

Board of Equalization Headquarters Building (028)

450 N Street, Sacramento, CA 95814

Facility Condition Assessment

June 2015

Prepared for the State of California Department of General Services



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EXECUTIVE SUMMARY

BACKGROUND

This Facility Condition Assessment (FCA), prepared by EMG Corporation (EMG) in collaboration with the Department of General Services (DGS) Real Estate Services Division (RESA) and the consulting team of Hellmuth, Obata & Kassabaum, Inc. (HOK), is a component of a comprehensive long-range strategic asset management plan for DGS's portfolio of general-purpose office buildings. The goal is to determine the best course of action to address DGS's general-purpose office buildings' infrastructure deficiencies and space needs with a focus on controlling long-term costs.

The DGS portfolio comprises nearly 17 million gross square feet (GSF) of state-owned office facilities statewide, contained within 54 general-purpose state-owned office building sites. The FCA inventories and evaluates each of the DGS general purpose office buildings to benchmark current condition and establish a replacement value. This FCA assesses the infrastructure conditions for the Board of Equalization Headquarters Building (028).

The assessment methodology identifies infrastructure systems and components requiring immediate repair or replacement based on their useful life expectancy. In addition, the FCA projects the capital funding needs over a ten-year lifecycle horizon period of 2015 to 2024. The assessments evaluate envelope, structure, plumbing, heating, air conditioning, energy and lighting controls, electrical, data/communications, elevators, fire protection and suppression, security, and utility capacity and systems. The replacement value is determined by multiplying the existing building square footage (SF) by the cost per SF to construct a new, similar building on a similar site.

OBJECTIVE

The objective of the FCA is to identify the capital reserves for infrastructure lifecycle repair/replacement needs over the ten-year lifecycle. The FCA projections will become the basis for the Facility Condition Index (FCI). The FCI is the ratio of immediate repair costs or capital reserve needs to the current replacement value of the existing building. The FCI is a key performance indicator that is used to objectively quantify and evaluate the current condition of a building and can be used to compare the relative condition of the subject building with other buildings within the same portfolio and as a trending matrix for infrastructure "health" over time.

The Board of Equalization Headquarters Building (028) FCI ratio will be incorporated as a comparative factor in the overall DGS portfolio analysis, enabling DGS to accurately rank and prioritize building repair/replacement needs in the long-range strategic plan.

SCOPE OF ASSESSMENT

The EMG evaluation team, comprised of engineers and architects, visited the Board of Equalization Headquarters Building (028) on December 1 & 2, 2014. The evaluation team reviewed available engineering studies and construction documents to familiarize themselves with the physical conditions. The evaluation team conducted a walk-through of the building to observe building systems and components, identify physical deficiencies, and formulate recommendations to remedy any deficiencies.

SURVEY FINDINGS

One of the major goals of the FCA is to calculate the FCI, which gives an indication of a building’s overall condition. Two FCI ratios are calculated and presented – Current Year and Ten-Year. The Current Year FCI is the ratio of Immediate Repair Costs to the building’s Current Replacement Value. Similarly, the Ten-Year FCI is the ratio of anticipated Capital Reserve Needs over the next ten years to the Current Replacement Value.

The values are based on a scale from 0-100 percent. A lower FCI ratio indicates that the building’s infrastructure is in “Good” condition. Based on industry standards, a “Good” condition building will have an FCI ratio at or below five percent. A “Fair” condition building will have an FCI ratio between five and ten percent. A “Poor” condition building will have an FCI ratio between 10 and 65 percent. A building with an FCI ratio exceeding 65 percent is considered “Very Poor” and is a candidate for replacement or divestment.

The table below represents summary-level findings for the FCA. The deficiencies identified in this assessment can be combined with potential new construction requirements to develop an overall strategy that can serve as the basis for a portfolio-wide capital improvement funding strategy. Key findings from the assessment include:

Key Finding	Metric
Current Replacement Value	\$414,409,560
Immediate Repair Costs (12 months)	\$24,141,982
1-5 Year Capital Needs	\$904,502
6-10 Year Capital Needs	\$10,016,376
Total 10-Year Capital Reserve Needs	\$35,062,860

$$FCI = \frac{\text{Immediate Repair Costs or Ten-Year Capital Reserve Needs}}{\text{Current Replacement Value of Building}}$$

Current Year FCI

$$\text{Current FCI} = \frac{\$24,141,982}{\$414,409,560}$$

Ten-Year FCI

$$\text{Ten-Year FCI} = \frac{\$35,062,860}{\$414,409,560}$$

Current Year FCI	Ten-Year FCI
5.83 % = <i>Fair Condition</i>	8.46 % = <i>Fair Condition</i>

The major issues contributing to the Immediate Repair Costs and the Current Year FCI ratio are summarized below:

- Install seismic bracing on the garage and mezzanine portions of the building.
- Replace spandrel panel on the exterior.
- Renovate restrooms for accessibility needs throughout building.
- Replace acoustic ceiling throughout building.
- Modernize fire alarm system.
- Replace waster and venting piping throughout building.

Further detail on the specific costs that make up the Immediate Repair Costs can be found in the cost tables in the appendices.

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INTRODUCTION

BUILDING BACKGROUND

The Board of Equalization Headquarters Building (028) was designed by Dreyfuss and Blackford Architects. Construction was completed in 1992. The California Public Employees Retirement System developed the project as a profit-making investment for its portfolio. DGS purchased the property in 2007.

The building headquarters the Board of Equalization (BOE), which provides tax service to business owners and the citizens of the State of California. It also houses a five-member board of Constitutional elected Officials. The 24-story plus mechanical floor penthouse building consists of open offices, private offices, computer rooms, a data center, storage rooms, and support areas. The BOE hearing room, childcare center, and full-service cafeteria are located on the ground floor. The building complex includes a four-story parking structure.

The gross area of the building and garage is 863,131 SF. The occupied area is 616,000 SF with a net usable area of 478,746 SF. The ratio of net usable to gross building area is 75.5 percent. The occupant capacity is 2,455. The onsite four-story parking garage has approximately 700 spaces.

BUILDING DESCRIPTION

The foundation system consists of precast piles. The building structural system is a steel superstructure with concrete topped metal floor decks. The roof structure is flat with polyvinyl chloride roofing on the main roof.

The exterior walls on the main building are finished with painted stucco, exposed aggregate, and pre-cast concrete panels on the parking garage.

The building has painted drywall walls. There is a mixture of floor finishes, including commercial carpet tiles in office areas, vinyl composition tiles in service areas, and ceramic tile in the entry lobby and restrooms. The interior ceilings are typically acoustic ceiling tiles.

The facility is served by seven traction passenger elevators in the main building. There are three hydraulic elevators in the parking garage. A freight elevator serves all 24 floors, plus the penthouse floor.

Domestic hot water is provided by a gas-fired commercial water heater in the parking garage, and electric water heaters in utility closets in the main building.

Heating and cooling are provided by water boilers, chillers, a smaller pony chiller, rooftop dual-cell cooling towers, and four air handling rooms with two fans each.

Life safety systems include fire sprinklers, hydrants, smoke detectors, alarms, and extinguishers.

The landscaping consists of trees, shrubs, and small lawn areas around the perimeter of the site.

The sidewalks throughout the property are constructed of cast-in-place concrete.

Project Statistics

Item	Description
Project Name	Board of Equalization Headquarters Building
Building ID	028
Property Type	Administration
Year Built	1992
Number of Stories	25
Occupied	Yes
Land Area (acres)	2.5
Gross Square Feet (GSF)	863,131

FACILITY CONDITION ASSESSMENT

The goal of the FCA is to gather the data necessary to understand the existing building’s condition, identify strategies to meet the building’s lifecycle needs, and create the foundation for a long-range strategic plan.

COMPONENTS OF THE FCA

Current conditions analysis

The current condition analysis identifies the existing building’s immediate requirements, including deferred maintenance, recommended discretionary improvements, and code non-compliance issues.

Anticipated building reserve analysis

The anticipated building reserve analysis projects the ongoing degradation of the building’s components and costs associated with the reserve or replacement of these components as they reach the end of their useful lives.

Funding needs analysis

The funding needs analysis results in a summary report of deferred maintenance and systems reserve funding needs.

CALCULATION OF FUNDING NEEDS

Calculating probable funding needs involves identifying and quantifying the building's infrastructure systems or components that require immediate or future action over their lifecycle horizon. Funding needs are segregated into two categories, Immediate Repair Costs and Capital Reserve Needs. A Replacement Value is calculated and a Remaining Useful Life Estimate is determined as well as Opinions of Probable Cost in order to establish the FCI. The terms are defined as follows:

Immediate Repair Costs

Immediate Repair Costs are Opinions of Probable Cost that require immediate action as a result of: (1) material existing or potentially unsafe conditions, (2) material building or fire code violations, or (3) conditions that, if left un-remedied, have the potential to result in, or contribute to, critical element or system failure within **one year** that will likely result in a significant escalation of its remedial cost. Immediate Repair Costs are items which require action within year one.

Capital Reserve Needs

Capital Reserve Needs are recurring probable expenditures, which are not considered operation or maintenance expenses, that should be budgeted annually. In general, Capital Reserve Needs are reasonably predictable both in terms of frequency and cost. However, Capital Reserve Needs may also include components or systems that have an indeterminable life but nonetheless have a potential liability for failure within a ten-year period. The Capital Reserve Needs presented in the FCA represent average industry costs as of 2015, without inflation. The Ten-Year Expenditure Forecast table in Appendix G includes inflation by assuming a five percent annual inflation rate on Total Capital Needs by year.

Current Replacement Value

Current Replacement Value is determined by multiplying the existing building's SF by the Cost per SF to construct a new, similar building on a similar site. Current Replacement Value is not an appraised or market value for the purposes of a property sale. To estimate the cost per SF, EMG referenced Marshall & Swift's *Marshall Valuation Service*. This building cost data index is an industry standard, adjusted annually, and relied upon by the insurance industry, as well as other agencies and organizations. Cost per SF is calculated by adjusting Marshall & Swift's unit cost for a Government Office Building to account for factors related to building systems, class of construction, and location to reflect the estimated cost of construction at the subject building site.

Remaining Useful Life

Remaining Useful Life (RUL) estimate is based upon site observations, research, and judgment, along with reference to Expected Useful Life (EUL) tables from various industry sources. A sample copy of the EUL table is included in the appendices. EMG estimates when a system or component will likely need replacement based on a visual review of the current condition and the RUL estimate. Exposure to the elements, quality of installation, extent of use, and quality and amount of preventive maintenance exercised are factors that impact the effective age of a system or component. As a result, a system or component might have an effective age that is greater or less than its actual chronological age. The RUL of a system or component equals the EUL less its effective age.

Opinions of Probable Cost

Opinions of Probable Cost are estimates for individual repair or replacement and are a key consideration of this engagement. These estimates may be based on invoice or bid documents provided by the owner or building manager, cost estimates developed by construction resources (such as R.S. Means), or EMG's experience with similar properties, city cost indexes, and projections of economic conditions. Where quantities cannot be derived from building plans, lump sum costs or allowances are utilized.

Opinions of Probable Cost should only be construed as preliminary, order-of-magnitude budgets. Actual costs will likely vary from EMG's estimates depending on type and design of suggested remedy, quality of materials and installation, manufacturer and type of equipment or system selected, field conditions, whether a physical deficiency is repaired or replaced in whole, phasing of the work (if applicable), quality of contractor, market conditions, and whether competitive pricing is solicited. ASTM E2018-08¹ recognizes that certain Opinions of Probable Cost cannot be developed within the scope of an FCA without further study. Instances where a visual inspection is not possible and further study is recommended, EMG provides a cost estimate of the additional study in the FCA.

Facility Condition Index

The FCI gives an indication of a building's overall state of condition. The values are based on a 0-100 percent scale. The Current Year FCI is the ratio of Immediate Repair Costs to Current Replacement Value. The Ten-Year FCI is the ratio of Capital Reserve Needs (2015 – 2024) to Current Replacement Value. The Ten-Year FCI is calculated using uninflated 2015 dollars because the year of project implementation is likely unknown or subject to change. Since both the repair/replacement costs and Current Replacement Value will increase at the same inflation rate, the impacts of inflation do not significantly affect the FCI ratio.

¹ ASTM 2018-08 is the national guideline for preparing a Facility Condition Assessment published by the American Society for the Testing of Materials.

SCOPE OF ASSESSMENT

The evaluation team conducted a walk-through survey of Board of Equalization Headquarters Building (028) on December 1 & 2, 2014. The survey included analysis and observation of the building's interior and exterior, including the roofs. The evaluation team interviewed the building maintenance staff to inquire about the subject property's previous repairs and replacements and their costs, level of preventive maintenance exercised, pending repairs and improvements, and frequency of repairs and replacements. Opinions were developed based on the site evaluation, interviews with relevant maintenance providers and facilities managers, and previous experience with comparable properties. The evaluation team questioned those knowledgeable of the subject property's physical condition and operation (or knowledgeable of similar systems) to gain comparative information to use in evaluation of the subject property. In addition, the building staff provided documents and information to the evaluation team that were relevant to the subject property's physical improvements, extent, and type of use and assisted the team in identifying potential discrepancies between reported information and observed conditions.

The evaluation team made a visual assessment for compliance with the American with Disabilities Act (ADA) Accessibility Guidelines and the California Title 24 disabled access requirements. Items determined to be out of compliance are included in the repair/replacement costs. The assessments did not include detailed measurements to determine compliance under the regulations.

The data collected in the FCA are the basis of the projected ten-year Capital Reserve Needs. The goals of the FCA are:

- Benchmark current building condition with recommended corrections for deficiencies to establish the Immediate Repair Costs.
- Estimate life expectancy of various building systems and components to establish the Capital Reserve Needs for infrastructure lifecycle repair/replacement for the ten-year assessment period from 2015 to 2024.
- Provide estimates for corrections for Immediate Repairs Costs and projections for Capital Reserve Needs for lifecycle component replacement within the ten-year projection timeframe.
- Serve as a guide for future replacement, repairs, and improvements and assist DGS in prioritizing its capital budget and expenditures across its real estate portfolio.

PRIORITY RANKING

The recorded existing conditions, identified problems and deficiencies, documented corrective action, and quantities of recommended repairs and/or replacements are documented during the assessment process. Data are collected and entered directly into the assessment and capital planning database using tablet computers. Based on the discussions with the client and industry standards, a Priority Ranking is calculated for each cost observation. The Priority Ranking calculation is a function of four key categories.

PRIORITY RANKING CATEGORIES

Building Mission Ranking

A building can be ranked on a scale of one to ten based on conversations with the client regarding the importance of each building to the overall mission of the building. The properties reviewed during this assessment are all general-purpose office buildings and for the purposes of this study are all ranked the same for Building Mission.

Remaining Useful Life Ranking

The EUL projection of the component is calibrated against the RUL as estimated by the field assessor. This ratio is then utilized as a factor in the priority ranking. An RUL of zero years is given the highest priority and always results in ranking the component as Priority 1.

Asset Component Category

Each material or system (asset) evaluated is assigned a unique Unifomat code. The Unifomat designation is then associated with a ranking based on the overall importance to the operation of the building. An asset that is related to the building envelope, e.g. roof, window, or exterior siding, is assigned a higher ranking than a component such as a flooring, carpeting, or other finish material.

Functional Asset Categories

The cost associated with each asset or component evaluated is assigned to a category to include: Code Compliance, Facility Operations, Environmental Factors, Facility Functionality, and Integrity of the Facility. The Asset Categories are given a ranking based on their relative importance. For example, Code Compliance is ranked higher than Maintenance.

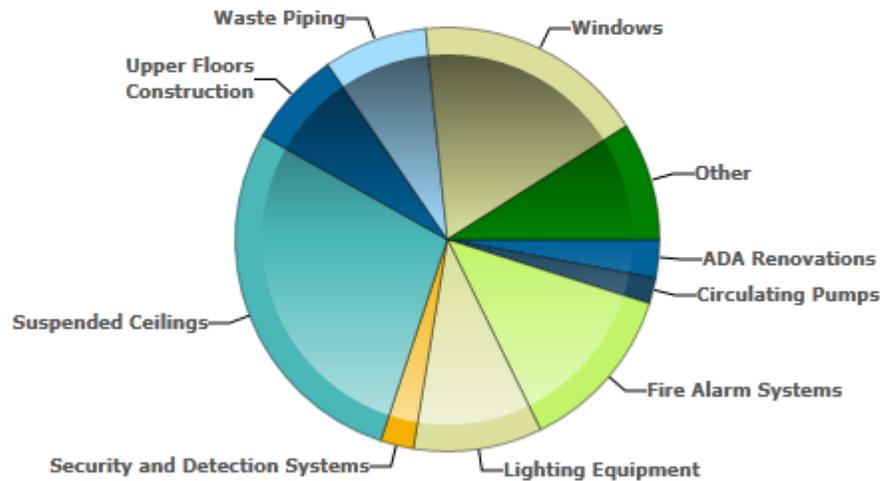
PRIORITY RATIO

The four categories above are assigned a numerical value and the values are multiplied together for each cost observation. The resulting number is then assigned a priority by the capital planning software with the lower range assigned Priority 1 and the higher range of numbers assigned among Priority 2, Priority 3, and Priority 4. Priority 5 is reserved for code issues that were permitted by the code at the time of construction but would be required only if a major renovation or code compliance project were to be undertaken.

The physical condition of building systems and related components are typically defined as being in one of four conditions: Good, Fair, Poor, or Very Poor, or a combination thereof. For the purposes of this report, the following definitions are used:

Condition	Definition
Good	In new or well-maintained condition, with no visual evidence of wear, soiling, or other deficiencies.
Fair	Subjected to wear and soiling but is still in a serviceable and functioning condition.
Poor	Subjected to hard or long-term wear. Nearing the end of its useful or serviceable life.
Very Poor	Subjected to hard or long-term wear. Has reached the end of its useful or serviceable life. Renewal is now necessary.

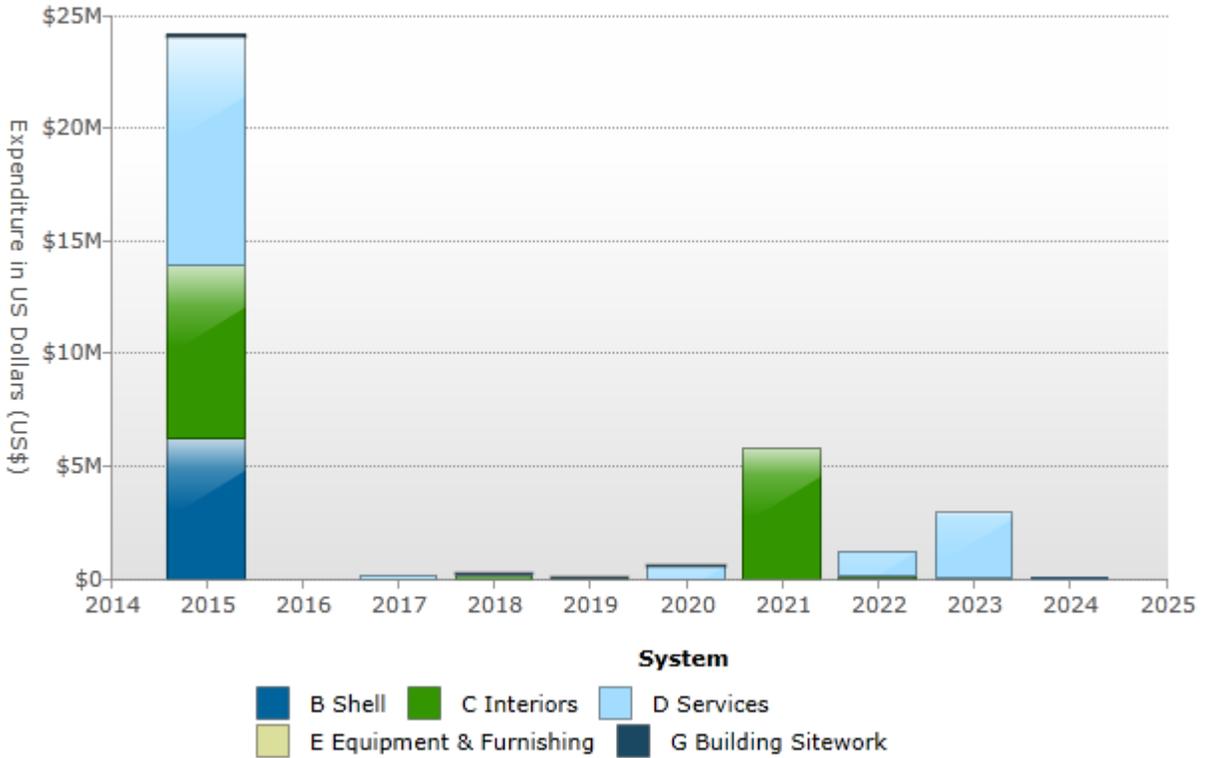
Distribution of Immediate Needs by Building System



Level	Building System	Estimated Cost
B1012	Upper Floors Construction	\$1,762,982
B1029	Other Roof Systems	\$57,288
B2011	Exterior Wall Construction	\$150,243
B2021	Windows	\$4,256,753
C3005	ADA Renovations	\$707,346
C3012	Wall Finishes to Interior Walls	\$138,205
C3024	Flooring	\$56,731
C3025	Carpeting	\$40,423
C3032	Suspended Ceilings	\$6,775,597
D1011	Passenger Elevators	\$87,997
D1012	Freight Elevators	\$7,826
D2021	Cold Water Service	\$206,883
D2031	Waste Piping	\$1,909,177
D3022	Circulating Pumps	\$473,202

Level	Building System	Estimated Cost
D3031	Cooling Towers	\$119,043
D3041	Air Handling Units	\$335,296
D3042	Exhaust Ventilation Systems	\$146,292
D3051	Terminal Heat Pumps	\$326,069
D3052	Package Units	\$87,296
D3063	Heating/Cooling Air Handling Units	\$98,654
D4012	Sprinkler Pumping Equipment	\$199,374
D5022	Lighting Equipment	\$2,370,787
D5037	Fire Alarm Systems	\$3,104,930
D5038	Security and Detection Systems	\$609,336
D5092	Emergency Light & Power Systems	\$9,555
E1025	Audio-visual Equipment	\$9,440
G2022	Paving & Surfacing	\$1,897
G2031	Paving & Surfacing	\$10,488
G2041	Fences & Gates	\$82,870
	Total	\$24,141,982

Total Capital Needs By System and Year



Year	Building System							Total
	A Sub-Structure	B Shell	C Interiors	D Services	E Equip. & Furnishings	F Spec. Const. & Demolition	G Bldg. Site Work	
2015	\$0	\$6,227,266	\$7,718,302	\$10,091,719	\$9,440	\$0	\$95,255	\$24,141,982
2017	\$0	\$0	\$0	\$121,009	\$0	\$0	\$0	\$121,009
2018	\$0	\$0	\$111,456	\$65,700	\$0	\$0	\$46,326	\$223,482
2019	\$0	\$0	\$4,637	\$0	\$0	\$0	\$14,177	\$18,814
2020	\$0	\$0	\$0	\$530,709	\$0	\$0	\$10,488	\$541,197
2021	\$0	\$0	\$5,796,336	\$0	\$0	\$0	\$0	\$5,796,336
2022	\$0	\$24,593	\$138,205	\$1,023,707	\$0	\$0	\$0	\$1,186,505
2023	\$0	\$21,678	\$0	\$2,938,414	\$0	\$0	\$0	\$2,960,092
2024	\$0	\$73,443	\$0	\$0	\$0	\$0	\$0	\$73,443
Total	\$0	\$6,346,979	\$13,768,937	\$14,771,258	\$9,440	\$0	\$166,246	\$35,062,860

CURRENT REPLACEMENT VALUE

The Current Replacement Value has been determined as \$414,409,560 for the Board of Equalization Headquarters Building Building (028). The Current Replacement Value is the existing building SF multiplied by the Cost per SF to construct a new, similar building. As noted previously, the basis of the Cost per SF amount is the Marshall & Swift Cost Valuation system. A copy of the cost calculation is included in Appendix H of this report.

