

EAST CAROLINA UNIVERSITY

Facility Condition Assessment

Rivers Building (010)

Asset RIVE

Inspected May 13, 2021

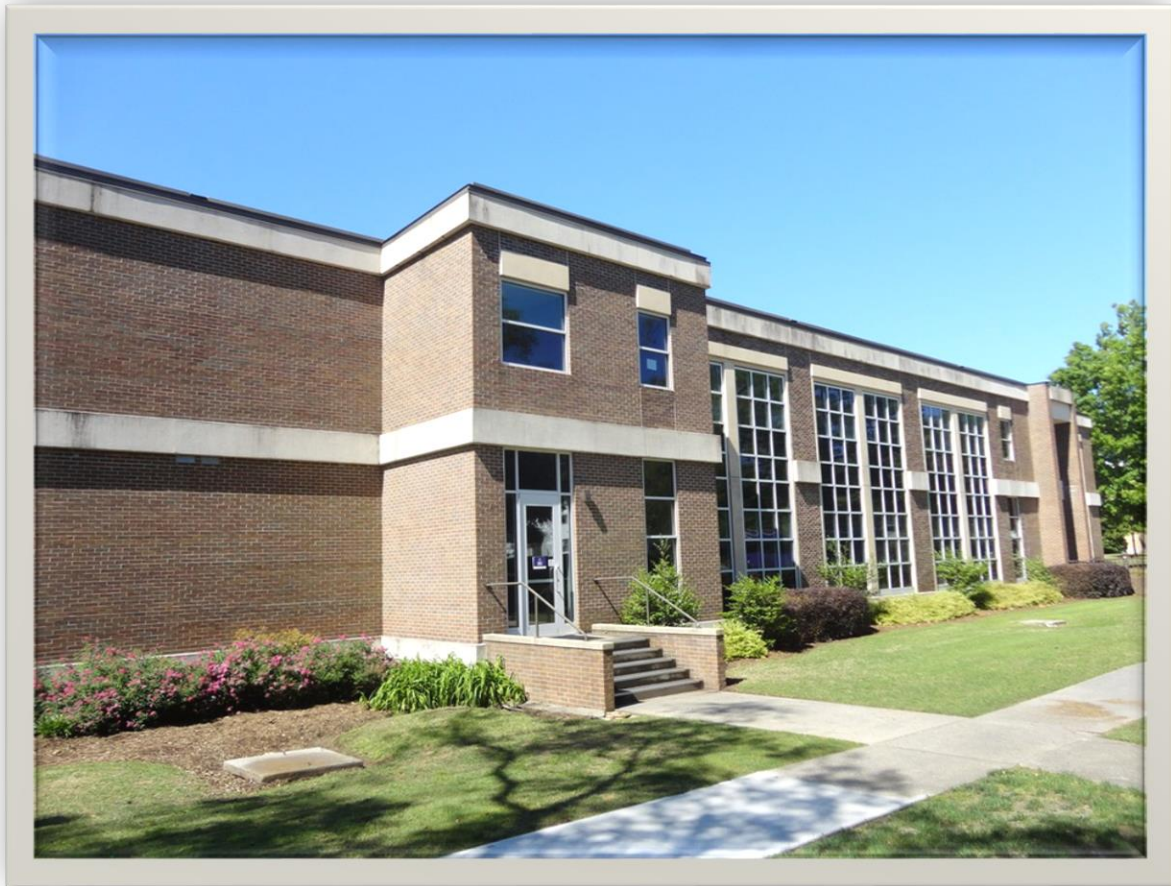


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FACILITY CONDITION ASSESSMENT

SECTION 1

ASSET OVERVIEW

ASSET EXECUTIVE SUMMARY

All costs shown as Present Value

ASSET CODE	RIVE	CURRENT REPLACEMENT VALUE	\$29,968,000
ASSET NAME	RIVERS BUILDING (010)	FACILITY CONDITION NEEDS INDEX	0.45
ASSET USE	Classroom / Academic	FACILITY CONDITION INDEX	0.32
YEAR BUILT	1968	10-YEAR \$/SF	180.78
GSF	73,997		
INSPECTION DATE	05/13/2021		

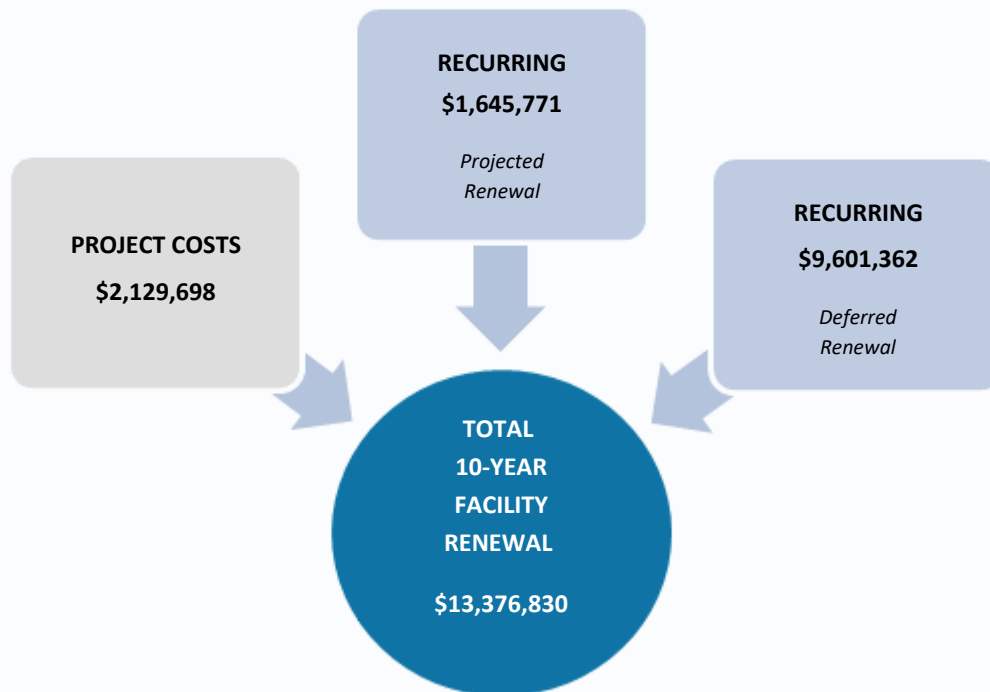
FCNI Scale

The FCNI for this asset is **0.45**

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



Total Facility Renewal Costs



Project Costs

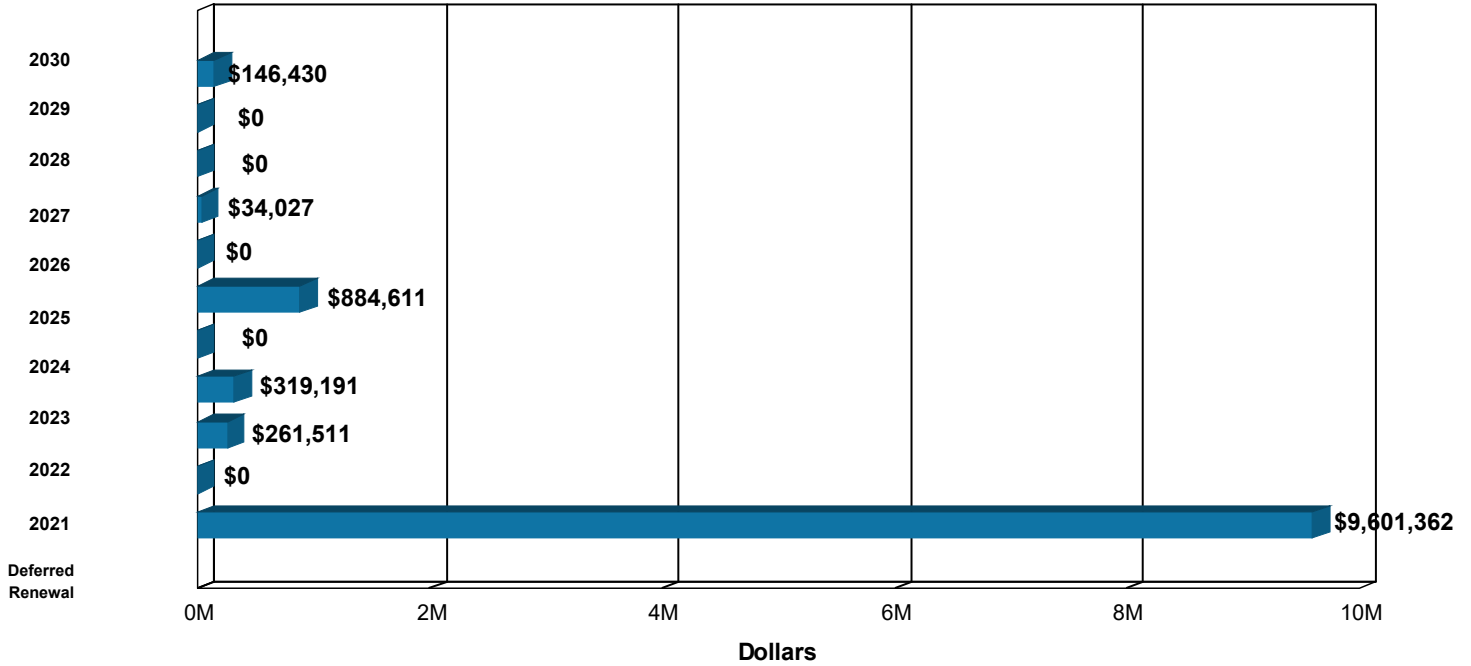
Project Cost by Priority

PLANT ADAPTION	
Priority 1	\$523,471
Priority 2	\$597,800
Priority 3	\$1,008,426
Priority 4	\$0
Priority 5	\$0

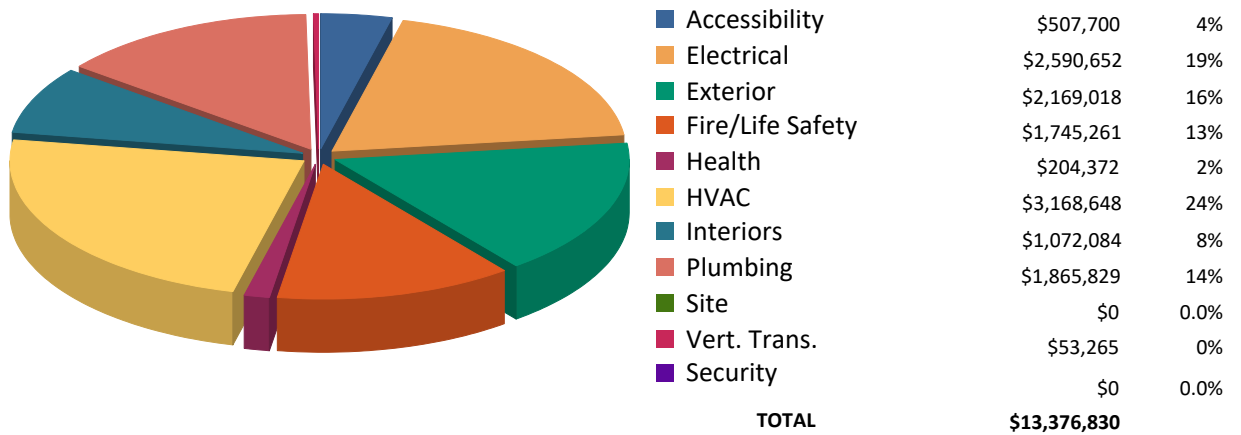
CORRECTIVE ACTION	
Priority 1	\$0
Priority 2	\$0
Priority 3	\$0
Priority 4	\$0
Priority 5	\$0

Recurring Costs

Component Replacement Cost by Year



Facilities Renewal Cost by System



ASSET SUMMARY

The Rivers Building is a 1968 two-story classroom and office building on the main East Carolina University campus. This facility is arranged into four wings with open ended courtyards between. Both floors have a mixture of offices, classrooms, and some labs. The first floor also has a lecture room and there is a daycare facility at the south end of the building. The exterior facades are brick with precast accent banding. The glazing is mostly original single pane with sections of new glazing on the west elevation. The primary exterior doors are glass and the secondary and service doors are hollow metal. The culinary classrooms were upgraded around 2014. The 2004 west addition to Rivers Building is addressed in a separate report. The original Rivers Building totals approximately 73,997 gross square feet.

The information for this report was gathered during an inspection conducted on May 13, 2021.

Site

The site is relatively flat and landscaping consists of turf grass and ornamental trees and shrubs. The planting scheme is adequate and no additional landscaping is recommended at this time. The concrete sidewalk layout is adequate and no repairs are recommended. The adjoining parking lots are considered part of campus infrastructure and not addressed in this report.

Exterior Structure

The brick facades and upper precast concrete banding are stained and the caulking along the banding is weathered. Some of the banding has stress cracks and select panels may require replacement. Cleaning, surface preparation, and selective repairs are recommended to restore the aesthetics and integrity of the building envelope.

With the exception of some of the west glazing, which was upgraded as part of the Rivers West addition, all of the remaining exterior windows are in good condition and should be replaced with new metal-framed, thermal-pane units. Most of the exterior primary and secondary doors are older and due for in-kind replacement. The newer glass entry doors on the north end of the building and the new service doors on the small east addition are in good condition at this time. The areaway metal stair runs in some of the courtyards have weathered paint finishes and should be cleaned and repainted, as recommended in the Accessibility section, to better maintain these areas.

The flat, built-up roofing system is heavily weathered and at, or past, its normal lifecycle. Replace the main roof in kind in the very near future. The small east addition has a much newer built-up roof that is in good condition and no upgrades are needed.

Interior Finishes/Systems

Interior finishes vary in age and condition throughout the facility, including the painted interior walls. All of the interior walls should be repainted within the next five to ten years. Acoustical tile ceilings are in average to good condition and should be serviceable for the near future. These ceilings may need to be removed as part of any textured ceiling abatement work if original ceilings remain above these systems.

Carpeting in the offices and some classrooms and corridors also varies from average to fair. While the areas of newer carpet tile should be adequate for the near future, all of the remaining broadloom carpeting should be replaced over the next few years and upgraded to carpet tile. Vinyl floor tile in the classrooms and main corridors is also a combination of older and newer finishes. The more worn vinyl flooring is due for replacement and the slightly newer vinyl flooring should be replaced within the next ten years. Newer sheet vinyl flooring in portions of the daycare area is in good condition and no upgrades are needed. Also, the areas with LVT flooring are adequate at this time. Ceramic floor tile finishes in the restrooms are older and should be replaced when the fixtures are upgraded.

