

EAST CAROLINA UNIVERSITY

Facility Condition Assessment

Old Cafeteria Complex

Asset 047

Inspected January 26, 2023



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FACILITY CONDITION ASSESSMENT

SECTION 1

ASSET OVERVIEW

ASSET EXECUTIVE SUMMARY

All costs shown as Present Value

ASSET CODE 047	CURRENT REPLACEMENT VALUE \$25,450,000
ASSET NAME OLD CAFETERIA COMPLEX	FACILITY CONDITION NEEDS INDEX 0.14
ASSET USE Office / Administrative	FACILITY CONDITION INDEX 0.04
YEAR BUILT 1909	10-YEAR \$/SF 77.13
GSF 46,268	
INSPECTION DATE 01/26/2023	

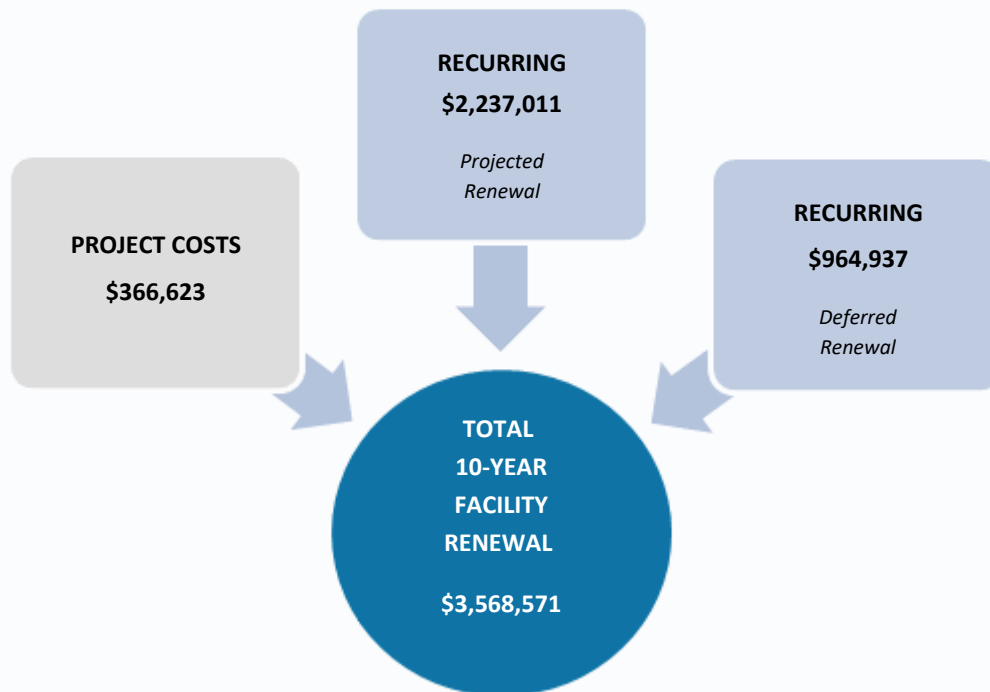
FCNI Scale

The FCNI for this asset is **0.14**

- Excellent Condition (typically new construction)
- Below Average Condition (major renovation required)
- Good Condition (maintained within lifecycle)
- Poor Condition (total renovation required)
- Fair Condition (normal renovations required)
- Replacement Indicated (unless historic)



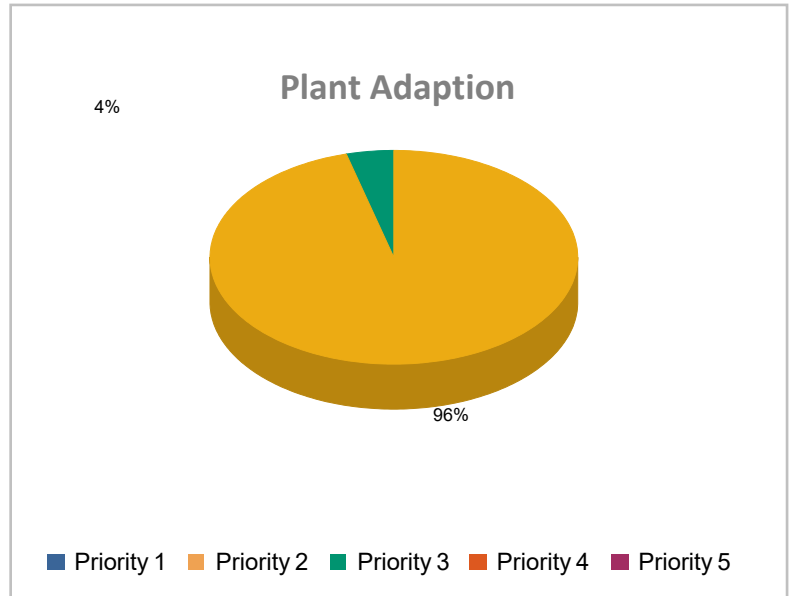
Total Facility Renewal Costs



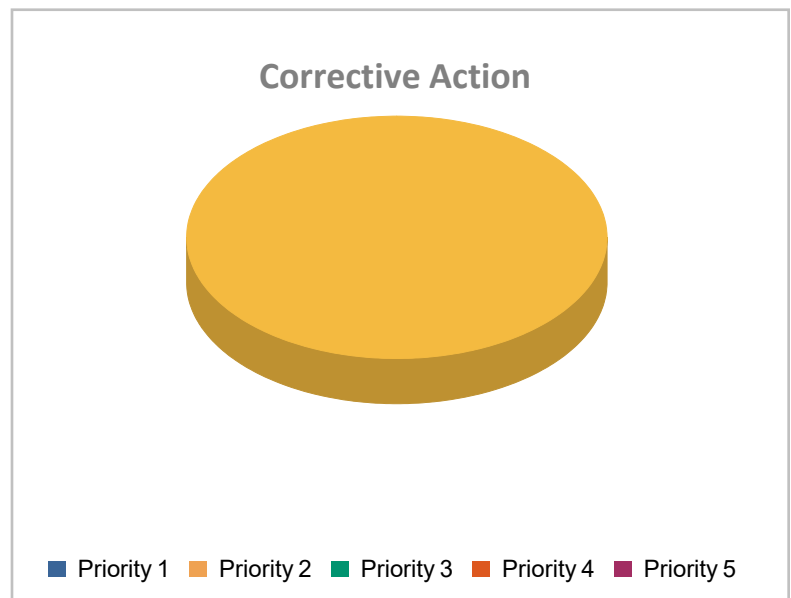
Project Costs

Project Cost by Priority

PLANT ADAPTION	
Priority 1	\$0
Priority 2	\$167,227
Priority 3	\$7,368
Priority 4	\$0
Priority 5	\$0

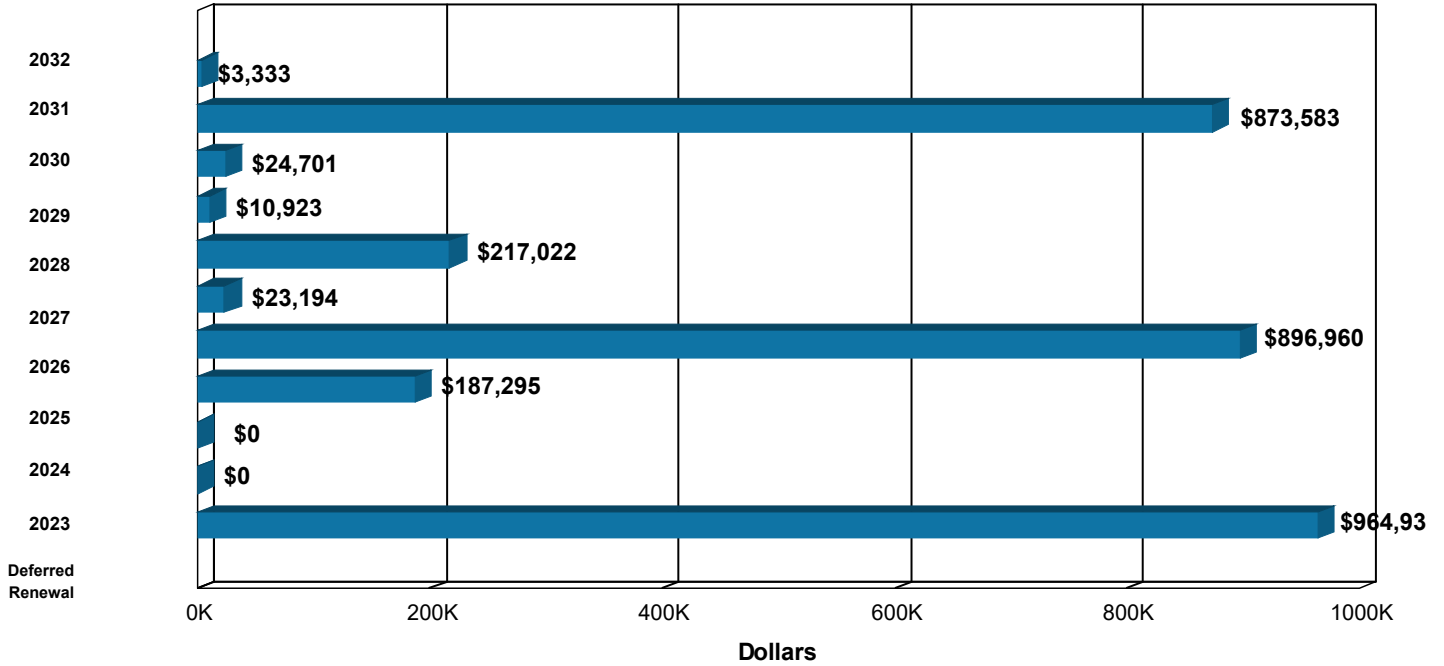


CORRECTIVE ACTION	
Priority 1	\$0
Priority 2	\$192,028
Priority 3	\$0
Priority 4	\$0
Priority 5	\$0

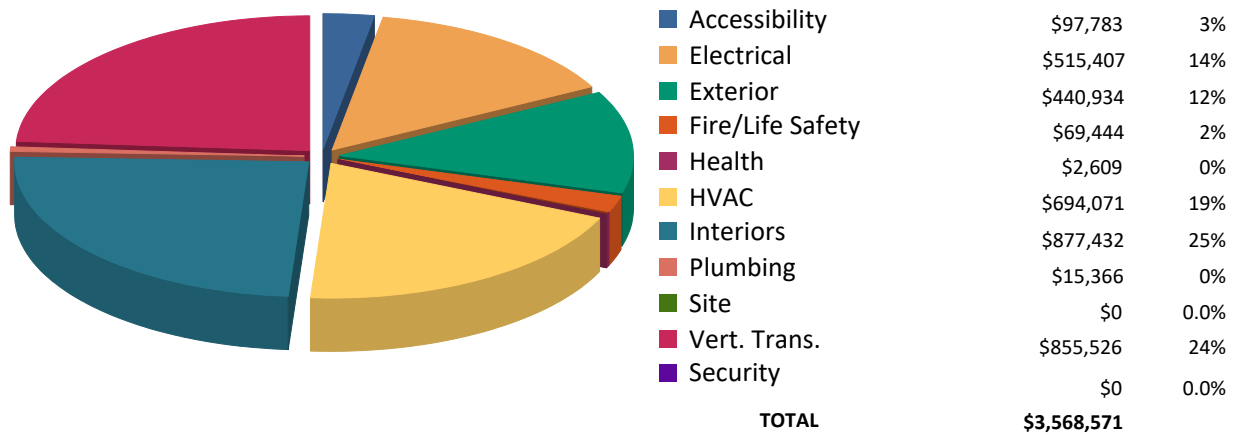


Recurring Costs

Component Replacement Cost by Year



Facilities Renewal Cost by System



ASSET SUMMARY

The Old Cafeteria Complex is a multi-story administrative office building at East Carolina University. Built in 1909, this 46,268 gross square foot building contains primarily offices, meeting rooms, and learning centers. Due to fire and university growth, the original building was added onto in 1915, 1927, 1946, and 1985. The last finish upgrades were reportedly in 2010.

The information in this report was gathered during a site visit conducted on January 26, 2023.

Site

The site has a slight east to west slope and is situated in the center of the campus. It has a mixture of pedestrian walkways, grassy lawns, shrubbery, and trees. The walkways leading to the entrances are in good condition. No site upgrades are recommended within the report scope.

Exterior Structure

Brick veneer is the primary exterior finish. While the brick is fundamentally sound, exposure to the elements has caused some deterioration of the mortar joints and expansion joints. Cleaning, surface prep, selective repairs, and applied finish or penetrating sealant upgrades are recommended to restore the aesthetics and integrity of the building envelope. The metal frame, dual-pane windows are in good condition and not expected to need replacement within the next ten years.

Exterior doors are painted metal (some with glass panels) and glass storefront. While the metal doors should outlast the report scope, the storefront doors will reach the end of their expected service life within the report scope and should be considered for replacement.

The building has mission clay tile and flat modified bitumen roofs, both of which are in fair condition. Water is evacuated via roof drains and gutters, and there are no reports of leaks or signs of water infiltration. The clay tile roof, gutters, and downspouts should outlast the scope of this report. The modified bitumen roof, however, is due for replacement.

Interior Finishes/Systems

Floor finishes include carpeting, vinyl tile, terrazzo, hardwood, and ceramic tile. While the floor finishes are generally in good condition, the carpet and vinyl tile are near the end of their lifecycle and due for replacement and the terrazzo should be considered for resurfacing. Ceilings are mostly suspended acoustical tile and some painted drywall. Walls are painted in most areas and ceramic tile in the restrooms. These finishes are in good condition, but the painted walls and ceilings should be repainted as part of a cyclical renewal program. Interior doors are wood with metal frames and standard commercial locksets. No door upgrades are recommended within the next ten years. Break areas have

laminated counters and cabinetry. They are near the end of their lifecycle and should be replaced within the next ten years.

Accessibility

Accessibility legislation requires that stairs have graspable handrails on both sides, that the rails have a specific end geometry, and that the handrails continue horizontally at the landings. The stairs are deficient in handrail and guardrail design relative to current standards, and the stair finishes have deteriorated or are otherwise unsafe. Future renovation efforts should include comprehensive stair railing and finish upgrades.

The configuration of break room kitchenettes on the ground and second floors are a barrier to accessibility. The installation of wheelchair accessible kitchenette cabinetry is recommended.

The restrooms are not fully ADA compliant. Install compliant signage, grab bars, and hardware to improve accessibility. Also, several of the dual-level drinking fountains should be set in alcoves or be replaced with units with a tapered lower cabinet design.