Building Area	Cost/SF	Current Replacement Value
863,131 GSF	\$480	\$414,409,560

FACILITY CONDITION INDEX

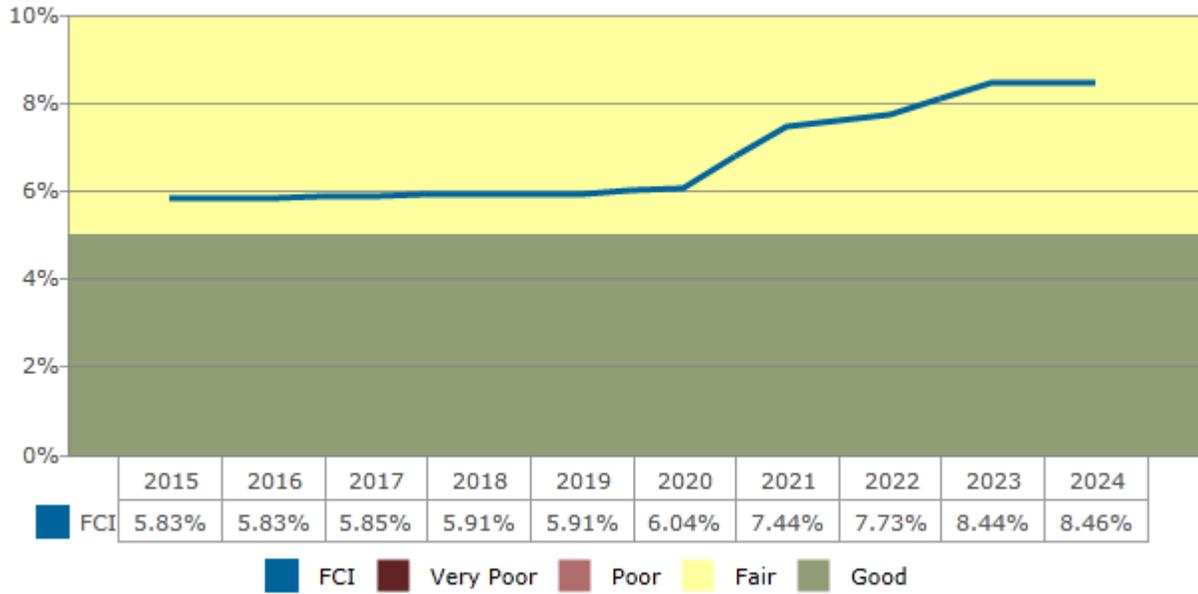
The FCI¹ is an indication of a building’s current and future overall condition. According to industry standards an FCI ratio of 65 percent, or the “rule of two-thirds,” is the threshold for identifying potential candidates for replacement or divestment.² Once the FCI ratio reaches 65 percent, or roughly two-thirds of the Current Replacement Value of the estimated cost to replace a building, it may not be prudent to continue to fund repairs. In cases where aggressive facilities planning is expected to be necessary, this threshold may be adjusted to address more pressing needs.

Condition	Definition	Value
Good	In new or well-maintained condition, with no visual evidence of wear, soiling or other deficiencies.	0% to 5%
Fair	Subjected to wear and soiling but is still in a serviceable and functioning condition.	Greater than 5% to 10%
Poor	Subjected to hard or long-term wear. Nearing the end of its useful or serviceable life.	Greater than 10% to 65%
Very Poor	Subjected to hard or long-term wear. Has reached the end of its useful or serviceable life. Renewal is now necessary.	Greater than 65%

² Sean C. Rush (1991). *Managing the Facilities Portfolio: a Practical Approach to Institutional Facility Renewal and Deferred Maintenance*. National Association of College and University Business Officers. pp. 26–66. ISBN 978-0-915164-59-2.

The chart below indicates the cumulative effects of the FCI ratio over the ten-year study period assuming the required funds are NOT provided to address the identified repairs and replacements for each year.

Cumulative Effects of FCI over the Study Period



APPENDICES

APPENDIX A: ACCESSIBILITY ISSUES

Item	Description
C3005 ADA Renovations	C3005 Restrooms /ADA Renovations
Condition	Poor - Fair
Qty / UOM	52 / EA
RUL (years)	0
Location	All Floors

Recommendations:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3005	Replace C3005 Restrooms /ADA Renovations	52.0 - EA	13602.8	CC - Accessibility	Priority 1	2015	707,346

Cost Summary:

Year	Total Expenditures
2015	\$707,346

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APPENDIX B: GENERAL ASSESSMENT INFORMATION

A Substructure Systems

A10 FOUNDATIONS

Item	Description
A1021 Pile Foundations	A1021 Pile Foundations
Condition	Good
Qty / UOM	24000 /
RUL (years)	67
Location	Throughout building

OBSERVATIONS/COMMENTS:

The foundation appears to be in good condition, with no signs of settlement.

B Shell Systems

B10 SUPERSTRUCTURE

Item	Description
B1012 Upper Floors Construction	B1012 Seismic Bracing - Mezzanine
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	0
Location	Parking garage mezzanine

OBSERVATIONS/COMMENTS:

Based on Stantec Tier I review of the parking garage structure, seismic bracing of the mezzanine is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B1012	Replace B1012 Seismic Bracing - Mezzanine	1.0 - EA	62674.6	CC - Building Code	Priority 1	2015	62,675

Item	Description
B1012 Upper Floors Construction	B1012 Seismic bracing of the garage
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	0
Location	Parking garage

OBSERVATIONS/COMMENTS:

Based on a Tier I report by Stantec, there are seismic deficiencies at the parking garage. The garage was designed in the early 1960s, before the implementation of the 1973 Sesimic Codes. Shear walls are deficient and the columns need reinforcing where they support the precast concrete beams. There are 98 columns that will require reinforcing.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B1012	Replace B1012 Seismic bracing of the garage	1.0 - EA	1700307.8	CC - Building Code	Priority 1	2015	1,700,308

Item	Description
B1029 Other Roof Systems	B1020 Balcony Concrete Tiles
Condition	Poor - Fair
Qty / UOM	10500 / SF
RUL (years)	0
Location	Balconies at 23rd floor

OBSERVATIONS/COMMENTS:

The balconies are surfaced with glazed concrete tile. Some grout deterioration is noted; joint repair and sealing are required.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B1029	Replace B1020 Balcony Concrete Tiles	10,500.0 - SF	5.5	OP - Maintenance	Priority 1	2015	57,288

COST SUMMARY:

Type	Year	Total Expenditures
B10 Superstructure	2015	\$1,820,270

B20 EXTERIOR ENCLOSURE

Item	Description
B2011 Exterior Wall Construction	B2011 Parking Garage painted walls
Condition	Fair - Good
Qty / UOM	12288 / SF
RUL (years)	0
Location	Parking garage

OBSERVATIONS/COMMENTS:

Painting of the interior walls in the garage is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B2011	Replace B2011 Parking Garage painted walls	12,288.0 - SF	6.0	IN - Appearance	Priority 1	2015	73,443
B2011	Replace B2011 Parking Garage painted walls	12,288.0 - SF	6.0	IN - Appearance	Priority 1	2024	73,443

Item	Description
B2011 Exterior Wall Construction	B2011 Exterior Painted Walls
Condition	Good
Qty / UOM	15860 / SF
RUL (years)	10
Location	All Floor

OBSERVATIONS/COMMENTS:

Periodic painting will be required.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B2011	B2011 Painting of Exteriors	12,800.0 - SF	6.0	IN - Appearance	Priority 1	2015	76,800

Item	Description
B2011 Exterior Wall Construction	B2011 Exposed Aggregate Precast Concrete Panels
Condition	Fair - Good
Qty / UOM	8800 / SF
RUL (years)	18
Location	Parking Garage

OBSERVATIONS/COMMENTS:

The exterior wall panels with exposed aggregate finish will require routine maintenance.

Item	Description
B2021 Windows	B2021 Spandrel Panels
Condition	Poor
Qty / UOM	27720 / SF
RUL (years)	0
Location	All Floors

OBSERVATIONS/COMMENTS:

Based on the fracture of one spandrel panel in 2012, and studies identifying potential problems with the spandrel panels, an overall replacement of the spandrel panels is recommended. The windows and leaks were repaired in 2012.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B2021	Replace B2021 Spandrel Panels	27,720.0 - SF	153.6	IN - Beyond Rated Life	Priority 1	2015	4,256,753

Item	Description
B2031 Glazed Doors & Entrances	B2031 Exterior Glazed Doors
Condition	Good
Qty / UOM	5 / EA
RUL (years)	8
Location	Lobby
Door Hardware	Lever
Door Operation	Manual
Glass Type	Standard Glass
Door Frame	Metal Framed
Door Use	Entrance

OBSERVATIONS/COMMENTS:

These doors open by key card. Based on their estimated RUL, the glazed doors will require replacement.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B2031	Replace B2031 Exterior Glazed Doors	5.0 - EA	4335.5	IN - Beyond Rated Life	Priority 4	2023	21,678

Item	Description
B2031 Glazed Doors & Entrances	B2031 Main Auminum Doors with Glass Panels
Condition	Good
Qty / UOM	2 / EA
RUL (years)	18
Location	First Floor
Door Hardware	Lever
Door Operation	Automatic
Glass Type	Tempered Glass
Door Frame	Frameless
Door Use	Entrance

OBSERVATIONS/COMMENTS:

There are two automatic doors to main lobby. No further action is required.

Item	Description
B2032 Solid Exterior Doors	B2032 Solid Exterior Doors
Condition	Good
Qty / UOM	4 / EA
RUL (years)	7
Location	Roof

OBSERVATIONS/COMMENTS:

Based on their estimated RUL, the exterior steel doors will require replacement.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
B2032	Replace B2032 Solid Exterior Doors	4.0 - EA	6148.2	IN - Beyond Rated Life	Priority 4	2022	24,593

COST SUMMARY:

Type	Year	Total Expenditures
B20 Exterior Enclosure	2015	\$4,406,995
B20 Exterior Enclosure	2022	\$24,593
B20 Exterior Enclosure	2023	\$21,678
B20 Exterior Enclosure	2024	\$73,443

B30 ROOFING

Item	Description
B3011 Roof Finishes	B3011 PVC Membrane Roofing
Condition	Good
Qty / UOM	18000 / SF
RUL (years)	19
Location	Roof
Insulation	Rigid
Flashings and Trim	Fully Adhered Roof Membrane
Roof Eaves and Soffits	No
Roof Drainage	Metal Gutter And Down Spouts
Roof Warranty	Yes

OBSERVATIONS/COMMENTS:

Roofs were replaced in 2013.

Item	Description
B3011 Roof Finishes	B3011 Standing Seam Metal Roof
Condition	Good
Qty / UOM	42 / SQ
RUL (years)	16
Location	Main roof penthouse

OBSERVATIONS/COMMENTS:

There is metal roof cladding on the penthouse, no further action is required.

C Interiors Systems

C20 STAIRS

Item	Description
C2011 Regular Stairs	C2011 Fire Exit Stairs
Condition	Good
Qty / UOM	7500 /
RUL (years)	37
Location	All Floor
Stairs Frame	Steel
Stair Riser	Closed
Stair Railings	Metal
Stair Soffit Finishes	Drywall
Stair Handrail Finishes	Polished Metal

OBSERVATIONS/COMMENTS:

There are two interior fire exit stairwells with steel stair parts, and concrete treads and landings. Painting will be required during the assessment period.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C2011	C3010 Scrape and paint metal stair parts	28,800.0 - SF	3.9	IN - Appearance	Priority 3	2018	111,456

COST SUMMARY:

Type	Year	Total Expenditures
C20 Stairs	2018	\$111,456

C30 INTERIOR FINISHES

Item	Description
C3005 ADA Renovations	C3005 Restrooms /ADA Renovations
Condition	Poor - Fair
Qty / UOM	52 / EA
RUL (years)	0
Location	All Floors

OBSERVATIONS/COMMENTS:

At each floor level there are two restrooms and two drinking fountains, though the first floor has four restrooms. Per conversation with building staff there is an ADA upgrade plan to renovate all restrooms.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3005	Replace C3005 Restrooms /ADA Renovations	52.0 - EA	13602.8	CC - Accessibility	Priority 1	2015	707,346

Item	Description
C3012 Wall Finishes to Interior Walls	C3012 Paint Interior Walls, Drywall
Condition	Fair
Qty / UOM	64800 / SF
RUL (years)	0
Location	All Floors

OBSERVATIONS/COMMENTS:

Periodic painting will be required.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3012	Replace C3012 Paint Interior Walls, Drywall	64,800.0 - SF	2.1	IN - Appearance	Priority 2	2015	138,205
C3012	Replace C3012 Paint Interior Walls, Drywall	64,800.0 - SF	2.1	IN - Appearance	Priority 2	2022	138,205

Item	Description
C3012 Wall Finishes to Interior Walls	C3012 Marble Tile
Condition	Good
Qty / UOM	960 / SF
RUL (years)	28
Location	Elevator

OBSERVATIONS/COMMENTS:

Elevator wall and lobby areas are finished with marble tiles. No further action is required.

Item	Description
C3024 Flooring	C3024 Vinyl Tile Flooring
Condition	Fair
Qty / UOM	331 / SY
RUL (years)	0
Location	Child Care
Floor Toppings	Light Weight Concrete
Traffic Membranes	Epoxy / Urethane Coated

OBSERVATIONS/COMMENTS:

Based on their condition, replacement of the vinyl tiles is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3024	Replace C3024 Vinyl Tile Flooring	331.0 - SY	171.4	IN - Appearance	Priority 2	2015	56,731

Item	Description
C3024 Flooring	C3024 Cafeteria - Ceramic Floor Tile
Condition	Good
Qty / UOM	2842 / SF
RUL (years)	29
Location	First floor Cafeteria
Floor Toppings	Light Weight Concrete
Traffic Membranes	Epoxy / Urethane Coated
Hardeners and Seals	Polymer Sealant

OBSERVATIONS/COMMENTS:

No further action is required.

Item	Description
C3025 Carpeting	C3025 Lobby Floor
Condition	Good
Qty / UOM	48 / SY
RUL (years)	4
Location	Lobby
Floor Toppings	Light Weight Concrete

OBSERVATIONS/COMMENTS:

The lobby floor is finished with carpet at the reception area, and quarry tile at the security area. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3025	Replace C3025 Lobby Floor	48.0 - SY	96.6	IN - Appearance	Priority 3	2019	4,637

Item	Description
C3025 Carpeting	C3025 Carpet Tiles - Standard
Condition	Good
Qty / UOM	60000 / SY
RUL (years)	6
Location	All Floors
Floor Toppings	Light Weight Concrete

OBSERVATIONS/COMMENTS:

All floors are covered with carpet tiles, except the break room area, which is finished with vinyl tiles. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3025	Replace C3025 Carpet Tiles - Standard	60,000.0 - SY	96.6	IN - Appearance	Priority 4	2021	5,796,336

Item	Description
C3025 Carpeting	C3025 Board Room finishes
Condition	Fair
Qty / UOM	335 / SY
RUL (years)	0
Location	Board Room
Floor Toppings	Light Weight Concrete
Traffic Membranes	Epoxy / Urethane Coated

OBSERVATIONS/COMMENTS:

The Board Room is located on the first floor.Finish replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3025	Replace C3025 Board Room finishes	335.0 - SY	120.7	IN - Appearance	Priority 2	2015	40,423

Item	Description
C3032 Suspended Ceilings	C3032 Lobby ceiling
Condition	Fair
Qty / UOM	23 / CSF
RUL (years)	0
Location	Lobby

OBSERVATIONS/COMMENTS:

Due to normal deterioration, the suspended acoustic tile in the reception/lobby area will require replacement.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3032	Replace C3032 Lobby ceiling	23.0 - CSF	1201.6	IN - Appearance	Priority 2	2015	27,636

Item	Description
C3032 Suspended Ceilings	C3032 Acoustical Ceiling Tiles
Condition	Poor - Fair
Qty / UOM	5616 / CSF
RUL (years)	0
Location	All Floors

OBSERVATIONS/COMMENTS:

Warped, sagging, and deteriorated ceiling tiles were observed. The property staff reported that special procedures are in place, including establishing negative air pressure, for any ceiling tile removal due to concerns over suspect mold. Full replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
C3032	Replace C3032 Acoustical Ceiling Tiles	5,616.0 - CSF	1201.6	IN - Appearance	Priority 2	2015	6,747,961

COST SUMMARY:

Type	Year	Total Expenditures
C30 Interior Finishes	2015	\$7,718,302
C30 Interior Finishes	2019	\$4,637
C30 Interior Finishes	2021	\$5,796,336
C30 Interior Finishes	2022	\$138,205

D Services Systems

D10 CONVEYING SYSTEMS

Item	Description
D1011 Passenger Elevators	D1010 Traction Elevator - High Rise
Condition	Poor - Fair
Qty / UOM	5 / EA
RUL (years)	10
Location	Cars 5-9
Elevator Style	Passenger
Elevator Type	Traction
Machinery Location	Penthouse At The Top Of The Shaft

OBSERVATIONS/COMMENTS:

See elevator consultant report in the appendices for further information.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D1011	D 1011 Perform five year full load tests	5.0 - EA	5460.0	CC - Building Code	Priority 1	2015	27,300
D1011	D1011 Adjust door and floor to floor time	5.0 - EA	910.0	OP - Maintenance	Priority 2	2015	4,550
D1011	D1011 Repair door restrictor on Car 7	1.0 - EA	3185.0	CC - Life Safety	Priority 1	2015	3,185
D1011	D1011 Install proper sized seismic retainers	5.0 - EA	1456.0	CC - Building Code	Priority 1	2015	7,280

Item	Description
D1011 Passenger Elevators	D1010 Traction Elevators - Low Rise
Condition	Poor - Fair
Qty / UOM	4 / EACH
RUL (years)	10
Location	Cars 1-4
Elevator Style	Passenger
Elevator Type	Traction
Machinery Location	Penthouse At The Top Of The Shaft

OBSERVATIONS/COMMENTS:

See elevator consultant report in the appendices for further information.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D1011	Perform five year full load test	4.0 - EA	5460.0	CC - Building Code	Priority 1	2015	21,840
D1011	Adjust door and floor to floor time	4.0 - EA	910.0	OP - Maintenance	Priority 2	2015	3,640
D1011	Install proper sized seismic retainers	4.0 - EA	1456.0	CC - Building Code	Priority 1	2015	5,824

Item	Description
D1011 Passenger Elevators	D1010 Hydraulic Parking Garage Elevators, 3,000 LB Capacity
Condition	Fair
Qty / UOM	3 / EA
RUL (years)	10
Location	Parking Garage Cars 11-13
Elevator Style	Passenger
Elevator Type	Hydraulic
Machinery Location	Room Adjacent To The Shaft

OBSERVATIONS/COMMENTS:

See elevator consultant report in the appendices for further information.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D1011	Install floor passing chimes	3.0 - EA	2184.0	CC - Building Code	Priority 1	2015	6,552
D1011	Install door restrictor on Car 13	1.0 - EA	6370.0	CC - Life Safety	Priority 1	2015	6,370
D1011	Install seismic retainers on Car 13	1.0 - EA	1456.0	CC - Building Code	Priority 1	2015	1,456

Item	Description
D1012 Freight Elevators	D1012 Freight Elevators
Condition	Good
Qty / UOM	1 / EA
RUL (years)	12
Location	Service Car 10

OBSERVATIONS/COMMENTS:

See elevator consultant report in the appendices for further information.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D1012	Perform full 5 year load test	1.0 - EA	5460.0	CC - Building Code	Priority 1	2015	5,460
D1012	Install proper seismic retainer.	1.0 - EA	1456.0	CC - Building Code	Priority 1	2015	1,456
D1012	Adjust door to floor time so the elevators perform better.	1.0 - EA	910.0	OP - Maintenance	Priority 2	2015	910

COST SUMMARY:

Type	Year	Total Expenditures
D10 Conveying Systems	2015	\$95,823

D20 PLUMBING

Item	Description
D2011 Water Closets	D2011 Commercial Grade Water Closet, 1.6 GPF
Condition	Fair - Good
Qty / UOM	184 / EA
RUL (years)	15
Location	Throughout Facility
Low Flow Toilet	Yes
System Grade	Commercial Grade

OBSERVATIONS/COMMENTS:

Manual flush valves were observed on the vast majority of plumbing fixtures. Automatic flush valves are recommended to improve hygiene.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D2011	D2013 Install automatic flush valves on toilets	36.0 - EA	944.0	OP - Energy	Priority 2	2017	33,984

Item	Description
D2012 Urinals	D2012 Urinal
Condition	Fair - Good
Qty / UOM	24 / EA
RUL (years)	15
Location	Throughout Facility
Low Flow Toilet	Yes
System Grade	Commercial Grade

OBSERVATIONS/COMMENTS:

Manual flush valves were observed on the vast majority of plumbing fixtures. Automatic flush valves are recommended to improve hygiene and save water.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D2012	D2012 Install automatic flush valves on urinals	10.0 - EA	944.0	OP - Energy	Priority 2	2017	9,440

Item	Description
D2013 Lavatories	D2013 Counter Top Sink and Faucet
Condition	Fair - Good
Qty / UOM	138 / EA
RUL (years)	15
Location	Throughout Facility

OBSERVATIONS/COMMENTS:

Automatic faucets were observed on the restroom sinks.

Item	Description
D2021 Cold Water Service	D2020 5-Inch Copper Pipe
Condition	Poor
Qty / UOM	750 / LF
RUL (years)	0
Location	Throughout Facility

OBSERVATIONS/COMMENTS:

Prior studies of the supply piping throughout the structure have indicated compromised structural integrity, confirmed by visual observation. Replacement of the piping is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D2021	Replace D2020 5-Inch Copper Pipe	750.0 - LF	275.8	OP - Maintenance	Priority 2	2015	206,883

Item	Description
D2023 Domestic Water Supply Equipment	D2023 Domestic Water Booster Pump Station
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	5
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

The ground floor utility room has a domestic water booster pump station original to the 1992 construction. The station consists of three 20-hp pumps. One of the pumps was recently replaced in full, and VFDs were added or replaced in 2011. Replacement of is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D2023	Replace D2023 Domestic Water Booster Pump Station	1.0 - EA	42697.2	IN - Beyond Rated Life	Priority 3	2020	42,697

Item	Description
D2023 Domestic Water Supply Equipment	D2023 Commercial Gas-Fired Domestic Water Heater, 390 MBH
Condition	Fair - Good
Qty / UOM	1 / EA
RUL (years)	16
Location	Parking Garage

OBSERVATIONS/COMMENTS:

The gas-fired water heater serving the first and second floors of the facility was replaced in 2010, and has no reported problems.