Interior corridor doors are largely older nonrated assemblies and the interior standard doors are also due for replacement. Corridor doors are addressed in the Fire/Life Safety section of this report. The corridor isolation doors are newer and in adequate condition at this time. Molded plastic fixed seating in the lecture room is still serviceable. Casework in the break areas varies in condition and the older cabinetry is due for replacement. The casework in the teaching kitchens is still in adequate condition and no upgrades are needed. Lab cabinetry in the few lab rooms is also in good condition. While the daycare casework varies in age, both the older and newer cabinetry should remain serviceable for the near future.

Accessibility

The building has accessible entry points, but the southeast entry ramp has failed and should be replaced in kind. The entrances lack fully accessible wall-mounted handrails, and certain entry steps will require modifications. Some of the key entry doors have power door assist units that also need to be upgraded. Prep and repaint the areaway service stairs as part of this ramp and railing upgrade work.

The passenger elevator has accessible elevator controls, but the stair towers are not fully compliant. The stair towers and corridor steps lack accessible railing designs and new wall-mounted railings should be installed. The inner switchback railings have large picket spacing and expanded metal infill panels should be installed to meet current standards. The rubber stair treads on the stair towers are new and in good condition but the rubber stair treads on the corridor steps are older and should be replaced. Also, install protective cane guards at the base of all stair towers.

The interior doors are recommended for replacement and the new doors should have lever hardware sets. However, if door upgrades are delayed then the existing door assemblies on both floors should be fitted with new lever hardware sets.

The restrooms are older, and most are not accessible. The current restroom configurations also do not lend themselves to restroom expansion and conversion to accessible restrooms within the existing

restroom space will reduce total fixture counts in the building. It is recommended that new fully accessible three-fixture, all-gender restrooms be installed at key locations on both levels to meet current accessibility requirements. Also, the water fountains vary in age and level of accessibility. There is one newer dual-level fountain, and the remaining fountains should be upgraded to similar accessible dual-level units set in wheelchair accessible corridor alcoves.

The seating in the lecture room does not provide adequate designated accessible areas and some seat layout modifications are needed. Also, the side aisles should be fitted with accessible handrails and an assistive listening system should be added to aid the hearing impaired.

Health

The small commercial kitchen for the daycare, as well as the culinary kitchen, are in good overall condition and no upgrades are warranted at this time.

Emergency eyewash and shower stations in the laboratory areas appear to be original. It is recommended that they be replaced due to lifecycle depletion.

Textured finishes in the corridor ceilings, as well as in the offices and classrooms, are suspected to contain asbestos. Many of these ceilings also have visible water or contact damage. It is also assumed that original textured ceilings are still present above the existing lay-in acoustical ceilings. These textured ceilings should be sampled and tested for the presence of asbestos. Assuming a positive test result, these ceilings should be properly abated prior to finish upgrades in these areas.

Asbestos insulation was observed on mechanical piping during the inspection. Prior to any future renovation efforts, it is recommended that it be properly removed and disposed of according to local, state, and federal regulations.

Fire/Life Safety

The building appears to have adequate egress pathways and no existing obstructions were noted. However, most of the corridor doors are older and not fire rated. Replace all corridor doors on both levels with new fire-rated, flush wood doors with metal frames and lever hardware sets.

This facility contains a point addressable fire alarm and detection system that has a main fire alarm panel, fire alarm extension panels, manual pull stations, smoke detectors, and horn and strobe alarm systems. The panel and devices were installed in the mid-2000s and should be evaluated for replacement within the next ten years due to technical obsolescence.

This facility is not protected via an automatic fire suppression system. Fire suppression is handled manually via strategically placed dry-type handheld fire extinguishers. As a part of future renovation efforts, it is recommended that an automatic wet-pipe fire suppression system be installed.

HVAC

The main HVAC system provides heating and cooling via seven original multizone constant air volume (CAV) air handling units utilizing heating hot water and chilled water. Heating hot water is generated and supplied by the Rivers West building with steam generated at the steam plant. Chilled water is supplied by a district energy plant. Exhaust for the restrooms and select spaces is handled by centrifugal rooftop exhaust fans. Propeller exhaust fans provide ventilation for the mechanical spaces. The majority of these systems are original and visually timeworn. Corrosion was observed on many of the air handling units. It is recommended that they be replaced with modern, energy-efficient systems, including variable air volume (VAV) capable air handling units. Supplemental cooling for select spaces is handled by two 1-ton ductless split systems. These systems were installed within the last ten years and are expected to remain viable for the next ten.

Commercial kitchen hoods were observed in the culinary kitchen and in the childcare center. Exhaust for the kitchen hoods is handled by centrifugal rooftop exhaust fans. Two makeup air handling units provide fresh air for the spaces. Makeup air handling unit MAU-1 utilizes heating hot water and chilled water while MAU-2 serves as a fresh air supply fan. No issues were observed or reported with these systems and they are expected to remain viable for the next ten years.

Two laboratory fume hoods were observed in select dry laboratory spaces. Exhaust for the fume hood in 110C is handled by a utility-style exhaust fan. The two fume hoods in 258 have on-board HEPA filters and are not connected to any rooftop units. The fume hoods and exhaust fan are in average condition and should be evaluated for replacement and/or removal, depending upon the future use of these spaces.

The HVAC distribution network is an original multizone CAV design. The distribution network consists of insulated metallic conduit, insulated mechanical piping, valves, diffusers, and similar elements. The HVAC controls are a direct digital (DDC) and pneumatic hybrid with the pneumatic systems original and some recent upgrades to DDC. It is recommended that the HVAC distribution network and controls be removed and replaced with a modern, energy-efficient VAV system with full DDC. The controls air compressor was replaced in 2017 and should remain viable for the next ten years. However, it may be removed from future budgeting with the upgrade to full DDC.

Electrical

Main electrical service is fed to this facility from a 1,500-kVA oil-filled transformer where power is reduced to 277/480 volts and routed to a 2,000-amp main switchboard. Power is distributed at 120/208 and 277/480 volts via individual conductors in metallic conduit to secondary panelboards for use in local devices. The distribution system consists of downline electrical system components beyond the main electrical service elements including the distribution feeders, conduits, local panelboards, load centers, safety switches, fused disconnects, receptacles, switches, and similar terminal elements. The electrical distribution network is original and should be considered for replacement as it has exceeded its statistical lifecycle. The oil-filled transformer and switchboard were replaced in the mid-2000s and are expected to remain viable for the next ten years.

The emergency power network consists of a 300-kW, diesel-fired generator with two associated automatic transfer switches (150 amp and 400 amp). The network was installed in 2006 and is reported to be in good condition. It is expected to remain viable for the next ten years. Additionally, the emergency power network serves the Rivers West building.

Variable frequency drives (VFDs) are associated with the air handling units. The drives are currently used as soft starts for the motors and not able to provide throttling due to the current HVAC controls. It is recommended that they be replaced during any future HVAC renovations.

The majority of the original interior lighting consists of retrofitted T8 and T12 fluorescent fixtures and CFLs. LED fixtures were observed in select classrooms and corridors and consist of newly installed recessed lay-in fixtures and retrofitted original fixtures. Although the original lighting appears to be in usable condition, it will fulfill its financially viable life expectancy within the next ten years. This includes the LED retrofitted fixtures, as replacement diffusers and exterior components will become difficult to obtain. Lighting technology is rapidly advancing, and expectations for lamp durability, quality, intensity control, and efficiency are increasing with the advancement of LED lighting options. The fixtures should be considered for upgrade to LED.

Automated on/off timer lighting controls and occupancy sensing on/off lighting controls are recommended to be added throughout to save energy and reduce operational costs through extended lamp life. Timers should be controlled by building automation systems or be otherwise digitally programmable. The occupancy sensors should be preset for preferred inactivity periods for activation. A cost adjustment has been added to the vintage lighting for this upgrade.

The exterior lighting consists of HID wallpacks, ceiling-mounted HID sconces, LED sconces, recessed can fixtures, and pole-mounted HID fixtures. While currently functional, the majority of the exterior lighting is less efficient and requires more frequent maintenance than modern LED lighting. It is recommended that the exterior lighting be replaced with LED fixtures. The current LED fixtures were installed within the last three years and are expected to remain viable for the next ten.

Plumbing

Potable water supply, sanitary sewer, and stormwater handling systems serve this facility. The supply piping is copper with soldered connections. The drain piping is cast-iron with bell-and-spigot connections. The majority of the supply and drain piping is original and recommended for replacement as aged piping can cause costly repairs due to unwanted leaks. Three backflow preventers are associated with the water main. The backflow preventers were installed in 2010 and should be evaluated for replacement prior to failure.

Domestic hot water is generated through three residential-style electric water heaters with associated fractional horsepower circulation pumps. The water heater associated with the childcare kitchen was installed in 2012 and should be evaluated for replacement within the next five years due to lifecycle depletion. Two electric water heaters and associated pumps serve the remainder of the building and were installed within the last two years. They should outlast the scope of this report.

Three duplex sump pumps in each of the basement mechanical spaces appear to have been replaced within the last ten years. It is recommended that they be evaluated for replacement within the next decade prior to pump failure which may cause flooding in these areas.

The plumbing fixtures are mostly older wall-hung lavatories and tankless water closets with a few updated, accessible counter and wall-hung lavatories and tankless water closets in renovated restrooms. The lavatories and water closets are due for replacement. The older mop sinks and staff water closets in the janitor's closets are aging and also due for replacement. Sinks in the various teaching kitchens and staff break areas vary in age and should be replaced as part of any recommended casework upgrades.

Vertical Transportation

A three-stop hydraulic-controlled passenger elevator with a capacity of 4,000 pounds serves this facility. The elevator was modernized in 2007 and no issues were observed or reported. However, the elevator cab should be evaluated for modernization within the next ten years due to lifecycle depletion. No detailed elevator testing was conducting during this assessment.

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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Duluth, GA 30096

Project Manager

Doug Fredendall
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Date of Inspection

May 13, 2021

Inspection Team Personnel

NAME	POSITION	SPECIALTY
Andrew Derrick	Project Engineer	Mechanical, Electrical, Plumbing, Energy, Fire/Life Safety, Health
Carl Turner, AIA	Senior Project Architect	Interior Finishes, Exterior Structure, ADA Compliance, Site, 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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	TOTAL
ACCESSIBILITY	0	459,882	47,818	0	0	0	0	0	0	0	0	0	0	0	\$507,700
EXTERIOR	0	0	0	2,140,586	0	0	0	0	0	0	28,432	0	0	0	\$2,169,018
INTERIOR	0	0	0	678,973	0	259,373	0	0	0	0	0	0	0	133,738	\$1,072,084
PLUMBING	0	0	0	1,768,797	0	2,138	0	0	82,202	0	0	0	0	12,692	\$1,865,829
HVAC	0	0	0	3,151,197	0	0	0	0	11,856	0	5,595	0	0	0	\$3,168,648
FIRE/LIFE SAFETY	523,471	0	894,155	37,851	0	0	289,784	0	0	0	0	0	0	0	\$1,745,261
ELECTRICAL	0	0	0	1,770,693	0	0	29,407	0	790,553	0	0	0	0	0	\$2,590,652
SITE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$0
VERT. TRANS.	0	0	0	53,265	0	0	0	0	0	0	0	0	0	0	\$53,265
HEALTH/EQUIP.	0	137,918	66,454	0	0	0	0	0	0	0	0	0	0	0	\$204,372
SUBTOTAL	\$523,471	\$597,800	\$1,008,426	\$9,601,362	\$0	\$261,511	\$319,191	\$0	\$884,611	\$0	\$34,027	\$0	\$0	\$146,430	\$13,376,830
TOTAL NONRECURRING PROJECT NEEDS			\$2,129,698	TOTAL RECURRING COMPONENT REPLACEMENT NEEDS										\$11,247,133	

CURRENT REPLACEMENT VALUE	\$29,968,000
FACILITY CONDITION NEEDS INDEX	0.45
FACILITY CONDITION INDEX	0.32

GSF	TOTAL 10-YEAR FACILITY RENEWAL NEEDS	10-YEAR NEEDS/SF
73,997	\$13,376,830	\$180.78

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	\$507,700	\$0	\$507,700
EXTERIOR	\$0	\$2,169,018	\$2,169,018
INTERIOR	\$0	\$1,072,084	\$1,072,084
PLUMBING	\$0	\$1,865,829	\$1,865,829
HVAC	\$0	\$3,168,648	\$3,168,648
FIRE/LIFE SAFETY	\$1,417,626	\$327,635	\$1,745,261
ELECTRICAL	\$0	\$2,590,652	\$2,590,652
SITE	\$0	\$0	\$0
VERT. TRANS	\$0	\$53,265	\$53,265
HEALTH	\$204,372	\$0	\$204,372
TOTALS	\$2,129,698	\$11,247,133	\$13,376,830

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
RIVE EW01	WALL, EXTERIOR, MASONRY POINTING	MASONRY AND PRECAST			B2010	Deferred Renewal	350,727
RIVE WN01	GLASS, WINDOW, ALUMINUM OR WOOD, STANDARD			MOST ELEVS	B2010	Deferred Renewal	1,397,218
RIVE DR05	DOOR AND FRAME, EXTERIOR, SWINGING, ALUMINUM AND GLASS			ENTRY/EGRESS	B2030	Deferred Renewal	17,311
RIVE RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP	FLAT		MAIN ROOF	B3010	Deferred Renewal	375,330
RIVE DR01	DOOR AND FRAME, INTERIOR, NON-RATED	STANDARD W/KNOBS			C1020	Deferred Renewal	97,408
RIVE DR24	DOOR LOCK, COMMERCIAL-GRADE	SERVICE			C1020	Deferred Renewal	2,979
RIVE DR26	DOOR PANIC HARDWARE			ENTRY/EGRESS	C1020	Deferred Renewal	7,310
RIVE DR26	DOOR PANIC HARDWARE	SECONDARY			C1020	Deferred Renewal	12,183
RIVE DR26	DOOR PANIC HARDWARE	ISOLATION DRS		CORRIDORS	C1020	Deferred Renewal	48,731
RIVE CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			BREAK AREA	C1030	Deferred Renewal	21,570
RIVE IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			C3010	Deferred Renewal	83,565
RIVE IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VINYL FLOOR TILE			C3020	Deferred Renewal	139,066
RIVE IF06	FLOORING - TILE, CERAMIC / STONE / QUARRY STANDARD	CERAMIC FLOOR TILE			C3020	Deferred Renewal	66,779
RIVE IF17	FLOORING - ATHLETIC, RUBBER, TILE OR ROLL	RUBBER TREADS		N CORR STEPS	C3020	Deferred Renewal	46,980
RIVE IC05	CEILING FINISH - PAINTED OR STAINED, TEXTURED	PT TEXTURED CLGS			C3030	Deferred Renewal	152,403
RIVE VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEV-1		ELEV	D1010	Deferred Renewal	53,265