The elevator is partially ADA compliant. It is recommended that a compliant hands-free phone be installed to meet current standards.

Health

Some of the vinyl tile in the corridors is suspected to contain asbestos. Prior to replacing this flooring, it should be properly investigated and abated.

Fire/Life Safety

Fall protection is required to protect workers on roofs over six feet above grade. The installation of hard looped tie-off points is recommended at intervals throughout the roof to support worker lifelines and harness personal protective equipment. Also install a metal guardrail around the roof hatch and a compliant wall-mounted vertical access ladder with safety cage to improve user safety and limit liability.

Egress paths are generally well marked by illuminated exit signs and emergency lighting. A modern point addressable Notifier fire alarm control panel in electrical room G204 monitors detection and notification devices throughout the building. Devices include manual pull stations, horn strobes, and open area and HVAC duct smoke detectors and CO2 sensors. The main panel and remote annunciators are newer than the devices and have significant remaining useful life. The devices are older but communicate with the new software and panel with no issues. No upgrade is recommended at this time.

The building is fully protected by an automated fire suppression sprinkler system. Hydraulic standpipes feed fire hose cabinets and sprinklers throughout the building, and the system is charged by pressurized

municipal water. A small pre-action pump is located in mechanical room G520, where the main fire risers are located.

HVAC

Heating, ventilation, and air conditioning are provided by unitary rooftop package units, split ductless units, and forced air units (air handlers) of various sizes. The 25 ton package unit serving the south wing offices will reach the end of its expected useful life within the report scope and should be planned for replacement. The first floor in this area is underserved by built-up air handlers located in small mechanical spaces, and humidity is a constant concern. These units should be replaced. It is likely that a small re-commissioning project will be necessary to properly design the HVAC system to condition these spaces.

Supplementary cooling in IT closets is provided by two split ductless units. Both should be planned for replacement within the next ten years.

Fan coil units and air handlers utilize hot and chilled water. Heating hot water is converted from campus-fed steam through a pressure reducing valve (PRV) and shell-and-tube heat exchanger. The PRV is near the end of its service life and should be planned for replacement. An electric condensate receiver collects condensate from the steam conversion process. Chilled water for cooling is provided from the adjacent Jenkins Art building. Electric pumps circulate hot and chilled water through the building. Above ceiling fan coil units temper air using both chilled and hot water coils, while air handlers are a mix of heating and cooling and cooling only. Consolidated exhaust fans provide toilet and general exhaust throughout the building. The only specific area of concern is built-up air handler #11, which served the lower south offices. This unit is ineffective and should be replaced with a modern unit capable of dehumidification as well as heating and cooling. Several other air handlers will reach the end of their expected useful life within the report scope and should also be replaced. The air distribution network consists of internally insulated and non-insulated metal ductwork. It adequately serves all areas of the building.

There are multiple generations of direct digital controls (DDC) that monitor and allow adjustments to the HVAC system, but the building is considered fully addressable with some difficulty. The preferred HVAC controls are Trane, and it is recommended that all non-Trane network controls be upgraded.

Electrical

Power is supplied underground from the campus 4,160 volt primary loop to a 500 kVA primary electrical transformer at the west exterior. Power is then fed to the basement electrical room to the main 277/480 volt (MDP) and 120/208 volt (DP), 3-phase distribution panels. The main transformer exhibits no leaks and should last beyond the report scope, as should the main distribution panels. Step-down transformers step the primary 480 voltage down to single-phase 120/240 volts and 3-phase 120/208 and 277 volt service. The secondary distribution system feeds safety switches, local panelboards, and devices and has been upgraded in phases. It should outlast the scope of this assessment.

Continuously operating HVAC equipment with electric motors are generally equipped with variable frequency drives (VFDs) for energy efficiency. All of these will reach the end of their expected useful life within the scope of this assessment and should be replaced.

A 55 kW diesel generator provides emergency power. Fuel is stored in a large day tank at the base of the generator. The unit only runs periodically, is run tested monthly, and should last another ten years. Automatic transfer switches engage emergency power when the generator is activated. These are also exercised regularly and should last another ten years.

Interior lighting is provided by fluorescent and LED, open parabolic and lay-in acrylic lens, surface-mounted and recessed fixtures. The T8 fluorescent fixtures are yellowing and exhibiting degradation of reflectivity. They should be planned for systematic replacement. LED lighting installed during recent renovations will outlast the scope of this assessment.

Exterior lighting is provided by LED and HID wall packs and recessed fluorescents. All are operational, but the recessed CFL fixtures should be planned for replacement. It is also recommended that additional exterior lighting be installed at the south entry/exit to ensure a safe environment for building users. Place all new lighting on photocell activation.

Plumbing

Domestic water is supplied through a copper piping network. Drain piping is cast-iron or plastic. The piping should last at least another ten years. Domestic hot water is produced by a relatively new commercial electric water heater. It should also outlast the report scope. Fire suppression water has a backflow preventer that is anticipated to need replacement within the next ten years. Restroom plumbing fixtures include wall-hung lavatories, tankless water closets, and urinals. All of these fixtures, as well as the utility sinks and kitchen sinks, are in satisfactory condition and should outlast the report.

Vertical Transportation

There are two hydraulic passenger elevators. Both are circa 2006 with submersible pumps, oil tanks, and solid state controllers. Both are functional but due for a modernization and controls upgrade towards the end of this assessment. The cabs should be remodeled at that time.

Note: The renewal needs outlined in this report were identified from the visual inspection and staff interviews. Our professional architectural and engineering inspectors examined the accessible equipment and various building components to determine what repairs or modifications may be necessary to restore the systems and asset to an acceptable condition, or to a level defined by the Client. The estimated costs represent correction of existing deficiencies and anticipated lifecycle failures within a ten-year period. These recommendations are to bring the facility to modern standards without any anticipation of change to facility space layout or function. The total costs include variable project delivery costs as determined by the Owner. The costs developed do not represent the cost of a complete facility renovation. Soft costs not represented in this report include telecommunications, security, furniture, window treatment, space change, program issues, relocation, swing space, contingency, or costs that could not be identified or determined from the visual inspection and available building information.

INSPECTION TEAM DATA

Report Development

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Project Manager

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Date of Inspection

January 26, 2023

Inspection Team Personnel

NAME	POSITION	SPECIALTY
Michelle Thompson	Facility Assessor	Interior Finishes, Exterior Structure, ADA Compliance, Site, Fire/Life Safety, Health
Jerry Watkins	Senior Project Manager	Mechanical, Electrical, Plumbing, Energy, Fire/Life Safety, Health

Client Contact

NAME	POSITION
Griffin L. Avin, CEFP	Director of Facilities Services, Health Sciences Campus Chief Sustainability Officer

DEFINITIONS

The following information is a clarification of the Facility Condition Assessment report using example definitions.

Overview

Recurring and Nonrecurring Facility Renewal Costs

Facility renewal costs are divided into two main categories – recurring and nonrecurring. Recurring costs are cyclical and consist primarily of major repairs to or replacement/rebuilding of facility systems and components (e.g., roof or HVAC system replacement at or past the end of its normal useful life). The tool for projecting the recurring renewal costs is the Renewable Component Inventory, which is explained in detail below. Nonrecurring costs typically consist of modifications or repairs necessary to comply with fire/life safety or accessibility code requirements or to address isolated, nonrecurring deficiencies that could negatively affect the structure of the facility or the systems and components within. For these nonrecurring costs, projects have been developed and include estimated material and labor costs.

Facility Condition Needs Index (FCNI)

The FCNI provides a lifecycle cost comparison. It is a ratio of the sum of the recurring and nonrecurring renewal costs over ten years to the current replacement value of the asset. The current replacement value is based on replacement with current construction standards for the facility use type, and not original design parameters. This index gives the university a comparison within all buildings for identifying worst case/best case building conditions.

$$\text{FCNI} = \frac{\text{Nonrecurring Projects} + \text{10-Year Recurring Component Renewal}}{\text{Current Replacement Value}}$$

Facility Condition Index (FCI)

The FCI is a ratio of the Deferred Renewal costs to the current replacement value.

$$\text{FCI} = \frac{\text{Deferred Renewal}}{\text{Current Replacement Value}}$$

Material and Labor Cost Factors and Additional Markups

The project costs are adjusted from the national averages to reflect conditions in Greenville using the R. S. Means City Cost Index for material and labor cost factors. The percentage adjustment of the national average is shown in the table below. Also included in the renewal costs are the construction markup (general contractor profit and overhead, construction management, permitting, accounting, site security, insurance, bonds, sales tax, institutional fees, site utilities, refuse fees, and insurance) and professional fees (architect or engineer design fees and in-house design costs).

GLOBAL MARKUP	%
Local Labor Index	71.3
Local Materials Index	100.7
Construction Markup	20.0
Professional Fees	16.0

Recurring Costs

Renewable Component Inventory and Cost Projections

The Renewable Component Inventory (starting on page 4.1.1) is based on industry standard lifecycle expectancies applied to an inventory of major systems and components within a facility. Each indicated component has the following associated information:

CATEGORY	DESCRIPTION
Component Code	A four-digit code assigned by AMS to the component
Component Description	Description of the individual component
Identifier	Identifying information can be entered as necessary.
Customer ID	Customer-provided equipment ID number
Location	The location of each component can be entered if applicable.
Quantity	The quantity of the listed component
Units	The unit of measure associated with the quantity
Complexity Factor	Adjusts the component replacement costs when it is anticipated that the actual cost will deviate from the average for that component
Total Cost	The unit cost multiplied by quantity, in today's dollars (note that this is a one-time renewal/replacement cost)
Install Date	This is the year that the component was or is estimated to have been installed. When this data is not available, the default is the year the asset was constructed.
Useful Life	Average life expectancy of the component
Useful Life Adjustment	An optional adjustment that lengthens or reduces the first lifecycle of the component
Replacement Year	Expresses when the next replacement should occur and is the sum of the install date, useful life, and any useful life adjustment

The component listing forms the basis of the Recurring Costs by Year report, which provides a year-by-year list of projected recurring renewal costs (in future year dollars) over the next ten years. Each individual component is assigned a replacement year based on lifecycles. For items already past the end of their lifecycle, the replacement year is shown as Deferred Renewal.

For a longer term perspective, the Recurring Component Expenditure Projections Graph presents recurring renewal cost projections over a 50-year period (starting from the date the report is run) based on each individual item's renewal cost and life span. Some components might require renewal several times within the 50-year model, while others might not occur at all. The vertical bars on the graph represent the accumulated total costs for each individual year. The average annual cost per gross square foot (\$/GSF) is shown at the bottom of the graph. In this calculation, costs are not escalated. This figure can be utilized to assess the adequacy of existing capital renewal and repair budgets.

Recurring Cost Classifications

- **Deferred Renewal**
Recurring repairs, generated by the Renewable Component Inventory, that are past due for completion and have not yet been accomplished as part of normal maintenance or capital repair efforts. Further deferral could impair the proper functioning of the facility. Deferred Renewal upgrades should include compliance with applicable codes, even if such compliance requires expenditures beyond those essential to effect the needed repairs.
- **Projected Renewal**
Recurring renewal efforts, generated by the Renewable Component Inventory, that will be due within the scope of the assessment. These are regular or normal facility maintenance, repair, or renovation efforts that should be planned in the near future.

Nonrecurring Costs

As previously mentioned, modifications or repairs necessary to comply with fire/life safety or accessibility code requirements and those that address isolated, nonrecurring deficiencies that could negatively affect the structure of the facility or the systems and components within are not included in the Renewable Component Inventory. For each such deficiency identified during the facility inspection, a project with an estimated cost to rectify said deficiency is recommended. These projects each have a unique identifier and are categorized by system type, priority, and classification, which are defined below. The costs in these projects are also indexed to local conditions and markups applied as the situation dictates.

Project Number

Each project has a unique number consisting of three elements, the asset identification number, system code, and a sequential number assigned by the FCA software. For example, the third fire/life safety project identified for asset 0001 would have a project number of 0001FS03 (0001 for the asset number, FS for fire/life safety, and 03 being the next sequential number for a fire/life safety project).

Project Classifications

- **Plant Adaption**
Nonrecurring expenditures, stored in the Projects module, required to adapt the physical plant to the evolving needs of the institution and to changing codes or standards. These are expenditures beyond normal maintenance. Examples include compliance with changing codes (e.g., accessibility), facility alterations required by changing teaching or research methods, and improvements occasioned by the adoption of modern technology (e.g., the use of personal computer networks).
- **Corrective Action**
Nonrecurring expenditures, stored in the Projects module, for repairs needed to correct random and unpredictable deficiencies. Such projects are not related to aligning a building with codes or standards. Deficiencies classified as Corrective Action could have an effect on building aesthetics, safety, or usability.

Priority Classes

Recurring renewal needs do not receive individual prioritization, as the entire data set of needs in this category is year-based. Each separate component has a distinct need year, rendering further prioritization unnecessary. Each nonrecurring renewal project, however, has a priority assigned to indicate the criticality of the recommended work. The prioritization utilized for this subset of the data is as follows.

- **Priority 1 – High**
Items in this category include:
 - a. correcting a cited safety hazard
 - b. stopping accelerated deterioration
 - c. returning a facility to normal operation
- **Priority 2 – Medium**
Items in this category include:
 - a. repairs to prevent further deterioration
 - b. improvements to facility approach/entry and access to goods and services (DOJ ADA title III, priorities 1 and 2)
 - c. correction of potential safety hazards

- **Priority 3 – Low**

Items in this category include:

- a. improving access to restrooms and other amenities (DOJ ADA title III, priorities 3 and 4)
- b. bringing a facility into compliance with current building codes as grandfather clauses expire
- c. increasing usability following an occupancy or use change
- d. actions that are recommended but not required by code

Project Subclass

Subclass ratings are assigned to accessibility upgrade activities based on the four Department of Justice priority rankings recommended by the Title III regulations for planning readily achievable barrier removal projects. These ratings are:

- DOJ1 Accessible approach and entrance
- DOJ2 Access to goods and services
- DOJ3 Access to restrooms
- DOJ4 Any other necessary measures

Category Codes

CATEGORY CODE*	SYSTEM DESCRIPTION
AC1A – AC4B	ACCESSIBILITY
EL1A – EL8A	ELECTRICAL
ES1A – ES6E	EXTERIOR STRUCTURE
FS1A – FS6A	FIRE/LIFE SAFETY
HE1A – HE7A	HEALTH
HV1A – HV8B	HVAC
IS1A – IS6D	INTERIOR FINISHES/SYSTEMS
PL1A – PL5A	PLUMBING
SI1A – SI4A	SITE
VT1A – VT7A	VERTICAL TRANSPORTATION

<i>Example:</i> Category Code = EL5A	
EL	System Description
5	Component Description
A	Element Description

Priority Sequence

A Priority Sequence number is automatically assigned to each project to rank the projects in order of relative criticality and show the recommended execution order. This number is calculated based on the Priority Class and identified system of each project.