Item	Description
D2023 Domestic Water Supply Equipment	D2023 Water Heater 80-Gallon Commercial
Condition	Fair - Good
Qty / UOM	4 / EA
RUL (years)	16
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

The electric water heaters on the various levels of the tower were replaced in 2010, and have no reported problems.

Item	Description
D2031 Waste Piping	D2034 Cast Iron Piping to 6"
Condition	Poor
Qty / UOM	684293 / SF
RUL (years)	0
Location	Throughout Building and First Level of Garage

OBSERVATIONS/COMMENTS:

Prior studies of the waste piping throughout the structure have indicated compromised structural integrity, confirmed by visual observation. The two-inch lines have sewer deposit build-up to the extent of occluding the entire stack. Replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D2031	Replace D2034 Cast Iron Piping to 6"	684,293.0 - SF	2.8	IN - Reliability	Priority 1	2015	1,909,177

COST SUMMARY:

Type	Year	Total Expenditures
D20 Plumbing	2015	\$2,116,060
D20 Plumbing	2017	\$43,424
D20 Plumbing	2020	\$42,697

D30 HVAC

Energy Supply	
Item	Description
Fuel Oil Type	N/A
Fuel Gas Type	Natural Gas
Solid Fuel Type	N/A
District Heat Type	Site Physical Plant Hot Water
District Cooling Type	Site Physical Plant Chilled Water
Solar Thermal	No
Fuel Tank Type	N/A
Fuel Tank Size (gallons)	N/A
Fuel Tank Location	N/A
Gas Meter Location	Exterior of building
Electrical Meter Location	Main electrical room
Water Meter Location	4th Street utility closet

Item	Description
D3021 Boilers	D3021 HVAC Water Boiler, Gas 3050 MBH
Condition	Fair - Good
Qty / UOM	1 / EA
RUL (years)	18
Location	Parking Garage
Boiler Draft Type	Atmospheric/Induced Draft
Boiler Manufacturer	Teledyne Laars
Boiler Model	HH 3050

OBSERVATIONS/COMMENTS:

The HVAC heating boiler is associated with the water source heat pumps in the older part of the facility. The boiler is reportedly still functioning and performing adequately and should continue to do so for quite some time. When it is time to replace the unit, EMG encourages replacing the unit with two smaller pulse-type units for higher efficiency and increased system flexibility. The cost for two smaller units is included in the Capital Reserves.

Item	Description
D3021 Boilers	D3021 HVAC Water Boilers, Gas 5500 MBH
Condition	Fair - Good
Qty / UOM	2 / EA
RUL (years)	18
Location	Penthouse Mechanical
Boiler Draft Type	Atmospheric/Induced Draft
Boiler Manufacturer	Cleaver Brooks
Boiler Model	FLX 700 600

OBSERVATIONS/COMMENTS:

The main HVAC heating boilers are original to the 1992 construction. New burners and controls were recently installed as an improvement. A comprehensive refurbishment project is recommended to maintain the performance, and prolong the lifespan of the boilers. Depending on the internal condition, recommended replacements include partial or complete re-tubing, as-needed welding repairs, and valve and other components.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3021	Refurbish and re-tube HVAC boilers	2.0 - EA	106200.0	OP - Energy	Priority 4	2022	212,400

Item	Description
D3022.1 Circulating Pumps	D3022 HVAC Heating Water Pumps 20 HP
Condition	Fair
Qty / UOM	3 / EA
RUL (years)	0
Location	Penthouse Mechanical
Piping Type	Galvanized Steel
Piping Diameter	6
Piping Insulation	Fiberglass
Pump Manufacturer	Bell & Gossett
Pump HP	20

OBSERVATIONS/COMMENTS:

The 20-hp heating water distribution pumps and associated motors appear to be original. These pumps are not equipped with variable frequency drives (VFDs). Installation of VFDs is recommended to improve the efficiency and longevity of the pumps.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3022	Replace D3022 HVAC Heating Water Pumps 20 HP	3.0 - EA	24794.2	IN - Reliability	Priority 1	2015	74,382
D3022	Add VFD's to HVAC heating pumps	3.0 - EA	15517.0	OP - Energy	Priority 2	2017	46,551

Item	Description
D3022.1 Circulating Pumps	D3022 Condenser Water Pumps 50 HP
Condition	Fair
Qty / UOM	3 / EA
RUL (years)	0
Location	Mezzanine Mechanical
Piping Type	Galvanized Steel
Piping Diameter	6
Piping Insulation	Fiberglass
Pump Manufacturer	Marathon
Pump HP	50

OBSERVATIONS/COMMENTS:

The 50-hp condenser water distribution pumps and associated motors appear to be original, and nearing the end of their lifecycle. The pumps are equipped with VFDs that were installed in 2011. Pump replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3022	Replace D3022 Condenser Water Pumps 50 HP	3.0 - EA	44933.6	IN - Reliability	Priority 1	2015	134,801

Item	Description
D3022.1 Circulating Pumps	D3022 WSHP Condenser Water Pumps 15 HP
Condition	Fair
Qty / UOM	2 / EA
RUL (years)	0
Location	Parking Garage
Piping Type	Galvanized Steel
Piping Diameter	6
Piping Insulation	Fiberglass
Pump Manufacturer	Bell & Gossett
Pump HP	15

OBSERVATIONS/COMMENTS:

The 15-HP distribution pumps and associated motors serving the condenser water loop in the older portion of the facility appear to be original, although nearing the end of their lifecycle. In addition, these pumps are not equipped with variable frequency drives (VFDs), and the installation of VFDs is also recommended to improve the efficiency and longevity of the pumps.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3022	Replace D3022 WSHP Condenser Water Pumps 15 HP	2.0 - EA	23022.5	IN - Reliability	Priority 1	2015	46,045
D3022	Add VFD's to older facility condenser water pumps	2.0 - EA	15517.0	OP - Energy	Priority 2	2017	31,034

Item	Description
D3022.1 Circulating Pumps	D3022 Chilled Water Pumps 40 HP
Condition	Fair
Qty / UOM	3 / EA
RUL (years)	0
Location	Utility Areas/Closets
Piping Type	Galvanized Steel
Piping Diameter	12
Piping Insulation	Fiberglass
Pump Manufacturer	Marathon
Pump HP	40

OBSERVATIONS/COMMENTS:

The 40-hp chilled water distribution pumps and associated motors appear to be original, and nearing the end of their lifecycle. The pumps are equipped with VFDs that were installed in 2011. Pump replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3022	Replace D3022 Chilled Water Pumps 40 HP	3.0 - EA	42638.7	IN - Reliability	Priority 5	2015	127,916

Item	Description
D3022.1 Circulating Pumps	D3022 Pony Chiller Water Pumps 10 HP
Condition	Fair
Qty / UOM	4 / EA
RUL (years)	0
Location	Mezzanine Mechanical
Piping Type	Galvanized Steel
Piping Diameter	12
Piping Insulation	Fiberglass
Pump Manufacturer	Marathon
Pump HP	10

OBSERVATIONS/COMMENTS:

The 10-hp water distribution pumps associated with the pony chiller appear to be original. Replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3022	Replace D3022 Pony Chiller Water Pumps 10 HP	4.0 - EA	22514.4	IN - Beyond Rated Life	Priority 1	2015	90,058

Item	Description
D3031.1 Chillers	D3031 Pony Chiller Centrifugal 80 Ton
Condition	Fair - Good
Qty / UOM	1 / EA
RUL (years)	7
Location	Mezzanine Mechanical
Chiller Refrigerant	22
Chiller Manufacturer	York
Chiller Model	YCWZ88

OBSERVATIONS/COMMENTS:

The pony chiller used for the server room and during hotter weather is original to the 1992 construction. One of the compressors was rebuilt approximately three years ago. The chiller is reportedly functioning and performing adequately, and should continue to do so for some time. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3031	Replace D3031 Pony Chiller Centrifugal 80 Ton	1.0 - EA	315947.0	IN - Beyond Rated Life	Priority 4	2022	315,947

Item	Description
D3031.1 Chillers	D3031 Water Cooled Chiller, Centrifugal, 700-800 Ton
Condition	Fair - Good
Qty / UOM	2 / EA
RUL (years)	4
Location	Mezzanine Mechanical
Chiller Manufacturer	Trane
Chiller Model	CVHE800

OBSERVATIONS/COMMENTS:

The main chillers are original to the 1992 construction, reportedly still functioning and performing adequately, although Chiller #2 has been described as temperamental. New control panels and adaptive frequency drives were

installed approximately three years ago. In lieu of replacement and the large associated costs, a comprehensive refurbishment project is recommended to maintain the performance, and prolong the lifespan of the chillers. Depending on the internal condition, a partial or complete re-build is recommended. A budgetary cost is included.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3031	Re-build/refurbish main HVAC chillers	2.0 - EA	161280.0	OP - Maintenance	Priority 4	2022	322,560

Item	Description
D3031.2 Cooling Towers	D3031 Fluid Cooler, Galvanized Steel, 288 Tons
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	0
Location	Parking Garage
Cooling Tower Type	Induced Draft Crossflow
Number of Cells	1
Cooling Tower Material	Galvanized Steel
Cooling Tower VFD	Yes
Cooling Tower Manufacturer	BAC
Cooling Tower Model	F1443-PM

OBSERVATIONS/COMMENTS:

The fluid cooler is associated with the water source heat pumps in the older part of the facility. The cooling tower is reportedly still functioning and performing adequately, with no major signs of deterioration on the exterior of the unit. Replacement of the tower and other components of the system are recommended due to age.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3031	Replace D3031 Fluid Cooler, Galvanized Steel, 288 Tons	1.0 - EA	119043.0	IN - Reliability	Priority 1	2015	119,043

Item	Description
D3031.2 Cooling Towers	D3031 Cooling Tower, Galvanized Steel, 680 Ton
Condition	Fair
Qty / UOM	2 / EA
RUL (years)	8
Location	Rooftop
Cooling Tower Type	Induced Draft Crossflow
Number of Cells	2
Cooling Tower Material	Galvanized Steel
Cooling Tower VFD	Yes
Cooling Tower Manufacturer	BAC
Cooling Tower Model	VT1-680 PC

OBSERVATIONS/COMMENTS:

The large dual-cell rooftop cooling towers are original to the 1992 construction, reportedly still functioning and performing adequately, with no major signs of deterioration on the exterior encasements of the units. In lieu of replacement and the large associated costs, a comprehensive refurbishment project is recommended, to maintain the performance and prolong the lifespan of the cooling towers.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3031	Refurbish rooftop cooling towers	2.0 - EA	86400.0	OP - Maintenance	Priority 4	2022	172,800

Item	Description
D3041 Air Distribution Systems	D3041 Balance Air Flow at Diffusers
Condition	Fair
Qty / UOM	684293 / SF
RUL (years)	8
Location	Throughout Facility

OBSERVATIONS/COMMENTS:

Cleaning and balancing the ductwork and diffusers is recommended whenever the VAV boxes are replaced and/or the control system is upgraded, in conjunction with as-needed re-commissioning of the system.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3041	Replace D3041 Balance Air Flow at Diffusers	684,293.0 - SF	0.7	IN - Beyond Rated Life	Priority 4	2023	458,203

Item	Description
D3041.1 Air Handling Units	D3041 Central Interior Large AHU Stations
Condition	Fair
Qty / UOM	4 / EA
RUL (years)	7
Location	Mezzanine Mechanical
Air Handling Unit Sub Type	Variable Volume Multi-Zone
Air Handling Unit Duct Heat Type	Hot Water
Air Handling Unit Cooling Type	Chilled Water Coil
Air Handling Unit Outdoor Air	Damper Controlled
Air Handling Unit Manufacturer	Acme
Air Handling Unit Model	8173 A/3
Number of Return Air Fans	4
Return Air Fan Capacity Units	Cfm
Duct Supply Diffusers and Registers	In Conditioned Spaces On Walls And Ceilings
Duct Return Grilles	Conditioned Space

OBSERVATIONS/COMMENTS:

The facility is provided with conditioned air by four very large, custom-built air handling rooms located on the mechanical mezzanine level, which feed VAV boxes located in each space. Each air handling room has either has two supply fans or two return fans. The supply fans are each nominally specified at 125,000 CFM and are driven by 125-hp motors. The return fans are each nominally specified at 110,000 CFM and are driven by 60-hp motors. The supply fan rooms have cooling decks provided with chilled water from the central system. Motors, fan belts, and other components are typically replaced upon failure. To date, three of the eight motors have been replaced; replacement of the remaining original motors is anticipated within the next several years. One noted issue with the very large supply fans is the excessive amount of vibration they cause to the adjacent floor. On SF-1, the seismic spring isolators around the perimeter base of the unit were replaced, somewhat mitigating the problem. Replacement of the original spring isolators on the other three supply fans is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3041	Replace 60 HP return fan motors	2.0 - EA	48608.0	IN - Reliability	Priority 1	2015	97,216
D3041	Replace spring isolators around base of supply fans	12.0 - EA	4960.0	IN - Reliability	Priority 1	2015	59,520
D3041	Replace 125 HP supply fan motors	3.0 - EA	59520.0	IN - Beyond Rated Life	Priority 1	2015	178,560

Item	Description
D3041.2 Terminal Units VAV	D3041 VAV Boxes
Condition	Fair
Qty / UOM	499 / EA
RUL (years)	8
Location	Throughout Facility
Terminal Units VAV Boxes	Hot Water Reheat
Terminal Units Control	Building System
Terminal Units Capacity	1000
Terminal Units Units	Cfm
Terminal Heating Medium	Hot Water

OBSERVATIONS/COMMENTS:

The facility is heated and cooled by VAVs supplied with conditioned air from the central system air handlers. The perimeter VAVs tend to have either electric re-heat coils or hot water coils supplied by the central system, whereas the interior VAVs do not. The mix of VAV boxes is approximately 50 percent hot water re-heat, 20 percent electric re-heat, and 30 percent cooling only. The maintenance staff reports that the vast majority of VAVs are most likely original to the building construction. Replacement of VAVs

are anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3041	Replace D3041 VAV Boxes	499.0 - EA	3460.5	IN - Beyond Rated Life	Priority 1	2023	1,726,786

Item	Description
D3042 Exhaust Ventilation Systems	D3042 Kitchen Make Up Air Unit 5000 CFM
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	5
Location	Old Section of Building
Ventilation Fan Manufacturer	Ares
Ventilation Fan Model	SE-2

OBSERVATIONS/COMMENTS:

The kitchen area utilizes a make-up air unit and adjacent cooling coil condensing unit for pre-cooling, both dated 1991. They are nearing the end of their useful life. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3042	Replace D3042 Kitchen Make Up Air Unit 5000 CFM	1.0 - EA	40650.7	IN - Beyond Rated Life	Priority 3	2020	40,651

Item	Description
D3042 Exhaust Ventilation Systems	D3042 Restroom Exhaust Fans
Condition	Fair
Qty / UOM	2 / EA
RUL (years)	0
Location	Mezzanine Mechanical
Ventilation Fan Manufacturer	Energy Labs, Inc.
Ventilation Fan Model	FC-24

OBSERVATIONS/COMMENTS:

The restroom exhaust fans are large interior units located in the mechanical mezzanine. Motor replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3042	Replace 20 HP exhaust fan motors	2.0 - EA	73146.0	IN - Beyond Rated Life	Priority 1	2015	146,292

Item	Description
D3042 Exhaust Ventilation Systems	D3042 Stair Pressurization Fans, 20 HP
Condition	Fair
Qty / UOM	2 / EA
RUL (years)	5
Location	Mezzanine Mechanical

OBSERVATIONS/COMMENTS:

The stairwell pressurization fans are ceiling-hung units located in the mechanical mezzanine. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3042	Replace D3042 Stair Pressurization Fans, 20 HP	2.0 - EA	36208.0	IN - Beyond Rated Life	Priority 3	2020	72,416

Item	Description
D3051.1 Terminal Heat Pumps	D3051 Penthouse Heat Pump Water Source, 10-Ton
Condition	Good
Qty / UOM	1 / EA
RUL (years)	23
Location	Penthouse Mechanical
Package Terminal Heat Pump (PTHP) Source	Water-Source
PTHP Manufacturer	Climate Master
PTHP Model	TLV120

OBSERVATIONS/COMMENTS:

Within the past few years, an additional water source heat pump was added to the penthouse area to help condition that space, which is commonly occupied by the maintenance staff.

Item	Description
D3051.1 Terminal Heat Pumps	D3051 Heat Pump Water Source, 10-Ton
Condition	Poor
Qty / UOM	15 / EA
RUL (years)	0
Location	Old Section of Building
Package Terminal Heat Pump (PTHP) Source	Water-Source
PTHP Manufacturer	Climate Master
PTHP Model	V120

OBSERVATIONS/COMMENTS:

The older (non-tower) portion of the facility is conditioned with an independent system, consisting of a boiler and fluid cooler connected to a closed loop system, with water-source heat pumps. There are 15 heat pumps conditioning the print shop, mail room, and various other areas. Most of the units are located on one of two mechanical mezzanines, and an isolated few are mounted to the ceilings within the spaces. The heat pumps are original to the 1992 conversion of the older portion of the building, and have become inefficient and unreliable. They are well beyond their typical lifespan. Replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3051	Replace D3051 Heat Pump Water Source, 10-Ton	15.0 - EA	21738.0	IN - Reliability	Priority 1	2015	326,069

Item	Description
D3051.1 Terminal Heat Pumps	D3051 Elevator Cooling Unit ECU-1
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	5
Location	Penthouse Mechanical
Package Terminal Heat Pump (PTHP) Source	Water-Source
PTHP Manufacturer	Climate Master
PTHP Model	V200

OBSERVATIONS/COMMENTS:

The main elevator machine room has a dedicated heat pump original to the 1992 construction. The unit is supplied with chilled water from the central system. Replacement of the unit is recommended during the reserve period. Replacement with a cooling-only unit is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3051	Replace D3051 Elevator Cooling Unit ECU-1	1.0 - EA	21738.0	IN - Beyond Rated Life	Priority 3	2020	21,738

Item	Description
D3052 Package Units	D3052 Phone Room A/C Unit, Water Cooled 7-Ton
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	5
Location	Server Room
Package Unit Location	Mechanical Room/Closet
Package Unit Controls	Building System
Package Unit Manufacturer	APC
Package Unit Model	TC-08-C-BA

OBSERVATIONS/COMMENTS:

The phone room has a dedicated air conditioning unit original to the early 1990s construction. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3052	Replace D3052 Phone Room A/C Unit, Water Cooled 7-Ton	1.0 - EA	24761.2	IN - Beyond Rated Life	Priority 3	2020	24,761

Item	Description
D3052 Package Units	D3052 Computer Room A/C Units, Air Cooled 10-Ton
Condition	Fair
Qty / UOM	4 / EA
RUL (years)	5
Location	Rooftop
Package Unit Location	Mechanical Room/Closet
Package Unit Controls	Building System
Package Unit Manufacturer	Liebert
Package Unit Model	FH376

OBSERVATIONS/COMMENTS:

The main server room has four dedicated air conditioning units original to the 1992 construction. The units are supplied with chilled water from the building's utility plant. The generator currently does not run any of the HVAC components, and is most likely incapable of handling the pony chiller load, meaning the server room equipment would not be protected with air conditioning during a loss of power. EMG recommends installation of some dry coolers as a back-up heat rejection source for the computer rooms, and a load analysis of the generator to ensure there would be adequate back-up power.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3052	Install drycoolers as back-up means for computer room AC	4.0 - EA	21824.0	FN - Mission	Priority 1	2015	87,296
D3052	Replace D3052 Computer Room A/C Units, Air Cooled 10-Ton	4.0 - EA	49252.8	IN - Beyond Rated Life	Priority 3	2020	197,011

Item	Description
D3063 Heating/Cooling Air Handling Units	D3063 Variable Frequency Drive, 20 HP Motor
Condition	Poor - Fair
Qty / UOM	5 / EA
RUL (years)	0
Location	Mezzanine Mechanical

OBSERVATIONS/COMMENTS:

With the exception of the HVAC heating water pumps and condenser water pumps in the older portion of the building, most of the major components have been equipped with VFDs to improve efficiency. Five of the VFDs are substantially older - the VFDs on the cooling tower, fluid cooler, and two others, replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D3063	Replace D3063 Variable Frequency Drive, 20 HP Motor	5.0 - EA	19730.9	IN - Reliability	Priority 1	2015	98,654

Item	Description
D3068 Building Automation Systems	D3068 Mixed DDC/Pneumatic HVAC Controls
Condition	Fair - Good
Qty / UOM	863131 / SF
RUL (years)	19
Location	Throughout Facility
Pneumatic Controls Equipment	Compressor
HVAC Controls Manufacturer	Niagara AX

OBSERVATIONS/COMMENTS:

Approximately six years ago, the facility began the process of upgrading and modernizing the building energy management system. The new system is in the process of having punch-list completed. The maintenance staff stated that the system works properly. Periodic software upgrades are recommended.

COST SUMMARY:

Type	Year	Total Expenditures
D30 HVAC	2015	\$1,585,853
D30 HVAC	2017	\$77,585
D30 HVAC	2020	\$356,577
D30 HVAC	2022	\$1,023,707
D30 HVAC	2023	\$2,184,989

D40 FIRE PROTECTION SYSTEMS

Fire and Life Safety System	
Item	Description
Fire Alarm System Components Present	
Smoke detectors	Yes
Pull stations	Yes
Audible alarms	Yes
Strobe lights	Yes
Central fire alarm panel	Yes
Annunciator panel	Yes
Smoke Detectors Power Supply	Hardwired Electric
Carbon Monoxide Detectors	No
Heat Detector	Yes
Central Fire Alarm Panel Location	Electrical Room
Annunciator Panel Location	Electrical Rooms
Fire Extinguishers	Yes
Fire Extinguisher Inspection Date	November 1, 2013
Distance to Nearest Fire Hydrant (ft)	20
Illuminated Exit Signs	Yes
Kitchen Suppression Systems	Yes
Halon Gas Systems	Yes
Smoke Evacuation Systems	No
Fire-rated Stairwells	Yes
Fire-rated Stairwell Finish	Masonry
Stairwell Discharge	Exterior of the building at Grade
Stairwell Pressurized	Yes
Fire-Rated Doors Observed	Yes
Location of Fire-Rated Doors	Stairwells
Fire Alarm Service Company	N/A
Date of Last Fire Alarm Service	N/A
Are the individual office unit fire alarm systems monitored?	N/A
Are the common area fire alarm systems monitored?	N/A
Types of Common Areas Monitored	N/A
Fire Alarm Monitoring Company	N/A

Item	Description
D4012 Sprinkler Pumping Equipment	D4012 Fire Pump Electric 200 HP Motor
Condition	Poor
Qty / UOM	1 / EA
RUL (years)	0
Location	Utility area

OBSERVATIONS/COMMENTS:

Install a secondary emergency fire pump per Stantec report and fire code requirements.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D4012	Replace D4012 Fire Pump Electric 200 HP Motor	1.0 - EA	199374.3	CC - Life Safety	Priority 1	2015	199,374

Item	Description
D4012 Sprinkler Pumping Equipment	D4011 Fire Sprinkler System
Condition	Fair - Good
Qty / UOM	863131 / SF
RUL (years)	15
Location	Throughout Facility
Fire Sprinkler Type	Wet Sprinkler
Fire Sprinkler Pipe Material	Steel
Recalled Sprinkler Heads (Omega or Central brands)	No
Sprinkler Standpipes	Yes
Location of Sprinkler Standpipes	Stairwells
Backflow Preventer	Yes
Date of Last Sprinkler Inspection	September 2010 (5-year)

OBSERVATIONS/COMMENTS:

The sprinkler riser and heads are original.