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
RIVE FX06	PLUMBING FIXTURE - SINK, SERVICE/LAUNDRY/UTILITY	WALL MOUNT		JAN CLOS	D2010	Deferred Renewal	7,170
RIVE FX15	PLUMBING FIXTURE - EMERGENCY EYEWASH	EM EYEWASH		LABS	D2010	Deferred Renewal	14,056
RIVE FX16	PLUMBING FIXTURE - EMERGENCY COMBINATION SHOWER/EYEWASH	EM COMBO		258	D2010	Deferred Renewal	8,054
RIVE BF01	BACKFLOW PREVENTER (<=1 INCH)	BFP-MU-1		03	D2020	Deferred Renewal	1,049
RIVE BF02	BACKFLOW PREVENTER (1-2 INCHES)	BFP-WM-1		EXT	D2020	Deferred Renewal	2,339
RIVE BF02	BACKFLOW PREVENTER (1-2 INCHES)	BFP-WM-2		EXT	D2020	Deferred Renewal	2,339
RIVE PS02	SUPPLY PIPING SYSTEM - CLASSROOM	COPPER		THROUGHOUT	D2020	Deferred Renewal	690,658
RIVE PD02	DRAIN PIPING SYSTEM - CLASSROOM	CAST IRON, BELL AND SPIGOT		THROUGHOUT	D2030	Deferred Renewal	1,043,130
RIVE AH02	AIR HANDLING UNIT - INDOOR (1.25-1.75 HP)	AHU-2		113	D3040	Deferred Renewal	11,059
RIVE AH02	AIR HANDLING UNIT - INDOOR (1.25-1.75 HP)	AHU-3		113	D3040	Deferred Renewal	11,059
RIVE AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AHU-1		02	D3040	Deferred Renewal	44,414
RIVE AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AHU-5		03	D3040	Deferred Renewal	44,414
RIVE AH07	AIR HANDLING UNIT - INDOOR (9-12 HP)	AHU-4		219	D3040	Deferred Renewal	81,604
RIVE AH07	AIR HANDLING UNIT - INDOOR (9-12 HP)	AHU-7		05	D3040	Deferred Renewal	81,604
RIVE AH09	AIR HANDLING UNIT - INDOOR (17-23 HP)	AHU-6		04	D3040	Deferred Renewal	130,263
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-1		ROOF	D3040	Deferred Renewal	7,951

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
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-2		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-3		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-6		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-7		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-8A		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-8		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-5		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-3A		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-4		ROOF	D3040	Deferred Renewal	7,951
RIVE FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-1A		ROOF	D3040	Deferred Renewal	7,951
RIVE FN26	FAN - PROPELLER WITH LOUVER, 1/4" SP (.5-1 HP)	EF-13		03	D3040	Deferred Renewal	2,772
RIVE HD01	HOOD, FUME	FH-258		258	D3040	Deferred Renewal	23,712
RIVE HV02	HVAC DISTRIBUTION NETWORKS - CLASSROOM	CAV, MULTIZONE		THROUGHOUT	D3040	Deferred Renewal	2,280,710
RIVE BA102	HVAC CONTROLS SYSTEM - CLASSROOM	HYBRID-PNEUM, DDC		THROUGHOUT	D3060	Deferred Renewal	352,127
RIVE FA01	FIRE ALARM PANEL, DIALER, BATTERY, & CHARGER	PA, SIMPLEX		03	D4030	Deferred Renewal	37,851

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
RIVE SE02	ELECTRICAL DISTRIBUTION NETWORK - CLASSROOM	277/480		THROUGHOUT	D5010	Deferred Renewal	1,742,531
RIVE VF02	VARIABLE FREQUENCY DRIVE (5-7.5 HP)	VFD MAU-1		ROOF	D5010	Deferred Renewal	4,764
RIVE LE03	LIGHTING - EXTERIOR, RECESSED (INC, CFL, LED)	REC CAN		EXT	D5020	Deferred Renewal	2,345
RIVE LE04	LIGHTING - EXTERIOR, STANCHION LUMINAIRE, 12-FOOT	PM HID FIX		EXT	D5020	Deferred Renewal	10,912
RIVE LE07	LIGHTING - EXTERIOR, WALL FLOOD (SV, MH, ID, LED)	HID WALLPACK		EXT	D5020	Deferred Renewal	8,896
RIVE LE08	LIGHTING - EXTERIOR, WALL LANTERN or FLOOD (INC, CFL, LED)	CFL SCONCE		EXT	D5020	Deferred Renewal	1,245
RIVE IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			C3010	2022	153,210
RIVE IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	CARPET TILE UPGRADE			C3020	2022	106,163
RIVE WH24	WATER HEATER - RESIDENTIAL, ELECTRIC (46-100 GAL)	WH-3		05	D2020	2022	2,138
RIVE FA02	FIRE ALARM SYSTEM - DEVICES	HS, MP, SD		THROUGHOUT	D4030	2023	289,784
RIVE VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-3		113	D5010	2023	1,051
RIVE VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-2		113	D5010	2023	1,051
RIVE VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-1		02	D5010	2023	3,503
RIVE VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-5		03	D5010	2023	3,503
RIVE VF03	VARIABLE FREQUENCY DRIVE (7.5-10 HP)	VFD AHU-4		219	D5010	2023	5,298
RIVE VF05	VARIABLE FREQUENCY DRIVE (15-20 HP)	VFD AHU-6		04	D5010	2023	7,501
RIVE VF05	VARIABLE FREQUENCY DRIVE (15-20 HP)	VFD AHU-7		05	D5010	2023	7,501

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
RIVE FX02	PLUMBING FIXTURE - LAVATORY, WALL HUNG	PC		RRS	D2010	2025	25,274
RIVE FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		BREAK RMS	D2010	2025	4,319
RIVE FX12	PLUMBING FIXTURE - WATER CLOSET, TANKLESS	PC		RRS	D2010	2025	52,609
RIVE HD01	HOOD, FUME	FH-110C		110C	D3040	2025	11,856
RIVE LI02	LIGHTING SYSTEM, INTERIOR - CLASSROOM	RETRO T8, T12, CFL		MOST SPACES	D5020	2025	790,553
RIVE DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SERVICE			B2030	2027	8,123
RIVE DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SECONDARY			B2030	2027	20,309
RIVE FN32	FAN - UTILITY SET, 1/4" SP (.4-1.25 HP)	EF-3		ROOF	D3040	2027	5,595
RIVE CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			BREAK AREA	C1030	2030	32,356
RIVE IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			C3010	2030	41,783
RIVE IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VINYL FLOOR TILE			C3020	2030	59,600
RIVE PP02	GREYWATER LIFT STATION	SUMP-2		04	D2030	2030	2,538
RIVE PP02	GREYWATER LIFT STATION	SUMP-1		03	D2030	2030	5,077
RIVE PP02	GREYWATER LIFT STATION	SUMP-3		05	D2030	2030	5,077
TOTAL							\$11,247,133

FACILITIES RENEWAL PLAN

NONRECURRING PROJECT COSTS

All costs shown as Present Value

PROJECT NUMBER	PROJECT TITLE	UNI-FORMAT	PRIORITY CLASS	PROJECT CLASSIFICATION	PROJECT COST
RIVEFS02	RATED CORRIDOR DOOR UPGRADES	C1020	1	Plant Adaption	523,471
RIVEAC01	SE ENTRY RAMP RECONSTRUCTION ALLOWANCE	B2030	2	Plant Adaption	169,694
RIVEAC03	LECTURE ROOM 102 ACCESSIBILITY UPGRADES	C1010	2	Plant Adaption	28,456
RIVEAC04	INTERIOR DOOR HARDWARE ACCESSIBILITY UPGRADES	C1010	2	Plant Adaption	137,774
RIVEAC06	STAIR TOWER ACCESSIBLE RAILING UPGRADES	C2020	2	Plant Adaption	34,455
RIVEAC05	UNISEX RESTROOM INSTALLATION	D2010	2	Plant Adaption	89,503
RIVEHE01	ASBESTOS ABATEMENT - MECHANICAL SYSTEMS	F2020	2	Plant Adaption	137,918
RIVEAC02	ACCESSIBLE WATER FOUNTAIN UPGRADES	C1010	3	Plant Adaption	47,818
RIVEFS01	FIRE SPRINKLER SYSTEM INSTALLATION	D4010	3	Plant Adaption	894,155
RIVEHE02	ASBESTOS ABATEMENT - INTERIOR FINISH SYSTEMS	F2020	3	Plant Adaption	66,454
TOTAL					\$2,129,698

FACILITY CONDITION ASSESSMENT

SECTION 3

**NONRECURRING
PROJECT DETAILS**

All costs shown as Present Value

RATED CORRIDOR DOOR UPGRADES			
Project Number:	RIVEFS02	Category Code:	
Priority Sequence:	1	FS5F	
Priority Class:	Immediate	System:	FIRE/LIFE SAFETY
Project Class:	Plant Adaption	Component:	EGRESS PATH
Date Basis:	6/21/2021	Element:	FIRE DOORS/HARDWARE

Code Application:		Subclass/Savings:	Project Location:
IBC	713	Not Applicable	Floor-wide: Floor(s) 1,2

Description

Most of the existing corridor doors are older and not fire rated. Replace all of the corridor doors on both floors with new fire-rated, flush wood doors with metal frames and lever hardware sets.

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
Rated door and rated metal frame installation	LEAF	140	\$2,278	\$318,867	\$551	\$77,080	\$395,947
Base Material/Labor Costs				\$318,867		\$77,080	
Indexed Material/Labor Costs				\$321,099		\$54,958	\$376,057
Construction Mark Up at 20.0%							\$75,211
Original Construction Cost							\$451,268
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$451,268
Professional Fees at 16.0%							\$72,203
TOTAL PROJECT COST							\$523,471

All costs shown as Present Value

ASBESTOS ABATEMENT - MECHANICAL SYSTEMS			
Project Number:	RIVEHE01	Category Code:	
Priority Sequence:	2	HE6B	
Priority Class:	Critical	System:	HEALTH
Project Class:	Plant Adaption	Component:	HAZARDOUS MATERIAL
Date Basis:	6/7/2021	Element:	MECHANICAL ASBESTOS

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

Description

There is asbestos existent on utility piping. Prior to future renovation of these systems, this asbestos will have to be properly removed from the utility networks.

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
HVAC system - abate asbestos from utility piping	SF	73,997	\$0.24	\$17,759	\$0.60	\$44,398	\$62,157
Plumbing system - abate asbestos from supply piping network	SF	73,997	\$0.24	\$17,759	\$0.60	\$44,398	\$62,157
Base Material/Labor Costs				\$35,519		\$88,796	
Indexed Material/Labor Costs				\$35,767		\$63,312	\$99,079
Construction Mark Up at 20.0%							\$19,816
Original Construction Cost							\$118,895
Date of Original Estimate:	6/7/2021				Inflation		\$0
Current Year Construction Cost							\$118,895
Professional Fees at 16.0%							\$19,023
TOTAL PROJECT COST							\$137,918

All costs shown as Present Value

SE ENTRY RAMP RECONSTRUCTION ALLOWANCE			
Project Number:	RIVEAC01	Category Code:	
Priority Sequence:	3	AC2A	
Priority Class:	Critical	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	BUILDING ENTRY
Date Basis:	6/21/2021	Element:	GENERAL

Code Application:		Subclass/Savings:	Project Location:
ADAAG	703.1, 309, 403.6, 405, 505, 410	DOJ1 - Approach & Entrance	Undefined: Floor(s) 1

Description

The southeast entry ramp has failed and needs to be removed and replaced in kind. Also, the various entry steps need selective railing upgrades to provide handrail extensions at the top of each stair flight. Some of the key entry doors have power door assist units that also need to be upgraded. Prep and repaint the areaway service stairs as part of this ramp and railing upgrade work.

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
Door operator, signage, and controls	EA	14	\$5,003	\$70,039	\$1,730	\$24,225	\$94,264
Wheelchair ramp construction, including handrails	VFT	3	\$3,500	\$10,500	\$3,500	\$10,500	\$21,000
Wall-mounted handrail system, painted	LF	130	\$68.81	\$8,945	\$48.23	\$6,270	\$15,215
Areaway metal stair prep and repainting allowance	LOT	1	\$850	\$850	\$2,400	\$2,400	\$3,250
Base Material/Labor Costs				\$90,334		\$43,395	
Indexed Material/Labor Costs				\$90,967		\$30,940	\$121,907
Construction Mark Up at 20.0%							\$24,381
Original Construction Cost							\$146,288
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$146,288
Professional Fees at 16.0%							\$23,406
TOTAL PROJECT COST							\$169,694

All costs shown as Present Value

UNISEX RESTROOM INSTALLATION			
Project Number:	RIVEAC05	Category Code:	
Priority Sequence:	4	AC3E	
Priority Class:	Critical	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	6/21/2021	Element:	RESTROOMS/BATHROOMS

Code Application:		Subclass/Savings:	Project Location:
ADAAG	604, 605, 606	DOJ3 - Restrooms	Undefined: Floor(s) 1,2

Description

The existing restrooms are older and most are not accessible. Additionally, the current restroom configurations do not lend themselves to restroom expansion and conversion to accessible restrooms within the existing restroom space will reduce total fixture counts in the building. It is recommended that new, fully accessible three-fixture, all-gender restrooms be installed at key locations on both levels to meet current accessibility requirements.

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 an accessible three-fixture, all-gender restroom including rough ins and new floor, wall and ceiling finishes	EA	4	\$8,500	\$34,000	\$10,540	\$42,160	\$76,160
Base Material/Labor Costs				\$34,000		\$42,160	
Indexed Material/Labor Costs				\$34,238		\$30,060	\$64,298
Construction Mark Up at 20.0%							\$12,860
Original Construction Cost							\$77,158
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$77,158
Professional Fees at 16.0%							\$12,345
TOTAL PROJECT COST							\$89,503

All costs shown as Present Value

LECTURE ROOM 102 ACCESSIBILITY UPGRADES			
Project Number:	RIVEAC03	Category Code:	
Priority Sequence:	5	AC3B	
Priority Class:	Critical	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	6/21/2021	Element:	STAIRS AND RAILINGS

Code Application:		Subclass/Savings:	Project Location:
ADAAG	219.3, 706.1, 806, 505	DOJ2 - Access to Goods & Services	Room Only: Floor(s) 1

Description

The layout in the lecture room does not provide adequate designated accessible seating and some modifications are needed. Also, the side aisles should be fitted with accessible handrails and the lecture room should receive an assistive listening system to aid the hearing impaired.