<i>Example</i>			
Priority Class	Category Code	Project Number	Priority Sequence
1	HV2C	0001HV04	01
1	PL1D	0001PL02	02
2	IS1E	0001IS06	03
2	EL4C	0001EL03	04

Drawings

Floor plans for this facility are provided as a reference.

Photographs

A code shown on the Photo Log identifies the asset number, photo sequence, and a letter designation for architect (a) or engineer (e).

<i>Example:</i>	
Photo Number: 0001006e	
0001	Asset Number
006	Photo Sequence
e	Engineering Photo

Sustainability/Energy Analysis

Energy/resource conservation measures (ECMs) are recommendations that will reduce resource consumption or the rate of growth in consumption. Examples include improving the efficiency of an HVAC system (e.g., digital motor speed controls, exhaust energy recovery, retrocommissioning) or directly reducing the consumption of a resource (e.g., low flow plumbing fixtures, high-efficiency lighting, or structural insulation improvement). Where significant conservation opportunities are evident for this facility, ECMs are identified and tabulated in Section 7 as a basis for further viability investigation.

FACILITY CONDITION ASSESSMENT

SECTION 2

COST SUMMARIES
AND TOTALS

RENEWAL NEEDS MATRIX

All dollars shown as Present Value

CATEGORY	NONRECURRING PROJECT NEEDS			RECURRING COMPONENT REPLACEMENT NEEDS											
	Immediate	Critical	Noncritical	Deferred Renewal	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	TOTAL
ACCESSIBILITY	0	97,783	0	0	0	0	0	0	0	0	0	0	0	0	\$97,783
EXTERIOR	0	0	0	422,878	0	0	0	0	0	0	0	0	18,057	0	\$440,934
INTERIOR	0	0	0	453,841	0	0	0	401,148	0	0	0	22,442	0	0	\$877,432
PLUMBING	0	0	0	0	0	0	0	15,366	0	0	0	0	0	0	\$15,366
HVAC	0	192,028	0	88,218	0	0	165,782	5,376	18,978	217,022	3,333	0	0	3,333	\$694,071
FIRE/LIFE SAFETY	0	69,444	0	0	0	0	0	0	0	0	0	0	0	0	\$69,444
ELECTRICAL	0	0	4,759	0	0	0	21,513	475,070	4,217	0	7,590	2,258	0	0	\$515,407
SITE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$0
VERT. TRANS.	0	0	0	0	0	0	0	0	0	0	0	0	855,526	0	\$855,526
HEALTH/EQUIP.	0	0	2,609	0	0	0	0	0	0	0	0	0	0	0	\$2,609
SUBTOTAL	\$0	\$359,255	\$7,368	\$964,937	\$0	\$0	\$187,295	\$896,960	\$23,194	\$217,022	\$10,923	\$24,701	\$873,583	\$3,333	\$3,568,571
TOTAL NONRECURRING PROJECT NEEDS			\$366,623	TOTAL RECURRING COMPONENT REPLACEMENT NEEDS											\$3,201,949

CURRENT REPLACEMENT VALUE	\$25,450,000
FACILITY CONDITION NEEDS INDEX	0.14
FACILITY CONDITION INDEX	0.04

GSF	TOTAL 10-YEAR FACILITY RENEWAL NEEDS	10-YEAR NEEDS/SF
46,268	\$3,568,571	\$77.13

RENEWAL NEEDS BY SYSTEM

All costs shown as Present Value

CATEGORY	NONRECURRING PROJECT COSTS	RECURRING COMPONENT REPLACEMENT COSTS	TOTAL 10-YEAR FACILITY RENEWAL COSTS
ACCESSIBILITY	\$97,783	\$0	\$97,783
EXTERIOR	\$0	\$440,934	\$440,934
INTERIOR	\$0	\$877,432	\$877,432
PLUMBING	\$0	\$15,366	\$15,366
HVAC	\$192,028	\$502,043	\$694,071
FIRE/LIFE SAFETY	\$69,444	\$0	\$69,444
ELECTRICAL	\$4,759	\$510,647	\$515,407
SITE	\$0	\$0	\$0
VERT. TRANS	\$0	\$855,526	\$855,526
HEALTH	\$2,609	\$0	\$2,609
TOTALS	\$366,623	\$3,201,949	\$3,568,571

FACILITIES RENEWAL PLAN
 RECURRING COMPONENT REPLACEMENT COSTS

All costs shown as Present Value

ASSET CODE COMP CODE	COMPONENT	IDENTIFIER	CUSTOMER ID	LOCATION	UNI- FORMAT	REPLACEMENT YEAR	REPLACEMENT COST
047 EW01	WALL, EXTERIOR, MASONRY POINTING	RED BRICK		EXTERIOR	B2010	Deferred Renewal	330,881
047 RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP	FLAT		ROOF	B3010	Deferred Renewal	91,996
047 IW01	WALL FINISH - PAINT, STANDARD	PTD DRYWALL		FLR G-2	C3010	Deferred Renewal	237,840
047 IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	BROADLOOM		FLR G-2	C3020	Deferred Renewal	184,115
047 IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	ACM VCT		CORRIDOR	C3020	Deferred Renewal	6,403
047 IF09	FLOORING - TERRAZZO RESURFACE			FLR 2	C3020	Deferred Renewal	25,483
047 AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AH#11	11727	G134	D3040	Deferred Renewal	53,468
047 BA14	HVAC CONTROLS - TERMINAL ASSEMBLIES - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	D3060	Deferred Renewal	24,434
047 BA37	HVAC CONTROLS - FIELD PANELS/OPS SOFTWARE - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	D3060	Deferred Renewal	6,761
047 BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	D3060	Deferred Renewal	3,555
047 BA14	HVAC CONTROLS - TERMINAL ASSEMBLIES - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	D3060	2025	116,879
047 BA37	HVAC CONTROLS - FIELD PANELS/OPS SOFTWARE - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	D3060	2025	32,342
047 BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	D3060	2025	16,561
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#3 VFD SQ D		G410	D5010	2025	2,530
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#1 VFD SQ D		G520	D5010	2025	4,217
047 VF04	VARIABLE FREQUENCY DRIVE (10-15 HP)	AH#2 VFD SQ D		G520	D5010	2025	7,383

FACILITIES RENEWAL PLAN
 RECURRING COMPONENT REPLACEMENT COSTS

All costs shown as Present Value

ASSET CODE COMP CODE	COMPONENT	IDENTIFIER	CUSTOMER ID	LOCATION	UNI- FORMAT	REPLACEMENT YEAR	REPLACEMENT COST
047 VF04	VARIABLE FREQUENCY DRIVE (10-15 HP)	AH#4 VFD SQ D		G301	D5010	2025	7,383
047 DR24	DOOR LOCK, COMMERCIAL-GRADE	HM DRS		EXTERIOR	C1020	2026	9,861
047 DR24	DOOR LOCK, COMMERCIAL-GRADE	WOOD		OFFICES	C1020	2026	201,697
047 DR26	DOOR PANIC HARDWARE	GLASS DRS		EXTERIOR	C1020	2026	5,866
047 CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD	LAMINATE		FLR G-2	C1030	2026	61,673
047 IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VCT		FLR G-2	C3020	2026	122,051
047 BF05	BACKFLOW PREVENTER (4-6 INCHES)	FIRE - ZURN		SOUTH SIDE	D2020	2026	15,366
047 HX09	PRESSURE REDUCING VALVE, STEAM SYSTEM (2")	SPENCE MED TO SVC PRESSURE		G520	D3040	2026	5,376
047 LI14	LIGHTING SYSTEM, INTERIOR - OFFICE	T8 FLUOR		THROUGHOUT	D5020	2026	475,070
047 AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	AH#13	11728	G137	D3040	2027	10,844
047 AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	AH#12	11729	G137	D3040	2027	8,133
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#11 VFD WEG		G134	D5010	2027	4,217
047 HU37	PACKAGE HVAC UNIT, DX, GAS OR ELECTRIC HEAT, MULTI-ZONE (9-35 TON)	RT#1 TRANE	11726	ROOF, SOUTH SIDE	D3050	2028	217,022
047 HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU#1 FUJITSU	22382	ROOF, SOUTH SIDE	D3030	2029	3,333
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#1 VFD ABB		ATTIC (ABOVE 2300)	D5010	2029	1,265
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#2 VFD ABB		ATTIC (ABOVE 2300)	D5010	2029	1,265

FACILITIES RENEWAL PLAN
 RECURRING COMPONENT REPLACEMENT COSTS

All costs shown as Present Value

ASSET CODE COMP CODE	COMPONENT	IDENTIFIER	CUSTOMER ID	LOCATION	UNI- FORMAT	REPLACEMENT YEAR	REPLACEMENT COST
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#3 VFD ABB		ATTIC (ABOVE 2300)	D5010	2029	1,265
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#4 VFD ABB		ATTIC (ABOVE 2300)	D5010	2029	1,265
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#5 VFD ABB		ATTIC (ABOVE 2300)	D5010	2029	1,265
047 VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#6 VFD ABB		ATTIC (ABOVE 2300)	D5010	2029	1,265
047 IC04	CEILING FINISH - PAINTED OR STAINED, STANDARD	PTD DRYWALL		FLR G-2	C3030	2030	22,442
047 LE03	LIGHTING - EXTERIOR, RECESSED (INC, CFL, LED)	RECESSED CFL		ALL ELEVATIONS	D5020	2030	2,258
047 DR12	DOOR AND STOREFRONT, EXTERIOR, SWINGING, ALUMINUM AND GLASS	METAL & GLASS		EXTERIOR	B2030	2031	18,057
047 VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEVATOR 2	11746	G206	D1010	2031	363,640
047 VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEVATOR 3	11747	G321	D1010	2031	363,640
047 VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEVATOR 2	11746	ELEV 2 CAB	D1010	2031	64,123
047 VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEVATOR 3	11747	ELEV 3 CAB	D1010	2031	64,123
047 HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU#1 MITSUBISHI		ROOF, SOUTH SIDE	D3030	2032	3,333
TOTAL							\$3,201,949

FACILITIES RENEWAL PLAN
NONRECURRING PROJECT COSTS

All costs shown as Present Value

PROJECT NUMBER	PROJECT TITLE	UNI-FORMAT	PRIORITY CLASS	PROJECT CLASSIFICATION	PROJECT COST
047AC01	RESTROOM AND DRINKING FOUNTAIN ACCESSIBILITY UPGRADES	D2010	2	Plant Adaption	28,788
047AC02	KITCHENETTE ACCESSIBILITY UPGRADES	C1010	2	Plant Adaption	29,917
047AC03	STAIR RAILING UPGRADES	C2020	2	Plant Adaption	35,711
047AC04	ELEVATOR ACCESSIBILITY UPGRADES	D1010	2	Plant Adaption	3,367
047FS01	ADD ROPE DAVITS TO SUPPORT WORKER FALL PROTECTION	B3010	2	Plant Adaption	58,611
047FS02	INSTALL COMPLIANT LADDER WITH SAFETY CAGE	B3020	2	Plant Adaption	4,948
047FS03	ADD ROOF HATCH FALL PROTECTION	B3020	2	Plant Adaption	5,885
047HV01	HVAC RECOMMISSIONING	D3080	2	Corrective Action	192,028
047EL01	ADD EXTERIOR LIGHTING	D5020	3	Plant Adaption	4,759
047HE01	ASBESTOS ABATEMENT - INTERIOR FINISH SYSTEMS	C3020	3	Plant Adaption	2,609
TOTAL					\$366,623

FACILITY CONDITION ASSESSMENT

SECTION 3

NONRECURRING
PROJECT DETAILS

All costs shown as Present Value

INSTALL COMPLIANT LADDER WITH SAFETY CAGE			
Project Number:	047FS02	Category Code:	
Priority Sequence:	1	FS6A	
Priority Class:	Medium	System:	FIRE/LIFE SAFETY
Project Class:	Plant Adaption	Component:	GENERAL
Date Basis:	2/20/2023	Element:	OTHER

Code Application:		Subclass/Savings:	Project Location:
OSHA	1910.27	Not Applicable	Item Only: Floor(s) 2

Description

The vertical roof access ladder lacks an OSHA compliant safety cage. Install a new wall-mounted ladder and cage to improve user safety and limit liability

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
Vertical safety ladder with cage	LF	30	\$65.20	\$1,956	\$74.08	\$2,222	\$4,178
Base Material/Labor Costs				\$1,956		\$2,222	
Indexed Material/Labor Costs				\$1,970		\$1,585	\$3,554
Construction Mark Up at 20.0%							\$711
Original Construction Cost							\$4,265
Date of Original Estimate:	2/20/2023					Inflation	\$0
Current Year Construction Cost							\$4,265
Professional Fees at 16.0%							\$682
TOTAL PROJECT COST							\$4,948

All costs shown as Present Value

ADD ROPE DAVITS TO SUPPORT WORKER FALL PROTECTION			
Project Number:	047FS01	Category Code:	
Priority Sequence:	2	FS6A	
Priority Class:	Medium	System:	FIRE/LIFE SAFETY
Project Class:	Plant Adaption	Component:	GENERAL
Date Basis:	2/20/2023	Element:	OTHER

Code Application:	Subclass/Savings:	Project Location:
Not Applicable	Not Applicable	Floor-wide: Floor(s) R

Description

Rooftop fall protection is required to protect workers on roofs over six feet above grade. The installation of hard looped tie-off points is recommended at intervals throughout the roof to support worker lifelines and harness personal protective equipment.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
Allocation to install metal rope davits to support PPE equipment on roof	EA	50	\$391	\$19,570	\$628	\$31,415	\$50,985
Base Material/Labor Costs				\$19,570		\$31,415	
Indexed Material/Labor Costs				\$19,707		\$22,399	\$42,106
Construction Mark Up at 20.0%							\$8,421
Original Construction Cost							\$50,527
Date of Original Estimate:	2/20/2023					Inflation	\$0
Current Year Construction Cost							\$50,527
Professional Fees at 16.0%							\$8,084
TOTAL PROJECT COST							\$58,611

All costs shown as Present Value

ADD ROOF HATCH FALL PROTECTION			
Project Number:	047FS03	Category Code:	
Priority Sequence:	3	FS6A	
Priority Class:	Medium	System:	FIRE/LIFE SAFETY
Project Class:	Plant Adaption	Component:	GENERAL
Date Basis:	2/20/2023	Element:	OTHER