Item	Description
D4012 Sprinkler Pumping Equipment	D4012 Fire Pump Electric 200 HP Motor
Condition	Good
Qty / UOM	1 / EA
RUL (years)	25
Location	Utility Areas/Closets
Fire Pump Delivery Rate (GPM)	1000
Check Valve	Yes

OBSERVATIONS/COMMENTS:

The fire pump was replaced within the past year.

Item	Description
D4094 Dry Chemical System	D4094 Dry Chemical System (Phone Room)
Condition	Good
Qty / UOM	1 / EACH
RUL (years)	19
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

A new halon/gaseous fire prevention system was recently installed within the phone room.

Item	Description
D4094 Dry Chemical System	D4094 Dry Chemical System (Server Room & Print Room)
Condition	Fair
Qty / UOM	2 / EACH
RUL (years)	5
Location	Server Room

OBSERVATIONS/COMMENTS:

The server room and print room are protected by local halon fire suppression systems original to the early 1992 construction. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D4094	Replace D4094 Dry Chemical System (Server Room & Print Room)	2.0 - EACH	65717.5	CC - Life Safety	Priority 3	2020	131,435

COST SUMMARY:

Type	Year	Total Expenditures
D40 Fire Protection Systems	2015	\$199,374
D40 Fire Protection Systems	2020	\$131,435

D50 ELECTRICAL SYSTEMS

Item	Description
D5012 Low Tension Service & Dist.	D5012 Breaker Panel 225 Amps, 30 Circuits
Condition	Fair
Qty / UOM	178 / EA
RUL (years)	18
Location	Throughout Facility

OBSERVATIONS/COMMENTS:

The vast majority of the electrical panels are original 1992 General Electric.

Item	Description
D5012 Low Tension Service & Dist.	D5012 Switchgear, Mainframe, 1600-2000 Amps
Condition	Fair
Qty / UOM	4 / EA
RUL (years)	18
Location	Main Electrical Room
Service Size (Amperage)	2000
Service Voltage	277/480
Service Voltage Type	Three-Phase Four-Wire Alternating Current (Ac)
Step Down Transformers	Yes

OBSERVATIONS/COMMENTS:

The switchboards and motor control centers are original 1992 General Electric equipment. The electrical service is reportedly adequate for the facility's needs. A full infrared scan, cleaning, and tightening effort is recommended as part of routine maintenance.

Item	Description
D5012 Low Tension Service & Dist.	D5012 Main Switchgear, Mainframe, 5000 Amps
Condition	Fair
Qty / UOM	2 / EA
RUL (years)	18

Item	Description
Location	Main Electrical Room
Service Size (Amperage)	5000
Service Voltage	277/480
Service Voltage Type	Three-Phase Four-Wire Alternating Current (Ac)
Step Down Transformers	Yes
Electrical Distribution Panel Type	Circuit Breakers
Main Electrical Distribution Lines	Underground
Site Electrical Transformer Location	Pad-Mounted
Electrical Wiring Material	Solid Copper
Electrical Wiring in Metal Conduit	Yes
Electrical Wiring in Non-Metal (NM) Conduit	No
Electrical Wiring in Non- Metal Sheathing (Romex)	No
Electrical Wiring in Metal Sheathing (BX)	No

OBSERVATIONS/COMMENTS:

The main switchgear is original 1992 General Electric equipment. The electrical service is reportedly adequate for the facility's needs. A full infrared scan, cleaning, and tightening effort is recommended as part of routine maintenance.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5012	Inspect and service main electrical equipment	1.0 - LS	65700.0	OP - Maintenance	Priority 3	2018	65,700

Item	Description
D5012 Low Tension Service & Dist.	D5012 Secondary Dry Transformer 45 kVA
Condition	Fair
Qty / UOM	26 / EA
RUL (years)	18
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

Most of the step-down transformers are original 1992 General Electric components. The electrical service is reportedly adequate for the facility's needs.

Item	Description
D5012 Low Tension Service & Dist.	D5012 Switchgear, Mainframe, 600-800
Condition	Fair
Qty / UOM	6 / EA
RUL (years)	18
Location	Utility Areas/Closets
Service Size (Amperage)	600
Service Voltage	277/480
Service Voltage Type	Three-Phase Four-Wire Alternating Current (Ac)
Electrical Wiring in Metal Conduit	Yes
Electrical Wiring in Non-Metal (NM) Conduit	No
Electrical Wiring in Non- Metal Sheathing (Romex)	No
Electrical Wiring in Metal Sheathing (BX)	No

OBSERVATIONS/COMMENTS:

The switchboards and motor control centers are original 1992 General Electric equipment. The electrical service is reportedly adequate for the facility's needs. A full infrared scan, cleaning, and tightening effort is recommended as part of routine maintenance.

Item	Description
D5012 Low Tension Service & Dist.	D5012 Secondary Dry Transformer 75 kVA
Condition	Fair
Qty / UOM	24 / EA
RUL (years)	18
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

Most of the step-down transformers are original 1992 General Electric components. The electrical service is reportedly adequate for the facility's needs.

Item	Description
D5012 Low Tension Service & Dist.	D5012 Secondary Dry Transformer 225 kVA
Condition	Fair
Qty / UOM	2 / EA
RUL (years)	18
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

Most of the step-down transformers are original 1992 General Electric components. The electrical service is reportedly adequate for the facility's needs.

Item	Description
D5022 Lighting Equipment	D5022 Lighting Fixtures
Condition	Fair
Qty / UOM	5639 / EA
RUL (years)	0
Location	Office areas and corridors

OBSERVATIONS/COMMENTS:

Replacement of the lighting fixtures will be required when the acoustical ceiling tiles are replaced.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5022	Replace D5022 Lighting Fixtures	5,639.0 - EA	401.2	FN - Modernization	Priority 1	2015	2,262,367

Item	Description
D5022 Lighting Equipment	D5022 Inadequate Parking Garage Lighting
Condition	Poor - Fair
Qty / UOM	32 / EA
RUL (years)	0
Location	Parking Garage

OBSERVATIONS/COMMENTS:

The lighting in the parking garage is very low in several areas, including parking areas, drive aisles, and at the elevator lobbies. Increased lighting is recommended using ceiling-mounted wall-pack light fixtures.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5022	Add lighting to parking garage	32.0 - EA	3388.1	OP - Security	Priority 1	2015	108,420

Item	Description
D5037 Fire Alarm Systems	D5037 Fire Alarm Panels
Condition	Fair
Qty / UOM	3 / EA
RUL (years)	0
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

The fire alarm panels appear to be original to the early 1990's construction. Replacement of the panels is highly recommended, as part of a full fire alarm modernization project.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5037	Replace D5037 Fire Alarm Panels	3.0 - EA	16482.2	CC - Life Safety	Priority 1	2015	49,447

Item	Description
D5037 Fire Alarm Systems	D5037 Fire Alarm System, Modernize
Condition	Fair
Qty / UOM	863131 / SF
RUL (years)	0
Location	Throughout Facility

OBSERVATIONS/COMMENTS:

The Fire alarm system is antiquated. Specific problems are cited in a comprehensive report. EMG observed a series of segmentation of panels. The main ground floor panel evidenced that the system is not fully addressable down to the device level. Due to the age of the components and the reported problems, a complete modernization of the fire alarm system is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5037	Modernize Fire Alarm System	863,131.0 - SF	3.5	CC - Life Safety	Priority 1	2015	3,055,484

Item	Description
D5038 Security and Detection Systems	D5038 Garage Emergency Call Stations
Condition	Poor
Qty / UOM	14 / EA
RUL (years)	0
Location	Parking garage

OBSERVATIONS/COMMENTS:

Emergency call stations with blue warning lights should be installed in the parking garage. The units are typically installed near the elevators, and at the end of the garage, furthest from the elevators. The recommended quantity is based on four alarms on the upper three floors, and two on the first floor.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5038	Replace D5038 Garage Emergency Call Stations	14.0 - EA	21762.0	OP - Security	Priority 1	2015	304,668

Item	Description
D5038 Security and Detection Systems	5038 Garage Emergency Call Stations
Condition	Poor
Qty / UOM	14 / EA
RUL (years)	0
Location	Parking Garage

OBSERVATIONS/COMMENTS:

Emergency call stations with blue warning lights are recommended to be installed in the parking garage. The units are typically installed near the elevators, and at the end of the garage, furthest from elevators. The recommend quantity is based on four alarms on upper three floors, and two on first floor.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5038	Replace 5038 Garage Emergency Call Stations	14.0 - EA	21762.0	IN - Beyond Rated Life	Priority 1	2015	304,668

Item	Description
D5092 Emergency Light & Power Systems	D5092 Diesel Generator 900 kW
Condition	Fair
Qty / UOM	1 / EA
RUL (years)	8
Location	Utility Areas/Closets
Generator Fuel	Diesel
Power Rating kVA	1125
Generator Serves	Fire And Life Safety Systems

OBSERVATIONS/COMMENTS:

The emergency generator located in a ground floor mechanical room is original to the building construction. It has had relatively limited use over the years. Replacement is anticipated within the term.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5092	Add/improve secondary containment for day tank	1.0 - EA	9555.0	EN - Air/ Water Quality	Priority 1	2015	9,555
D5092	Replace D5092 Diesel Generator 900 kW	1.0 - EA	719967.6	IN - Beyond Rated Life	Priority 4	2023	719,968

Item	Description
D5092 Emergency Light & Power Systems	D5092 Transfer Switch
Condition	Fair
Qty / UOM	3 / EA
RUL (years)	8
Location	Utility Areas/Closets

OBSERVATIONS/COMMENTS:

The three transfer switches associated with the facility are reported to be functioning adequately. Replacement of the transfer switches is recommended when the generator is replaced.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
D5092	Replace D5092 Transfer Switch	3.0 - EA	11152.7	IN - Beyond Rated Life	Priority 4	2023	33,458

COST SUMMARY:

Type	Year	Total Expenditures
D50 Electrical Systems	2015	\$6,094,608
D50 Electrical Systems	2018	\$65,700
D50 Electrical Systems	2023	\$753,426

E Equipment & Furnishing Systems

E10 EQUIPMENT

Item	Description
E1025 Audio-visual Equipment	E1025 Audio-visual Equipment
Condition	Poor - Fair
Qty / UOM	1 / EA
RUL (years)	0
Location	Board Room

OBSERVATIONS/COMMENTS:

The audio-visual equipment is reportedly original to the building construction and has exceeded its expected life. Replacement is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
E1025	Replace E1025 Audio-visual Equipment	1.0 - EA	9440.0	IN - Beyond Rated Life	Priority 2	2015	9,440

COST SUMMARY:

Type	Year	Total Expenditures
E10 Equipment	2015	\$9,440

G Building Sitework Systems

G20 SITE IMPROVEMENTS

Site Information	
Item	Description
Main Ingress and Egress	N/A
Access from	NE
Additional Entrances	N/A
Access from	N
Parking Count: Open lot	0
Parking Count: Sheltered by carports	0
Parking Count: Private garages	0
Parking Count: Subterranean garage	N/A
Parking Count: Freestanding parking structure	704
Number of ADA Compliant Spaces	27
Number of ADA Compliant Spaces for Vans	1
Method of obtaining parking count	Point of contact
Property Identification Sign-Primary	Structure mounted
Property Identification Sign- Secondary	Monument Sign
Illuminated Identification Signage	N/A
Building Identification Sign	Yes
Illuminated Sign	No
Location of Property ID Sign	Main entrance drive
Trees Present	Yes
Shrubs Present	Yes
Grasses Present	Yes
Flower beds Present	Yes
Decorative Rocks Present	No
Lava Rocks Present	No
Ponds Present	No
Fountains Present	No
Topography	Flat

Item	Description
G2022 Paving & Surfacing	G2022 Protective Finishes
Condition	Good
Qty / UOM	81420 /
RUL (years)	15
Location	Top level of parking garage

OBSERVATIONS/COMMENTS:

The top level of the parking garage has a waterproof coating installed over the concrete structure.

Item	Description
G2022 Paving & Surfacing	G2020 Clear Seal Concrete Floor
Condition	Fair
Qty / UOM	750 /
RUL (years)	0
Location	Main Mechanical Room and Storage

OBSERVATIONS/COMMENTS:

Concrete floor crack repairs by epoxy injection are recommended at the main mechanical room and storage area.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
G2022	Replace G2020 Clear Seal Concrete Floor	750.0 -	2.5	IN - Appearance	Priority 2	2015	1,897

Item	Description
G2025 Markings & Signage	G2025 Markings & Signage
Condition	Fair - Good
Qty / UOM	704 / EA
RUL (years)	4
Location	Parking garage

OBSERVATIONS/COMMENTS:

Parking lot restriping will be required.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
G2025	Replace G2025 Markings & Signage	704.0 - EA	20.1	OP - Maintenance	Priority 4	2019	14,177

Item	Description
G2031 Paving & Surfacing	G2031 Concrete Pavement
Condition	Fair - Good
Qty / UOM	750 / SF
RUL (years)	15
Location	First Floor

OBSERVATIONS/COMMENTS:

Repair cracks at the perimeter sidewalks.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
G2031	Repair Concrete Pavement	375.0 - SF	28.0	CC - Life Safety	Priority 1	2015	10,488
G2031	Repair Concrete Pavement	375.0 - SF	28.0	CC - Life Safety	Priority 1	2020	10,488

Item	Description
G2031 Paving & Surfacing	G2031 Surfacing & Quarry tiles
Condition	Good
Qty / UOM	8175 / SF
RUL (years)	15
Location	Ground Level

OBSERVATIONS/COMMENTS:

Ceramic tiles are located at the exterior around the building and at the lobby entrance.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
G2031	Repair and seal quarry tiles	2,043.8 - SF	22.7	OP - Maintenance	Priority 3	2018	46,326

Item	Description
G2041 Fences & Gates	G2041 Child Care fencing
Condition	Poor
Qty / UOM	210 / LF
RUL (years)	0
Location	Child Care outdoor area

OBSERVATIONS/COMMENTS:

The wood wall fencing around the Child Care Center requires replacement, due to weathering and distortion. Replacement with a vinyl composite material is recommended.

COST RECOMMENDATIONS:

Type	Component Description	Qty / UOM	Unit Cost (\$)	Plan Type	Priority	Year	Expenditures (\$)
G2041	Replace G2041 Child Care fencing	210.0 - LF	394.6	OP - Maintenance	Priority 2	2015	82,870

COST SUMMARY:

Type	Year	Total Expenditures
G20 Site Improvements	2015	\$95,255
G20 Site Improvements	2018	\$46,326
G20 Site Improvements	2019	\$14,177
G20 Site Improvements	2020	\$10,488

The weather at the time of the assessment was:

Item	Description
Approximate Outdoor Temperature (degrees F)	54
Weather Conditions	Rainy
Snow Covering Ground	No
Wind Conditions	Light Winds

The documentation provided at the time of the assessment is as:

Item	Description
Site Plan Reviewed	Yes
Floor Plan Reviewed	Yes
Construction Drawings Reviewed	Yes
Termite Inspection Report Reviewed	No
Boiler Certificates Reviewed	No
Document Year Built Information Obtained From	Ben Ruedger(OBM1)

APPENDIX C: CERTIFICATION

EMG has completed a FCA of the subject property listed on the cover page. The FCA was performed at the Client's request using methods and procedures consistent with good commercial and customary practice conforming with ASTM E2018-08, Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process. Within this Property Condition Report (PCR), EMG's reference to the Client follows the ASTM guide's definition of User, that is, the party that retains EMG for the preparation of a baseline FCA of the subject property.

This report is exclusively for the use and benefit of the Client identified on the first page of this report. The purpose for which this report shall be used shall be limited to the use as stated in the contract between the client and EMG.

The opinions EMG expresses in this report were formed utilizing the degree of skill and care ordinarily exercised by any prudent architect or engineer in the same community under similar circumstances. EMG assumes no responsibility or liability for the accuracy of information contained within this report that has been obtained from the Client or the Client's representatives, from other interested parties, or from the public domain. The conclusions presented represent EMG's professional judgment based on information obtained during the course of this assignment. EMG's evaluations, analyses, and opinions are not representations regarding the building design, structural soundness, or actual value of the property. Factual information regarding operations, conditions, and test data provided by the Client or the Client's representative has been assumed to be correct and complete. The conclusions presented within this report are based on the data provided, observations made, and conditions that existed specifically on the date of the assessment. EMG certifies that EMG has no undisclosed interest in the subject property, that EMG's relationship with the Client is at arms-length, and that EMG's employment and compensation are not contingent upon the findings or estimated costs to remedy any noted deficiencies due to deferred maintenance and/or any noted component or system replacements.

EMG's FCA cannot wholly eliminate the uncertainty regarding the presence of physical deficiencies and/or the performance of a subject property's building systems. Preparation of a FCA in accordance with ASTM E2018-08 is intended to reduce, but not eliminate, the uncertainty regarding the potential for component or system failure and to reduce the potential that such component or system failure may not be initially observed. This FCA was prepared recognizing the inherent subjective nature of EMG's opinions as to such issues as workmanship, quality of original installation, and estimating the remaining useful life of any given component or system. It should be understood that EMG's suggested remedy may be determined under time constraints or may be formed without the aid of engineering calculations, testing, exploratory probing, the removal of materials, or design. Furthermore, there may be other alternate or more appropriate schemes or methods to remedy the noted physical deficiencies. EMG's opinions are generally formed without detailed knowledge from individuals familiar with the performance of noted components or systems.

Any questions regarding this report should be directed to the Program Manager.

Prepared By: Djahan Nabili, Field Observer

Reviewed By: 
Matt Anderson, Program Manager

APPENDIX D: PHOTOS



:- Front elevation



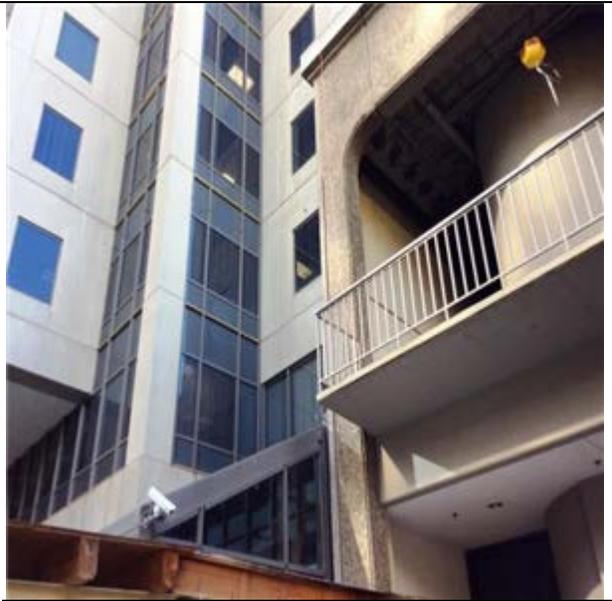
B1012 Seismic bracing of the garage



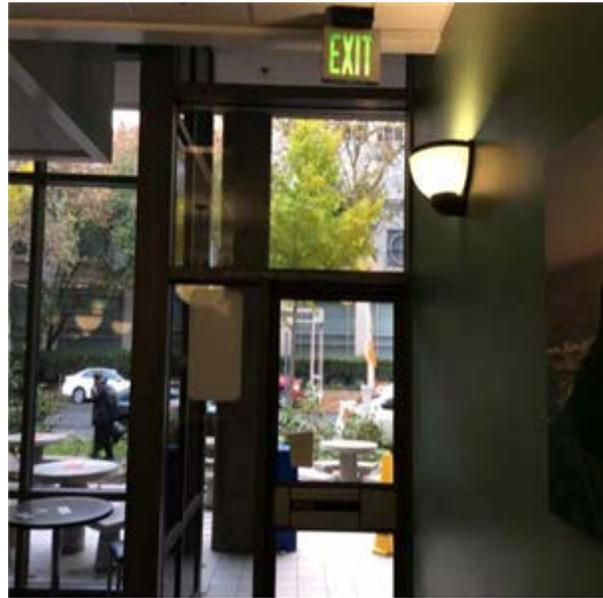
B2011 Exterior Painted Walls



B2021 Spandrel Panels



B2021 Spandrel Panels



B2031 Exterior Glazed Doors :- Interior application



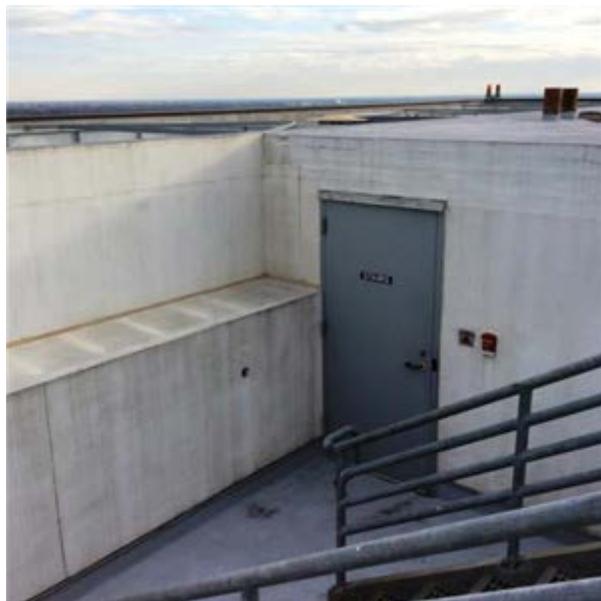
B2031 Exterior Glazed Doors



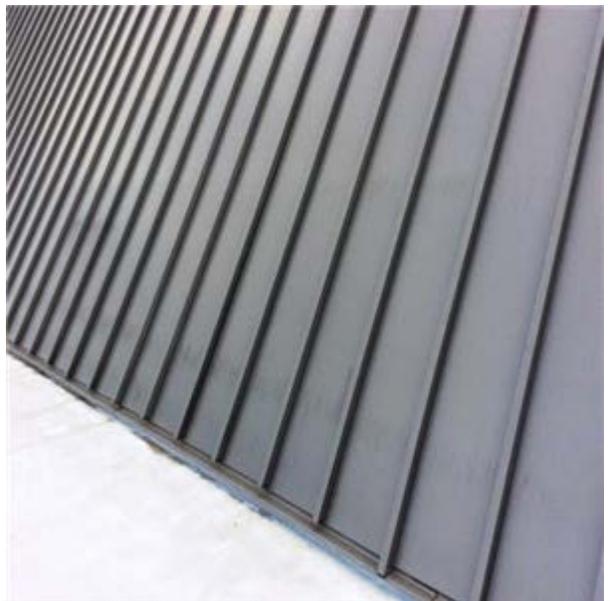
B2031 Main Auminum Doors with Glass Panels :- main door at east side