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
Table and seating modifications	LOT	5	\$1,206	\$6,030	\$756	\$3,781	\$9,811
Infrared transmitter and headphone receiver sets	SYS	1	\$2,071	\$2,071	\$1,816	\$1,816	\$3,887
Wall-mounted handrail system, painted	LF	80	\$68.81	\$5,505	\$48.23	\$3,858	\$9,363
Base Material/Labor Costs				\$13,606		\$9,455	
Indexed Material/Labor Costs				\$13,701		\$6,742	\$20,443
Construction Mark Up at 20.0%							\$4,089
Original Construction Cost							\$24,531
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$24,531
Professional Fees at 16.0%							\$3,925
TOTAL PROJECT COST							\$28,456

All costs shown as Present Value

INTERIOR DOOR HARDWARE ACCESSIBILITY UPGRADES			
Project Number:	RIVEAC04	Category Code:	
Priority Sequence:	6	AC3C	
Priority Class:	Critical	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	6/21/2021	Element:	DOORS AND HARDWARE

Code Application:		Subclass/Savings:	Project Location:
ADAAG	309.4	DOJ2 - Access to Goods & Services	Floor-wide: Floor(s) 1,2

Description

The interior doors are recommended for replacement. However, if the door upgrades are delayed then the existing doors on both floors should be fitted with new lever hardware sets.

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
Lever actuated door hardware	EA	185	\$414	\$76,570	\$166	\$30,673	\$107,243
Base Material/Labor Costs				\$76,570		\$30,673	
Indexed Material/Labor Costs				\$77,106		\$21,870	\$98,975
Construction Mark Up at 20.0%							\$19,795
Original Construction Cost							\$118,771
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$118,771
Professional Fees at 16.0%							\$19,003
TOTAL PROJECT COST							\$137,774

All costs shown as Present Value

STAIR TOWER ACCESSIBLE RAILING UPGRADES			
Project Number:	RIVEAC06	Category Code:	
Priority Sequence:	7	AC3B	
Priority Class:	Critical	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	6/21/2021	Element:	STAIRS AND RAILINGS

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

Description

The existing stair towers and corridor steps lack accessible railing designs and new wall-mounted railings should be installed. The inner switchback railings have large picket spacing and expanded metal infill panels should be installed to meet current standards. While the rubber stair treads on the stair towers are new and in good condition, the rubber stair treads on the corridor steps are older and should be replaced. Also, install protective cane guards at the base of all stair towers.

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
Wall-mounted handrail system per floor	FLR	6	\$780	\$4,682	\$709	\$4,256	\$8,938
Switchback rail metal infill allowance	FLR	5	\$850	\$4,250	\$750	\$3,750	\$8,000
Stair tread and landing finish upgrades per floor	FLR	1	\$1,975	\$1,975	\$1,053	\$1,053	\$3,028
Prefinished metal cane guard installation allowance	LOT	5	\$850	\$4,250	\$850	\$4,250	\$8,500
Base Material/Labor Costs				\$15,157		\$13,309	
Indexed Material/Labor Costs				\$15,263		\$9,489	\$24,752
Construction Mark Up at 20.0%							\$4,950
Original Construction Cost							\$29,702
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$29,703
Professional Fees at 16.0%							\$4,752
TOTAL PROJECT COST							\$34,455

All costs shown as Present Value

FIRE SPRINKLER SYSTEM INSTALLATION			
Project Number:	RIVEFS01	Category Code:	
Priority Sequence:	8	FS3A	
Priority Class:	Noncritical	System:	FIRE/LIFE SAFETY
Project Class:	Plant Adaption	Component:	SUPPRESSION
Date Basis:	6/7/2021	Element:	SPRINKLERS

Code Application:

NFPA 1, 13, 13R, 101

Subclass/Savings:

Not Applicable

Project Location:

Floor-wide: Floor(s) 1,2

Description

As a part of future renovation efforts, it is recommended that this facility be fully protected by an automatic, wet-pipe sprinkler system.

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 a wet-pipe sprinkler system, including valves, piping, sprinkler heads, piping supports, etc.	SF	73,997	\$4.62	\$341,866	\$5.65	\$418,083	\$759,949
Base Material/Labor Costs				\$341,866		\$418,083	
Indexed Material/Labor Costs				\$344,259		\$298,093	\$642,352
Construction Mark Up at 20.0%							\$128,470
Original Construction Cost							\$770,823
Date of Original Estimate:	6/7/2021					Inflation	\$0
Current Year Construction Cost							\$770,823
Professional Fees at 16.0%							\$123,332
TOTAL PROJECT COST							\$894,155

All costs shown as Present Value

ASBESTOS ABATEMENT - INTERIOR FINISH SYSTEMS			
Project Number:	RIVEHE02	Category Code:	
Priority Sequence:	9	HE6F	
Priority Class:	Noncritical	System:	HEALTH
Project Class:	Plant Adaption	Component:	HAZARDOUS MATERIAL
Date Basis:	6/21/2021	Element:	OTHER

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

Description

Textured finishes in the corridor ceilings, as well as in the offices and classrooms, are suspected to contain asbestos. Many of these ceilings also have visible water or contact damage. It is also assumed that original textured ceilings are still present above the existing lay-in acoustical ceilings. These textured ceilings should be sampled and tested for the presence of asbestos. Assuming a positive test result, these ceilings should be properly abated prior to finish upgrades in these areas.

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 attached ceiling finishes	SF	21,700	\$0.45	\$9,765	\$2.45	\$53,165	\$62,930
Base Material/Labor Costs				\$9,765		\$53,165	
Indexed Material/Labor Costs				\$9,833		\$37,907	\$47,740
Construction Mark Up at 20.0%							\$9,548
Original Construction Cost							\$57,288
Date of Original Estimate:	6/21/2021					Inflation	\$0
Current Year Construction Cost							\$57,288
Professional Fees at 16.0%							\$9,166
TOTAL PROJECT COST							\$66,454

All costs shown as Present Value

ACCESSIBLE WATER FOUNTAIN UPGRADES			
Project Number:	RIVEAC02	Category Code:	
Priority Sequence:	10	AC3F	
Priority Class:	Noncritical	System:	ACCESSIBILITY
Project Class:	Plant Adaption	Component:	INTERIOR PATH OF TRAVEL
Date Basis:	6/21/2021	Element:	DRINKING FOUNTAINS

Code Application:		Subclass/Savings:	Project Location:
ADAAG	211, 602	DOJ4 - Other	Floor-wide: Floor(s) 1,2

Description

The water fountains vary in age and level of accessibility. There was one newer dual-level fountain and the remaining fountains should be upgraded to similar new accessible dual-level water units set in wheelchair accessible corridor alcoves.

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
Dual-level drinking fountain	EA	5	\$1,657	\$8,285	\$509	\$2,547	\$10,832
Alcove construction for drinking fountain	EA	5	\$1,195	\$5,973	\$5,099	\$25,495	\$31,468
Base Material/Labor Costs				\$14,258		\$28,041	
Indexed Material/Labor Costs				\$14,358		\$19,994	\$34,352
Construction Mark Up at 20.0%							\$6,870
Original Construction Cost							\$41,222
Date of Original Estimate:	6/21/2021		Inflation			\$0	
Current Year Construction Cost							\$41,222
Professional Fees at 16.0%							\$6,596
TOTAL PROJECT COST							\$47,818

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	MASONRY AND PRECAST			40,770	SF	1.12	\$350,727	1968	30	22	DR
WN01	GLASS, WINDOW, ALUMINUM OR WOOD, STANDARD			MOST ELEVS	8,150	SF	1.12	\$1,397,218	1968	40	12	DR
WN01	GLASS, WINDOW, ALUMINUM OR WOOD, STANDARD			WEST ELEV	2,040	SF	1.12	\$349,733	2004	40		2044
DR05	DOOR AND FRAME, EXTERIOR, SWINGING, ALUMINUM AND GLASS	ENTRY/EGRESS		NORTH ELEV	4	LEAF	1.00	\$11,541	2014	25		2039
DR05	DOOR AND FRAME, EXTERIOR, SWINGING, ALUMINUM AND GLASS			ENTRY/EGRES S	6	LEAF	1.00	\$17,311	1990	25	5	DR
DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SECONDARY			10	LEAF	1.00	\$20,309	1990	40	-3	2027
DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SERVICE			4	LEAF	1.00	\$8,123	1990	40	-3	2027
DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SERVICE		LOAD DOCK	2	LEAF	1.00	\$4,062	2014	40		2054
RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP	FLAT		MAIN ROOF	37,000	SF	1.50	\$375,330	1998	20	2	DR
RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP			LOWER EAST ROOF	760	SF	1.00	\$5,140	2014	20		2034
DR01	DOOR AND FRAME, INTERIOR, NON-RATED	STANDARD W/KNOBS			45	LEAF	1.00	\$97,408	1968	40	12	DR
DR02	DOOR AND FRAME, INTERIOR, FIRE-RATED	ISOLATION DRS		CORRIDORS	40	LEAF	1.00	\$149,546	2000	40		2040
DR24	DOOR LOCK, COMMERCIAL-GRADE	SERVICE			4	EA	1.00	\$2,979	1990	20	10	DR
DR24	DOOR LOCK, COMMERCIAL-GRADE	SERVICE		LOAD DOCK	2	EA	1.00	\$1,489	2014	20		2034
DR26	DOOR PANIC HARDWARE	ENTRY/EGRESS		NORTH ELEV	4	EA	1.00	\$4,873	2014	20		2034

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
DR26	DOOR PANIC HARDWARE			ENTRY/EGRES S	6	EA	1.00	\$7,310	1990	20	10	DR
DR26	DOOR PANIC HARDWARE	SECONDARY			10	EA	1.00	\$12,183	1990	20	10	DR
DR26	DOOR PANIC HARDWARE	ISOLATION DRS		CORRIDORS	40	EA	1.00	\$48,731	2000	20		DR
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			TEACHING KITS	240	LF	1.00	\$129,423	2000	20	12	2032
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			BREAK AREA	60	LF	1.00	\$32,356	2010	20		2030
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			BREAK AREA	40	LF	1.00	\$21,570	1990	20	10	DR
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			DAYCARE	20	LF	1.00	\$10,785	2019	20		2039
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			DAYCARE	30	LF	1.00	\$16,178	2000	20	15	2035
CW04	CASEWORK - LABORATORY, INCLUDES REAGENT SHELF AND TOP			LABS	600	SF	1.00	\$90,021	2000	40		2040
CW04	CASEWORK - LABORATORY, INCLUDES REAGENT SHELF AND TOP			LABS	300	SF	1.00	\$45,010	2019	40		2059
IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			37,340	SF	1.00	\$83,565	2000	12	8	DR
IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			68,460	SF	1.00	\$153,210	2010	12		2022
IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			18,670	SF	1.00	\$41,783	2019	12	-1	2030
IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	CARPET TILE UPGRADE			8,670	SF	1.00	\$106,163	2010	12		2022
IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	CARPET TILE			2,890	SF	1.00	\$35,388	2019	12		2031

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	VINYL FLOOR TILE			21,700	SF	1.00	\$139,066	1990	20	10	DR
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VINYL FLOOR TILE			9,300	SF	1.00	\$59,600	2010	20		2030
IF04	FLOORING - VINYL SHEET, STANDARD	SHEET VINYL		DAYCARE	2,100	SF	1.00	\$22,427	2019	15		2034
IF06	FLOORING - TILE, CERAMIC / STONE / QUARRY STANDARD	CERAMIC FLOOR TILE			2,100	SF	1.00	\$66,779	1968	30	22	DR
IF13	FLOORING - LAMINATE PLANK, PREMIUM	LVT			4,200	SF	1.00	\$46,831	2019	15		2034
IF17	FLOORING - ATHLETIC, RUBBER, TILE OR ROLL	RUBBER TREADS		N CORR STEPS	1,580	SF	1.00	\$46,980	1990	15	15	DR
IC01	CEILING FINISH - SUSPENDED ACOUSTICAL TILE, STANDARD	ACOUS CLG			9,250	SF	1.00	\$93,347	2005	30		2035
IC01	CEILING FINISH - SUSPENDED ACOUSTICAL TILE, STANDARD	ACOUS CLG			2,310	SF	1.00	\$23,311	2015	30		2045
IC05	CEILING FINISH - PAINTED OR STAINED, TEXTURED	PT TEXTURED CLGS			40,980	SF	1.00	\$152,403	1968	24	28	DR
VT03	ELEVATOR MODERNIZATION - HYDRAULIC	ELEV-1		111	1	EA	1.00	\$302,064	2007	25		2032
VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEV-1		ELEV	1	EA	1.00	\$53,265	2007	12	1	DR
FX01	PLUMBING FIXTURE - LAVATORY, COUNTER	PC		ADA RRS	3	EA	1.00	\$3,954	2012	35		2047
FX02	PLUMBING FIXTURE - LAVATORY, WALL HUNG	PC		ADA RRS	1	EA	1.00	\$1,330	2012	35		2047
FX02	PLUMBING FIXTURE - LAVATORY, WALL HUNG	PC		CHILDREN'S RRS	4	EA	1.00	\$5,321	2000	35		2035
FX02	PLUMBING FIXTURE - LAVATORY, WALL HUNG	PC		RRS	19	EA	1.00	\$25,274	1990	35		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
FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		TEACHING KITS, DAYCARE RMS	14	EA	1.00	\$30,234	2000	35		2035
FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		BREAK RMS	2	EA	1.00	\$4,319	1990	35		2025
FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		BREAK RMS	3	EA	1.00	\$6,479	2010	35		2045
FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		DAYCARE RM	1	EA	1.00	\$2,160	2019	35		2054
FX06	PLUMBING FIXTURE - SINK, SERVICE/LAUNDRY/UTILITY	WALL MOUNT		JAN CLOS	4	EA	1.00	\$7,170	1968	35		DR
FX12	PLUMBING FIXTURE - WATER CLOSET, TANKLESS	PC		CHILDREN'S RRS	6	EA	1.00	\$11,691	2000	35		2035
FX12	PLUMBING FIXTURE - WATER CLOSET, TANKLESS	PC		ADA RRS	4	EA	1.00	\$7,794	2012	35		2047
FX12	PLUMBING FIXTURE - WATER CLOSET, TANKLESS	PC		RRS	27	EA	1.00	\$52,609	1990	35		2025
FX15	PLUMBING FIXTURE - EMERGENCY EYEWASH	EM EYEWASH		LABS	3	EA	1.00	\$14,056	1968	35	17	DR
FX16	PLUMBING FIXTURE - EMERGENCY COMBINATION SHOWER/EYEWASH	EM COMBO		258	1	EA	1.00	\$8,054	1968	35	17	DR
BF01	BACKFLOW PREVENTER (<=1 INCH)	BFP-MU-1		03	1	EA	1.00	\$1,049	2010	10		DR
BF02	BACKFLOW PREVENTER (1-2 INCHES)	BFP-WM-1		EXT	1	EA	1.00	\$2,339	2010	10		DR
BF02	BACKFLOW PREVENTER (1-2 INCHES)	BFP-WM-2		EXT	1	EA	1.00	\$2,339	2010	10		DR
PS02	SUPPLY PIPING SYSTEM - CLASSROOM	COPPER		THROUGHOUT	73,997	SF	0.96	\$690,658	1968	35	17	DR
WH24	WATER HEATER - RESIDENTIAL, ELECTRIC (46-100 GAL)	WH-1		03	80	GAL	1.00	\$2,631	2019	10	3	2032