Code Application:		Subclass/Savings:	Project Location:
OSHA	29 CFR 1910.21(A) (4)	Not Applicable	Item Only: Floor(s) R
OSHA	29 CFR 1910.23(E) (8)		

Description

OSHA standards dictate that roof access hatches have fall protection on the periphery. Install an appropriately designed metal guardrail around the hatch on the roof.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
Metal pipe guard rail, average	LF	36	\$98.97	\$3,563	\$24.93	\$897	\$4,460
Base Material/Labor Costs				\$3,563		\$897	
Indexed Material/Labor Costs				\$3,588		\$640	\$4,228
Construction Mark Up at 20.0%							\$846
Original Construction Cost							\$5,073
Date of Original Estimate:	2/20/2023					Inflation	\$0
Current Year Construction Cost							\$5,073
Professional Fees at 16.0%							\$812
TOTAL PROJECT COST							\$5,885

All costs shown as Present Value

RESTROOM AND DRINKING FOUNTAIN ACCESSIBILITY UPGRADES			
Project Number:	047AC01	Category Code:	
Priority Sequence:	4	AC3E	
Priority Class:	Medium	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	2/18/2023	Element:	RESTROOMS/BATHROOMS

Code Application:		Subclass/Savings:	Project Location:
ADAAG	211, 602, 604-608	DOJ3 - Restrooms	Floor-wide: Floor(s) 1,2,G

Description

The restrooms are not fully ADA compliant. Install compliant signage, grab bars, and hardware to improve accessibility. Also, several of the dual-level drinking fountains should be set in alcoves or be replaced with units with a tapered lower cabinet design.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
Install grab bars	SYS	8	\$232	\$1,858	\$546	\$4,372	\$6,229
Alcove construction for drinking fountain	EA	2	\$1,438	\$2,876	\$6,137	\$12,274	\$15,150
ADA compliant signage	EA	2	\$87.09	\$174	\$25.61	\$51	\$225
Base Material/Labor Costs				\$4,908		\$16,697	
Indexed Material/Labor Costs				\$7,607		\$13,074	\$20,681
Construction Mark Up at 20.0%							\$4,136
Original Construction Cost							\$24,818
Date of Original Estimate:	2/18/2023		Inflation				\$0
Current Year Construction Cost							\$24,818
Professional Fees at 16.0%							\$3,971
TOTAL PROJECT COST							\$28,788

All costs shown as Present Value

KITCHENETTE ACCESSIBILITY UPGRADES			
Project Number:	047AC02	Category Code:	
Priority Sequence:	5	AC4A	
Priority Class:	Medium	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	GENERAL
Date Basis:	2/18/2023	Element:	FUNCTIONAL SPACE MOD.

Code Application:		Subclass/Savings:	Project Location:
ADAAG	804	DOJ2 - Access to Goods & Services	Item Only: Floor(s) 2,G

Description

The configuration of break room kitchenettes on the ground and second floors are a barrier to accessibility. The installation of wheelchair accessible kitchenette cabinetry is recommended.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
ADA compliant kitchenette unit with base cabinetry, overhead cabinetry, and amenities	EA	2	\$8,553	\$17,106	\$2,992	\$5,984	\$23,089
Base Material/Labor Costs				\$17,106		\$5,984	
Indexed Material/Labor Costs				\$17,225		\$4,267	\$21,492
Construction Mark Up at 20.0%							\$4,298
Original Construction Cost							\$25,790
Date of Original Estimate:	2/18/2023					Inflation	\$0
Current Year Construction Cost							\$25,790
Professional Fees at 16.0%							\$4,126
TOTAL PROJECT COST							\$29,917

All costs shown as Present Value

ELEVATOR ACCESSIBILITY UPGRADES			
Project Number:	047AC04	Category Code:	
Priority Sequence:	6	AC3A	
Priority Class:	Medium	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	3/23/2023	Element:	LIFTS/RAMPS/ELEVATORS

Code Application:		Subclass/Savings:	Project Location:
ADAAG	405	DOJ2 - Access to Goods & Services	Item Only: Floor(s) 1

Description

The elevator is partially ADA compliant. It is recommended that a compliant hands-free phone be installed to meet current standards.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
ADA compliant hands-free elevator emergency telephone	EA	1	\$1,580	\$1,580	\$1,161	\$1,161	\$2,741
Base Material/Labor Costs				\$1,580		\$1,161	
Indexed Material/Labor Costs				\$1,591		\$828	\$2,419
Construction Mark Up at 20.0%							\$484
Original Construction Cost							\$2,902
Date of Original Estimate:	3/23/2023		Inflation				\$0
Current Year Construction Cost							\$2,902
Professional Fees at 16.0%							\$464
TOTAL PROJECT COST							\$3,367

All costs shown as Present Value

STAIR RAILING UPGRADES			
Project Number:	047AC03	Category Code:	
Priority Sequence:	7	AC3B	
Priority Class:	Medium	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	2/20/2023	Element:	STAIRS AND RAILINGS

Code Application:		Subclass/Savings:	Project Location:
IBC	1003.3	DOJ2 - Access to Goods & Services	Floor-wide: Floor(s) 1,2,G
ADAAG	505		

Description

Accessibility legislation requires that stairs have graspable handrails on both sides, that the rails have a specific end geometry, and that the handrails continue horizontally at the landings. The stairs are deficient in handrail and guardrail design relative to current standards, and the stair finishes have deteriorated or are otherwise unsafe. Future renovation efforts should include comprehensive stair railing and finish upgrades.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost	
Switchback handrail/guardrail system per floor	FLR	4	\$2,128	\$8,511	\$1,366	\$5,464	\$13,975	
Stair tread and landing finish upgrades per floor	FLR	4	\$2,377	\$9,508	\$1,267	\$5,068	\$14,576	
Base Material/Labor Costs				\$18,019		\$10,533		
Indexed Material/Labor Costs				\$18,145		\$7,510	\$25,655	
Construction Mark Up at 20.0%								\$5,131
Original Construction Cost								\$30,786
Date of Original Estimate:	2/20/2023				Inflation		\$0	
Current Year Construction Cost								\$30,786
Professional Fees at 16.0%								\$4,926
TOTAL PROJECT COST								\$35,711

All costs shown as Present Value

HVAC RECOMMISSIONING			
Project Number:	047HV01	Category Code:	
Priority Sequence:	8	HV3A	
Priority Class:	Medium	System:	HVAC
Project Class:	Corrective Action	Component:	HEATING/COOLING
Date Basis:	2/7/2023	Element:	SYSTEM RETROFIT/REPLACE

Code Application:		Subclass/Savings:	Project Location:
ASHRAE	0-2019,0.2-2015	Not Applicable	Undefined: Floor(s) 1

Description

This building is heated, cooled, and ventilated through a complex combination of unitary equipment (RTU and split ductless units), large air handlers, small modular air handlers, and fan coil units. Some areas are underserved and have difficulty maintaining occupant comfort and acceptable air quality. It is recommended that the building undergo recommissioning to identify potential solutions.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
Recommissioning study and repairs	SF	46,268	\$0.13	\$6,015	\$0.52	\$24,059	\$30,074
Anticipated repairs	LOT	1	\$75,000	\$75,000	\$55,000	\$55,000	\$130,000
Base Material/Labor Costs				\$81,015		\$79,059	
Indexed Material/Labor Costs				\$81,582		\$56,369	\$137,951
Construction Mark Up at 20.0%							\$27,590
Original Construction Cost							\$165,542
Date of Original Estimate:	2/7/2023				Inflation		\$0
Current Year Construction Cost							\$165,542
Professional Fees at 16.0%							\$26,487
TOTAL PROJECT COST							\$192,028

All costs shown as Present Value

ASBESTOS ABATEMENT - INTERIOR FINISH SYSTEMS			
Project Number:	047HE01	Category Code:	
Priority Sequence:	9	HE6A	
Priority Class:	Low	System:	HEALTH
Project Class:	Plant Adaption	Component:	HAZARDOUS MATERIAL
Date Basis:	3/23/2023	Element:	STRUCTURAL ASBESTOS

Code Application:		Subclass/Savings:	Project Location:
EPA	40 CFR 61.M, 763	Not Applicable	Area Wide: Floor(s) 1,2,G
OSHA	29 CFR 1910.1001, 1926.1101		

Description

Some of the vinyl tile in the corridors is suspected to contain asbestos. Prior to replacing this flooring, it should be properly investigated and abated.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
Typical asbestos abatement of floor tile and mastic	SF	830	\$0.38	\$315	\$2.63	\$2,183	\$2,498
Base Material/Labor Costs				\$315		\$2,183	
Indexed Material/Labor Costs				\$318		\$1,556	\$1,874
Construction Mark Up at 20.0%							\$375
Original Construction Cost							\$2,249
Date of Original Estimate:	3/23/2023				Inflation		\$0
Current Year Construction Cost							\$2,249
Professional Fees at 16.0%							\$360
TOTAL PROJECT COST							\$2,609

All costs shown as Present Value

ADD EXTERIOR LIGHTING			
Project Number:	047EL01	Category Code:	
Priority Sequence:	10	EL4A	
Priority Class:	Low	System:	ELECTRICAL
Project Class:	Plant Adaption	Component:	DEVICES AND FIXTURES
Date Basis:	2/7/2023	Element:	EXTERIOR LIGHTING

Code Application:	Subclass/Savings:	Project Location:
Not Applicable	Not Applicable	Undefined: Floor(s) 1

Description

It is recommended that additional exterior lighting be installed at the south entry/exit to ensure a safe environment for building users. Place all new lighting on photocell activation.

All costs shown as Present Value

Project Cost Estimate

Task Description	Unit	Qty	Material Unit Cost	Total Material Cost	Labor Unit Cost	Total Labor Cost	Total Cost
HID wall-mount fixture	EA	4	\$511	\$2,044	\$477	\$1,909	\$3,952
Base Material/Labor Costs				\$2,044		\$1,909	
Indexed Material/Labor Costs				\$2,058		\$1,361	\$3,419
Construction Mark Up at 20.0%							\$684
Original Construction Cost							\$4,103
Date of Original Estimate:	2/7/2023					Inflation	\$0
Current Year Construction Cost							\$4,103
Professional Fees at 16.0%							\$656
TOTAL PROJECT COST							\$4,759

FACILITY CONDITION ASSESSMENT

SECTION 4

LIFECYCLE COMPONENT
INVENTORY

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
EW01	WALL, EXTERIOR, MASONRY POINTING	RED BRICK		EXTERIOR	31,950	SF	1.12	\$330,881	1909	30	83	DR
WN01	GLASS, WINDOW, ALUMINUM OR WOOD, STANDARD	DUAL PANE		EXTERIOR	5,640	SF	1.12	\$1,164,015	2006	40		2046
DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	PTD HM		EXTERIOR	11	LEAF	1.00	\$26,893	2006	40		2046
DR12	DOOR AND STOREFRONT, EXTERIOR, SWINGING, ALUMINUM AND GLASS	METAL & GLASS		EXTERIOR	4	LEAF	1.00	\$18,057	2006	25		2031
RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP	FLAT		ROOF	11,300	SF	1.00	\$91,996	2001	20	1	DR
RR19	ROOF - TILE, CLAY, MISSION PAN AND CAP OR BARREL	PITCHED		ROOF	28,000	SF	1.00	\$1,071,238	2001	70		2071
RR21	ROOF GUTTER AND LEADER - COPPER, LEAD-COATED	GUTTERS & DOWNSPOUTS		ROOF	1,140	LF	1.00	\$68,022	1985	70		2055
DR02	DOOR AND FRAME, INTERIOR, FIRE-RATED	WOOD		OFFICES	225	LEAF	1.00	\$1,012,673	2006	40		2046
DR24	DOOR LOCK, COMMERCIAL-GRADE	WOOD		OFFICES	225	EA	1.00	\$201,697	2006	20		2026
DR24	DOOR LOCK, COMMERCIAL-GRADE	HM DRS		EXTERIOR	11	EA	1.00	\$9,861	2006	20		2026
DR26	DOOR PANIC HARDWARE	GLASS DRS		EXTERIOR	4	EA	1.00	\$5,866	2006	20		2026
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD	LAMINATE		FLR G-2	95	LF	1.00	\$61,673	2006	20		2026
IW01	WALL FINISH - PAINT, STANDARD	PTD DRYWALL		FLR G-2	88,280	SF	1.00	\$237,840	2006	12	4	DR
IW03	WALL FINISH - TILE, CERAMIC / STONE, STANDARD	CERAMIC		FLR G-2	9,810	SF	1.00	\$453,202	2006	30		2036
IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	BROADLOOM		FLR G-2	12,490	SF	1.00	\$184,115	2006	12	4	DR

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VCT		FLR G-2	15,820	SF	1.00	\$122,051	2006	20		2026
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	ACM VCT		CORRIDOR	830	SF	1.00	\$6,403	1985	20	17	DR
IF06	FLOORING - TILE, CERAMIC / STONE / QUARRY STANDARD	CERAMIC		RESTROOM	6,250	SF	1.00	\$239,261	2006	30		2036
IF09	FLOORING - TERRAZZO RESURFACE			FLR 2	2,080	SF	1.00	\$25,483	1909	50	63	DR
IF10	FLOORING - HARDWOOD STRIP, STANDARD	PINE		TUTOR RM	4,160	SF	1.00	\$70,498	2010	50		2060
IC01	CEILING FINISH - SUSPENDED ACOUSTICAL TILE, STANDARD	2X2 GRID		FLR G-2	33,310	SF	1.00	\$404,674	2006	30		2036
IC04	CEILING FINISH - PAINTED OR STAINED, STANDARD	PTD DRYWALL		FLR G-2	8,330	SF	1.00	\$22,442	2006	24		2030
VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEVATOR 2	11746	G206	1	EA	1.00	\$363,640	2006	25		2031
VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEVATOR 3	11747	G321	1	EA	1.00	\$363,640	2006	25		2031
VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEVATOR 2	11746	ELEV 2 CAB	1	EA	1.00	\$64,123	2006	12	13	2031
VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEVATOR 3	11747	ELEV 3 CAB	1	EA	1.00	\$64,123	2006	12	13	2031
FX02	PLUMBING FIXTURE - LAVATORY, WALL HUNG	PC		RESTROOM	17	EA	1.00	\$27,223	2006	35		2041
FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		BREAK RM	2	EA	1.00	\$5,200	2006	35		2041
FX06	PLUMBING FIXTURE - SINK, SERVICE/LAUNDRY/UTILITY	COMPOSITE		CUSTODIAL	2	EA	1.00	\$4,316	2006	35		2041
FX10	PLUMBING FIXTURE - URINAL	PC WALL MOUNT		RESTROOM	10	EA	1.00	\$25,496	2006	35		2041