B2031 Main Auminum Doors with Glass Panels:- North side Entrance



B2032 Solid Exterior Doors



B3011 Standing Seam Metal Roof:- Upper roof level



B3011 PVC Membrane Roofing :- Roof drainage



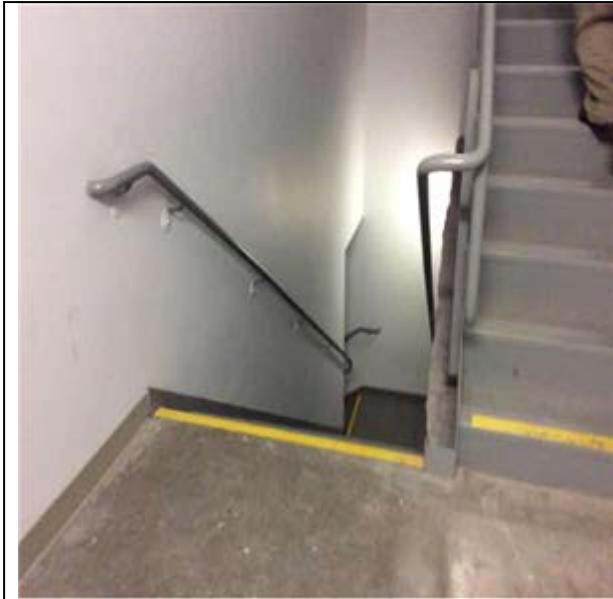
B3011 PVC Membrane Roofing:- Roof parapet



C2011 Fire Exit Stairs



C2011 Fire Exit Stairs



C2011 Fire Exit Stairs



C3005 Restrooms /ADA Renovations



C3005 Restrooms /ADA Renovations



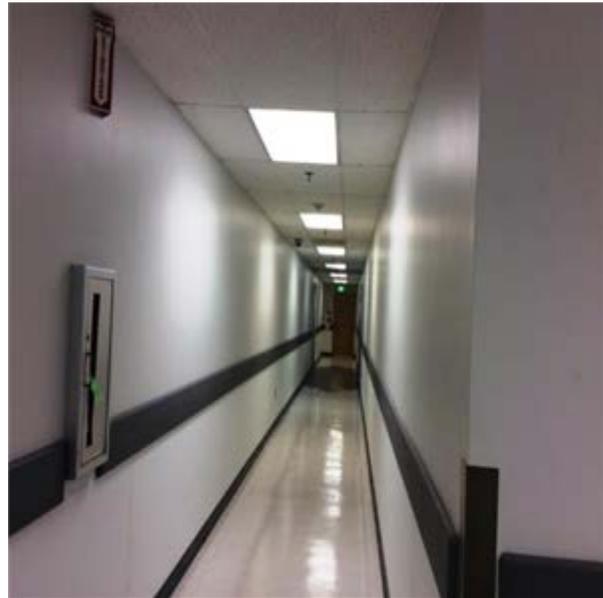
C3005 Restrooms /ADA Renovations



C3005 Restrooms /ADA Renovations



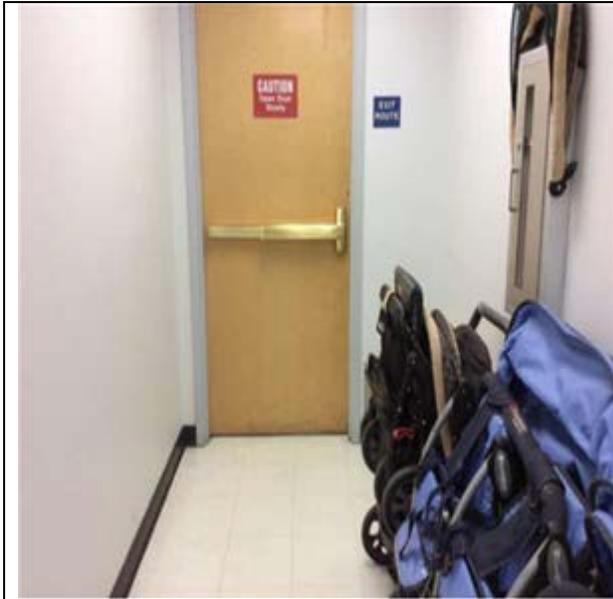
C3005 Restrooms /ADA Renovations



C3012 Paint Interior Walls, Drywall



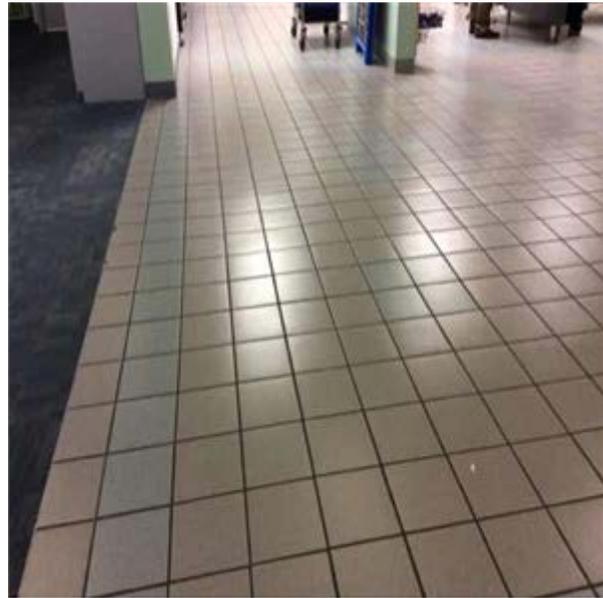
C3012 Marble Tile



C3024 Vinyl Tile Flooring :- Child Care area



C3024 Cafeteria - Ceramic Floor Tile



C3024 Cafeteria - Ceramic Floor Tile



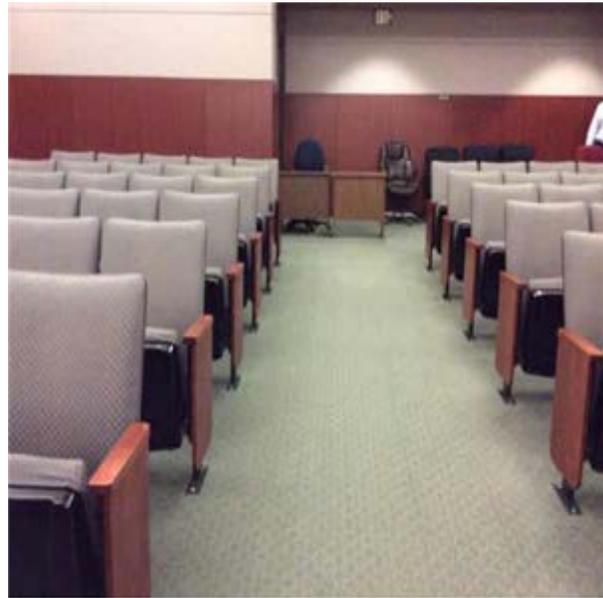
C3025 Carpet Tiles - Standard



C3025 Carpet Tiles - Standard



C3025 Board Room finishes



C3025 Board Room finishes :- Board Room



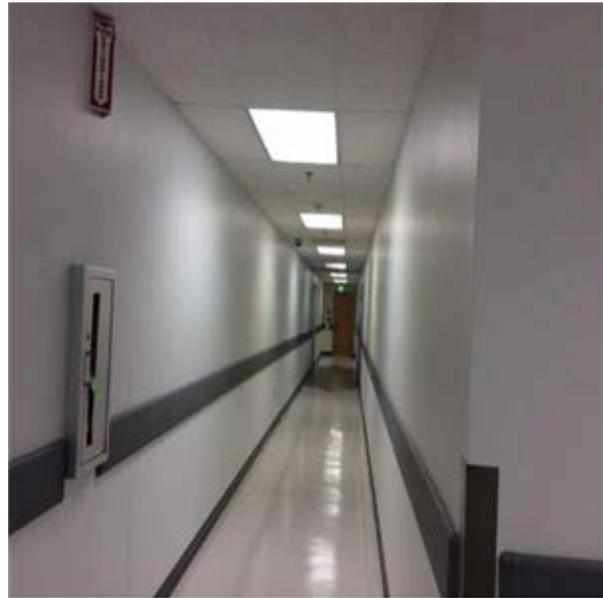
C3025 Lobby Floor:- Lobby



C3032 Lobby ceiling :- main lobby



C3032 Lobby ceiling:- reception



C3032 Acoustical Ceiling Tiles



C3032 Acoustical Ceiling Tiles



D1010 Hydraulic Parking Garage Elevators, 3,000 LB Capacity :- Hydraulic elevator equipment



D2011 Commercial Grade Water Closet, 1.6 GPF:- Toilet



D2012 Urinal :- Urinals



D2013 Counter Top Sink and Faucet:- Countertop sinks and faucets



D2023 Commercial Gas-Fired Domestic Water Heater, 390 MBH :- Water heater for old section of building



D2023 Domestic Water Booster Pump Station:- Domestic water booster pumps



D2023 Water Heater 80-Gallon Commercial :- Electric water heater



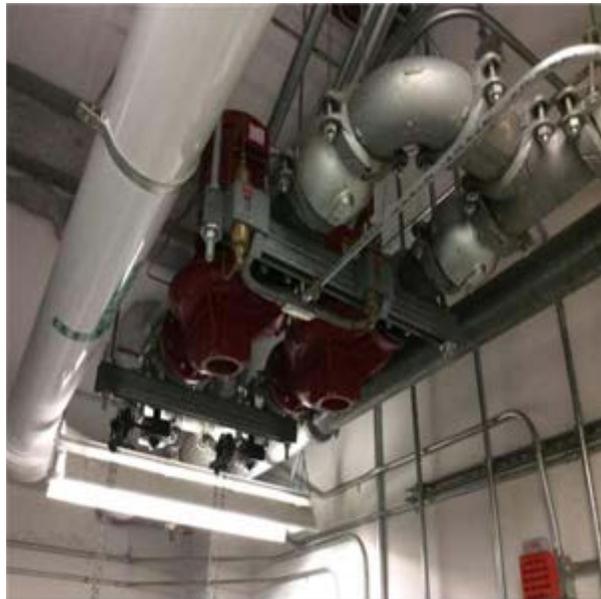
D3021 HVAC Water Boilers, Gas 5500 MBH:- HVAC boilers



D3021 HVAC Water Boiler, Gas 3050 MBH :- HVAC boiler for water source heat pumps



D3022 HVAC Heating Water Pumps 20 HP:- HVAC heating water pumps



D3022 Pony Chiller Water Pumps 10 HP :- Pony chiller chilled and condenser water pumps



D3022 WSHP Condenser Water Pumps 15 HP:- Water source heat pump condenser water pumps



D3022 Condenser Water Pumps 50 HP :- Condenser water pumps



D3022 Chilled Water Pumps 40 HP:- Chilled water pumps



D3031 Water Cooled Chiller, Centrifugal, 700-800 Ton



D3031 Pony Chiller Centrifugal 80 Ton:- Pony chiller



D3031 Fluid Cooler, Galvanized Steel, 288 Tons :- Fluid cooler for water source heat pumps



D3031 Cooling Tower, Galvanized Steel, 680 Ton:- Rooftop cooling towers



D3041 Balance Air Flow at Diffusers :- HVAC diffuser in hallway



D3041 Central Interior Large AHU Stations:- Large supply fan for AHU



D3041 Central Interior Large AHU Stations :- Large fan motor



D3041 Central Interior Large AHU Stations:- Original seismic spring isolator



D3041 VAV Boxes :- Typical hot water re-heat VAV box



D3042 Restroom Exhaust Fans:- Restroom exhaust fan box



D3042 Kitchen Make Up Air Unit 5000 CFM :- Kitchen MUA



D3042 Stair Pressurization Fans, 20 HP:- Stairwell pressurization fan



D3051 Heat Pump Water Source, 10-Ton :- Water source heat pumps, old section of building



D3051 Elevator Cooling Unit ECU-1:- Elevator cooling unit



D3051 Penthouse Heat Pump Water Source, 10-Ton :- Heat pump for penthouse area



D3052 Phone Room A/C Unit, Water Cooled 7-Ton:- Phone room AC unit



D3052 Computer Room A/C Units, Air Cooled 10-Ton :- Computer room AC units



D3063 Variable Frequency Drive, 20 HP Motor:- Older VFD's



D3068 Mixed DDC/Pneumatic HVAC Controls :-
Desktop computer with HVAC controls software



D4011 Fire Sprinkler System:- Main sprinkler riser



D4012 Fire Pump Electric 200 HP Motor :- New fire
pump



D4094 Dry Chemical System (Phone Room):- Halon
tank for phone room



D4094 Dry Chemical System (Server Room & Print Room) :- Halon system for server room



D5012 Breaker Panel 225 Amps, 30 Circuits:- Electrical panels



D5012 Secondary Dry Transformer 75 kVA :- Step-down transformer



D5012 Main Switchgear, Mainframe, 5000 Amps:- Main sections of switchgear



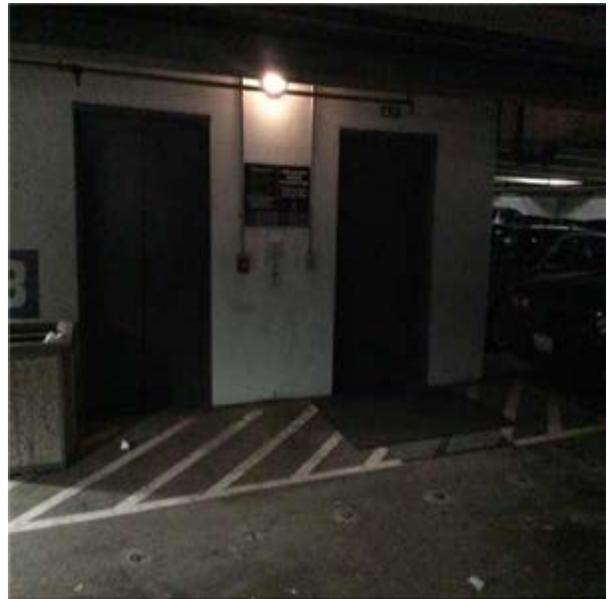
D5012 Switchgear, Mainframe, 600-800 :- Motor control centers and switchboards



D5012 Switchgear, Mainframe, 1600-2000 Amps:- Secondary electrical switchgear



D5022 Inadequate Parking Garage Lighting :- Dark area of parking garage



D5022 Inadequate Parking Garage Lighting:- Dark area at parking garage elevator



D5037 Fire Alarm Panels



D5037 Fire Alarm System, Modernize:- Original fire alarm panels



D5092 Diesel Generator 900 kW :- Emergency generator



D5092 Transfer Switch:- Emergency transfer switch



G2020 Clear Seal Concrete Floor



G2025 Markings & Signage



G2031 Concrete Pavement :- Crack at side walk



G2031 Concrete Pavement



G2031 Surfacing & Quarry tiles :- inside of the main entrance



G2031 Surfacing & Quarry tiles



G2041 Child Care fencing

APPENDIX E: TERMINOLOGY AND ABBREVIATIONS

TERMINOLOGY and ABBREVIATIONS	
Actual Knowledge	Information or observations known first hand by EMG.
ADA	The Americans with Disabilities Act
AHU	Air Handling Unit
Ancillary Structures	Structures that are not the primary improvements of the Property but which may have been constructed to provide support uses.
ASTM	American Society for Testing and Materials
Baseline	A minimum scope level of observation, inquiry, research, documentation review, and cost estimating for conducting a Property Condition Assessment as normally conducted by EMG.
BOMA	Building Owners & Managers Association
Building	Referring to the primary building or buildings on the Property, which are within the scope of the FCA.
Building Codes	A compilation of rules adopted by the municipal, county and/or state governments having jurisdiction over the Property that govern the property's design &/or construction of buildings.
Building Department Records	Information concerning the Property's compliance with applicable Building, Fire and Zoning Codes that is readily available for use by EMG within the time frame required for production of the Property Condition Assessment.
Building Systems	Interacting or interdependent components that comprise a building such as structural, roofing, side wall, plumbing, HVAC, water, sanitary sewer and electrical systems.
BUR	Built Up Roof
CBC	California Building Code
Component	A piece of equipment or element in its entirety that is part of a system.
CFM	Cubic Feet per Minute, usually referring to air flow in a heating or cooling system.
Dangerous or Adverse Conditions	Situations which may pose a threat or possible injury to the Project Manager, or those situations which may require the use of special protective clothing, safety equipment, access equipment, or any precautionary measures.
Deferred Maintenance	Deficiencies that result from postponed maintenance, or repairs that have been put off until a later time and that require repair or replacement to an acceptable condition relative to the age of the system or property.
DHW	Domestic Hot Water
DDC	Direct Digital Controls, for HVAC systems
Dismantle	To take apart; disassemble; tear down any component, device or piece of equipment that is bolted, screwed, secured, or fastened by other means.
DWV	Drainage Waste Ventilation
EPDM	Ethylene propylene diene terpolymer, a single ply roofing material, usually black
EIFS	Exterior Insulation and Finish System
EMS	Energy Management System
Engineering	Analysis or design work requiring extensive formal education, preparation and experience in the use of mathematics, chemistry, physics, and the engineering sciences as provided by a Professional Engineer licensed to practice engineering by any state of the 50 states.
Expected Useful Life (EUL)	The average amount of time in years that a system or component is estimated to function when installed new.

TERMINOLOGY and ABBREVIATIONS	
FEMA	Federal Emergency Management Agency
Fire Department Records	Information generated or acquired by the Fire Department having jurisdiction over the Property, and that is readily available to EMG within the time frame required for production of the FCA.
FIRM	Flood Insurance Rate Maps
FM	Factory Mutual
FRT	Fire Retardant Treated
Guide	A series of options or instructions that do not recommend a specific course of action.
HP	Horse Power, a unit of measure for pumps and motors.
HVAC	Heating, Ventilating & Air Conditioning
IAQ	Indoor Air Quality
Immediate Repairs	Physical deficiencies that require immediate action as a result of: (i) existing or potentially material unsafe conditions, (ii) significant negative conditions impacting tenancy/marketability, (iii) material building code violations, or (iv) poor or deteriorated condition of critical element or system, or (v) a condition that if left “as is”, with an extensive delay in addressing same, has the potential to result in or contribute to critical element or system failure within one (1) year.
Interviews	Interrogatory with those knowledgeable about the Property.
kVA	Kilo Volt Amps, a measurement used for electrical devices where Amps is the plural of Amperage, a measure of electrical force.
kW	One thousand Watts, a measure of electrical output.
Material	Having significant importance or great consequence to the asset’s intended use or physical condition.
MEP	Mechanical, Electrical, and Plumbing
NFPA	National Fire Protection Association
Observations	The results of the Project Manager’s Walk-through Survey.
Observe	The act of conducting a visual, unaided survey of items, systems or conditions that are readily accessible and easily visible on a given day as a result of the Project Manager’s walk-through.
Obvious	That which is plain or evident; a condition that is readily accessible and can be easily seen by the Project Manager as a result of his Walk-through without the removal of materials, moving of chattel, or the aid of any instrument, device, or equipment.
Owner	The entity holding the deed to the Property that is the subject of the FCA.
Physical Deficiency	Patent, conspicuous defects, or significant deferred maintenance of the Property’s material systems, components, or equipment as observed during the Project Manager’s Walk-through Survey. Material systems, components, or equipment that are approaching, have realized, or have exceeded their typical Expected Useful Life (EUL); or, that have exceeded their useful life result of abuse, excessive wear and tear, exposure to the elements, or lack of proper or adequate maintenance. This definition specifically excludes deficiencies that may be remedied with routine maintenance, miscellaneous repairs, normal operating maintenance, and conditions that do not present a material deficiency to the Property.
PVC	Poly Vinyl Chloride

TERMINOLOGY and ABBREVIATIONS	
Practically Reviewable	Information that is practically reviewable means that the information is provided by the source in a manner and form that, upon examination, yields information relevant to the property without the need for extraordinary analysis of irrelevant data.
Practice	A definitive procedure for performing one or more specific operations or functions that does not produce a test result.
Primary Improvements	The site and building improvements that are of fundamental importance with respect to the Property.
Project Manager	The individual Professional Engineer, Contractor, or Registered Architect having a general, well rounded knowledge of all pertinent site and building systems and components that conducts the on site visit and walk-through observation.
Property	The site and building improvements, which are specifically within the scope of the FCA to be prepared in accordance with the agreement between the Client and EMG.
Readily Accessible	Those areas of the Property that are promptly made available for observation by the Project Manager without the removal of materials or chattel, or the aid of any instrument, device, or equipment at the time of the Walk-through Survey.
Reasonably Ascertainable	Information that is publicly available, provided to EMG's offices from either its source or an information research/retrieval concern, practically reviewable, and available at a nominal cost for either retrieval, reproduction or forwarding.
Recreational Facilities	Spas, saunas, steam baths, swimming pools, tennis courts, playground equipment, and other exercise, entertainment, or athletic facilities.
Remaining Useful Life (RUL)	<p>The consultant's professional opinion of the number of years before a system or component will require replacement or reconditioning. The estimate is based upon observation, available maintenance records, and accepted EUL's for similar items or systems.</p> <p>Inclement weather, exposure to the elements, demand on the system, quality of installation, extent of use, and the degree and quality of preventive maintenance exercised are all factors that could impact the RUL of a system or component. As a result, a system or component may have an effective age greater or less than its actual age. The RUL may be greater or less than its Expected Useful Life (EUL) less actual age.</p>
Replacement Costs	Costs to replace the system or component "in kind" based on Invoices or Bid Documents provided by the current owner or the client, construction costs developed by construction resources such as <i>Means</i> and <i>Dodge</i> , EMG's experience with past costs for similar properties, or the current owner's historical incurred costs.
RTU	Rooftop Unit
Shut-Down	Equipment or systems that are not operating at the time of the Project Manager's Walk-through Survey. Equipment or systems may be considered shutdown if it is not in operation as a result of seasonal temperatures.
Significant	Important, material, and/or serious.
Site Visit	The visit to the property by EMG's Project Manager including walk-through visual observations of the Property, interviews of available project personnel and tenants (if appropriate), review of available documents and interviews of available municipal personnel at municipal offices, all in accordance with the agreement for the Property Condition Assessment.

TERMINOLOGY and ABBREVIATIONS	
Specialty Consultants	Practitioners in the fields of engineering, architecture; or, building system mechanics, specialized service personnel or other specialized individuals that have experience in the maintenance and repair of a particular building component, equipment, or system that have acquired detailed, specialized knowledge in the design, assessment, operation, repair, or installation of the particular component, equipment, or system.
Structural Component	A component of the building, which supports non-variable forces or weights (dead loads) and variable forces or weights (live loads).
Suggested Remedy	A preliminary opinion as to a course of action to remedy or repair a physical deficiency. There may be alternate methods that may be more commensurate with the Client's requirements. Further investigation might make other schemes more appropriate or the suggested remedy unworkable. The suggested remedy may be to conduct further research or testing, or to employ Specialty Consultants to gain a better understanding of the cause, extent of a deficiency (whether observed or highly probable), and the appropriate remedy.
Survey	Observations as the result of a walk-through scan or reconnaissance to obtain information by EMG of the Property's readily accessible and easily visible components or systems.
System	A combination of interacting or interdependent components assembled to carry out one or more functions.
Technically Exhaustive	The use of measurements, instruments, testing, calculations, exploratory probing or discover, and/or other means to discover and/or troubleshoot Physical Deficiencies, develop scientific or Engineering findings, conclusions, and recommendations.
Term	Reserve Term: The number of years that Capital Reserves are projected for as specified in the Expenditure Forecast.
TPO	Thermoplastic polyolefin, a white single ply roofing material, usually white
Timely Access	Entry provided to the Project Manager at the time of his site visit.
UST	Underground Storage Tank
Walk-through Survey	The Project Manager's site visit of the Property consisting of his visual reconnaissance and scan of readily accessible and easily visible components and systems. This definition connotes that such a survey should not be considered in depth, and is to be conducted without the aid of special protective clothing, exploratory probing, removal of materials, testing, or the use of special equipment such as ladders, scaffolding, binoculars, moisture meters, air flow meters, or metering/testing equipment or devices of any kind. It is literally the Project Manager's walk of the Property and observations.