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
WH24	WATER HEATER - RESIDENTIAL, ELECTRIC (46-100 GAL)	WH-2		05	50	GAL	1.00	\$1,645	2020	10	2	2032
WH24	WATER HEATER - RESIDENTIAL, ELECTRIC (46-100 GAL)	WH-3		05	65	GAL	1.00	\$2,138	2012	10		2022
PD02	DRAIN PIPING SYSTEM - CLASSROOM	CAST IRON, BELL AND SPIGOT		THROUGHOUT	73,997	SF	0.96	\$1,043,130	1968	40	12	DR
PP02	GREYWATER LIFT STATION	SUMP-1		03	2	HP	1.00	\$5,077	2010	20		2030
PP02	GREYWATER LIFT STATION	SUMP-2		04	1	HP	1.00	\$2,538	2010	20		2030
PP02	GREYWATER LIFT STATION	SUMP-3		05	2	HP	1.00	\$5,077	2010	20		2030
HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU-1		ROOF	1	TON	1.00	\$2,769	2015	23		2038
HU17	DUCTLESS DX SPLIT SYSTEM (<=1 TON)	CU-2		ROOF	1	TON	1.00	\$2,769	2012	23		2035
AH02	AIR HANDLING UNIT - INDOOR (1.25-1.75 HP)	AHU-2		113	1.50	HP	1.00	\$11,059	1968	25	27	DR
AH02	AIR HANDLING UNIT - INDOOR (1.25-1.75 HP)	AHU-3		113	1.50	HP	1.00	\$11,059	1968	25	27	DR
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AHU-1		02	5	HP	1.00	\$44,414	1968	25	27	DR
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AHU-5		03	5	HP	1.00	\$44,414	1968	25	27	DR
AH07	AIR HANDLING UNIT - INDOOR (9-12 HP)	AHU-7		05	10	HP	1.00	\$81,604	1968	25	27	DR
AH07	AIR HANDLING UNIT - INDOOR (9-12 HP)	AHU-4		219	10	HP	1.00	\$81,604	1968	25	27	DR
AH09	AIR HANDLING UNIT - INDOOR (17-23 HP)	AHU-6		04	20	HP	1.00	\$130,263	1968	25	27	DR

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	INSL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
AH18	AIR HANDLING UNIT - OUTDOOR PACKAGE (5-8 HP)	MAU-1		ROOF	7.50	HP	1.00	\$121,105	2008	23		2031
FN08	FAN - AXIAL, SUPPLY, 2.5" SP (<=3 HP) 3800 CFM	MAU-2		ROOF	2	HP	1.00	\$7,197	2013	20		2033
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-1		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-2		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-3		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-6		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-7		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-8A		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-9		ROOF	1	EA	1.00	\$7,951	2013	20		2033
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-8		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-5		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-3A		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-4		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-1A		ROOF	1	EA	1.00	\$7,951	1968	20	32	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-10		ROOF	1	EA	1.00	\$7,951	2008	20	4	2032

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
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-11		ROOF	1	EA	1.00	\$7,951	2008	20	4	2032
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-12		ROOF	1	EA	1.00	\$7,951	2008	20	4	2032
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-13		ROOF	1	EA	1.00	\$7,951	2013	20		2033
FN26	FAN - PROPELLER WITH LOUVER, 1/4" SP (.5-1 HP)	EF-13		03	1	HP	1.00	\$2,772	1968	20	32	DR
FN32	FAN - UTILITY SET, 1/4" SP (.4-1.25 HP)	EF-3		ROOF	1	HP	1.00	\$5,595	2007	20		2027
HD01	HOOD, FUME	FH-258		258	10	LF	1.00	\$23,712	1968	20	32	DR
HD01	HOOD, FUME	FH-110C		110C	5	LF	1.00	\$11,856	2005	20		2025
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CKH-1, CHILDCARE		172	4	LF	1.00	\$4,177	2008	30		2038
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CKH-1		158	16	LF	1.00	\$16,706	2008	30		2038
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CKH-2		158	16	LF	1.00	\$16,706	2008	30		2038
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CKH-1, 151		151	8	LF	1.00	\$8,353	2013	30		2043
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CHK-2, 151		151	8	LF	1.00	\$8,353	2013	30		2043
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CHK-3, 151		151	8	LF	1.00	\$8,353	2013	30		2043
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CKH-4, 151		151	8	LF	1.00	\$8,353	2013	30		2043
HD02	HOOD, KITCHEN, COMMERCIAL WITH FIRE SUPPRESSION	CKH-5, 151		151	4	LF	1.00	\$4,177	2013	30		2043

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	INSL DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
HV02	HVAC DISTRIBUTION NETWORKS - CLASSROOM	CAV, MULTIZONE		THROUGHOUT	73,997	SF	0.96	\$2,280,710	1968	40	12	DR
PH01	PUMP - ELECTRIC (<=10 HP)	DHWP-1		03	1	HP	1.00	\$1,645	2019	25		2044
PH01	PUMP - ELECTRIC (<=10 HP)	DHWP-2		05	1	HP	1.00	\$1,645	2020	25		2045
AC02	AIR COMPRESSOR SYSTEM - HVAC CONTROLS (6-10 TOTAL HP)	CAC-1		03	7.50	HP	1.00	\$15,011	2017	20		2037
BA102	HVAC CONTROLS SYSTEM - CLASSROOM	HYBRID-PNEUM, DDC		THROUGHOUT	73,997	SF	0.96	\$352,127	1968	18	34	DR
FA01	FIRE ALARM PANEL, DIALER, BATTERY, & CHARGER	PA, SIMPLEX		03	1	EA	1.00	\$37,851	2005	15		DR
FA02	FIRE ALARM SYSTEM - DEVICES	HS, MP, SD		THROUGHOUT	73,997	SF	0.96	\$289,784	2005	18		2023
SE02	ELECTRICAL DISTRIBUTION NETWORK - CLASSROOM	277/480		THROUGHOUT	73,997	SF	1.07	\$1,742,531	1968	40	12	DR
SG06	MAIN SWITCHBOARD W/BREAKERS (1600-2500 AMP)	MS		03	2,000	AMP	1.00	\$166,076	2005	20	7	2032
TX20	TRANSFORMER - OIL-FILLED, 3PH, 5-15KV PRIMARY (1000-1500 KVA)	RIVERS TX		EXT	1,500	KVA	1.00	\$140,815	2003	40		2043
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-3		113	1.50	HP	1.00	\$1,051	2011	12		2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-2		113	1.50	HP	1.00	\$1,051	2011	12		2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-1		02	5	HP	1.00	\$3,503	2011	12		2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-5		03	5	HP	1.00	\$3,503	2011	12		2023
VF02	VARIABLE FREQUENCY DRIVE (5-7.5 HP)	VFD MAU-1		ROOF	7.50	HP	1.00	\$4,764	2008	12		DR

RENEWABLE COMPONENT INVENTORY

COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	QTY	UNITS	CPLX FACTR	TOTAL COST	INSTR DATE	USEFUL LIFE	USEFUL LIFE ADJ	REPL YEAR
VF03	VARIABLE FREQUENCY DRIVE (7.5-10 HP)	VFD AHU-4		219	10	HP	1.00	\$5,298	2011	12		2023
VF05	VARIABLE FREQUENCY DRIVE (15-20 HP)	VFD AHU-6		04	20	HP	1.00	\$7,501	2011	12		2023
VF05	VARIABLE FREQUENCY DRIVE (15-20 HP)	VFD AHU-7		05	20	HP	1.00	\$7,501	2011	12		2023
LE03	LIGHTING - EXTERIOR, RECESSED (INC, CFL, LED)	REC CAN		EXT	10	EA	1.00	\$2,345	1985	15	20	DR
LE04	LIGHTING - EXTERIOR, STANCHION LUMINAIRE, 12-FOOT	PM HID FIX		EXT	5	EA	1.00	\$10,912	1985	15	20	DR
LE07	LIGHTING - EXTERIOR, WALL FLOOD (SV, MH, ID, LED)	HID WALLPACK		EXT	9	EA	1.00	\$8,896	1985	15	20	DR
LE07	LIGHTING - EXTERIOR, WALL FLOOD (SV, MH, ID, LED)	LED SCONCE		EXT	1	EA	1.00	\$988	2017	15		2032
LE08	LIGHTING - EXTERIOR, WALL LANTERN or FLOOD (INC, CFL, LED)	CFL SCONCE		EXT	3	EA	1.00	\$1,245	1985	15	20	DR
LI02	LIGHTING SYSTEM, INTERIOR - CLASSROOM	RETRO T8, T12, CFL		MOST SPACES	72,898	SF	1.07	\$790,553	2005	20		2025
LI02	LIGHTING SYSTEM, INTERIOR - CLASSROOM	LED		SELECT SPACES	1,099	SF	1.18	\$13,144	2016	20		2036
GN04	GENERATOR - DIESEL (200-500 KW)	EGEN		EXT	300	KW	1.00	\$146,595	2006	25	1	2032
GN15	SWITCH - AUTO TRANSFER, 480 V (100-400 AMP)	ATS-2		03	400	AMP	1.00	\$16,446	2006	25	1	2032
GN15	SWITCH - AUTO TRANSFER, 480 V (100-400 AMP)	ATS-1		03	150	AMP	1.00	\$6,167	2006	25	1	2032
CK01	COMMERCIAL KITCHEN EQUIPMENT ESTIMATE BY SQUARE FOOT			TEACHING KIT	75	SF	1.00	\$65,315	2014	20	5	2039
CK01	COMMERCIAL KITCHEN EQUIPMENT ESTIMATE BY SQUARE FOOT			DAYCARE KIT	10	SF	1.00	\$8,709	2005	20	8	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
SF01	SEATING, FIXED, FOLDING, STANDARD			LECTURE RM	126	EA	1.00	\$44,408	1990	40	3	2033
Grand Total:								\$13,537,275				

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	MASONRY AND PRECAST			B2010	40,770	SF	\$350,727	DR
WN01	GLASS, WINDOW, ALUMINUM OR WOOD, STANDARD			MOST ELEVS	B2010	8,150	SF	\$1,397,218	DR
DR05	DOOR AND FRAME, EXTERIOR, SWINGING, ALUMINUM AND GLASS			ENTRY/EGRESS	B2030	6	LEAF	\$17,311	DR
RR06	ROOF - BITUMINOUS, 2-PLY, SBS MODIFIED BITUMEN, MOP	FLAT		MAIN ROOF	B3010	37,000	SF	\$375,330	DR
DR24	DOOR LOCK, COMMERCIAL-GRADE	SERVICE			C1020	4	EA	\$2,979	DR
DR26	DOOR PANIC HARDWARE			ENTRY/EGRESS	C1020	6	EA	\$7,310	DR
DR26	DOOR PANIC HARDWARE	SECONDARY			C1020	10	EA	\$12,183	DR
DR01	DOOR AND FRAME, INTERIOR, NON-RATED	STANDARD W/KNOBS			C1020	45	LEAF	\$97,408	DR
DR26	DOOR PANIC HARDWARE	ISOLATION DRS		CORRIDORS	C1020	40	EA	\$48,731	DR
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			BREAK AREA	C1030	40	LF	\$21,570	DR
IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			C3010	37,340	SF	\$83,565	DR
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VINYL FLOOR TILE			C3020	21,700	SF	\$139,066	DR

RECURRING NEEDS BY YEAR

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

IF06	FLOORING - TILE, CERAMIC / STONE / QUARRY STANDARD	CERAMIC FLOOR TILE			C3020	2,100	SF	\$66,779	DR
IF17	FLOORING - ATHLETIC, RUBBER, TILE OR ROLL	RUBBER TREADS		N CORR STEPS	C3020	1,580	SF	\$46,980	DR
IC05	CEILING FINISH - PAINTED OR STAINED, TEXTURED	PT TEXTURED CLGS			C3030	40,980	SF	\$152,403	DR
VT04	ELEVATOR CAB RENOVATION - PASSENGER	ELEV-1		ELEV	D1010	1	EA	\$53,265	DR
FX06	PLUMBING FIXTURE - SINK, SERVICE/LAUNDRY/UTILITY	WALL MOUNT		JAN CLOS	D2010	4	EA	\$7,170	DR
FX15	PLUMBING FIXTURE - EMERGENCY EYEWASH	EM EYEWASH		LABS	D2010	3	EA	\$14,056	DR
FX16	PLUMBING FIXTURE - EMERGENCY COMBINATION SHOWER/EYEWASH	EM COMBO		258	D2010	1	EA	\$8,054	DR
BF01	BACKFLOW PREVENTER (<=1 INCH)	BFP-MU-1		03	D2020	1	EA	\$1,049	DR
BF02	BACKFLOW PREVENTER (1-2 INCHES)	BFP-WM-1		EXT	D2020	1	EA	\$2,339	DR
BF02	BACKFLOW PREVENTER (1-2 INCHES)	BFP-WM-2		EXT	D2020	1	EA	\$2,339	DR
PS02	SUPPLY PIPING SYSTEM - CLASSROOM	COPPER		THROUGHOUT	D2020	73,997	SF	\$690,658	DR
PD02	DRAIN PIPING SYSTEM - CLASSROOM	CAST IRON, BELL AND SPIGOT		THROUGHOUT	D2030	73,997	SF	\$1,043,130	DR
HV02	HVAC DISTRIBUTION NETWORKS - CLASSROOM	CAV, MULTIZONE		THROUGHOUT	D3040	73,997	SF	\$2,280,710	DR
AH07	AIR HANDLING UNIT - INDOOR (9-12 HP)	AHU-4		219	D3040	10	HP	\$81,604	DR