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
FX12	PLUMBING FIXTURE - WATER CLOSET, TANKLESS	PC LOW FLOW		RESTROOM	25	EA	1.00	\$58,642	2006	35		2041
BF05	BACKFLOW PREVENTER (4-6 INCHES)	FIRE - ZURN		SOUTH SIDE	1	EA	1.00	\$15,366	2006	10	10	2026
PS14	SUPPLY PIPING SYSTEM - OFFICE	COPPER		THROUGHOUT	46,268	SF	0.94	\$184,024	1990	35	8	2033
WH13	WATER HEATER - COMMERCIAL, ELECTRIC (70-90 GAL)	STATE DHW		G520	80	GAL	1.00	\$16,379	2019	20		2039
PD14	DRAIN PIPING SYSTEM - OFFICE	CI NO HUB		THROUGHOUT	46,268	SF	0.94	\$276,858	1990	40	3	2033
HU52	UNIT HEATER, ELECTRIC	TRANE ELEC SPACE HTRS	11779, 11780	G520, G401	3	KW	1.00	\$591	2006	15	12	2033
TK03	EXPANSION TANK (21-40 GAL)	HOT WTR EXP TANK TAN-001	11773	G520	40	GAL	1.00	\$9,691	2006	25	2	2033
HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU#1 FUJITSU	22382	ROOF, SOUTH SIDE	1	TON	1.00	\$3,333	2006	23		2029
HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU#1 MITSUBISHI		ROOF, SOUTH SIDE	1	TON	1.00	\$3,333	2009	23		2032
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FCU#1	22376	ATTIC (ABOVE 2300)	1	HP	1.00	\$10,844	2010	25		2035
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FCU#2	22377	ATTIC (ABOVE 2300)	1	HP	1.00	\$10,844	2010	25		2035
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FCU#3	22378	ATTIC (ABOVE 2300)	1	HP	1.00	\$10,844	2010	25		2035
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FCU#4	22379	ATTIC (ABOVE 2300)	1	HP	1.00	\$10,844	2010	25		2035
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FCU#5	22380	ATTIC (ABOVE 2300)	1	HP	1.00	\$10,844	2010	25		2035
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FCU#6	22381	ATTIC (ABOVE 2300)	1	HP	1.00	\$10,844	2010	25		2035

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	AH#12	11729	G137	0.75	HP	1.00	\$8,133	2002	25		2027
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	AH#13	11728	G137	1	HP	1.00	\$10,844	2002	25		2027
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FC#1	22375	G403C	0.75	HP	1.00	\$8,133	2006	25	2	2033
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	FC#2	11751	STAIRWELL 1	0.75	HP	1.00	\$8,133	2006	25	2	2033
AH04	AIR HANDLING UNIT - INDOOR (2.75-3.25 HP)	AH#3	11732	G410	3	HP	1.00	\$29,647	2006	25	2	2033
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AH#1	11734	G520	5	HP	1.00	\$53,468	2006	25	2	2033
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AH#11	11727	G134	5	HP	1.00	\$53,468	1999	25	-2	DR
AH08	AIR HANDLING UNIT - INDOOR (12-17 HP)	AH#2	11733	G520	15	HP	1.00	\$124,512	2006	25	2	2033
AH08	AIR HANDLING UNIT - INDOOR (12-17 HP)	AH#4	11731	G301	15	HP	1.00	\$124,512	2006	25	2	2033
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	EX FAN EAF 001	11740	2417	3	HP	1.00	\$12,997	2006	20	7	2033
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	EX FAN EAF 002	11741	2525	3	HP	1.00	\$12,997	2006	20	7	2033
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	EX FAN EAF 003	11742	2526	3	HP	1.00	\$12,997	2006	20	7	2033
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	EX FAN EAF 004	11743	1606	3	HP	1.00	\$12,997	2006	20	7	2033
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	EX FAN EAF 005	11744	1608	3	HP	1.00	\$12,997	2006	20	7	2033
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	EX FAN EAF 006	11745	2200B	3	HP	1.00	\$12,997	2006	20	7	2033

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
HV14	HVAC DISTRIBUTION NETWORKS - OFFICE	INSULATED METAL DUCT		THROUGHOUT	31,268	SF	0.96	\$937,583	1990	40	3	2033
HV14	HVAC DISTRIBUTION NETWORKS - OFFICE	INSULATED FLEX DUCT		THROUGHOUT	15,000	SF	1.02	\$477,892	2006	40		2046
HX04	HEAT EXCHANGER - SHELL & TUBE STEAM TO WATER (20-85 GPM)	TACO HTG HOT WATER		G520	50	GPM	1.00	\$10,209	2006	35		2041
HX09	PRESSURE REDUCING VALVE, STEAM SYSTEM (2")	SPENCE MED TO SVC PRESSURE		G520	1	EA	1.00	\$5,376	2006	20		2026
PH01	PUMP - ELECTRIC (<=10 HP)	POND PUMP		G520	2	HP	1.00	\$3,961	2006	25	2	2033
PH01	PUMP - ELECTRIC (<=10 HP)	HHW-P2	11771	G520	5	HP	1.00	\$9,903	2006	25	2	2033
PH01	PUMP - ELECTRIC (<=10 HP)	HHW-P3	11772	G520	5	HP	1.00	\$9,903	2006	25	2	2033
PH01	PUMP - ELECTRIC (<=10 HP)	CHW-P1	11770	G520	10	HP	1.00	\$19,806	2006	25	2	2033
PH01	PUMP - ELECTRIC (<=10 HP)	DHW P	11769	G520	1	HP	1.00	\$1,981	2006	25	2	2033
PH14	CONDENSATE RECEIVER, ELECTRIC, 2 PUMPS	CP#1		G520	3	HP	1.00	\$26,858	2006	20	7	2033
HU37	PACKAGE HVAC UNIT, DX, GAS OR ELECTRIC HEAT, MULTI-ZONE (9-35 TON)	RT#1 TRANE	11726	ROOF, SOUTH SIDE	25	TON	1.00	\$217,022	2005	23		2028
BA14	HVAC CONTROLS - TERMINAL ASSEMBLIES - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	8,000	SF	1.00	\$24,434	1990	20	12	DR
BA14	HVAC CONTROLS - TERMINAL ASSEMBLIES - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	38,268	SF	1.00	\$116,879	2005	20		2025
BA37	HVAC CONTROLS - FIELD PANELS/OPS SOFTWARE - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	8,000	SF	1.00	\$6,761	1990	10	22	DR
BA37	HVAC CONTROLS - FIELD PANELS/OPS SOFTWARE - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	38,268	SF	1.00	\$32,342	2005	10	10	2025

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	8,000	SF	1.00	\$3,555	1990	10	22	DR
BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	37,268	SF	1.00	\$16,561	2005	10	10	2025
BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	TRANE DDC		G520	1,000	SF	1.00	\$444	2018	10	5	2033
FS01	FIRE SPRINKLER SYSTEM	WET PIPE	11786	THROUGHOUT	46,268	SF	0.94	\$657,298	2006	80		2086
EL04	EMERGENCY LIGHT - UNITARY WITH BATTERY BACK-UP	BATTERY BACKUP	11749	THROUGHOUT	20	EA	1.00	\$14,372	2005	20	8	2033
FA01	FIRE ALARM PANEL, DIALER, BATTERY, & CHARGER	NOTIFIER	11737	G204	1	EA	1.00	\$45,567	2019	15		2034
FA02	FIRE ALARM SYSTEM - DEVICES	HS, PULLS, CO2 & SMOKE DET	11737	THROUGHOUT	46,268	SF	0.94	\$213,585	2006	18	9	2033
SE14	ELECTRICAL DISTRIBUTION NETWORK - OFFICE	SIEMENS		THROUGHOUT	15,000	SF	1.02	\$361,566	1990	40	3	2033
SE14	ELECTRICAL DISTRIBUTION NETWORK - OFFICE	CUTLER HAMMER		THROUGHOUT	31,268	SF	0.96	\$709,361	2006	40		2046
SG02	MAIN SWITCHBOARD W/BREAKERS (400-600 AMP)	DP		G401	600	AMP	1.00	\$56,085	2005	20	8	2033
SG03	MAIN SWITCHBOARD W/BREAKERS (600-800 AMP)	MDP		G401	800	AMP	1.00	\$69,152	2005	20	8	2033
TX17	TRANSFORMER - OIL-FILLED, 3PH, 5-15KV PRIMARY (300-500 KVA)	TRANSFORMER ONE		WEST SIDE	500	KVA	1.00	\$85,642	2006	35		2041
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#1 VFD ABB		ATTIC (ABOVE 2300)	1.50	HP	1.00	\$1,265	2012	12	5	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#2 VFD ABB		ATTIC (ABOVE 2300)	1.50	HP	1.00	\$1,265	2012	12	5	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#3 VFD ABB		ATTIC (ABOVE 2300)	1.50	HP	1.00	\$1,265	2012	12	5	2029

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	IN STL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#4 VFD ABB		ATTIC (ABOVE 2300)	1.50	HP	1.00	\$1,265	2012	12	5	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#5 VFD ABB		ATTIC (ABOVE 2300)	1.50	HP	1.00	\$1,265	2012	12	5	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#6 VFD ABB		ATTIC (ABOVE 2300)	1.50	HP	1.00	\$1,265	2012	12	5	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#1 VFD SQ D		G520	5	HP	1.00	\$4,217	2006	12	7	2025
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#3 VFD SQ D		G410	3	HP	1.00	\$2,530	2006	12	7	2025
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#11 VFD WEG		G134	5	HP	1.00	\$4,217	2008	12	7	2027
VF04	VARIABLE FREQUENCY DRIVE (10-15 HP)	AH#2 VFD SQ D		G520	15	HP	1.00	\$7,383	2006	12	7	2025
VF04	VARIABLE FREQUENCY DRIVE (10-15 HP)	AH#4 VFD SQ D		G301	15	HP	1.00	\$7,383	2006	12	7	2025
LE03	LIGHTING - EXTERIOR, RECESSED (INC, CFL, LED)	RECESSED CFL		ALL ELEVATIONS	8	EA	1.00	\$2,258	1990	15	25	2030
LE07	LIGHTING - EXTERIOR, WALL FLOOD (SV, MH, ID, LED)	LED		ALL ELEVATIONS	18	EA	1.00	\$21,418	2020	15		2035
LI14	LIGHTING SYSTEM, INTERIOR - OFFICE	T8 FLUOR		THROUGHOUT	34,768	SF	0.96	\$475,070	2006	20		2026
LI14	LIGHTING SYSTEM, INTERIOR - OFFICE	LED		THROUGHOUT	1,500	SF	1.18	\$25,193	2010	20	3	2033
GN02	GENERATOR - DIESEL (<30-100KW)	DETROIT DIESEL	11748	WEST SIDE	55	KW	1.00	\$67,343	2006	25	2	2033
GN15	SWITCH - AUTO TRANSFER, 480 V (100-400 AMP)	ATS-2	11778	G401	150	AMP	1.00	\$7,424	2006	25	2	2033
GN15	SWITCH - AUTO TRANSFER, 480 V (100-400 AMP)	ATS-1	11777	G401	150	AMP	1.00	\$7,424	2006	25	2	2033

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	INSTL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
SI01	CONCRETE PEDESTRIAN PAVING - JOINT MAINTENANCE			EXTERIOR	276	LF	1.00	\$1,651	2006	7	20	2033
Grand Total:								\$12,653,917				

RECURRING NEEDS BY YEAR

All costs shown as Future Value using a 3% average inflation rate

DEFERRED RENEWAL									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
EW01	WALL, EXTERIOR, MASONRY POINTING	RED BRICK		EXTERIOR	B2010	31,950	SF	\$330,881	DR
RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP	FLAT		ROOF	B3010	11,300	SF	\$91,996	DR
IW01	WALL FINISH - PAINT, STANDARD	PTD DRYWALL		FLR G-2	C3010	88,280	SF	\$237,840	DR
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	ACM VCT		CORRIDOR	C3020	830	SF	\$6,403	DR
IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	BROADLOOM		FLR G-2	C3020	12,490	SF	\$184,115	DR
IF09	FLOORING - TERRAZZO RESURFACE			FLR 2	C3020	2,080	SF	\$25,483	DR
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AH#11	11727	G134	D3040	5	HP	\$53,468	DR
BA14	HVAC CONTROLS - TERMINAL ASSEMBLIES - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	D3060	8,000	SF	\$24,434	DR
BA37	HVAC CONTROLS - FIELD PANELS/OPS SOFTWARE - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	D3060	8,000	SF	\$6,761	DR
BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	OLDER ROBERT SHAW DDC		G100 SUITES	D3060	8,000	SF	\$3,555	DR
TOTAL DEFERRED RENEWAL COST								\$964,937	

RECURRING NEEDS BY YEAR

All costs shown as Future Value using a 3% average inflation rate

No Projected Component Replacement Cost for Asset No. 047 for 2023

No Projected Component Replacement Cost for Asset No. 047 for 2024

2025									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
BA14	HVAC CONTROLS - TERMINAL ASSEMBLIES - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	D3060	38,268	SF	\$123,997	2025
BA37	HVAC CONTROLS - FIELD PANELS/OPS SOFTWARE - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	D3060	38,268	SF	\$34,312	2025
BA60	HVAC CONTROLS - MAJOR INSTRUMENTATION - OFFICE	UPGRADED ROBERT SHAW		THROUGHOUT	D3060	37,268	SF	\$17,570	2025

RECURRING NEEDS BY YEAR

All costs shown as Future Value using a 3% average inflation rate

VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#1 VFD SQ D		G520	D5010	5	HP	\$4,473	2025
VF04	VARIABLE FREQUENCY DRIVE (10-15 HP)	AH#2 VFD SQ D		G520	D5010	15	HP	\$7,833	2025
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#3 VFD SQ D		G410	D5010	3	HP	\$2,684	2025
VF04	VARIABLE FREQUENCY DRIVE (10-15 HP)	AH#4 VFD SQ D		G301	D5010	15	HP	\$7,833	2025
2025 PROJECTED COMPONENT REPLACEMENT COST								\$198,701	

2026									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
DR26	DOOR PANIC HARDWARE	GLASS DRS		EXTERIOR	C1020	4	EA	\$6,410	2026
DR24	DOOR LOCK, COMMERCIAL-GRADE	HM DRS		EXTERIOR	C1020	11	EA	\$10,775	2026
DR24	DOOR LOCK, COMMERCIAL-GRADE	WOOD		OFFICES	C1020	225	EA	\$220,399	2026
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD	LAMINATE		FLR G-2	C1030	95	LF	\$67,392	2026
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VCT		FLR G-2	C3020	15,820	SF	\$133,369	2026