APPENDIX F: BUILDING FACT SHEET

BOARD OF EQUALIZATION HEADQUARTERS BUILDING FACT SHEET

450 N Street

Sacramento

Sacramento County

Category 2 - Medium Priority - Further Study Required

BUILDING INFORMATION

- Age: 23 years (completed in 1992)
- Size:*
 - 25-story
 - 868,131 GSF 478,746 NUSF 478,746 Assigned SF
 - 2.5 Acre Parcel
 - 690-space parking structure (4-stories)
 - On-site cafeteria and child care facility
 - Capacity - 2,455 occupants
- Financial: State of California/Public Works Board
 - 2011 Series E Bond, Matures 2021 (\$77.1M balance as of 6/2014)
 - IRR Rate - \$3.18/month per SF, FY 2014-15 (DGS Price Book)
 - \$3.18/month per SF, FY 2015-16 (Proposed DGS Price Book)
- LEED Status: Pursuing LEED-EB Silver Certification
- Tenants: The single-tenant occupying the building is the Board of Equalization.



SPI Structure #: 4404
Real Property #: 10025
BPM #: 028

COMPLETED STUDIES AND SIGNIFICANT FINDINGS

A. 2007 Biomax Environmental (Industrial Hygiene - Air Testing/Mold Remediation)

Thorough air tests and step-by-step procedures for mold remediation were provided, and protocols for remediation jointly developed/agreed upon by DGS and BOE. All DGS remediation activities were completed in accordance with US EPA and recognized industry guidelines.

B. February 2009 LaCroix Davis Building & Environmental Forensics

LaCroix Davis was hired by DGS in 2008 to conduct a complete forensic analysis of the building including review of historical records related to water intrusion and water damage, and elevator inspections for visible mold growth.

C. May 2009 Infrastructure Study

A full Infrastructure Study was completed in 2009, which identified needed repairs for all building systems. Refer to the "Projects" sections for work undertaken as a result of this study.

D. McGinnis Chen & Associates - Spandrel Glass Breakage Analysis

Due to the spontaneous fracture of a single panel of spandrel glass that subsequently fell from its 9th floor frame on January 11, 2012, DGS hired a forensic architect to analyze the cause of this glazing failure. Spandrel glass is an architectural feature of the building's curtain wall and is not window/vision glass. The analysis performed by McGinnis Chen & Associates was inconclusive; a single definitive cause for the fracture could not be determined. The most likely cause was identified as a nickel-sulfide inclusion, an impurity in the original manufacturing of the glass. The consultant could not guarantee that another spontaneous fracture could never occur in the future. Their recommendation is that DGS: 1) apply a safety film to keep hold the glass within the frame until replacement of the panel is performed, if another spontaneous fracture ever occurred, or 2) replace the spandrel panels with new glazing, or an alternate panel material.

E. Interactive Resources - Analysis and Second Opinion of Spandrel Glass Failure

Interactive Resources reviewed the building's history and conducted independent studies and testing to investigate the cause of the spandrel glass fracture. The consultant's report indicates that potential causes include mechanical damage, thermal stress, nickel-sulfide inclusions or wind. The report concluded that none of these potential causes could be confirmed and none appeared to be more likely than the other. Based on the two independent analyses from the forensic architects, DGS is currently analyzing the cost, the respective benefits and timing to implement the alternatives: 1) safety film, or 2) replacement of the spandrel panels. A decision regarding which solution to utilize is anticipated in August 2012 and a proposed funding source has been tentatively identified.

F. Drain Line Corrosion (On-going)

Failure of waste drain line piping discovered in May 2012 and further studies are being conducted. Funding has been transferred to the ARF to accomplish this work.

* Source: Statewide Property Inventory

G. July 2012 Access Compliance Conceptual Budget / Evaluation

In follow up to the 2009 American Disability Act Accessibility compliance Survey, this report provides the Conceptual Cost and Path of Travel Plans. ADA upgrades have been proposed for this building as part of DGS's ten year ADA Compliance Upgrades and Deferred Special Repairs Program.

ADDITIONAL BUILDING ISSUES

The building's curtain wall was repaired between 2006 and 2008 as a result of spandrel panels falling from the upper floors and a water intrusion issue. Testing identified thermal stress, differential stress, and failing gaskets as the sources of the spandrel panel troubles. Problems with the spandrel panel have been on-going since then, requiring further analysis currently underway. A legislative bill has been introduced which would permit BOE to relocate/consolidate operations into a new facility. This would ultimately affect disposition and future plans for the existing BOE building.

CURRENT UTILIZATION PROJECTS

No Projects.

RECENTLY COMPLETED PROJECTS

	Cost
Lighting Retrofit (lamps/ballasts), 2012	\$ 1,800,000
Elevator Modernization (all 14 cars), 2012	\$ 3,600,000
Window Wall Project and Leak Remediation, 2012	\$ 14,350,000
Domestic Water Riser Repairs (floors 1 - 24), 2012	\$ 445,160
Install Energy Management System Controls (remaining 10 floors), 2012	\$ 620,000
Replace Exterior Hinge Doors (6)	

ACTIVE PROJECTS

	Cost
Window Replacement	\$ 2,300,000 (estimated)
Retro-commission Energy Management System	\$ 4,400,000 (estimated)
Drain Line Corrosion and Infrastructure Repair	\$ 14,000,000 (estimated)

PLANNED SPECIAL REPAIRS BY FISCAL YEAR

	Estimated Cost
FY 2014-15, Replace Seismic Spring Isolators for HVAC Air Handlers	\$ 24,000
FY 2014-15, Replace Dock Leveler	TBD
FY 2014-15, First Floor Epoxy Recoat	\$ 45,000
FY 2014-15, Replace 3 Heat Pumps (Mezz.)	\$ 55,000
FY 2014-15 Replace Variable Frequency Drive Controllers (VFD)	\$ 28,000
FY 2014-15, Replace Fire Pump	\$ 35,000
FY 2014-15, Remodel 1st Floor Garage Restrooms ADA	\$ 42,000
FY 2014-15, Switchgear Testing	\$ 20,000
FY 2015-16, Replace 5 Heat Pumps (Mezz.)	\$ 102,500
FY 2015-16, Re-Seal 4 Balcony Decks, 23rd Floor	\$ 32,000
FY 2016-17, Paint Garage Exterior/Railing	\$ 74,000
FY 2016-17, Major Overhaul #1 Chiller and #1 Boiler	TBD
FY 2016-17, Replace Ceiling Tile and T-Bar, 1st Floor Corridor	\$ 110,000
FY 2017-18, Vision Window Seal Inspection	\$ 140,000
FY 2017-18, Major Overhaul #2 Chiller and #2 Boiler	TBD
FY 2018-19, Exterior Windows Acid Wash Cleaning for Scale	\$ 65,000
FY 2018-19, New Tile Install @ Walkway Main Entrance	\$ 80,000

DGS STRATEGY: Multiple infrastructure-related issues exist with this building, and are being resolved through DGS's and BOE's Special Repair program. No capital outlay work is currently planned for this building but may be included in the near future.

APPENDIX G: COST TABLES

Element #	Component Description	Asset	Location	Action	EUL (Yrs)	RUL (Yrs)	Qty.	Unit of Meas.	Unit Cost	Plan Type	Priority ¹	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total - Deferred	Total - Scheduled		
												Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9				
D3041.1	Central Station Ahu 63000 CFM	D3041 Central Interior Large AHU Stations	Mezzanine Mechanical	Replace spring isolators around base of supply fans	15	0	12.00	EA	\$4,960.00	IN - Reliability	Priority 1	\$59,520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$59,520	\$0	
D3041.2	Vav Box , 600 to 1500 CFM	D3041 VAV Boxes	Throughout Facility	Replace D3041 VAV Boxes	30	8	499.00	EA	\$3,460.49	IN - Beyond Rated Life	Priority 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,726,786	\$0	\$0	\$1,726,786	
D3042	Fan, Inflatable Structure, 10HP	D3042 Stair Pressurization Fans, 20 HP	Mezzanine Mechanical	Replace D3042 Stair Pressurization Fans, 20 HP	20	5	2.00	EA	\$36,208.00	IN - Beyond Rated Life	Priority 3	\$0	\$0	\$0	\$0	\$0	\$72,416	\$0	\$0	\$0	\$0	\$0	\$0	\$72,416	
D3042	Exhaust Fan 8500 CFM	D3042 Restroom Exhaust Fans	Mezzanine Mechanical	Replace 20 HP exhaust fan motors	20	0	2.00	EA	\$73,146.00	IN - Beyond Rated Life	Priority 1	\$146,292	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$146,292	\$0	
D3042	Make Up Air Unit 5000 CFM	D3042 Kitchen Make Up Air Unit 5000 CFM	Old Section of Building	Replace D3042 Kitchen Make Up Air Unit 5000 CFM	20	5	1.00	EA	\$40,650.67	IN - Beyond Rated Life	Priority 3	\$0	\$0	\$0	\$0	\$0	\$40,651	\$0	\$0	\$0	\$0	\$0	\$0	\$40,651	
D3051.1	Heat Pump Water Source, 5-Ton	D3051 Elevator Cooling Unit ECU-I	Penthouse Mechanical	Replace D3051 Elevator Cooling Unit ECU-I	25	5	1.00	EA	\$21,737.96	IN - Beyond Rated Life	Priority 3	\$0	\$0	\$0	\$0	\$0	\$21,738	\$0	\$0	\$0	\$0	\$0	\$0	\$21,738	
D3051.1	Heat Pump Water Source, 5-Ton	D3051 Heat Pump Water Source, 10-Ton	Old Section of Building	Replace D3051 Heat Pump Water Source, 10-Ton	25	0	15.00	EA	\$21,737.96	IN - Reliability	Priority 1	\$326,069	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$326,069	\$0
D3052	Computer Room A/C Units, Air Cooled 10-Ton	D3052 Computer Room A/C Units, Air Cooled 10-Ton	Rooftop	Install drycoolers as back-up means for computer room AC	15	0	4.00	EA	\$21,824.00	FN - Mission	Priority 1	\$87,296	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$87,296	\$0
	Computer Room A/C Units, Air Cooled 10-Ton	D3052 Computer Room A/C Units, Air Cooled 10-Ton	Rooftop	Replace D3052 Computer Room A/C Units, Air Cooled 10-Ton	20	5	4.00	EA	\$49,252.80	IN - Beyond Rated Life	Priority 3	\$0	\$0	\$0	\$0	\$0	\$197,011	\$0	\$0	\$0	\$0	\$0	\$0	\$197,011	
D3052	Air Conditioner, Dx Package (Liebert) 5-Ton	D3052 Phone Room A/C Unit, Water Cooled 7-Ton	Server Room	Replace D3052 Phone Room A/C Unit, Water Cooled 7-Ton	20	5	1.00	EA	\$24,761.21	IN - Beyond Rated Life	Priority 3	\$0	\$0	\$0	\$0	\$0	\$24,761	\$0	\$0	\$0	\$0	\$0	\$0	\$24,761	
D3063	Variable Frequency Drive, 20 HP Motor	D3063 Variable Frequency Drive, 20 HP Motor	Mezzanine Mechanical	Replace D3063 Variable Frequency Drive, 20 HP Motor	15	0	5.00	EA	\$19,730.88	IN - Reliability	Priority 1	\$98,654	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$98,654	\$0
D40 FIRE PROTECTION SYSTEMS																									
D4012	D4012 Sprinkler Pumping Equipment	D4012 Fire Pump Electric 200 HP Motor	Utility area	Replace D4012 Fire Pump Electric 200 HP Motor	25	0	1.00	EA	\$199,374.27	CC - Life Safety	Priority 1	\$199,374	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$199,374	\$0
D4094	Dry Chemical System	D4094 Dry Chemical System (Server Room & Print Room)	Server Room	Replace D4094 Dry Chemical System (Server Room & Print Room)	20	5	2.00	EACH	\$65,717.50	CC - Life Safety	Priority 3	\$0	\$0	\$0	\$0	\$0	\$131,435	\$0	\$0	\$0	\$0	\$0	\$0	\$131,435	
D50 ELECTRICAL SYSTEMS																									
D5012	Switchgear, Mainframe, 1600 Amps	D5012 Main Switchgear, Mainframe, 5000 Amps	Main Electrical Room	Inspect and service main electrical equipment	25	3	1.00	LS	\$65,700.00	OP - Maintenance	Priority 3	\$0	\$0	\$0	\$65,700	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$65,700	
D5022	Wall Pack 70 Watt High Pressure Sodium	D5022 Inadequate Parking Garage Lighting	Parking Garage	Add lighting to parking garage	20	0	32.00	EA	\$3,388.13	OP - Security	Priority 1	\$108,420	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$108,420	\$0
D5022	D5022 Lighting Equipment	D5022 Lighting Fixtures	Office areas and corridors	Replace D5022 Lighting Fixtures	20	0	5,639.00	EA	\$401.20	FN - Modernization	Priority 1	\$2,262,367	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,262,367	\$0
D5037	Fire Alarm System, Install New	D5037 Fire Alarm System, Modernize	Throughout Facility	Modernize Fire Alarm System	25	0	863,131.00	SF	\$3.54	CC - Life Safety	Priority 1	\$3,055,484	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,055,484	\$0
D5037	Fire Alarm Panel	D5037 Fire Alarm Panels	Utility Areas/Closets	Replace D5037 Fire Alarm Panels	15	0	3.00	EA	\$16,482.24	CC - Life Safety	Priority 1	\$49,447	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$49,447	\$0
D5038	D5038 Security and Detection Systems	D5038 Garage Emergency Call Stations	Parking Garage	Replace D5038 Garage Emergency Call Stations	20	0	14.00	EA	\$21,762.00	IN - Beyond Rated Life	Priority 1	\$304,668	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$304,668	\$0
D5038	D5038 Security and Detection Systems	D5038 Garage Emergency Call Stations	Parking garage	Replace D5038 Garage Emergency Call Stations	20	0	14.00	EA	\$21,762.00	OP - Security	Priority 1	\$304,668	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$304,668	\$0
D5092	Transfer Switch	D5092 Transfer Switch	Utility Areas/Closets	Replace D5092 Transfer Switch	25	8	3.00	EA	\$11,152.71	IN - Beyond Rated Life	Priority 4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,458	\$0	\$0	\$33,458	
D5092	Diesel Generator 650 to 750 kW	D5092 Diesel Generator 900 kW	Utility Areas/Closets	Add/improve secondary containment for day tank	15	0	1.00	EA	\$9,555.00	EN - Air/ Water Quality	Priority 1	\$9,555	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,555	\$0	
	Diesel Generator 650 to 750 kW	D5092 Diesel Generator 900 kW	Utility Areas/Closets	Replace D5092 Diesel Generator 900 kW	25	8	1.00	EA	\$719,967.63	IN - Beyond Rated Life	Priority 4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$719,968	\$0	\$0	\$719,968	
Services Subtotal												\$10,091,719	\$0	\$121,009	\$65,700	\$0	\$530,709	\$0	\$1,023,707	\$2,938,414	\$0	\$10,091,719	\$4,679,540		

E. EQUIPMENT & FURNISHING																																	
E10 EQUIPMENT																																	
E1025	E1025 Audio-visual Equipment	E1025 Audio-visual Equipment	Board Room	Replace E1025 Audio-visual Equipment	15	0	1.00	EA	\$9,440.00	IN - Beyond Rated Life	Priority 2	\$9,440	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,440	\$0								
Equipment & Furnishing Subtotal												\$9,440	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,440	\$0

F. SPECIAL CONSTRUCTION AND DEMOLITION																																				
Special Construction And Demolition Subtotal												\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

G. BUILDING SITEWORK																																	
G20 SITE IMPROVEMENTS																																	
G2022	G2022 Paving & Surfacing	G2020 Clear Seal Concrete Floor	Main Mechanical Room and Storage	Replace G2020 Clear Seal Concrete Floor	20	0	750.00		\$2.53	IN - Appearance	Priority 2	\$1,897	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,897	\$0								
G2025	G2025 Markings & Signage	G2025 Markings & Signage	Parking garage	Replace G2025 Markings & Signage	6	4	704.00	EA	\$20.14	OP - Maintenance	Priority 4	\$0	\$0	\$0	\$0	\$14,177	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,177								
G2031	Concrete Sidewalk	G2031 Surfacing & Quarry tiles	Ground Level	Repair and seal quarry tiles	8	3	2,043.75	SF	\$22.67	OP - Maintenance	Priority 3	\$0	\$0	\$0	\$46,326	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$46,326								
G2031	Concrete Sidewalk	G2031 Concrete Pavement	First Floor	Repair Concrete Pavement	5	0	375.00	SF	\$27.97	CC - Life Safety	Priority 1	\$10,488	\$0	\$0	\$0	\$0	\$10,488	\$0	\$0	\$0	\$0	\$0	\$0	\$10,488	\$10,488								
G2041	Vinyl Composite Fence , 6' High	G2041 Child Care fencing	Child Care outdoor area	Replace G2041 Child Care fencing	20	0	210.00	LF	\$394.62	OP - Maintenance	Priority 2	\$82,870	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,870	\$0								
Building Sitework Subtotal												\$95,255	\$0	\$0	\$46,326	\$14,177	\$10,488	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$95,255	\$70,991

Z. GENERAL																																				
General Subtotal												\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Expenditure Totals per Year	\$24,141,982	\$0	\$121,009	\$223,482	\$18,814	\$541,197	\$5,796,336	\$1,186,505	\$2,946,092	\$73,443	\$24,141,982	\$10,920,878
Total Cost (Inflated @ 3% per Yr.)	\$24,141,982	\$0	\$133,412	\$258,708	\$22,868	\$690,720	\$7,767,645	\$1,469,532	\$4,373,404	\$113,934	Total ¹	\$35,062,840

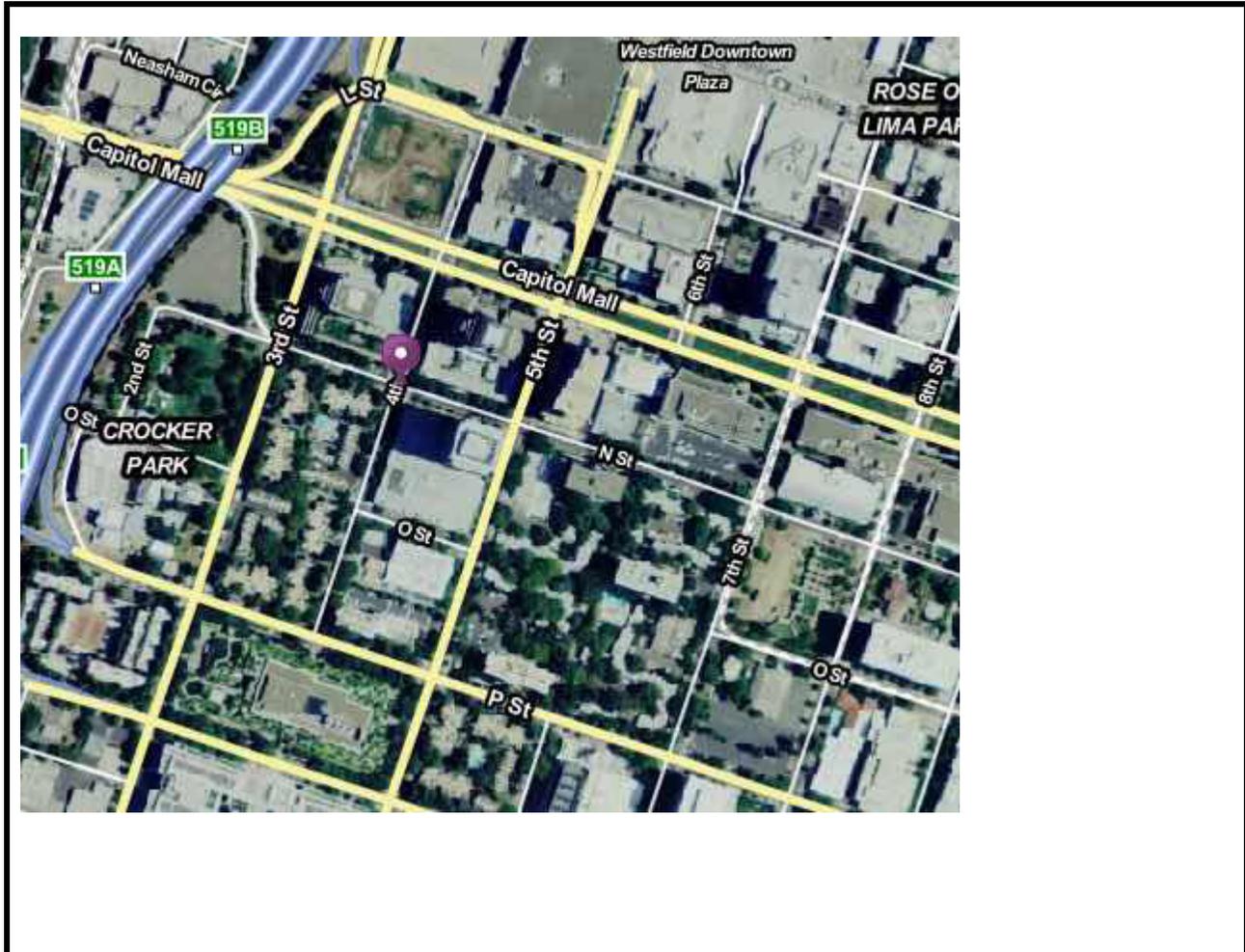
** - Present Value Currency

Footnotes

- Detailed descriptions for Useful Life and Plan Type can be found in the Appendices of the Facility Condition
- Detailed Descriptions of the Priorities can be found in the Appendices of the Facility Condition Assessment