RECURRING NEEDS BY YEAR

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

AH02	AIR HANDLING UNIT - INDOOR (1.25-1.75 HP)	AHU-2		113	D3040	1.50	HP	\$11,059	DR
AH02	AIR HANDLING UNIT - INDOOR (1.25-1.75 HP)	AHU-3		113	D3040	1.50	HP	\$11,059	DR
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AHU-1		02	D3040	5	HP	\$44,414	DR
AH05	AIR HANDLING UNIT - INDOOR (3.25-6 HP)	AHU-5		03	D3040	5	HP	\$44,414	DR
AH09	AIR HANDLING UNIT - INDOOR (17-23 HP)	AHU-6		04	D3040	20	HP	\$130,263	DR
AH07	AIR HANDLING UNIT - INDOOR (9-12 HP)	AHU-7		05	D3040	10	HP	\$81,604	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-1		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-2		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-3		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-6		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-7		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-8A		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-8		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-5		ROOF	D3040	1	EA	\$7,951	DR

RECURRING NEEDS BY YEAR

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

FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-3A		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-4		ROOF	D3040	1	EA	\$7,951	DR
FN20	FAN - CENTRIFUGAL ROOF EXHAUST, 1/4" SP (25"-30" DIAMETER)	EF-1A		ROOF	D3040	1	EA	\$7,951	DR
FN26	FAN - PROPELLER WITH LOUVER, 1/4" SP (.5-1 HP)	EF-13		03	D3040	1	HP	\$2,772	DR
HD01	HOOD, FUME	FH-258		258	D3040	10	LF	\$23,712	DR
BA102	HVAC CONTROLS SYSTEM - CLASSROOM	HYBRID-PNEUM, DDC		THROUGHOUT	D3060	73,997	SF	\$352,127	DR
FA01	FIRE ALARM PANEL, DIALER, BATTERY, & CHARGER	PA, SIMPLEX		03	D4030	1	EA	\$37,851	DR
SE02	ELECTRICAL DISTRIBUTION NETWORK - CLASSROOM	277/480		THROUGHOUT	D5010	73,997	SF	\$1,742,531	DR
VF02	VARIABLE FREQUENCY DRIVE (5-7.5 HP)	VFD MAU-1		ROOF	D5010	7.50	HP	\$4,764	DR
LE03	LIGHTING - EXTERIOR, RECESSED (INC, CFL, LED)	REC CAN		EXT	D5020	10	EA	\$2,345	DR
LE04	LIGHTING - EXTERIOR, STANCHION LUMINAIRE, 12-FOOT	PM HID FIX		EXT	D5020	5	EA	\$10,912	DR
LE07	LIGHTING - EXTERIOR, WALL FLOOD (SV, MH, ID, LED)	HID WALLPACK		EXT	D5020	9	EA	\$8,896	DR
LE08	LIGHTING - EXTERIOR, WALL LANTERN or FLOOD (INC, CFL, LED)	CFL SCONCE		EXT	D5020	3	EA	\$1,245	DR
TOTAL DEFERRED RENEWAL COST								\$9,601,361.98	

RECURRING NEEDS BY YEAR

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

No Projected Component Replacement Cost for Asset No. RIVE for 2021

2022									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			C3010	68,460	SF	\$157,806	2022
IF01	FLOORING - CARPET, TILE OR ROLL, STANDARD	CARPET TILE UPGRADE			C3020	8,670	SF	\$109,348	2022
WH24	WATER HEATER - RESIDENTIAL, ELECTRIC (46-100 GAL)	WH-3		05	D2020	65	GAL	\$2,202	2022
2022 PROJECTED COMPONENT REPLACEMENT COST								\$269,356.25	

RECURRING NEEDS BY YEAR

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

2023									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
FA02	FIRE ALARM SYSTEM - DEVICES	HS, MP, SD		THROUGHOUT	D4030	73,997	SF	\$307,432	2023
VF03	VARIABLE FREQUENCY DRIVE (7.5-10 HP)	VFD AHU-4		219	D5010	10	HP	\$5,621	2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-3		113	D5010	1.50	HP	\$1,115	2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-2		113	D5010	1.50	HP	\$1,115	2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-1		02	D5010	5	HP	\$3,716	2023
VF01	VARIABLE FREQUENCY DRIVE (<=5 HP)	VFD AHU-5		03	D5010	5	HP	\$3,716	2023
VF05	VARIABLE FREQUENCY DRIVE (15-20 HP)	VFD AHU-6		04	D5010	20	HP	\$7,958	2023
VF05	VARIABLE FREQUENCY DRIVE (15-20 HP)	VFD AHU-7		05	D5010	20	HP	\$7,958	2023
2023 PROJECTED COMPONENT REPLACEMENT COST								\$338,630.15	

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

RECURRING NEEDS BY YEAR

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

2025									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
FX02	PLUMBING FIXTURE - LAVATORY, WALL HUNG	PC		RRS	D2010	19	EA	\$28,446	2025
FX12	PLUMBING FIXTURE - WATER CLOSET, TANKLESS	PC		RRS	D2010	27	EA	\$59,212	2025
FX04	PLUMBING FIXTURE - SINK, KITCHEN	SST		BREAK RMS	D2010	2	EA	\$4,861	2025
HD01	HOOD, FUME	FH-110C		110C	D3040	5	LF	\$13,344	2025
LI02	LIGHTING SYSTEM, INTERIOR - CLASSROOM	RETRO T8, T12, CFL		MOST SPACES	D5020	72,898	SF	\$889,774	2025
2025 PROJECTED COMPONENT REPLACEMENT COST								\$995,637.42	

No Projected Component Replacement Cost for Asset No. RIVE for 2026

RECURRING NEEDS BY YEAR

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

2027									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SECONDARY			B2030	10	LEAF	\$24,250	2027
DR08	DOOR AND FRAME, EXTERIOR, SWINGING, HOLLOW METAL	SERVICE			B2030	4	LEAF	\$9,700	2027
FN32	FAN - UTILITY SET, 1/4" SP (.4-1.25 HP)	EF-3		ROOF	D3040	1	HP	\$6,681	2027
2027 PROJECTED COMPONENT REPLACEMENT COST								\$40,630.15	

No Projected Component Replacement Cost for Asset No. RIVE for 2028

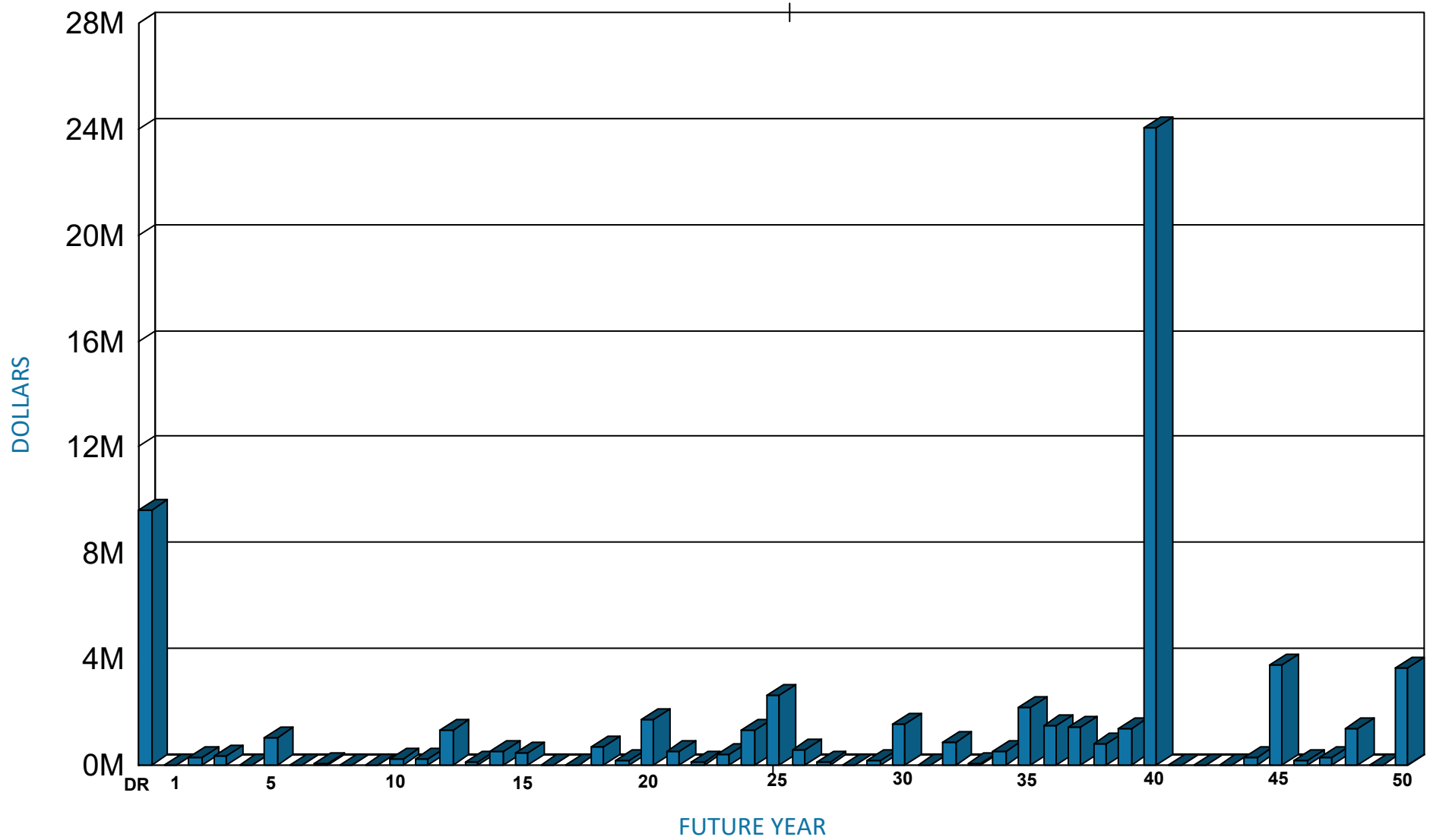
No Projected Component Replacement Cost for Asset No. RIVE for 2029

RECURRING NEEDS BY YEAR

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

2030									
COMP CODE	COMPONENT DESCRIPTION	IDENTIFIER	CUSTOMER ID	LOCATION	UNI-FORMAT	QTY	UNITS	REPLACEMENT COST	YEAR
CW01	CASEWORK - WOOD BASE AND WALL, TOP, STANDARD			BREAK AREA	C1030	60	LF	\$42,217	2030
IW01	WALL FINISH - PAINT, STANDARD	PT WALLS			C3010	18,670	SF	\$54,517	2030
IF03	FLOORING - VINYL COMPOSITION TILE, STANDARD	VINYL FLOOR TILE			C3020	9,300	SF	\$77,764	2030
PP02	GREYWATER LIFT STATION	SUMP-1		03	D2030	2	HP	\$6,624	2030
PP02	GREYWATER LIFT STATION	SUMP-2		04	D2030	1	HP	\$3,312	2030
PP02	GREYWATER LIFT STATION	SUMP-3		05	D2030	2	HP	\$6,624	2030
2030 PROJECTED COMPONENT REPLACEMENT COST								\$191,058.16	