RECURRING NEEDS BY YEAR

All costs shown as Future Value using a 3% average inflation rate

BF05	BACKFLOW PREVENTER (4-6 INCHES)	FIRE - ZURN		SOUTH SIDE	D2020	1	EA	\$16,791	2026
HX09	PRESSURE REDUCING VALVE, STEAM SYSTEM (2")	SPENCE MED TO SVC PRESSURE		G520	D3040	1	EA	\$5,875	2026
LI14	LIGHTING SYSTEM, INTERIOR - OFFICE	T8 FLUOR		THROUGHOUT	D5020	34,768	SF	\$519,121	2026
2026 PROJECTED COMPONENT REPLACEMENT COST								\$980,133	

2027									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	AH#12	11729	G137	D3040	0.75	HP	\$9,154	2027
AH01	AIR HANDLING UNIT - INDOOR (.5-1.25 HP)	AH#13	11728	G137	D3040	1	HP	\$12,205	2027
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	AH#11 VFD WEG		G134	D5010	5	HP	\$4,746	2027
2027 PROJECTED COMPONENT REPLACEMENT COST								\$26,105	

RECURRING NEEDS BY YEAR

All costs shown as Future Value using a 3% average inflation rate

2028									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
HU37	PACKAGE HVAC UNIT, DX, GAS OR ELECTRIC HEAT, MULTI-ZONE (9-35 TON)	RT#1 TRANE	11726	ROOF, SOUTH SIDE	D3050	25	TON	\$251,588	2028
2028 PROJECTED COMPONENT REPLACEMENT COST								\$251,588	

2029									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU#1 FUJITSU	22382	ROOF, SOUTH SIDE	D3030	1	TON	\$3,980	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#1 VFD ABB		ATTIC (ABOVE 2300)	D5010	1.50	HP	\$1,510	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#2 VFD ABB		ATTIC (ABOVE 2300)	D5010	1.50	HP	\$1,510	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#3 VFD ABB		ATTIC (ABOVE 2300)	D5010	1.50	HP	\$1,510	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#4 VFD ABB		ATTIC (ABOVE 2300)	D5010	1.50	HP	\$1,510	2029
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#5 VFD ABB		ATTIC (ABOVE 2300)	D5010	1.50	HP	\$1,510	2029

RECURRING NEEDS BY YEAR

All costs shown as Future Value using a 3% average inflation rate

VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	FCU#6 VFD ABB		ATTIC (ABOVE 2300)	D5010	1.50	HP	\$1,510	2029
2029 PROJECTED COMPONENT REPLACEMENT COST								\$13,043	

2030									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
IC04	CEILING FINISH - PAINTED OR STAINED, STANDARD	PTD DRYWALL		FLR G-2	C3030	8,330	SF	\$27,601	2030
LE03	LIGHTING - EXTERIOR, RECESSED (INC, CFL, LED)	RECESSED CFL		ALL ELEVATIONS	D5020	8	EA	\$2,778	2030
2030 PROJECTED COMPONENT REPLACEMENT COST								\$30,379	

2031									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
DR12	DOOR AND STOREFRONT, EXTERIOR, SWINGING, ALUMINUM AND GLASS	METAL & GLASS		EXTERIOR	B2030	4	LEAF	\$22,874	2031

RECURRING NEEDS BY YEAR

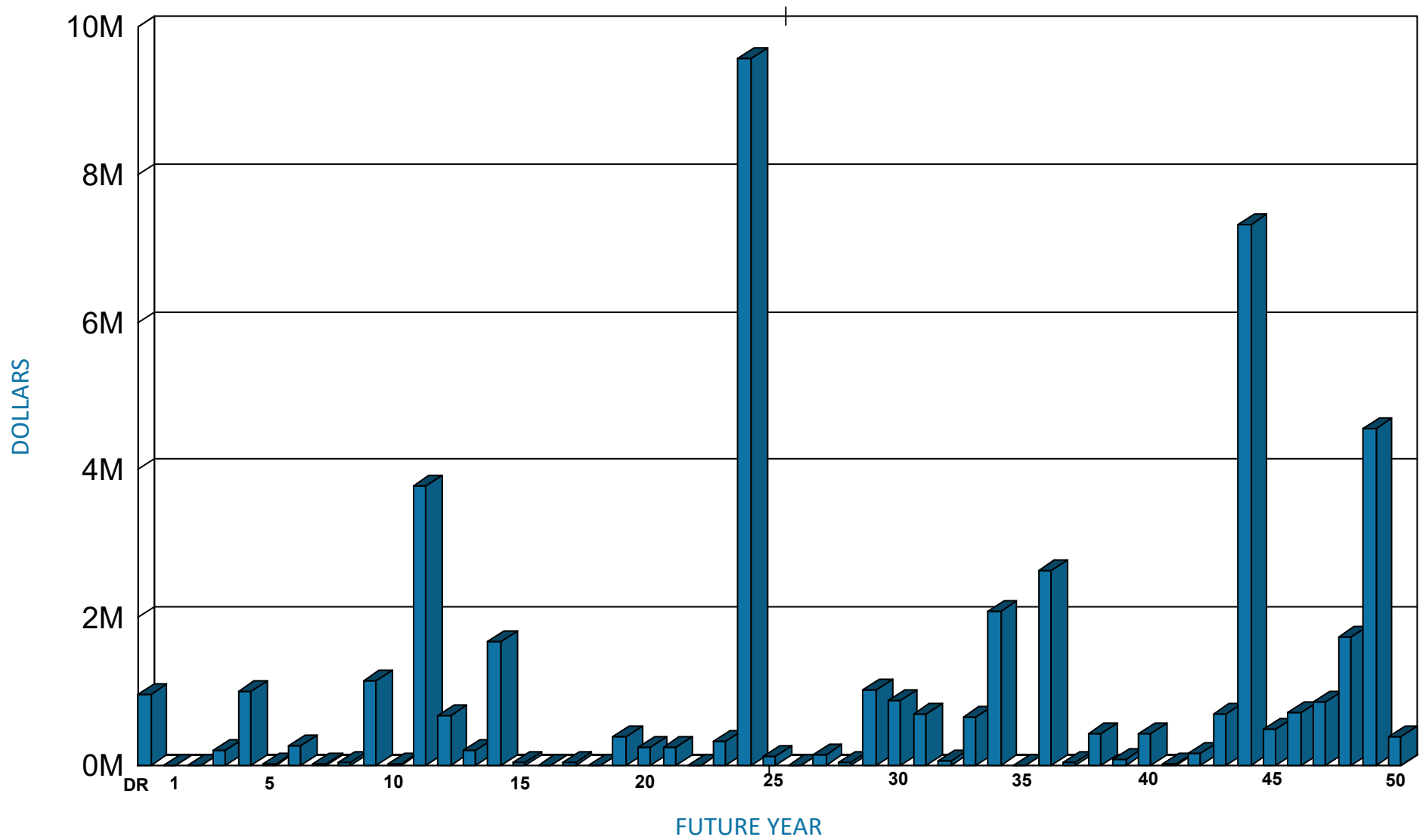
All costs shown as Future Value using a 3% average inflation rate

VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEVATOR 2	11746	G206	D1010	1	EA	\$460,648	2031
VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEVATOR 2	11746	ELEV 2 CAB	D1010	1	EA	\$81,229	2031
VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEVATOR 3	11747	G321	D1010	1	EA	\$460,648	2031
VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEVATOR 3	11747	ELEV 3 CAB	D1010	1	EA	\$81,229	2031
2031 PROJECTED COMPONENT REPLACEMENT COST								\$1,106,629	

2032

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU#1 MITSUBISHI		ROOF, SOUTH SIDE	D3030	1	TON	\$4,349	2032
2032 PROJECTED COMPONENT REPLACEMENT COST								\$4,349	

RECURRING COMPONENT EXPENDITURE PROJECTIONS

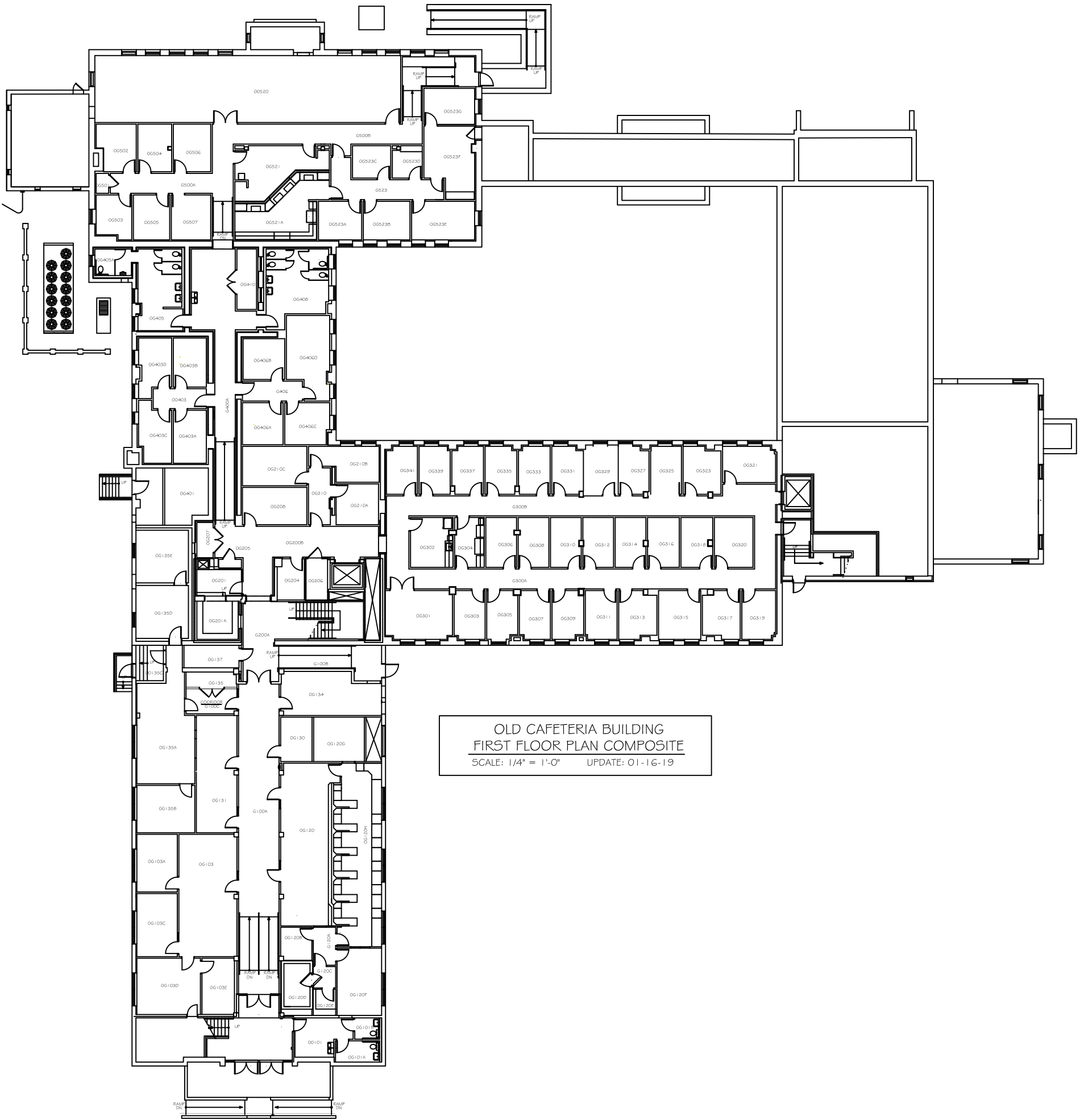


Average Annual Renewal Cost per SF \$8.85

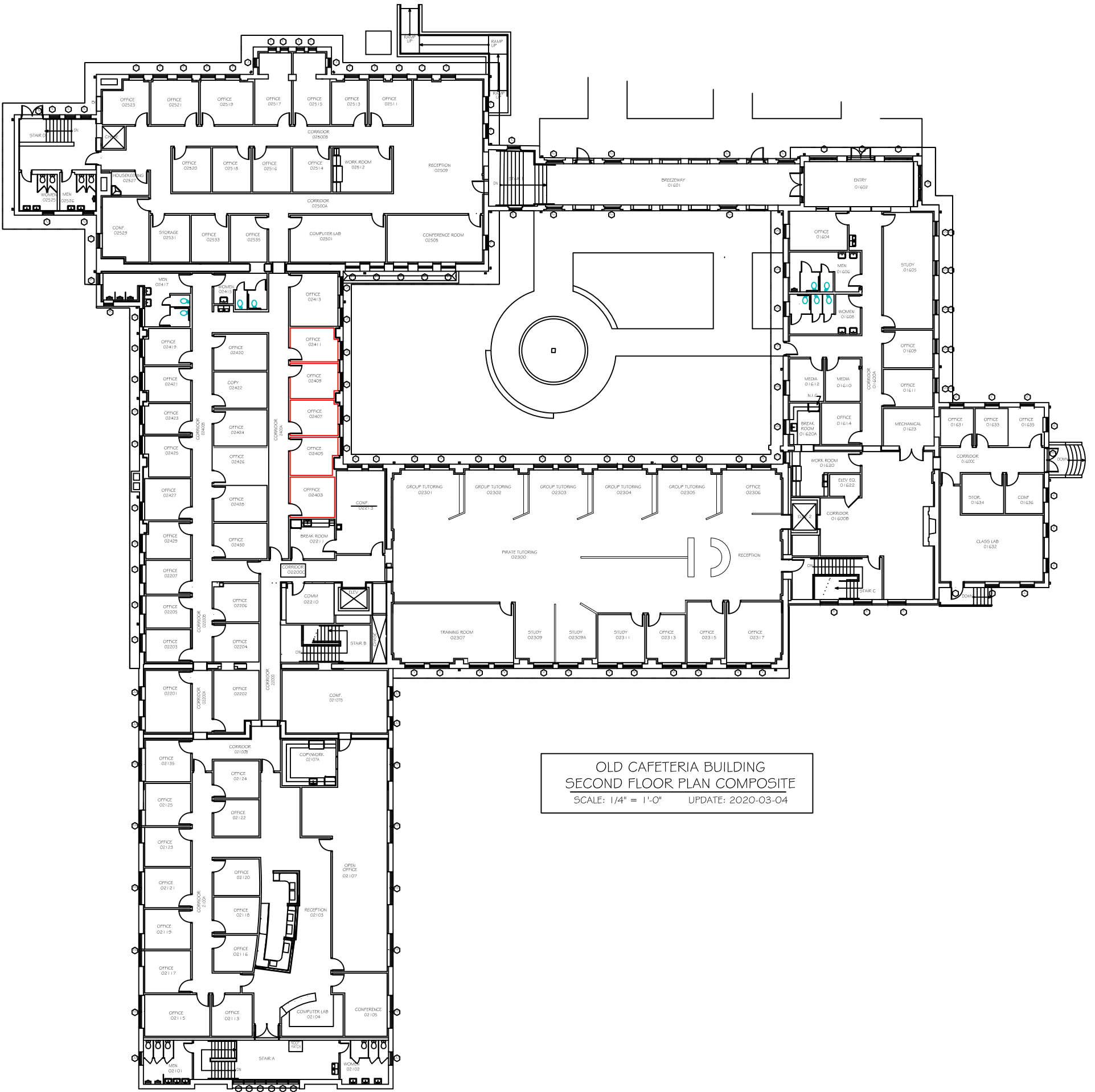
FACILITY CONDITION ASSESSMENT

SECTION 5

DRAWINGS



OLD CAFETERIA BUILDING
 FIRST FLOOR PLAN COMPOSITE
 SCALE: 1/4" = 1'-0" UPDATE: 01-16-19



OLD CAFETERIA BUILDING
SECOND FLOOR PLAN COMPOSITE
SCALE: 1/4" = 1'-0" UPDATE: 2020-03-04

FACILITY CONDITION ASSESSMENT

SECTION 6

PHOTOGRAPHS



047001a 1/26/2023
Painted CMU wall and painted ceiling, roof ladder
Corridor



047001e 1/26/2023
Ductless split system condensing units CU#1, CU#2
Roof, south side