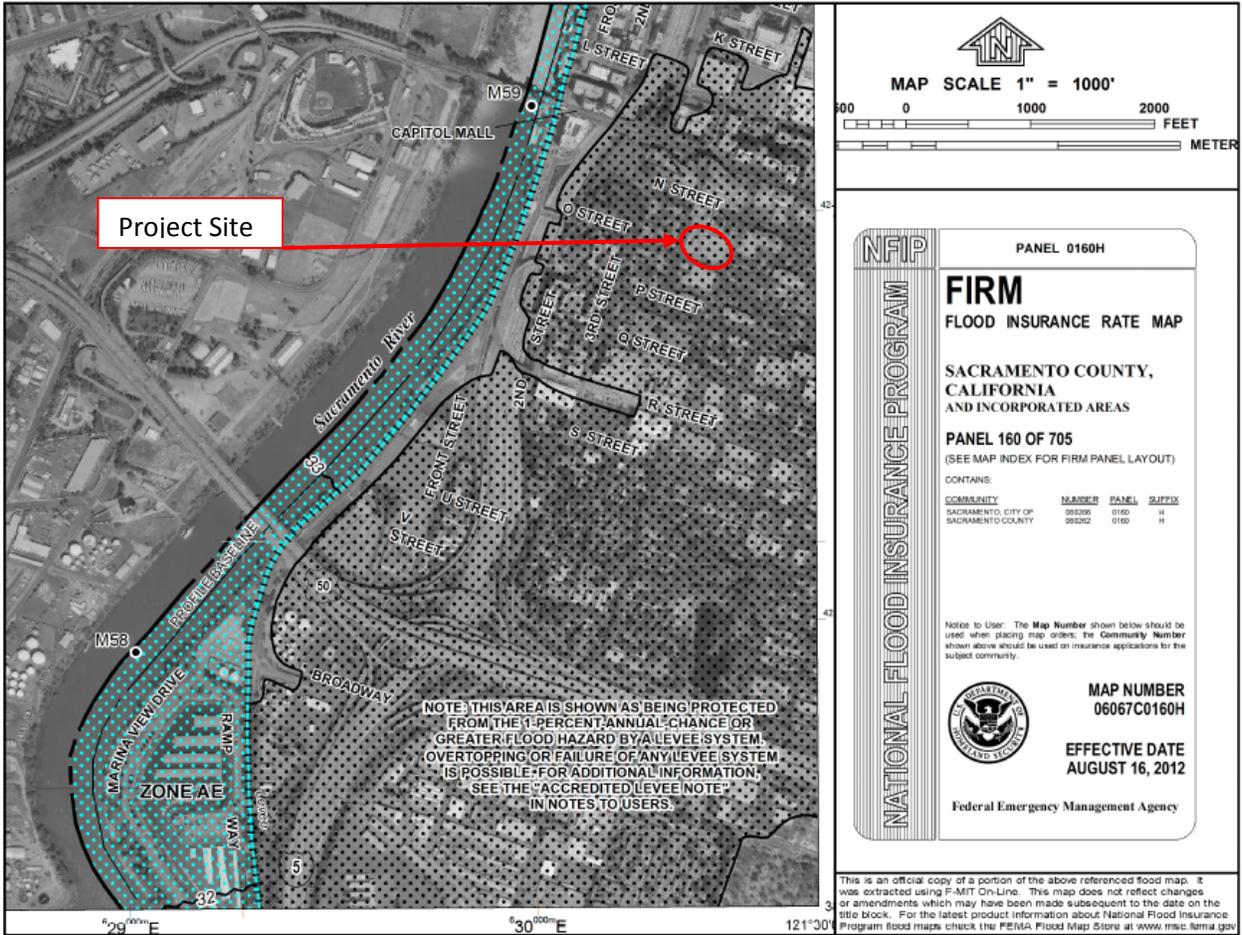
Current Repl.Value \$414,409,560

APPENDIX H: SUPPORTING DOCUMENTATION



	<p>Source:</p> <p>The north arrow indicator is an approximation of 0° North.</p>	<p>Project Number:</p> <p>111326.14R.005.305</p> <p>Project Name:</p> <p>Board of Equalization Headquarters Building</p>
		<p>On-Site Date:</p> <p>December 1 & 2, 2014</p>

Flood Map



	SOURCE: FEMA	Project Number: 111326.14R-005.305
	 <p>Not drawn to scale. The north arrow indicator is an approximation of 0° North.</p>	Project Name: Board of Equalization Headquarters Building
		On-Site Date: December 1, 2014

Estimate of Structures Cost Using Marshall Cost Systems			
Site Calculation			
Estimate of Unusual Land Improvements Cost (Estimators Data Cost Base):			
Description	Cost	Estimated \$/ SF	Unusual Land Total
			\$0
Total			\$0
Estimate of Unusual Land Improvements Cost (Estimators Cost Data Base):			
Estimate of Structure Cost :			
Building Type	Cost per SF	Number of SF	Building TypeTotal
Parking Garage	\$79.69	223,838	\$17,837,206
High-rise office	\$490.68	639,293	\$313,690,442
	\$0.00	0	\$0
	\$0.00	0	\$0
	\$0.00	0	\$0
Total		863,131	\$331,527,648
Estimate of Adjustments for Fees:			
Description	% increase		
Soft costs	25.00%		
	0.00%		
	0.00%		
Total Fees/ Interest included in Marshall System			25.00%
Total Structure Estimate:			
Description	Unit	Fee Adjust	Adjusted Totals
Parking Garage	\$17,837,206	25.00%	\$22,296,508
High-rise office	\$313,690,442	25.00%	\$392,113,053
	\$0	25.00%	\$0
	\$0	25.00%	\$0
	\$0	25.00%	\$0
Cost Per SF	\$480.12	Total Estimate	\$414,409,560

Expected Useful Life (EUL) Table	
SITE SYSTEM ITEMS	
ROADWAYS/ PARKING/ WALKWAYS	
Asphalt pavement	25
Asphalt seal coat	5
Concrete pavement	50
Curbing, asphalt	25
Curbing, concrete	50
Parking, stall striping	5
Parking, gravel surfaced	15
Security gate- rolling gate	10
Security gate- lift arm	10
Sidewalk, asphalt	25
Sidewalk, brick paver	30
Sidewalk, concrete	50
STORM SEWER, DRAINAGE AND EROSION CONTROL	
Catch basins, inlets, culverts	50
Earthwork, grading and erosion control	50
Storm drain lines	40
LANDSCAPING, TOPOGRAPHY AND FENCING	
Fencing, chain-link (4' height)	40
Fencing, dumpster enclosure (wood)	12
Fencing, Tennis Court (10' height)-Chain link	40
Fencing, wood privacy (6' height)	15
Fencing, wrought iron (4-6' height and decorative)	50
Fencing, concrete masonry unit (CMU)	30
Irrigation System	30
Retaining walls, 80 lb block type	50
Retaining walls, concrete masonry unit (CMU) with brick face	40
Fencing, PVC (6' height)	25
Retaining walls, timber (railroad tie)	25
SITE SYSTEM ITEMS	
GENERAL SITE IMPROVEMENTS	
Lighting (pole mounted)	25
Mail kiosk	10
Pool deck	15
Pool/ spa plaster liner	8
Signage, monument	20
Signage, roadway/ parking	10
Tennis court / basketball court surface (paint markings)	5

GENERAL SITE IMPROVEMENTS	
Tennis court Surface (acrylic emulsion)	10
Tot-lot (playground equipment)	10
SITE SANITARY AND WATER	
Domestic Hot Water (DHW) - supply / return	30
Lift station	50
Sanitary lines	50
Sanitary treatment	40
Water main	40
Water supply lines	50
Water tower	50
SITE MECHANICAL / ELECTRICAL	
Compactors	15
Dumpsters	10
Electrical distribution center	40
Electric main	40
Emergency Generator	25
Gas lines	40
Gas main	40
Heating supply/ return	40
Power distribution	40
Transformer	30
BUILDING ARCHITECTURAL ITEMS	
Wood Decks	20
Storage Sheds	30
Carports	40
Garages	50
Basement Stairs	50
Building mounted exterior lighting	10
Building mounted High Intensity Discharge (HID) lighting	10
Bulkhead	10
Canopy, concrete	50
Canopy, wood / metal	40
Ceilings, open or exterior	30
Chimney	40
Common area doors, interior (solid wood/ metal clad)	30
Common area floors, ceramic / quarry tile, terrazzo	50+
Common area floors, wood (strip or parquet)	30
Common area floors, resilient tile or sheet	15
Common area floors, carpet	8
Common area floors, concrete	50+

BUILDING ARCHITECTURAL ITEMS	
Common area railing	20
Common area ceiling, concrete	50+
Common area ceiling, acoustic tile (drop ceiling),	15
Common area countertop and sink	20
Common area dishwasher	15
Common area disposal	5
Common area kitchen cabinets, wood	15
Common area wall coverings	15
Caps, copings (aluminum/ terra-cotta) - Parapet	25
Exterior common door, aluminum and glass	30
Exterior common door, solid core wood or metal clad	25
Exterior stairs, wood	15
Exterior stairs, metal pan- concrete filled	30
Exterior stairs, concrete	50
Exterior unit door, solid wood/ metal clad	25
EXTERIOR CLADDING	
Aluminum Siding	40
Brick or block	40
Brownstone or stone veneer	40
Exterior Insulation Finishing Systems (EIFS)	20
Glass block	40
Granite block	40
Metal/ glass curtain wall	30
Precast concrete panel (tilt-up)	40
Vinyl siding	25
Wood shingle/ clapboard/ plywood, stucco, composite wood	20
Cement-board siding (Hardi-plank)/ non integral color	45
Fire Escapes	40
Foundations	50+
Roof hatch	30
Roof skylight	30
Insulation, wall	50+
Interior lighting	15
Interior railings	20
Mail facility, interior	20
Parapet wall,	50+
Penthouse	50
Railing, roof	25

INTERIORS	
Public bathroom accessories	7
Public bathroom fixtures	15
Refrigerator, common area	10
BUILDING ARCHITECTURAL ITEMS	
ROOF COVERINGS	
Built-up roof - Ethylene Propylene Diene Monomer (EPDM) / Thermoplastic Polyolefin (TPO)	20
Asphalt shingle (3-tab)	20
Wood shingles (cedar shake)	25
Slate, clay, concrete tile	40
Metal	40
Roof drainage exterior (gutter/ downspout)	10
Roof drainage interior (drain covers)	30
Roof structure	50+
Slab	50+
Service door	25
Soffits (wood/ stucco)	20
Soffits (aluminum or vinyl)	25
Stair structures	50+
Storm/ screen doors	7
Storm/ screen windows	10
Waterproofing (foundations)	50+
Windows (frames and glazing), vinyl or aluminum	30
Wood floor frame	50+
BOILER ROOM EQUIPMENT	
Blowdown and Water Treatment	25
Boiler Room Pipe Insulation	Included in boiler
Boiler Room Piping	Included in boiler
Boiler Room Valves	15
Boiler Temperature Controls	Included in boiler
Oil-fired, sectional	22
Gas/ dual fuel, sectional	25
Oil/ gas/ dual fired, low MBH	30
BOILERS	
Oil/ gas/ dual fired, high MBH	40
Gas fired atmospheric	25
Electric	20

BUILDING HEATING WATER TEMPERATURE CONTROLS	
Common area	15
Buzzer/Intercom, central panel	20
Central Unit Exhaust, roof mounted	15
Chilled Water Distribution	50+
Chilling Plant	15
Cooling Tower	25
Combustion Air, Duct with fixed louvers	30
Combustion Air, Motor louver and duct	25
CONDENSATE, FEEDWATER, WATER	
Feedwater only (hydronic)	10
Cooling Tower	25
DHW Circulating Pumps	by size
Tank only, dedicated fuel	10
Exchanger in storage tank	15
Exchanger in boiler	15
External tankless	15
Instantaneous (tankless type)	10
Domestic Hot Water Storage Tanks, Small (up to 150 gallons)	15
Domestic Hot Water Storage Tanks, Large (over 150 gallons)	15
Domestic Cold Water Pumps	15
ELECTRICAL & ELEVATOR	
Electrical Switchgear	50+
Electrical Wiring	30
Elevator, Controller, dispatcher	15
Elevator, Cab	15
Elevator, Machinery	30
Elevator, Shaft-way Doors	20
Elevator, Shaft-way Hoist rails, cables, traveling	25
Elevator, Shaft-way Hydraulic piston and leveling	25
EMERGENCY ALARM AND FIRE PROTECTION	
Call station	10
Emergency Generator	25
Emergency Lights	8
Evaporative Cooler	15
Fire Extinguisher	10
Fire Pumps	20
Fire Suppression	50+
Flue Exhaust	w/boiler
Free Standing Chimney	50+
Fuel Oil Storage	25

EMERGENCY ALARM AND FIRE PROTECTION	
Fuel Transfer System	25
Gas Distribution	50+
Heat Sensors	15
Heat Exchanger	35
Heating Risers and Distribution	50+
MECHANICAL – ELECTRIC – PLUMBING ITEMS	
Heating Water Circulating Pumps	by size
Heating Water Controller	15
Hot and Cold Water Distribution	50
HVAC	
Pad/ roof condenser	20
A/C window unit or through wall	10
Fan coil unit, electric	20
Fan coil unit, hydronic	30
Furnace (electric heat with A/C)	20
Furnace (electric heat with A/C)	20
Furnace (gas heat with A/C)	20
Packaged terminal air conditioner (PTAC)	15
Packaged HVAC (roof top units)	20
Heat pump condensing component	20
Heater, electric baseboard	25
Heater, wall mounted electric or gas	20
Hydronic heat/ electric A/C	20
Line Dryers	15
Master TV System	10
Motorized Valves	12
Outdoor Temperature Sensor	10
Pneumatic lines and Controls	30
POWER VENTILATOR	
Purchased Steam Supply Station	50+
Sanitary Waste and Vent System	50+
Sewage Ejectors	50
Smoke and Fire Detection System, central panel	15
Solar Hot Water	20
SUMP PUMP	
Commercial Sump Pump	15
Water Softening and Filtration	15
Water Tower	50+

PLAN TYPE DEFINITION

Within the report text a Plan Type is assigned to the various cost categories. The following is a brief description of the Plan Types that may be used in the report.

Code Compliance (CC)

- **Accessibility:** Conditions that are not in conformance with the American Disabilities Act Accessibility Guidelines
- **Building Code:** Conditions that are not in conformance with the Building codes
- **Life Safety:** Conditions that are not in conformance with the NFPA 101 Life Safety Code

Operations (OP)

- **Energy:** Conditions that adversely affect energy use or will decrease water or energy usage
- **Maintenance:** Components or systems that can usually be accomplished by the current maintenance staff
- **Security:** Conditions that compromise the protection of the asset or its occupants

Environmental (EN)

- **Air/ Water Quality:** Conditions that affect air or water quality
- **Asbestos:** Reported or suspected asbestos-containing material(ACM)
- **Lead:** Reported lead based paint
- **PCB:** Reported PCB containing equipment

Functionality (FN)

- **Mission:** Components which do not meet the mission of the organization
- **Modernization:** Conditions that need to be upgraded in appearance or function
- **Plant Adaptation:** Components or systems that must change to fit a new or adapted use
- **Obsolescence:** Components or systems that are or are becoming obsolete
- **Capacity:** Components or system which cannot meet demand load

Integrity (IN)

- **Appearance:** Problems with the material or system appearance that are not functional in nature
- **Reliability:** Components or systems which cannot be depended on to function as designed
- **Beyond Rated Life:** A component or system that has exceeded its rated life

APPENDIX I: PRE-SURVEY QUESTIONNAIRE

Property Condition Assessment: Pre-Survey Questionnaire

This questionnaire should be completed by someone knowledgeable about the subject property. The completed form should be presented to EMG's Field Observer on the day of the site visit. If the form is not completed, EMG's Project Manager will require additional time during the on-site visit with such a knowledgeable person in order to complete the questionnaire. During the site visit, EMG's Field Observer may ask for details associated with selected questions. This questionnaire will be utilized as an exhibit in EMG's final Property Condition Report.

Name of person completing questionnaire: Verne Gore

Building name: Board of Equalization Headquarters Building (028)

What is your association with this property? OBM III

What is the length of your association with this property? 2 years 6 months

Phone number: 916-446-9505

Please provide information about inspections relating to the following items

Inspections	Date Last Inspected	List Name & Contact for Maintenance Contractor, if any.
1. Elevators	12/2014	TK
2. HVAC, Mechanical, Electric, Plumbing	1/2/15	BPM Staff
3. Life-Safety/Fire	8/1/2014	Simplex Grinnell
4. Roofs	12/1/2014	Interactive Resources

5. List any major capital improvements within the last three years.

Replacement of the Fire Pump, Requires two and we only have one

6. Are there any other major capital expenditures planned in the near term?

None

7. What is the age of the roof(s)?

25 years

8. What building systems (HVAC, roof, interior/exterior finishes, paving etc.) are the responsibilities of contractors to repair or replace?

Elevators Only

Mark the column corresponding to the appropriate response. Please provide additional details in the Comments column, or backup documentation for any Yes responses. Note: N/A indicates "Not Applicable", Unk indicates "Unknown"

Question	Y	N	N/A	Unk	Comments
9. Are there any unresolved building, or fire code issues?	x				Yes Windows, Roof, Waste line, Intertitial space mold issues
10. Are there any "down" or unusable units?		x			
11. Are there any problems with erosion, storm-water drainage or areas of paving that do not drain?				x	

Question	Y	N	N/A	Unk	Comments
12. Is the property served by a private water well?		x			
13. Is the property served by a private septic system or other waste treatment systems?		x			
14. Are there any problems with foundations or structures?				x	
15. Is there any water infiltration in basements or crawl spaces?				x	
16. Are there any wall, or window leaks?	x				Window curtain wall Issues for many years
17. Are there any roof leaks?	x				Penthouse area
18. Is the roofing covered by a warranty or bond?		x			
19. Are there any poorly insulated areas?				x	
20. Is Fire Retardant Treated (FRT) plywood used?		x			
21. Is exterior insulation and finish system (EIFS) or a synthetic stucco finish used?		x			
22. Are there any problems with the utilities, such as inadequate capacities?				x	
23. Are there any problems with the landscape irrigation systems?		x			
24. Has a termite/wood boring insect inspection been performed within the last year?		x			
25. Do any of the HVAC systems use R-11, 12, or 22 refrigerants?				x	
26. Has any part of the property ever contained visible suspect mold growth?				x	Multiple areas undert containment or encapsulated
27. Is there a mold Operations and Maintenance Plan?				x	
28. Have there been indoor air quality or mold related complaints from tenants?				x	Lawsuit been filed

Question	Y	N	N/A	Unk	Comments
29. Is polybutylene piping used?				x	
30. Are there any plumbing leaks or water pressure problems?	x				Wae water line failing
31. Are there any leaks or pressure problems with natural gas service?				x	
32. Does any part of the electrical system use aluminum wiring?				x	
33. Are there transformers inside the building?		x			
34. Do any Commercial units have less than 200-Amp service?				x	
35. Are there any recalled fire sprinkler heads (Star, GEM, Central, Omega)?				x	
36. Is there any pending litigation concerning the property?	x				Mold issue regarding tenant health
37. Has the State previously completed an ADA or 'Title 24 review?		x			
38. Have any ADA or Title 24 improvements been made to the property?				x	
39. Does a Barrier Removal Plan exist for the property?				x	
40. Has the Barrier Removal Plan been approved by a credentialed third party?				x	
41. Have there been any ADA or Title 24 related complaints?				x	
42. Have there been any complaints about the elevators or wait times?	x				
43. Are there any problems with exterior lighting?		x			
44. Are there any other significant issues/hazards with the property?		x			
45. Are there any unresolved construction defects at the property?				x	

APPENDIX J: ELEVATOR REPORT



Board of Equalization
450 "N" Street
Sacramento, CA

Due Diligence
Elevator Report

December 14, 2014

Prepared for:

Ms. Karla Rodriquez
EMG Corporation
Hunt Valley, MD 21212

Prepared by:

Mr. James Young
Project Manager
Architectural Elevator Consulting, LLC
1326 5th Ave., Suite 630
Seattle, WA 98101

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Section I: Executive Summary

A. Introduction

On December 1, 2014 James Young of Architectural Elevator Consulting, LLC (AEC) surveyed all the vertical transportation systems at the Board of Equalization (BOE) Building, 450 “N” Street, Sacramento, CA. There are ten (10) traction and three (3) hydraulic elevators. The traction elevators provide vertical transportation to the office floors on levels 1-24 while the garage elevators provide service to the attached four story parking garage. The purpose of the survey was to review the major components, to identify upgrades needed over the next ten years and check for compliance with various codes. In addition to reviewing the major components of the elevators we checked the performance parameters of the equipment and tested safety devices such as door restrictors, electric edges and emergency phones.

All the traction elevators were manufactured and installed by Dover Elevator Company during the original building construction in 1992. Two of the parking garage elevators were also installed during that time, but one of the parking garage elevators is slightly older and was installed a few years prior to the main building construction. The traction elevators have the original Dover machines but were recently modernized with new non-proprietary Swift controllers, TKE door operators and all new signal fixtures. The garage elevators have new TKE power units, Swift controllers, TKE door operators, and upgraded door equipment. The power units are equipped with IMO pumps and TKE I-2 valves which are known to be good quality.

During our survey we noted that the elevators were being well maintained by ThyssenKrupp Elevator Company with a few areas that need work. Housekeeping in the machine rooms and car tops needs to be improved. Car and door performance is below average and should be improved. The performance needs to be adjusted to achieve the designed times and speeds.

B. Elevator Layout

The office building has a high and low rise bank of elevators and one dedicated service car that serves all the landings and some mechanical floors. Low-rise elevators, Cars 1-4 provide service from floors 1-11, while the high-rise elevators, Cars 5-9 provide service from the 1st floor to 11, 14 to 24. The service elevator, Car 10, provides service to all floors. All three garage elevators provide service to the three levels of above ground parking. All the passenger elevators have fast and efficient center opening doors. All nine passenger traction elevators are rated for 3,500 lbs capacity while the parking garage elevators are rated for 3,000 lbs. The number and speed of elevators appear to be inadequate for the building.

Elevator Summary				
Elevator Bank	Elevator Speed	Floors Served	Capacity	Door Type
Low-rise (Cars 1-4)	450 FPM	1-11	3,500 lbs.	Center
High-rise (Cars 5-9)	800 FPM	1, 11, 14-24	3,500 lbs.	Center
Service (Car 10)	350 FPM	1-11, M, 14-24, PH	6,000 lbs.	Side
North Parking (Cars 11-12)	150 FPM	1-4	3,000 lbs.	Center
South Parking (Car 13)	150 FPM	1-4	3,000 lbs.	Center

C. Condition

Most the major components of the elevators were found to be in good condition. All the elevators were fully modernized in the last five years and have solid state controllers that are non-proprietary. No major work is anticipated over the next 5 to 10 years. In **Section II** of this report we provide an in-depth review of each of the major components of the elevators with photographs.

D. Maintenance/Performance

The elevators are currently being maintained by ThyssenKrupp Elevator Company. The level of maintenance was good in most areas, but needed some attention in other areas. Oil is leaking some of the power units and the housekeeping for the machine rooms and pits needs to be improved. The performance was observed to be below the designed times and speeds. This needs to be remedied. In **Appendix C** of this report we provide a summary of the performance times for each elevator followed by a maintenance deficiency list. We recommend this list be provided to the elevator service provider so they can correct these items.

E. Code Review:

There are several codes affecting existing elevators in the State of California. During our survey we reviewed the elevators for compliance to the following codes; Americans with Disabilities Act (ADA)/California T24, and compliance with the National Elevator Code for Existing Elevators, A17.3.