RECURRING COMPONENT EXPENDITURE PROJECTIONS

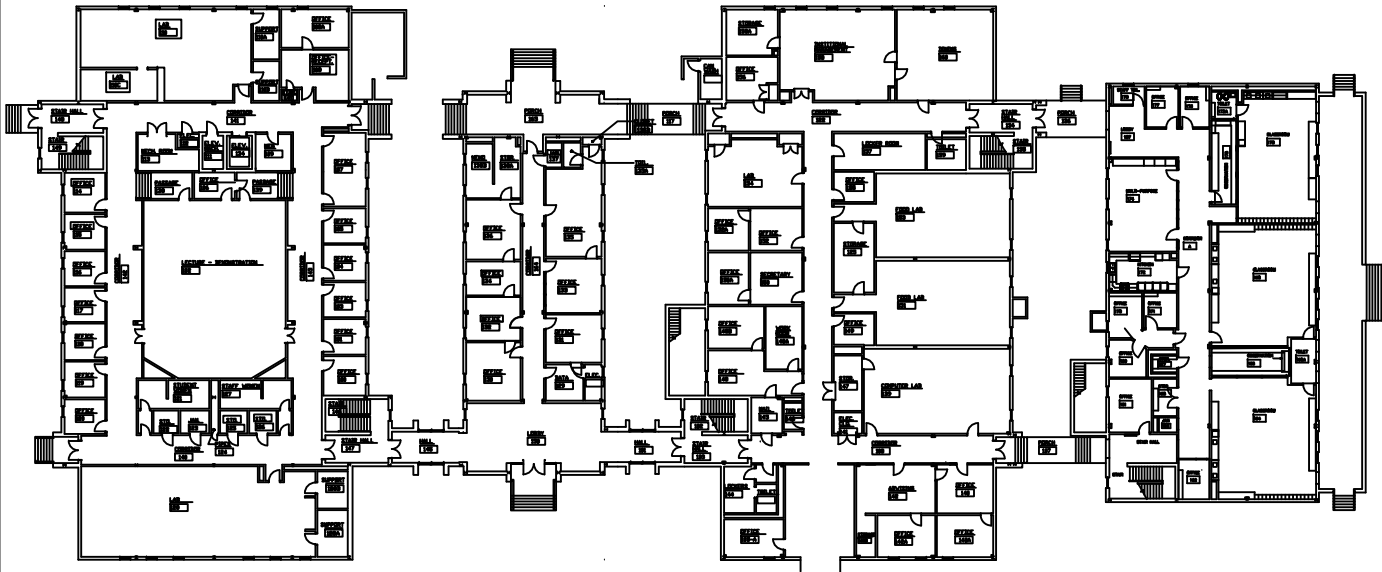


Average Annual Renewal Cost per SF \$8.15

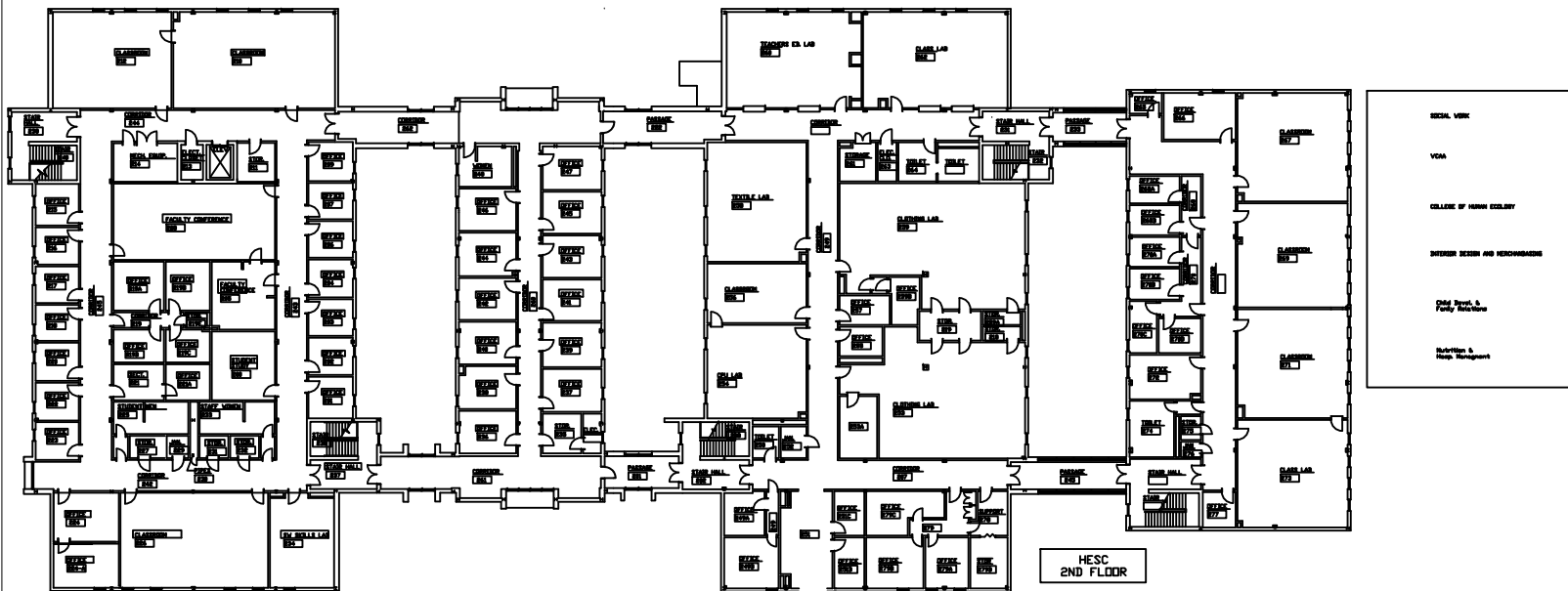
FACILITY CONDITION ASSESSMENT

SECTION 5

DRAWINGS



- MECH. ROOM
- VIA
- COLLEGE OF HUMAN SERVICES
- STUDENT CENTER AND RECREATION CENTER
- 2000 PAVILION & TOWER BUILDING
- STUDENT UNION & TOWER BUILDING



FACILITY CONDITION ASSESSMENT

SECTION 6

PHOTOGRAPHS



RIVE001a 5/13/2021
Weathered built-up roof with cap sheet
Main roof



RIVE001e 5/13/2021
Centrifugal rooftop exhaust fan
Roof



RIVE002a 5/13/2021
Low parapet with continuous metal cap
Main roof



RIVE002e 5/13/2021
Centrifugal rooftop exhaust fan
Roof



RIVE003a 5/13/2021
Staining and weathered caulking
Upper precast concrete banding



RIVE003e 5/13/2021
Utility-style exhaust fan
Roof



RIVE004a 5/13/2021
Stained and weathered caulking
Upper precast concrete banding



RIVE004e 5/13/2021
Centrifugal rooftop exhaust fan
Roof



RIVE005a 5/13/2021
Brick facade and original single-pane glazing
Typical courtyard exterior



RIVE005e 5/13/2021
Kitchen exhaust fan
Roof



RIVE006a 5/13/2021
Some stress cracks in precast banding
Upper facade exterior precast



RIVE006e 5/13/2021
Fresh air makeup air handling unit
Roof



RIVE007a 5/13/2021
Heavy weathering of granular finish on cap sheet
Main roof



RIVE007e 5/13/2021
Makeup air handling unit
Roof



RIVE008a 5/13/2021
View of areaway in one of the courtyards
Exterior courtyard



RIVE008e 5/13/2021
Kitchen exhaust fan
Roof



RIVE009a 5/13/2021
Tree in courtyard restricting access for facade cleaning
Exterior courtyard



RIVE009e 5/13/2021
Kitchen exhaust fan
Roof



RIVE010a 5/13/2021
Older vinyl flooring with dissimilar tile repair
Second floor corridor



RIVE010e 5/13/2021
Local panelboard
Second floor, electrical room



RIVE011a 5/13/2021
Exterior doors to breezeway link
Second floor corridor



RIVE011e 5/13/2021
Retrofitted LED lighting fixtures
Second floor corridor



RIVE012a 5/13/2021
Older vinyl floor tile but newer dual-level water fountain
Second floor corridor



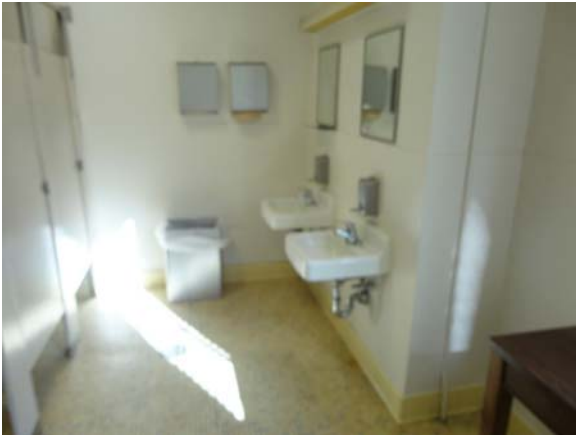
RIVE012e 5/13/2021
Original retrofitted T8 lighting fixtures
Room 262



RIVE013a 5/13/2021
Older vinyl tile and suspected ACM above acoustical ceiling
Second floor, south corridor



RIVE013e 5/13/2021
Manual pull fire alarm device
Second floor corridor



RIVE014a 5/13/2021
Older wall-hung lavatories
Second floor, south women's restroom



RIVE014e 5/13/2021
Horn with strobe fire alarm device
Second floor corridor



RIVE015a 5/13/2021
Older 1x1 ceramic floor tile
Second floor, south women's restroom



RIVE015e 5/13/2021
Recessed, lay-in LED lighting fixtures
Room 260



RIVE016a 5/13/2021
Older standard tankless water closets
Second floor, south women's restroom



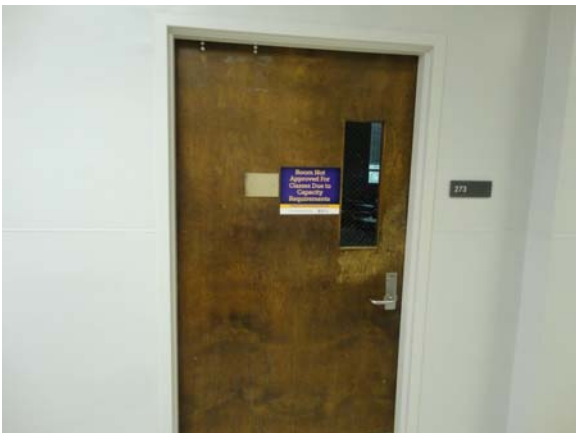
RIVE016e 5/13/2021
Retrofitted LED lighting fixtures
Second floor corridor



RIVE017a 5/13/2021
Narrow clearances in restroom vestibules
Second floor, restrooms



RIVE017e 5/13/2021
Laboratory fume hood
Room 258



RIVE018a 5/13/2021
Lever hardware on older nonrated corridor door
Second floor corridor



RIVE018e 5/13/2021
Emergency eyewash station
Room 258



RIVE019a 5/13/2021
Older vinyl floor tile and older acoustical ceiling
Second floor, classroom



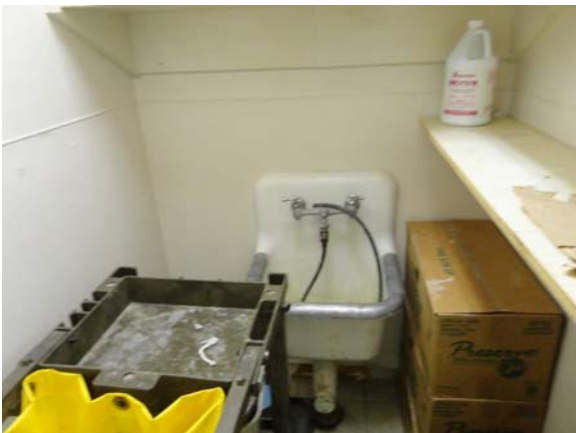
RIVE019e 5/13/2021
Emergency shower
Room 258



RIVE020a 5/13/2021
Original single-pane, metal-framed glazing
Second floor



RIVE020e 5/13/2021
Original retrofitted T8 lighting fixtures
Room 253



RIVE021a 5/13/2021
Original wall-mounted service sink
Second floor, janitor's closet



RIVE021e 5/13/2021
Air handling unit AHU-005
Room 214



RIVE022a 5/13/2021
Original doors with knob hardware
Second floor corridor



RIVE022e 5/13/2021
VFD for AHU-005
Room 214



RIVE023a 5/13/2021
Original casework and break area sink
Second floor, south office suite



RIVE023e 5/13/2021
Commercial kitchen hood
Room 158



RIVE024a 5/13/2021
Original textured ceiling
Second floor, south office suite



RIVE024e 5/13/2021
Commercial kitchen hood
Room 158



RIVE025a 5/13/2021
Newer LVT flooring but original textured ceiling
Second floor, south computer labs



RIVE025e 5/13/2021
Commercial kitchen hood
Room 158



RIVE026a 5/13/2021
Older broadloom carpeting and 2x2 acoustical ceiling
Second floor, computer lab



RIVE026e 5/13/2021
Secondary step-down transformer
Room 158



RIVE027a 5/13/2021
Damaged textured ceiling
Second floor, textile lab



RIVE027e 5/13/2021
Recessed T8 lighting fixtures
First floor corridor



RIVE028a 5/13/2021
Newer casework
Second floor, textile lab



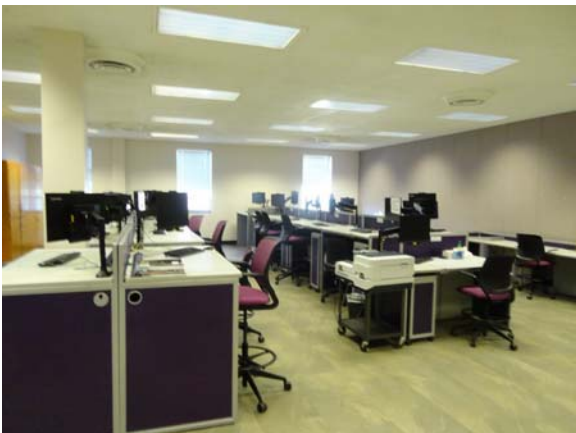
RIVE028e 5/13/2021
Fire alarm extension panel
First floor corridor



RIVE029a 5/13/2021
Newer single-level water fountain with bottle filler
Second floor corridor



RIVE029e 5/13/2021
Open-cell grid T8 lighting fixtures
Room 102



RIVE030a 5/13/2021
Newer LVT flooring with original textured ceiling
Second floor, Interior Design studio



RIVE030e 5/13/2021
Air handling unit AHU-002
Room 113



RIVE031a 5/13/2021
Older broadloom carpeting and acoustical ceiling
Second floor, computer lab



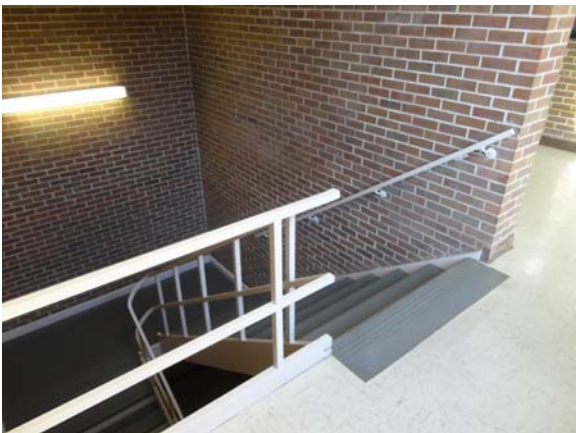
RIVE031e 5/13/2021
VFD for AHU-002
Room 113



RIVE032a 5/13/2021
Older standard fixtures
Second floor, central men's restroom



RIVE032e 5/13/2021
VFD for AHU-003
Room 113



RIVE033a 5/13/2021
Nonaccessible inner and outer handrails
Second floor, central stair tower



RIVE033e 5/13/2021
Air handling unit AHU-003
Room 113



RIVE034a 5/13/2021
Rubber stair treads in average condition
Second floor, central stair tower



RIVE034e 5/13/2021
Elevator interior
Elevator



RIVE035a 5/13/2021
Older broadloom carpeting and textured ceiling
Second floor, north office corridor



RIVE035e 5/13/2021
Emergency eyewash station
Room 110C



RIVE036a 5/13/2021
Older wall-hung lavatories
Second floor, central women's restroom



RIVE036e 5/13/2021
Elevator A controls
Room 111



RIVE037a 5/13/2021
Older standard toilet stalls
Second floor, central women's restroom



RIVE037e 5/13/2021
Pneumatic local thermostat
First floor corridor



RIVE038a 5/13/2021
Some brick veneer walls along upper corridor
Second floor, north corridor



RIVE038e 5/13/2021
HID wallpack
Breezeway



RIVE039a 5/13/2021
Some efflorescence around exterior glazing
Second floor, north corridor



RIVE039e 5/13/2021
Zoned deck for air handling unit AHU-001
Room 02



RIVE040a 5/13/2021
Newer exterior glazing in select areas
Second floor, office



RIVE040e 5/13/2021
VFD for AHU-001
Room 02



RIVE041a 5/13/2021
Stained textured ceiling
Second floor, office



RIVE041e 5/13/2021
HID wallpack
Areaway



RIVE042a 5/13/2021
Older standard fixtures
First floor, south unisex restroom



RIVE042e 5/13/2021
Sump pump
Room 03



RIVE043a 5/13/2021
Broadloom carpeting and acoustical ceiling
First floor, south daycare area