047002a 1/26/2023
CMU walls, terrazzo floor, roof ladder
Corridor



047002e 1/26/2023
Rooftop package unit RT#1
Roof, south side



047003a 1/26/2023
CMU walls, terrazzo floor, noncompliant guardrail
Stairwell



047003e 1/26/2023
Blower box for RT#1
Roof, south side



047004a 1/26/2023
CMU walls, terrazzo floor, noncompliant railing
Stairwell



047004e 1/26/2023
Fire alarm system horn strobe
Men's restroom 2101



047005a 1/26/2023
Acoustical tile ceiling, painted walls, carpeting, counter
Work area



047005e 1/26/2023
GFCI electrical outlet
Men's restroom 2101



047006a 1/26/2023
Acoustical tile ceiling, painted walls, carpeting
Work area



047006e 1/26/2023
Central HVAC air distribution supply grille, concealed fire
suppression sprinkler head, toilet exhaust fan
Men's restroom 2101



047007a 1/26/2023
Casework with a sink, vinyl tile floor, acoustical tile ceiling
Break area



047007e 1/26/2023
Specialty interior light fixture
Second floor, stair A



047008a 1/26/2023
Acoustical tile ceiling, painted walls, carpeting
Conference room



047008e 1/26/2023
Fire alarm system horn strobe
Second floor, stair A



047009a 1/26/2023
Acoustical tile ceiling, painted walls, carpeting, wood doors
Corridor



047009e 1/26/2023
Upgraded secondary electrical distribution panel R7
Office suite 2100



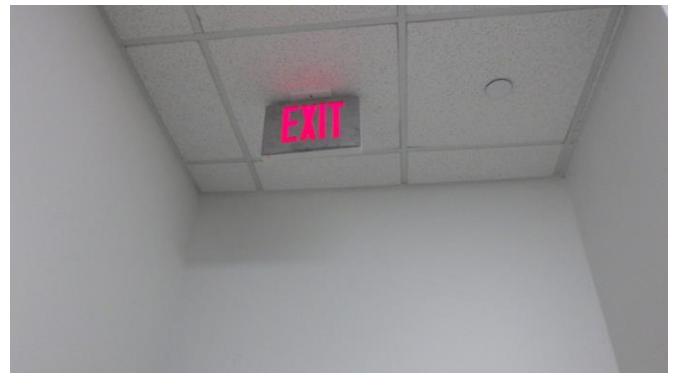
047010a 1/26/2023
Painted walls, carpeting
Office



047010e 1/26/2023
Upgraded secondary electrical distribution panel R7
Office suite 2100



047011a 1/26/2023
Acoustical tile ceiling, vinyl floor tile (with and without
asbestos), painted walls, wood doors
Corridor



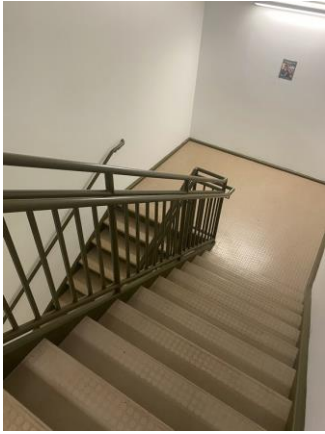
047011e 1/26/2023
Illuminated emergency exit sign
Office suite 2100



047012a 1/26/2023
Vinyl treads and landings, metal railings
Stairwell



047012e 1/26/2023
Smoke/CO2 sensor, concealed fire suppression sprinkler
head
Office suite 2100



047013a 1/26/2023
Vinyl treads and landings, metal railings
Stairwell



047013e 1/26/2023
HVAC sensor
Office suite 2100



047014a 1/26/2023
Noncompliant elevator phone
Elevator



047014e 1/26/2023
Fire alarm system manual pull station
Second floor, stair B



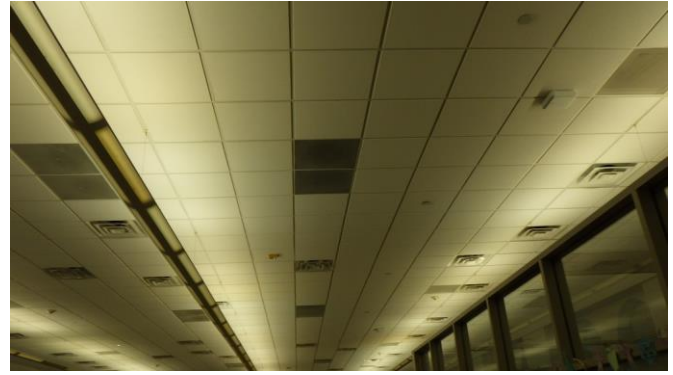
047015a 1/26/2023
Penetration through ceiling
Data closet



047015e 1/26/2023
Elevator controls
Elevator 1 cab



047016a 1/26/2023
Dual-pane, metal frame window
Tutor room



047016e 1/26/2023
Open troffer fluorescent interior light fixtures
Tutoring 2300



047017a 1/26/2023
Acoustical tile ceiling, wood flooring
Tutor room



047017e 1/26/2023
Central HVAC air distribution supply grille, concealed fire
suppression sprinkler head
Tutoring 2300



047018a 1/26/2023
Tile wall and floor, lavatory
Restroom



047018e 1/26/2023
Ductless split system evaporative unit DU#2
Communications 2210



047019a 1/26/2023
Tile walls and floor, toilet with hands-free flush valve
Restroom



047019e 1/26/2023
FCU#5 supply fan VFD
Attic (above 2300)



047020a 1/26/2023
Tile walls and floor, accessible water closet
Restroom



047020e 1/26/2023
FCU #6
Attic (above 2300)



047021a 1/26/2023
Tile walls and floor, urinal
Restroom



047021e 1/26/2023
FCU #3
Attic (above 2300)



047022a 1/26/2023
Dual-level drinking fountain
Corridor



047022e 1/26/2023
HVAC distribution network chilled water piping
Attic (above 2300)



047023a 1/26/2023
Painted brick, quarry tile
Breezeway



047023e 1/26/2023
HVAC sensor and thermostat
Corridor 2200D



047024a 1/26/2023
Acoustical tile ceiling, painted walls, terrazzo
Work area



047024e 1/26/2023
Fire suppression system backflow preventer
North side



047025a 1/26/2023
Concrete utility sink
Custodial closet



047025e 1/26/2023
Electric unit heater
Mechanical room G520



047026a 1/26/2023
Brick facade, clay tile roof, glazing
Courtyard



047026e 1/26/2023
Campus steam distribution network
Mechanical room G520



047027a 1/26/2023
Brick facade, clay tile roof, glazing
Courtyard



047027e 1/26/2023
Medium to service pressure PRV
Mechanical room G520



047028a 1/26/2023
Acoustical tile ceiling, tile flooring, casework
Office area



047028e 1/26/2023
Fountain pump
Mechanical room G520



047029a 1/26/2023
Acoustical tile ceiling, vinyl tile floor, wood doors
Corridor



047029e 1/26/2023
Steam to hot water converter - shell-and-tube heat
exchanger
Mechanical room G520



047030a 1/26/2023
Acoustical tile ceiling, carpeting, counter
Work area



047030e 1/26/2023
HVAC distribution network steam trap
Mechanical room G520



047031a 1/26/2023
Brick facade, glazing, glass entry doors
Exterior



047031e 1/26/2023
HVAC distribution network hot water expansion tank
TAN001
Mechanical room G520



047032a 1/26/2023
Brick facade, glazing, mission tile roof
Exterior



047032e 1/26/2023
HVAC distribution network heating hot water piping
Mechanical room G520



047033a 1/26/2023
Brick facade, glazing, hollow metal doors
Exterior



047033e 1/26/2023
HVAC distribution network heating hot water pumps 2, 3
Mechanical room G520



047034a 1/26/2023
Brick facade, glazing, metal and glass door
Exterior



047034e 1/26/2023
Steam electric duplex condensate receiver CP#1
Mechanical room G520



047035a 1/26/2023
Brick facade, glazing, metal and glass doors
Exterior



047035e 1/26/2023
HVAC controls panel, flow (energy) meters
Mechanical room G520



047036a 1/26/2023
Brick facade, glazing
Exterior



047036e 1/26/2023
HVAC chilled and heating hot water flow (energy) meters
Mechanical room G520



047037a 1/26/2023
Brick facade, glazing, metal and glass doors
Exterior



047037e 1/26/2023
HVAC DDC (Trane) controls panel
Mechanical room G520



047038a 1/26/2023
Brick facade, glazing, tile roof, gutters and downspouts
Exterior



047038e 1/26/2023
AH#1 supply fan VFD Square D
Mechanical room G520



047039a 1/26/2023
Brick facade, glazing
Exterior



047039e 1/26/2023
AH#1 supply fan VFD Square D
Mechanical room G520



047040a 1/26/2023
Modified bitumen roof
Roof



047040e 1/26/2023
Indoor AHU#1
Mechanical room G520



047041a 1/26/2023
Modified bitumen roof
Roof



047041e 1/26/2023
HVAC distribution network chilled water pump 1
Mechanical room G520



047042a 1/26/2023
Clay tile roof
Roof



047042e 1/26/2023
Indoor AHU#2
Mechanical room G520



047043a 1/26/2023
Clay tile roof
Roof



047043e 1/26/2023
AH#2 supply fan VFD, Square D
Mechanical room G520



047044a 1/26/2023
Roof hatch
Roof



047044e 1/26/2023
AH#2 supply fan VFD Square D
Mechanical room G520



047045e 1/26/2023
Fire suppression system main risers
Mechanical room G520



047046e 1/26/2023
Pre-action fire suppression system pump
Mechanical room G520



047047e 1/26/2023
Battery backup emergency exit light fixture
Mechanical room G520



047048e 1/26/2023
Domestic hot water heater
Mechanical room G520



047049e 1/26/2023
Lay-in acrylic lens fluorescent interior light fixtures
Corridor G400A



047050e 1/26/2023
Fan coil unit FC#1
Mechanical room G403C



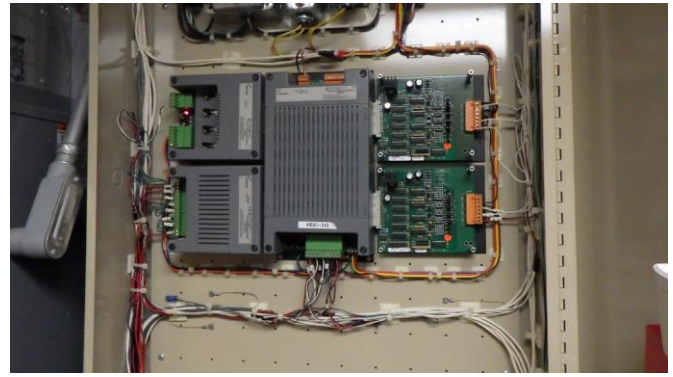
047051e 1/26/2023
HVAC distribution network chilled and heating hot water
piping
Mechanical room G403C



047052e 1/26/2023
Indoor AH#3
Mechanical room G410



047053e 1/26/2023
AH supply fan VFD, Square D
Mechanical room G410



047054e 1/26/2023
HVAC controls panel
Mechanical room G410



047055e 1/26/2023
Main fire alarm control panel FACP
Electrical room G204



047056e 1/26/2023
Hydraulic passenger elevator #1 machine and controller
Elevator room G206



047057e 1/26/2023
Solid state elevator controller
Elevator room G206



047058e 1/26/2023
Hydraulic passenger elevator #1 machine
Elevator room G206



047059e 1/26/2023
Indoor AH#4
Mechanical room G301



047060e 1/26/2023
AH#4 supply fan VFD, Square D
Mechanical room G301



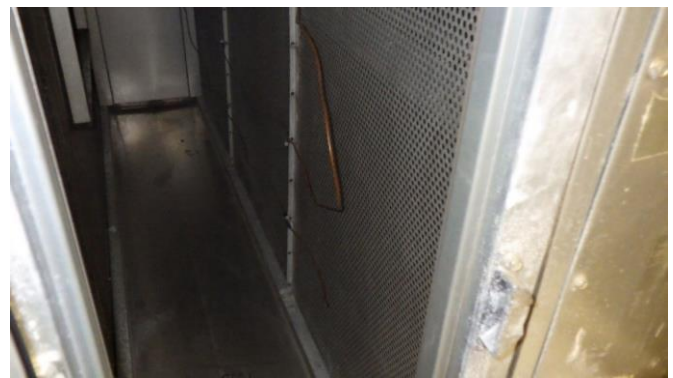
047061e 1/26/2023
AH#4 supply fan motor
Mechanical room G301



