condition	Component
Rating	Value Multiplier	Rating

SAFETY STANDARDS

FAC # 295

DATE: 10/90

INSPECTOR: RDL

A. SYSTEM DESCRIPTION

(a) Exits:

Stair Construction:

concrete YES

steel NO

wood NO

Number of exits TWO, AT THE END OF THE HALLWAYS

(b) Fire Rating:

Construction Type: I X II III IV V VI

Building Height: N/A ft., FOUR (4) stories

(c) Extinguishing Systems:

Portable YES

Standpipe YES

Hose Cabinets YES

Sprinklers NO

Suppression NO

Other N/A

(d) Detection & Alarm Systems:

Manual Alarm YES

Annunciator YES

Smoke Detectors NO

(e) Lighting Systems:

Exit Signs YES

Exit Lighting YES

Emergency Lighting YES

Emergency Generator YES

B. COMMENTS:

1. THE FRONT STEPS ARE UNEVEN FROM SETTLEMENT AND NEED TO BE LEVELED.

2. THE HANDRAILS ON THE FRONT STEPS ARE LOOSE AND NEED TO BE PROPERLY SECURED.

3. ASBESTOS CONTAINING MATERIALS WERE FOUND IN ROOMS 008, 015 & 064 DURING THE OHIO BOARD OF REGENTS ASBESTOS SURVEY IN 1986.

C. COMPONENT RATING: (6.10) X (1.00) = 6.10
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 first step up at all entries. Ramps outside the buildings are included; the steps and walks up to the ramps are not 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 DUCK 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

Reduced Building Floor Plans
C-1 Building Space Assignments