RIVE043e 5/13/2021
Air handling unit AHU-005
Room 03



RIVE044a 5/13/2021
Older casework in toddler's dayroom
First floor, south daycare area



RIVE044e 5/13/2021
Controls air compressor
Room 03



RIVE045a 5/13/2021
Two children's water closets and one wall-hung lavatory
First floor, south daycare area



RIVE045e 5/13/2021
Residential electric water heater
Room 03



RIVE046a 5/13/2021
Acoustical ceiling
First floor, south daycare area



RIVE046e 5/13/2021
Domestic hot water circulation pump
Room 03



RIVE047a 5/13/2021
Typical finishes
First floor, south daycare kitchen



RIVE047e 5/13/2021
Main switchboard
Room 03



RIVE048a 5/13/2021
Newer casework
First floor, south daycare area



RIVE048e 5/13/2021
Automatic transfer switch
Room 03



RIVE049a 5/13/2021
Newer sheet vinyl flooring
First floor, south daycare area



RIVE049e 5/13/2021
Automatic transfer switch
Room 03



RIVE050a 5/13/2021
Three children's water closets and two wall-hung
lavatories
First floor, south daycare area



RIVE050e 5/13/2021
VFD for AHU-005
Room 03



RIVE051a 5/13/2021
Newer sheet vinyl flooring in offices
First floor, south daycare area



RIVE051e 5/13/2021
Propeller exhaust fan
Room 03



RIVE052a 5/13/2021
Older two-level water fountain
First floor, south daycare area



RIVE052e 5/13/2021
Ductless split condensing unit
Site



RIVE053a 5/13/2021
Three new accessible counter lavatories
First floor, central women's restroom



RIVE053e 5/13/2021
HID wallpack and recessed can exterior fixtures
Entry



RIVE054a 5/13/2021
Accessible toilet stall
First floor, central women's restroom



RIVE054e 5/13/2021
Emergency generator
Site



RIVE055a 5/13/2021
Newer broadloom carpeting and acoustical ceiling
First floor, east Culinary area



RIVE055e 5/13/2021
Ductless split condensing unit
Site



RIVE056a 5/13/2021
Cooking equipment
First floor, east Culinary area



RIVE056e 5/13/2021
Air handling unit AHU-006
Room 04



RIVE057a 5/13/2021
Quarry tile floor and painted ceiling
First floor, east Culinary area



RIVE057e 5/13/2021
VFD for AHU-006
Room 04



RIVE058a 5/13/2021
Quarry tile floor and staged cooking equipment
First floor, teaching kitchen



RIVE058e 5/13/2021
Sump pump
Room 04



RIVE059a 5/13/2021
Older vinyl floor tile and original textured ceiling
First floor corridor



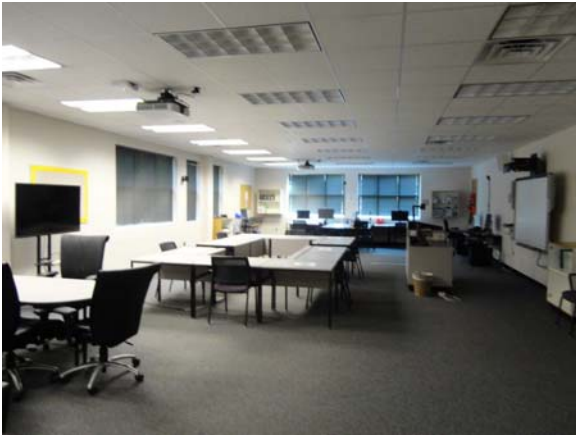
RIVE059e 5/13/2021
Location of water main backflow preventers
Site



RIVE060a 5/13/2021
Older casework with sink
First floor, conference area



RIVE060e 5/13/2021
VFD for AHU-007
Room 05



RIVE061a 5/13/2021
Older carpeting and acoustical ceiling
First floor, conference room



RIVE061e 5/13/2021
Air handling unit AHU-007
Room 05



RIVE062a 5/13/2021
Fixed seating
First floor, north lecture room



RIVE062e 5/13/2021
Residential electric water heater
Room 05



RIVE063a 5/13/2021
No side aisle handrails or assistive listening
First floor, north lecture room



RIVE063e 5/13/2021
Residential electric water heater
Room 05



RIVE064a 5/13/2021
Molded plastic fixed seating
First floor, north lecture room



RIVE064e 5/13/2021
Sump pump
Room 05



RIVE065a 5/13/2021
Worn vinyl flooring in seating aisles
First floor, north lecture room



RIVE065e 5/13/2021
Domestic hot water circulation pump
Room 05



RIVE066a 5/13/2021
Newer dual-level water fountain
First floor, north corridor



RIVE066e 5/13/2021
Ceiling-mounted HID lighting fixture
Exterior soffit



RIVE067a 5/13/2021
Accessible elevator control panel
Passenger elevator cab



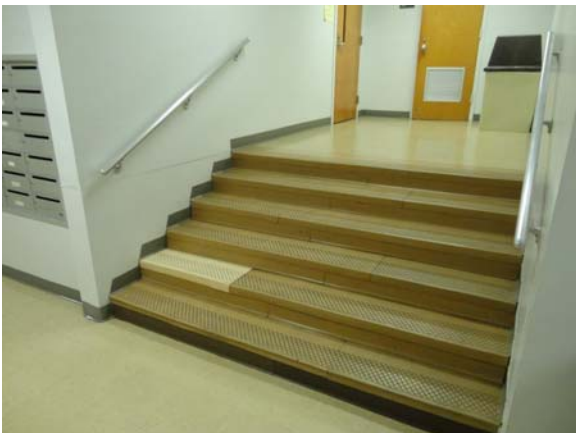
RIVE068a 5/13/2021
Standard wood lab cabinetry with vinyl floor tile
First floor, engineering lab



RIVE069a 5/13/2021
New casework and sink
First floor, office area



RIVE070a 5/13/2021
Partially accessible toilet stall
First floor, men's restroom



RIVE071a 5/13/2021
Worn rubber stair treads and nonaccessible handrails
First floor, north corridor steps



RIVE072a 5/13/2021
Older casework and sink
First floor, north office area



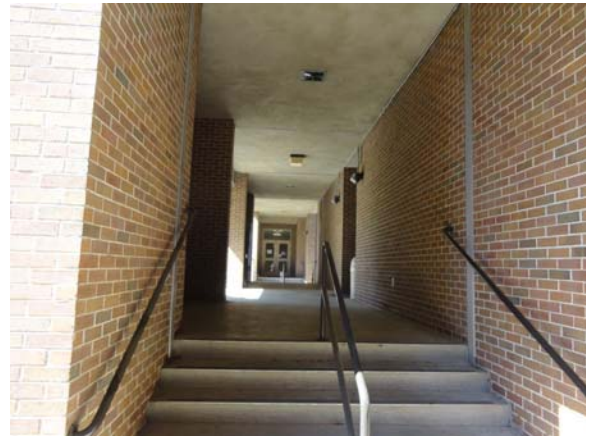
RIVE073a 5/13/2021
Ramp and railing to secondary egress
Courtyard



RIVE074a 5/13/2021
Rusted areaway access steps
Courtyard



RIVE075a 5/13/2021
Hollow-metal louvered service door
Courtyard areaway



RIVE076a 5/13/2021
Lack of handrail extensions at top of steps
Courtyard steps



RIVE077a 5/13/2021
Brick, precast banding, and single-pane glazing
Northeast corner elevation



RIVE078a 5/13/2021
Typical metal and glass corridor egress doors
First floor, entry/egress



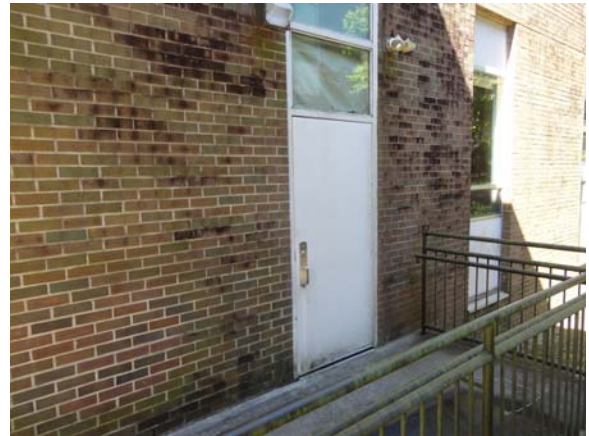
RIVE079a 5/13/2021
Single-pane glazing
Courtyard



RIVE080a 5/13/2021
Small service area addition and dock area
Central east elevation



RIVE081a 5/13/2021
Rusted out pedestrian entry ramp
Southeast elevation



RIVE082a 5/13/2021
Stained brick facade
Courtyard



RIVE083a 5/13/2021
Coated chain link fencing around playground
Southeast site



RIVE084a 5/13/2021
Brick, precast banding, and single-pane glazing
South elevation



RIVE085a 5/13/2021
Staining visible on upper banding
South elevation



RIVE086a 5/13/2021
Brick, precast banding, and single-pane glazing
East end elevation



RIVE087a 5/13/2021
Upgraded glass near new addition
Northwest corner elevation



RIVE088a 5/13/2021
Damaged rail anchor at new service dock
Southeast elevation



RIVE089a 5/13/2021
Peeling paint on areaway steps
Typical areaway



RIVE090a 5/13/2021
New accessible two-fixture unisex restroom
First floor, restroom upgrade

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	RIVE
Asset Name	Rivers Building (010)
Year Built or Last Energy Renovation	1968

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.

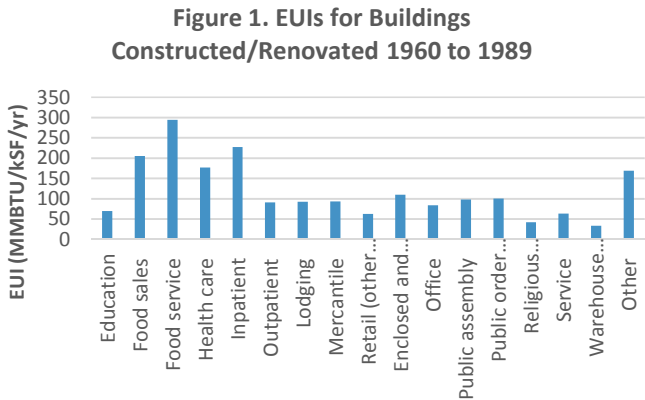
Metric #1: Energy Use Intensity (EUI)

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	Classroom
Range of Years Constructed/Last Major Energy Renovation	1960 to 1989
Benchmark EUI (MMBTU/kSF/yr) =	70.1
Building EUI to be Calculated by Client (MMBTU/kSF/yr) =	

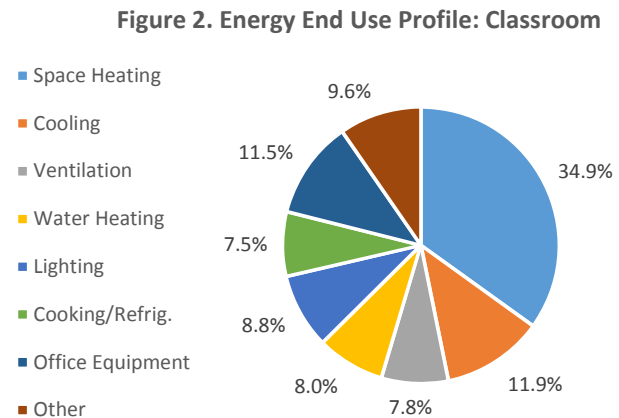
TABLE 3. EUI COMPARISON	
Very Energy Efficient (consumes more than 30% less energy)	EUI < 49.1
Energy Efficient (consumes 10% to 30% less energy)	49.1 <= EUI <= 63.1
Similar (consumes within 10% less or 10% more energy)	63.1 < EUI < 77.1
Energy Inefficient (consumes 10% to 30% more energy)	77.1 <= EUI <= 91.1
Very Energy Inefficient (consumes more than 30% more energy)	EUI > 91.1



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: CLASSROOM	
Space Heating	34.9%
Cooling	11.9%
Ventilation	7.8%
Water Heating	8.0%
Lighting	8.8%
Cooking/Refrig.	7.5%
Office Equipment	11.5%
Other	9.6%
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
Building Envelope - Window/Door Heat Gain/Loss	INCREASE THE R-VALUE OF THE WINDOWS/DOORS. ENERGY STAR qualified fenestration products such as windows and doors can minimize HVAC energy consumption by reducing solar heat gain/loss.	CAP
Building Envelope - Window/Door Air Infiltration	WEATHERSTRIP/CAULK WINDOWS/DOORS. When there is air leakage, weatherstrip around movable components and caulk around rigid components to reduce infiltration and save on heating/cooling costs.	O&M; LC/NC
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

ECM CATEGORY	ECM RECOMMENDED FOR FURTHER CONSIDERATION	COST CATEGORY
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 - Hydronic Dist. Network Insulation	INSULATE THE HVAC PIPING. Insulating HVAC piping reduces heat loss and decreases energy consumption.	CAP
HVAC - Air Dist. Network Insulation	INSULATE DUCTWORK. Insulating HVAC ductwork reduces heat loss and decreases energy consumption.	CAP
HVAC - Air Dist. Network, VAV	INSTALL VARIABLE AIR VOLUME (VAV) SYSTEM. In constant air volume (CAV) systems, more energy is required to heat, cool, and distribute air than in VAV systems. Consider a VAV system to reduce energy consumption, mainly fan energy consumption.	CAP
HVAC - BAS	INSTALL A BAS. Consider installing a BAS so that there is autonomous control of the building HVAC systems.	CAP
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 - Exhaust Ventilation	INSTALL ENERGY RECOVERY SYSTEM. Energy Recovery Ventilation (ERV) systems exchange heat between outgoing exhaust air and the incoming outdoor air. Investigate the feasibility of installing an ERV system to pre-heat/cool ventilation air.	LC/NC; 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 - Unitary Equipment Controls	UPGRADE CONTROLS. Install controls that allow the unitary equipment to be programmed for on/off and/or thermostat setpoints so that the systems operate at appropriate temperatures and do not run when the building/space is unoccupied.	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 Piping Insulation	INSULATE THE DOMESTIC HOT WATER PIPES. Insulating piping reduces heat loss, thereby reducing the amount of energy consumption.	LC/NC; CAP
Plumbing - Water Closets	INSTALL LOW-FLOW FLUSH VALVES/NEW WATER CLOSETS. WaterSense labeled water closets save water and reduce the energy required to pump water.	LC/NC; CAP