047062e 1/26/2023
AH#4 filtration section
Mechanical room G301



047063e 1/26/2023
AH#4 cooling coil section
Mechanical room G301



047064e 1/26/2023
AH#4 cooling coil section
Mechanical room G301



047065e 1/26/2023
Old built-in place air handler
Mechanical room G137



047066e 1/26/2023
Old built-in place air handler
Mechanical room G137



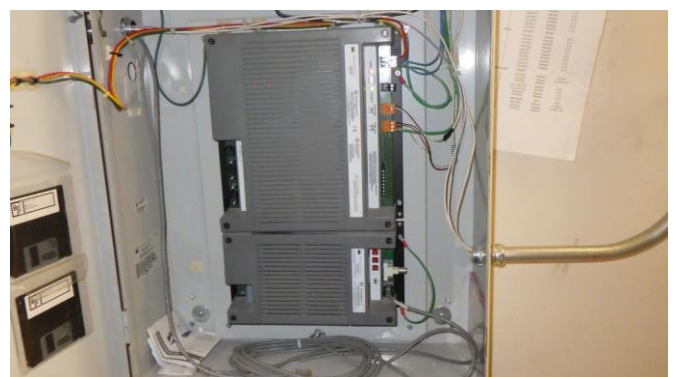
047067e 1/26/2023
HVAC controls panel
Mechanical room G137



047068e 1/26/2023
Indoor AH#11
Mechanical room G134



047069e 1/26/2023
Secondary electrical distribution panel DL
Mechanical room G134



047070e 1/26/2023
HVAC controls panel
Mechanical room G134



047071e 1/26/2023
AH#11 supply fan VFD, Square D
Mechanical room G134



047072e 1/26/2023
Battery backup emergency exit light fixture
Corridor G100A



047073e 1/26/2023
Open parabolic lay-in fluorescent interior light fixture
Corridor G100A



047074e 1/26/2023
Suspended LED interior light fixtures
Office suite G120



047075e 1/26/2023
Portable dehumidifier
Office suite G120



047076e 1/26/2023
HVAC sensor
Office suite G120



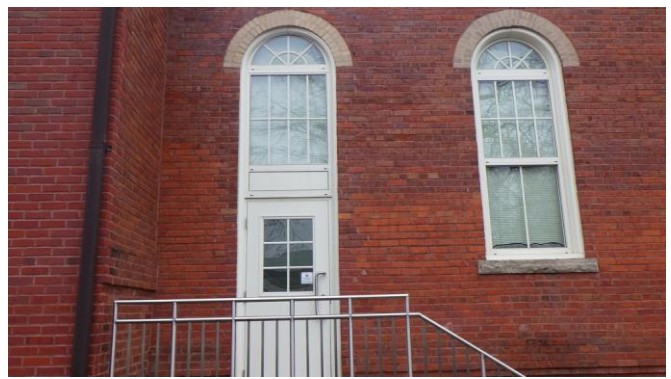
047077e 1/26/2023
Fan coil unit #2
Second floor, stair A



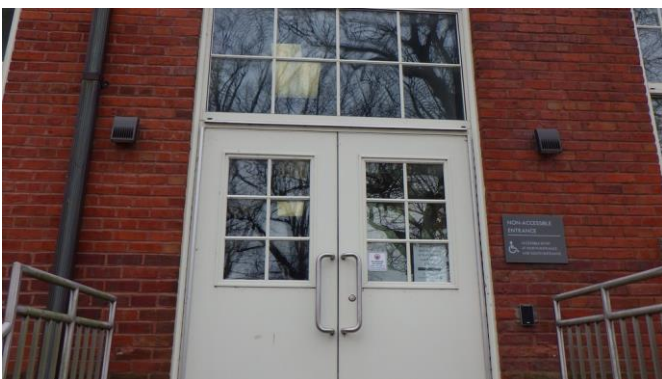
047078e 1/26/2023
LED wall pack exterior light fixture
Southwest corner



047079e 1/26/2023
LED wall pack exterior light fixture
South exterior



047080e 1/26/2023
Exit with no exterior lighting
South exterior



047081e 1/26/2023
Entry/exit with exterior lighting
East exterior



047082e 1/26/2023
Recessed CFL exterior light fixture
North side covered walk



047083e 1/26/2023
Recessed CFL exterior light fixtures
North side covered walk



047084e 1/26/2023
Fire alarm system manual pull station
North side covered walk



047085e 1/26/2023
Fire suppression system backflow preventer insulated
box
North exterior



047086e 1/26/2023
Primary electrical distribution transformer
West exterior



047087e 1/26/2023
Main electrical distribution panel MDP
Electrical room G401



047088e 1/26/2023
Main electrical distribution panel MDP
Electrical room G401



047089e 1/26/2023
Main electrical distribution panel DP
Electrical room G401



047090e 1/26/2023
Main electrical distribution panel DP
Electrical room G401



047091e 1/26/2023
Electric unit heater UH#3
Electrical room G401



047092e 1/26/2023
Emergency power ATS-1 and ATS-2
Electrical room G401



047093e 1/26/2023
Diesel fuel emergency generator
West exterior

FACILITY CONDITION ASSESSMENT

SECTION 7

PRELIMINARY ENERGY
ASSESSMENT

INTRODUCTION

A Preliminary Energy Assessment (PEA) was conducted to identify energy conservation opportunities. The PEA is intended to be a preliminary energy screening only. The goal is to identify potential energy savings opportunities in a building. It is not equivalent to an American Society of Heating, Refrigeration, or Air Conditioning Engineers (ASHRAE) Level 1, 2, or 3 audit. The PEA has two sections: 1) Benchmarking Data and 2) Energy Conservation Opportunities. Basic building information is provided in **Table 1**.

TABLE 1. BUILDING INFORMATION	
Client	East Carolina University
Asset Number	047
Asset Name	OLD CAFETERIA COMPLEX
Year Built or Last Energy Renovation	2006

BENCHMARKING DATA

The purpose of benchmarking building performance is to determine how well a building performs in comparison to other similar buildings. For this analysis, buildings were assessed based on their primary use (e.g., education, food sales, food service, etc.) and year constructed. Two metrics -- energy use intensity and energy end use -- are presented for the building manager to use to assess how efficiently the building performs compared to similar buildings.

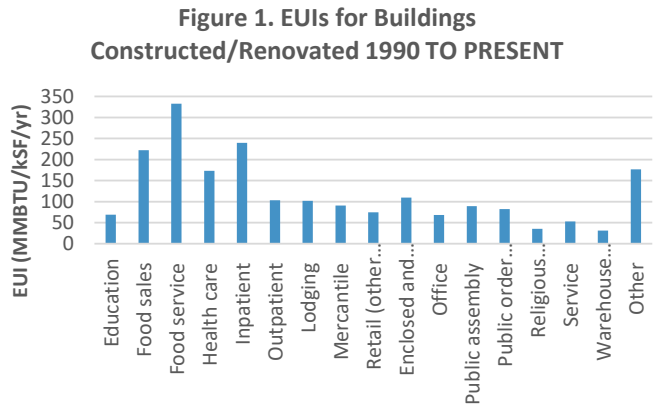
Metric #1: Energy Use Intensity (EUI)

EUI is a measure of energy consumption per square foot of building space per year. The units of measurement are million British thermal units per thousand square foot per year (MMBTU/kSF/yr). The US-DOE EUI can be compared to the actual EUI of the client building to determine how efficient the building is compared to other similar buildings. A building manager can calculate EUI by summing total energy consumption per year (in MMBTU/yr) and dividing it by the building area (in kSF). Benchmarking data from the U.S. Energy Information Administration (EIA) Commercial Building Energy Consumption Survey (CBECS) database was used for this analysis.

Basic information about the building use and the time of the most recent major HVAC or lighting upgrade is provided in **Table 2**. That information is used to determine the Benchmark EUI. The building manager can calculate the Building EUI and compare it to the Benchmark EUI to determine how building efficiency compares to similar buildings (see **Table 3**). In addition, **Figure 1** shows the EUIs of various building types for further comparison.

TABLE 2. BUILDING DETAILS	
FCA Building Type	Office
Energy Information Administration Equivalent Building Type	Office
Range of Years Constructed/Last Major Energy Renovation	1990 TO PRESENT
Benchmark EUI (MMBTU/kSF/yr) =	68.5
<i>Building EUI to be Calculated by Client (MMBTU/kSF/yr) =</i>	

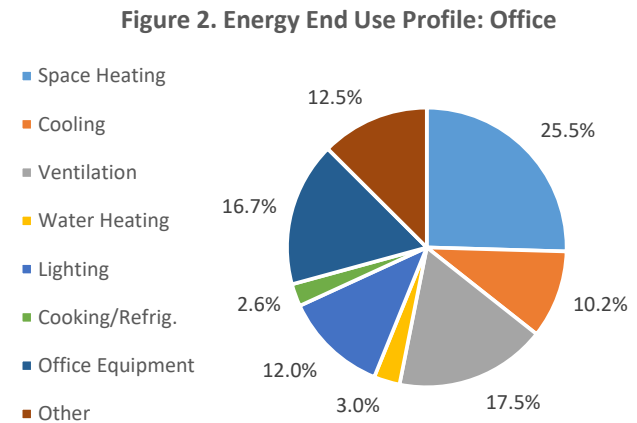
TABLE 3. EUI COMPARISON	
Very Energy Efficient (consumes more than 30% less energy)	EUI < 48
Energy Efficient (consumes 10% to 30% less energy)	48 <= EUI <= 61.7
Similar (consumes within 10% less or 10% more energy)	61.7 < EUI < 75.4
Energy Inefficient (consumes 10% to 30% more energy)	75.4 <= EUI <= 89.1
Very Energy Inefficient (consumes more than 30% more energy)	EUI > 89.1



Metric #2: Energy End Use

Energy end use data characterizes how energy is used by profiling energy consumption into end use categories such as space heating, cooling, ventilation, lighting, etc. When energy end use data is presented in a pie chart, high energy-consuming activities are readily identified. A building manager can determine the energy end use profile for a building by analyzing trend data from a Building Automation System and/or Energy Management Control System.

TABLE 4. ENERGY END USE PROFILE: OFFICE	
Space Heating	25.5%
Cooling	10.2%
Ventilation	17.5%
Water Heating	3.0%
Lighting	12.0%
Cooking/Refrig.	2.6%
Office Equipment	16.7%
Other	12.5%
Total	100.0%



References:

1. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. "Technologies and Products by Category." Efficient Technologies and Products for Federal Facilities. DOE. <http://energy.gov/eere/femp/efficient-technologies-and-products-federal-facilities>. Accessed: June 2016.
2. U.S. Energy Information Administration [EIA]. "2012 CBECS Survey Data." Commercial Building Energy Consumption Survey. EIA. <http://www.eia.gov/consumption/commercial/data/2012/index.cfm?view=consumption#c1-c12>, Accessed: June 2016.

ENERGY CONSERVATION OPPORTUNITIES

This section presents energy conservation measures (ECMs) recommended for further investigation. Recommended ECMs are categorized into one or more cost categories to indicate an approximate level of resources required to implement the ECM. These cost categories are:

Operation and Maintenance Measures (O&M): O&M actions usually (a) can be completed by in-house maintenance personnel and (b) result in an immediate return on investment.

Low-Cost/No-Cost Measures (LC/NC): LC/NC measures typically (a) can be done by in-house personnel, (b) require little to no investment cost, and (c) result in significant energy savings. In other words, LC/NC measures typically have a quick payback period (less than one year).

Capital Improvement Measures (CAP): CAP measures are major capital investments that usually require significant time (i.e., approximately six months to three years) for planning, design, and implementation. Oftentimes, a request for proposal, design/bid/build (D/B/B), and/or design/build (D/B) package is required. The return on investment for CAP projects ranges significantly, varying from a payback period from one to twenty plus years.

ECM CATEGORY	ECM RECOMMENDED FOR FURTHER CONSIDERATION	COST CATEGORY
Lighting - Interior	INSTALL EFFICIENT LIGHTING FIXTURES. While incandescent lamp fixtures have a low initial cost, the lamps are energy inefficient and have a short useful life. Consider CFL and LED lighting instead. HID lamps are necessary in some applications; however, alternatives such as high bay, T5 lighting fixtures or LED fixtures should be considered as an alternate. T12 lamps are an outdated lighting technology that should be replaced with newer technologies such as T8, T5, or LED lamp fixtures.	N/A, Varies
Lighting - Interior, Controls	INSTALL LIGHTING CONTROLS. Oftentimes, lighting fixtures on switches do not get turned off when a space is unoccupied. Occupancy sensors, photocell sensors, and lighting control systems can help reduce lighting energy consumption. For example, consider installing occupancy sensors in offices, common areas, and other areas that have variable occupancy. In areas where there is natural lighting, consider using photocell sensors to dim or shut off fixtures that aren't needed. Alternatively, install a comprehensive light control system that uses time clock schedules, occupancy sensors, photocell sensors, etc., to monitor and control lighting throughout an entire building.	N/A, Varies
Lighting - Exterior	INSTALL EFFICIENT LIGHTING FIXTURES. While incandescent lamp fixtures have a low initial cost, the lamps are energy inefficient and have a short useful life. Consider CFL and LED lighting instead. HID lamps are necessary in some applications; however, alternatives such as high intensity T5 or LED fixtures should be considered. T12 lamps are an outdated lighting technology that should be replaced with newer technologies such as high intensity fluorescent or LED lamp fixtures.	N/A, Varies
Lighting - Exterior, Controls	INSTALL LIGHTING CONTROLS. Consider using photocell sensors or timeclocks to shut off building/parking lot fixtures during daylight hours.	N/A, Varies
HVAC - BAS	INSTALL A BAS. Consider installing a BAS so that there is autonomous control of the building HVAC systems.	CAP

ECM CATEGORY	ECM RECOMMENDED FOR FURTHER CONSIDERATION	COST CATEGORY
HVAC - EMCS	CONNECT BAS TO EMCS. Consider connecting the BAS to a central EMCS so that the system can be monitored and controlled at a central location.	CAP
HVAC - Unitary Equipment	INSTALL EFFICIENT UNITARY EQUIPMENT. Consider replacing the existing equipment with FEMP recommended/ENERGY STAR qualified unitary equipment.	LC/NC; CAP
HVAC - Building Comfort/Tuning	CONDUCT RETROCOMMISSIONING (RCX). RCx the building to identify and address operating deficiencies, optimize HVAC operations, reduce energy bills, and improve occupant comfort.	CAP
Electrical - VFDs	INSTALL VARIABLE FREQUENCY DRIVES. Install VFDs on motors greater than 5 hp to reduce energy consumption by varying motor speed based on system demand.	O&M; LC/NC; CAP
Plumbing - DHW Heater Efficiency	INSTALL A HIGH-EFFICIENCY WATER HEATER. High efficiency/ENERGY STAR water heaters consume less energy. Consider condensing water heaters that capture the latent heat from water vapor contained in the flue gases.	LC/NC; CAP