1. **Americans with Disability Act (ADA)/California T24:** In 1990 the federal government enacted ADA to make public spaces more accessible to disabled persons. California has a few specific accessibility requirements in addition to ADA. All of the elevators meet most ADA and California Title 24 requirements. The sizes of the passenger elevators meet ADA for new and existing elevators. All the cars had proper hall lanterns and gongs. **Appendix A** provides a complete listing of the ADA/T24 requirements. The following is a list of which items need to be corrected to meet ADA:
 - a. Garage Cars 11-13: Provide floor passing chimes.
 - b. Car 10 – install raised buttons for T24
2. **Retro Active Codes for Existing Elevators:** We reviewed the elevators for compliance to A17.3 Code, the national safety code for existing elevators. This code requires all elevators, no matter age or installation date, to meet a minimum level of safety. A17.3 is not adopted in California, thus not required by the State, but highly recommended. A complete check list for this retro-active code is included in **Appendix B** of this report. The elevators have been retro-actively upgraded for most of these codes. The following is a list of items missing:
 - a. Install door restrictors on parking garage elevator, Car 13 and repair door restrictor on Car 7 that is inoperative.
3. **Seismic:** The elevators were installed per seismic code adopted at the time in the State of California. All the parking garage elevators have seismic rupture valves and the traction elevators have a seismic switch in the machine room, dual ring and string derailment, and

seismic retainers. Most of the seismic retainers on the traction cars were too small and do not comply with current code. We recommend the correct size retainers be installed. The fishplates on the car and counterweight rails are non-seismic, but do not need to be updated unless meeting the most stringent code is desired.

F. Recommendation:

We recommend all traction cars be outfitted with correctly sized seismic retainers. Floor passing chimes should be added to the parking garage elevators and Car 10 should have raised buttons to meet T24. A door restrictor should be added to Car 13 and the one on Car 7 should be repaired. All the traction elevators should be adjusted for proper operation. The floor-to-floor times are very slow. Because all of the elevators were recently modernized no major capital expenses are needed over the next ten years. The traction elevators were installed under Group II and do not require annual or five year full load tests. We recommend five year full load tests be performed. The hydraulic parking garage elevators are required to have five year full load tests and the tests were current on those elevators.

Section II : Component Review - Traction

A. MACHINE ROOM:

Controllers:

The controllers were manufactured by CEC/Swift and installed locally by TKE when the elevators were modernized. The controllers have energy efficient SCR drives made by Magnetec, the world's leading supplier of SCR drives.



High-rise Machines:

All the high-rise elevators have Dover gearless machines. The machines have D.C. hoist motors and appear to have been refurbished when modernized in the last 4 years. All the machines were found to be in good condition.



Machines:

All the low-rise elevators and the service car have Dover geared machines. The machines have the original D.C. hoist motors. All the machines were found to be in good condition.



B. HOISTWAY:

Hoistway Construction:

The hoistway (elevator shaft) is the main area where the elevators go up and down. The hoistways are mostly built of drywall and some concrete.

Car Guide Rails:

The car rails are in good condition but do not have seismic fish plates. Upgrading the guide rails to current seismic standards is voluntary.



Pits:

The pits for are poured concrete with sump areas and metal grating. The pits were found to be clean and dry.

C. CAR TOP:

Door Operator:

The door operators were made by TKE and are closed loop. The door operation was noted to be fair with room for improvement. All of the traction cars are equipped with door restrictors. The TKE door operators that are installed are known to be reliable and have a long life cycle.



Car Roller/Slide Guides:

On both sides of the elevators and on the top and bottom roller guides keep the elevators riding up and down the steel guide rails. The existing ride quality was noted to be good. These are original Dover equipment but the cars do not have seismic retainer plates that meet current code. The roller guides are of high quality.



D. SIGNAL FIXTURES:

Car Operating Panels:

All the elevators have the newer Car Operating Panels (COP's) installed during the recent elevator modernization. The panels are in good condition meet ADA and T24 and do not need any work at this time. Service Car 10 does not have raised buttons.



Hall Lanterns:

Hall lanterns inform persons waiting in the hall of which direction the elevator is about to travel in next. ADA requires that the hall lanterns illuminate and sound for the waiting passengers. The existing elevators have hall lanterns for each car. The lanterns have the proper gong for up and down.



Hall Call Pushbuttons:

At each floor hall call push buttons are located so that users can call the elevator. The hall call stations have raised operation buttons which meet ADA and California Title 24. These were all noted to be in good condition.



E. CAB INTERIOR:

Wall Finish:

The existing cab interiors are likely original and are in fair condition. The back wall has the code required handrail. The railing heights are in compliance with Title 24 California code.



Ceilings:

The cabs have down light ceilings with incandescent light fixtures. The light fixtures could be updated with energy efficient LED's and/or the entire ceiling could be replaced.

Section IIB : Component Review-Hydraulic

F. MACHINE ROOM:

Controllers:

The controllers were manufactured by Swift/CEC and installed locally by TKE during a recent elevator modernization. No work is anticipated for the next 20 years.



Hydraulic Power Units:

All the elevators have newer TKE I2 valves installed in the original Dover power units. The original tanks, motors and IMO pumps were retained. These are in good condition.



Pits:

The pits were found to be clean and dry. The jack heads and pistons appeared to be in good condition. All the pits had seismic rupture valves.



Vertical Transportation

BOE - 450 N Street

Item No.	Recommendation	Rating	Quantity	Unit	Unit Cost	Immediate Code Items	Immediate - Repair	Years 1-3	Years 4-6	Years 7-10	Totals
1	Install a door restrictor on Car 13 and repair door restrictor on Car 7. All other cars have door restrictors.	1	2	EA	\$3,500.00	\$3,500					\$3,500
2	Adjust door and floor to floor time so the elevators perform better.	2	9	EA	\$500.00	\$4,500					\$4,500
3	Perform Five year full load tests on Cars 1-10. They have not been performed since installed in 1992	1	4	EA	\$3,000.00	\$27,000					\$27,000
4	Install floor passing chimes on garage elevators 11-13	1	3	EA	\$1,200.00	\$3,600					\$3,600
5	Install seismic retainers on Car 13, none exist	1	1	EA	\$800.00	\$1,200					\$1,200
6	Install proper sized seismic retainers on Cars 1-10	1	9	EA	\$800.00	\$7,200					\$7,200
7		4	4	EA							\$0
8		4	4	EA							\$0
9		1	4	EA							\$0
10		1	4	EA							\$0
11											
12											
Subtotal						\$47,000	\$0	\$0	\$0	\$0	\$47,000
		1	\$47,000	Code and Safety							
		2	\$0	Deferred Maintenance & Repair							
		3	\$0	Capital Expenditure							
		4		Modernization / Improvements							
		5	\$47,000	Total							

Rating:

- 1 - Code and Safety
- 2 - Repair and Maintenance
- 3 - Capital Expenditure
- 4 - Modernization / Improvements
- 5 - Other

Appendix A
ADA/California T24 ELEVATOR CHECKLIST

ADA	Item	Complies Yes/No/N/A			
		Cars 1-4	Car 6-9	Car 10	Cars 11-13
	GENERAL				
4.10.1	Elevator must comply with ASME A17.1-1990. Freight elevators are not acceptable unless only elevator provided, and is permitted to carry passengers, both public and employees.	Yes	Yes	Yes	Yes
	AUTOMATIC OPERATION				
4.10.2	Elevators must be Automatic.	Yes	Yes	Yes	Yes
4.10.2	Self-leveling to within 1/2 in.	Yes	Yes	Yes	Yes
	HALL CALL BUTTONS				
4.10.3	Buttons centered at 42 in. above the floor.	Yes	Yes	Yes	Yes
4.10.3	Buttons to illuminate when call is entered and extinguish when answered.	Yes	Yes	Yes	Yes
4.10.3	Buttons to be at least 3/4 in. in the smallest dimension.	Yes	Yes	Yes	Yes
4.10.3	Up button located above down button.	Yes	Yes	Yes	Yes
4.10.3	Buttons raised or flushed. (T24 must be raised)	Yes	Yes	No-Flush	Yes
4.10.3	Objects mounted beneath hall buttons not to project into the lobby more than 4 in.	Yes	Yes	Yes	Yes
	HALL or CAR LANTERNS				
4.10.4	Visible and audible signals at each hoistway entrance to indicate which car is responding to the call.	Yes	Yes	Yes	Yes
4.10.4	Audible signals to sound once for up and twice for "down" or may verbal announcement stating "up" "down."	Yes	Yes	Yes	Yes
4.10.4	Hall directional lantern centered 72 in. above floor.	Yes	Yes	Yes	Yes
4.10.4	Directional lantern visible elements minimum of 2-1/2 in. in the smallest dimension.	Yes	Yes	Yes	Yes
4.10.4	Directional lanterns must be visible from the vicinity of the hall call button.	Yes	Yes	Yes	Yes
4.10.4	In car lanterns, meeting the requirements above are acceptable in lieu of hall directional lanterns.	Yes	Yes	Yes	Yes
	HOISTWAY ENTRANCES				
4.10.5	Raised and Braille floor designations are required on both door jambs. Permanently applied plates are acceptable. (T24 must be to the left)	Yes	Yes	Yes	Yes
4.10.5	Centerline of floor designation characters 60 in. above floor.	Yes	Yes	Yes	Yes
4.30.4	Characters must be 2 in. high, raised 1/32 in. upper sans serif (block letters) or simple serif type.	Yes	Yes	Yes	Yes
4.30.4	Grade II Braille to accompany raised characters.	Yes	Yes	Yes	Yes

Appendix A
ADA/California T24 ELEVATOR CHECKLIST

ADA	Item	Complies Yes/No/N/A			
		Cars 1-4	Car 6-9	Car 10	Cars 11-13
	DOOR PROTECTIVE & REOPENING DEVICES				
4.10.6	Doors must open and close automatically.	Yes	Yes	Yes	Yes
4.10.6	Non-contact door reopening device at 5 in. and 29 in. above the floor.	Yes	Yes	Yes	Yes
4.1.6(3)(c)	If safety edges are provided on existing elevators, the non-contact door reopening devices may be omitted.	Yes	Yes	Yes	Yes
4.10.6	Reopening device to remain operational for at least 20 seconds.	Yes	Yes	Yes	Yes
	DOOR AND SIGNAL TIMING				
4.10.7	Minimum acceptable door open time from notification car is answering a hall call until the car doors begin to close: $T=D/(1.5ft/s)$, where T is the total time in and D is the distance from a point in the lobby or corridor 60 in. directly in front of the farthest button controlling that car to centerline of its hoistway door.	Yes	Yes	Yes	Yes
4.10.7	Minimum acceptable notification time 5.0 seconds.	Yes	Yes	Yes	Yes
	DOOR DELAY FOR CAR CALLS				
4.10.8	Doors to remain open for a minimum of 3.0 seconds in response to car calls.	Yes	Yes	Yes	Yes
	FLOOR PLAN NEW ELEVATOR				
4.10.9	At least 36" wide door. Side Open Door: Cab must be 5'-8" wide x 4'-3" deep Center Open Door: Cab must be 6'-8" wide by 4'-3" deep	Yes	Yes	Yes	Yes
	FLOOR PLAN EXISTING ELEVATOR				
4.1.6	Minimum of 48" x 48"	Yes	Yes	Yes	Yes
4.10.9	Clearance between car platform sill and edge of hoistway landing sill no greater than 1-1/4 in.	Yes	Yes	Yes	Yes
	Handrails Circular Square Dia. ____ Top of Handrail ____ Height Side Back (T24 must be 34")	Yes	Yes	Yes	Yes
	FLOOR SURFACES				
4.10.10	Surfaces to be stable, firm and slip resistant.	Yes	Yes	Yes	Yes
4.5.3	Carpeting if installed must have firm cushion, pad or backing, or no cushion or pad. Carpeting must have level loop, textured loop, level pile texture. Carpeting pile thickness not to exceed 1/2 in. Carpeting must have exposed edges fastened to the floor surface. Exposed edges of carpets must be trimmed.	Yes	Yes	Yes	Yes
	ILLUMINATION LEVELS				
4.10.11	Five foot-candles of illumination to be provided at car controls, platform and at sill.	Yes	Yes	Yes	Yes

Appendix A
ADA/California T24 ELEVATOR CHECKLIST

ADA	Item	Complies Yes/No/N/A			
		Cars 1-4	Car 6-9	Car 10	Cars 11-13
	CAR CONTROLS				
4.10.12	Buttons to be at least 3/4 in. in their smallest dimension.	Yes	Yes	Yes	Yes
4.10.12	Buttons must be flush or raised.	Yes	Yes	Yes	Yes
4.10.12	Buttons must be designated by raised characters and Braille or symbols complying with ASME A17.1 Rule 210.13.	Yes	Yes	Yes	Yes
4.10.12	Characters must be a minimum of 5/8 in. high, upper case sans (block letters) or simple serif type.	Yes	Yes	Yes	Yes
4.10.12	Grade II Braille to accompany raised character of symbol.	Yes	Yes	Yes	Yes
4.10.12	Raised designations must be to the immediate left of the button to which they apply.	Yes	Yes	Yes	Yes
4.10.12	Call button illuminates when call is entered and extinguish when answered.	Yes	Yes	Yes	Yes
4.10.12	Floor buttons must be no higher than 48 in. when located in front return. Buttons must be no higher than 54 in. when a side approach provided.	Yes	Yes	Yes	Yes
4.10.12	Emergency controls, including emergency alarm and emergency stop (if provided) must be grouped at the bottom of the panel and have centerlines no less than 35 in. above the finished floor.	Yes	Yes	Yes	Yes
4.10.12	Controls must be on the front return wall with center-opening doors. They may be on the front return or strike jamb sidewall with side doors.	Yes	Yes	Yes	Yes
	CAR POSITION INDICATORS				
4.10.13	Visual car position indicator must be provided above control panel or over door.	Yes	Yes	Yes	Yes
4.10.13	Car position indicator numerals must be a minimum of 1/2 in. high.	Yes	Yes	Yes	Yes
4.10.13	Audible signal to sound as the car passes or stops at a floor and a corresponding floor designation must illuminate. Audible signal must be at least 20 dB with a frequency no higher than 1,500 Hz.	Yes	Yes	Yes	No - None
4.10.13	A button to activate audible signal only for desired trip may be provided.	N/A	N/A	N/A	N/A
4.10.13	An automatic verbal announcement the floor at which a car stops may be substituted for the audible signal.	N/A	N/A	N/A	N/A
	EMERGENCY COMMUNICATIONS				
4.10.14	If provided, emergency two-way communication systems between the elevator and a point outside the hoistway must comply with ASME A17.1-1990, Rule 211.1.	Yes	Yes	Yes	Yes

Appendix A
ADA/California T24 ELEVATOR CHECKLIST

ADA	Item	Complies Yes/No/N/A			
		Cars 1-4	Car 6-9	Car 10	Cars 11-13
4.10.14	The highest operable part must be a maximum of 48 in. from the car floor.	Yes	Yes	NO-51"	Yes
4.10.14	Emergency communication identification must be provided and located adjacent to the device. Characters must be a minimum of 5/8 in. high raised 1/32 in., upper case serif (block letters) or simple serif type, and accompanied by Grade II Braille.	Yes	Yes	Yes	Yes
4.10.13	If a handset is provided the cord must be at least 29 in. long.	Yes	N/A	N/A	N/A
4.27.4	If located in a closed compartment, the door must be operable with one hand. It must not require tight grasping, pinching or twisting of the wrist. The force required to open the door must not exceed 5 lb/f.	Yes	Yes	Yes	Yes
4.10.13	The system must not require voice communication.	Yes	Yes	Yes	Yes

Appendix “B”

A17.3 Code for Existing Traction/Hydraulic Elevators

A17.3	TRACTION PORTION	Complies Yes/No	Complies Yes/No
		Cars: 1-10	Cars: 11-13
2.1	HOISTWAYS		
2.1.1	Hoistway Construction (Enclosed & Fire rated per local code or ANSI/NFPA No. 101)	Yes	Yes
2.1.2	Windows in Hoistway Enclosures: (If provided are they guarded properly.)	Yes	Yes
2.1.3	Projections in Hoistway (Must be flush and level; Leveling zone +3”/ 60 to 75 deg bevel.)	Yes	Yes
2.1.4	Pipes Conveying Gases, Vapors, or Liquids. (If provided must be properly covered & securely fastened.)	Yes	Yes
2.2	MACHINE ROOMS AND MACHINERY SPACES		
2.2.1	Enclosures – Designated Machine Room (No-non elevator equipment- existing can stay)	Yes	Yes
2.2.2	Access to Machine Rooms and Machinery Spaces (A permanent means to the machine room- locked door)	Yes	Yes
2.2.3	Lighting (Permanent lighting in all machine rooms)	Yes	Yes
2.2.4	Ventilation (Natural or mechanical to avoid overheating)	Yes	Yes
2.2.5	Pipes Conveying Gases, Vapors, or liquids (Existing pipes allowed if guarded to prevent discharge)	Yes	Yes
2.2.6	Protection From Weather	Yes	Yes
2.3	PITS		Yes
2.3.1	Access to Pits (Means of access to all pits. If access door provide closer & keys onsite. Ladders required if over 3’ pit)	Yes	Yes
2.3.2	Drains (Drains connected directly to the sewer are not permitted.)	Yes(may discharge to sewer)	Yes
2.3.3	Stop Switch (A stop switch shall be provided for every pit. Locate near access, color, etc.)	Yes	Yes
2.1.5	Counterweight Guards (Start at 12” go to 84” above pit floor; not needed with comp rope/chain)	Yes	N/A
2.4	CLEARANCES AND RUNBYS		
2.4.1	Horizontal Car Clearances (Not more then 5” for horizontal doors; 7.5” for vertical doors)	Yes	Yes
2.4.2	Bottom Car Clearances (Car shall not strike any equipment when resting on fully compressed buffer.)	Yes	Yes
2.4.3	Bottom Car and Counterweight Runby (Shall not exceed 24” for cars; or 36” for cwt.)	Yes	Yes
2.4.4	Top Car Clearance (Car does not strike any overhead structure)	Yes	Yes
2.4.5	Landing Sill Clearance (At least ½” for side guides; at least ¾” for corner guides. Max cannot exceed 1 ½”.)	Yes	Yes
	PROTECTION OF SPACES BELOW HOISTWAYS		
2.5	Counterweight safeties required	N/A	N/A
2.6	HOISTWAY ENTRANCES		
2.6.1	Doors or Gates Required (Passenger Elevators – full width/height – no hand latches.) (Freight Elevators – at least 6-0” gate)	Yes	Yes
2.6.2	Closing of Hoistway Doors (Door closers required on cars except swinging portion of horizontal door)	Yes	Yes
2.6.3	Hoistway Door Vision Panels (Required on manually operated or self closing doors, location, Size, and type of glass)	Yes	Yes
2.6.4	Door Hangers (Prevent jumping, and stops, 4 times load)	Yes	Yes
2.6.5	Non-Shearing Astragals (For vertical bi-parting doors only)	N/A	N/A
2.6.6	Pull Straps (Must not be more than 6’-6” from floor when open)	N/A	N/A
2.7	HOISTWAY DOOR LOCKING DEVICES, PARKING, DEVICES, AND ACCESS		
2.7.1	Hoistway Door or Gate Locking Devices (Mechanical and electrical interlocks required)	Yes	
2.7.2	Elevator Parking Device (For cars operated from within car only)	N/A	N/A
2.7.3	Access to Hoistway (Hoistway door unlocking devices and access switches)	Yes	Yes
2.7.4	Restricted Opening of Hoistway Doors and/or Car Doors on Passenger Elevators (Cannot open more then 4” outside unlocking zone +-18” max.)	Yes 1-6,8-10 No- car 7	Yes 11-12 No 13
2.7.5	Hoistway Emergency Door Contacts (Positively opened)	Yes	Yes

Appendix “B”

A17.3 Code for Existing Traction/Hydraulic Elevators

A17.3	TRACTION PORTION	Complies Yes/No	Complies Yes/No
		Cars: 1-10	Cars: 11-13
2.8	POWER OPERATION OF DOORS AND GATES		
2.8.1	Kinetic Energy and Force Limitations for Power-operated Horizontal Sliding Doors. (Shall not exceed 7ft/lbs. with re-opening device, without 2.5ft/lbs.; cannot exceed 30 ft/lbs)	Yes	Yes
2.8.2	Reopening Device for Power-Operated Car Doors or Gates (Can be rendered inoperative if less than 2.5ft/lb)	Yes	Yes
	Part III		
3.1	Buffers And Bumpers (Car and counterweight buffers are required)	Yes	Yes
3.2	Counterweights (The weights shall be protected so that they cannot be dislodged. The rod nuts shall be protected)	Yes	N/A
3.3	CAR FRAMES AND PLATFORMS		
3.3.1	Car Platforms (Cover entire area)	Yes	Yes
3.3.2	Platform Guards (Aprons) (Vertical face at least 21” A17.3, 60-75deg, withstand 150#)	Yes	Yes
3.3.3	Hinged Platform Sills (Must have contacts & prevent operation unless within 2”)	N/A	N/A
3.3.4	Floating (Movable) Platforms (Prohibited if car can move when door is not closed)	N/A	N/A
3.3.5	Protection of Platforms Against Fire (Must be covered with sheet metal or fire resistant material)	Yes	Yes
3.4	CAR ENCLOSURES		
3.4.1	Car Enclosures (Passenger – total enclosed; Frt maybe perforated, but not by the cwt.; Car top must withstand 300lbs on any 2sqft.)	Yes	Yes
	Cab Lining Materials (Must have class 1 rating, flame spread of 25 or less.	Yes	Yes
3.4.2	Car Doors and Gates (Must have gate or door and electric contract)	Yes	Yes
3.4.3	Location of Car Doors and Gates (Hor, distance not more than 5 ½”, Swing door 4” max., space and site guard requirements.)	Yes	Yes
3.4.4	Emergency Exits (Cover hinged, single car blind shaft-every 36’, side allowed)	Yes	Yes
3.4.5	Car Illumination (At least two lights, 5ftc; frt=2.5ftc; emerg. .2ftc for 4 hrs.)	Yes	Yes
3.4.6	Protection of Light Bulbs and Tubes (Guarded or coated to prevent breaks)	Yes	Yes
3.5	SAFTIES		
3.5.1	Car Safeties(Every car must have a safety)	Yes	Yes
3.5.2	Counterweight Safeties(If occupied space below)	N/A	N/A
3.5.3	Safeties to Stop Ascending Cars or Counterweights Prohibited (Cannot be provided)	Yes	Yes
3.5.4	Application and Release of Safeties (Can only release if car goes up)	Yes	Yes
3.5.5	Max. Permissible Movement of Gov. Rope to Oper. Safety (For type “B” Safeties-200ft or less 42in.; 201 to 375fpm – 36in.; Over 375 FPM 30in. Cwt. = 42in all speeds.)	Yes	Yes
3.5.6	Rail Lubricants and Lubrication Plate (Plate on cross head stating type of lubricant)	Yes	Yes
3.5.7	Overall Length of Guide Rails (Extended to prevent disengaging)	Yes	Yes
3.6	SPEED GOVERNORS		
3.6.1	Speed Governor Overspeed and Car Safety Mechanism Switches. (A switch shall be provided when speed is over 150FPM. For static control switch shall be for all speeds & both direct.)	Yes	N/A
3.6.2	Governor Ropes (Shall be of iron, steel, monel metal, phosphor bronze, or ss. At least 3/8” in diameter Tiller rope not allowed.)	Yes	N/A
3.7	CAPACITY AND LOADING		
3.7.1	Minimum Rated Load for Passenger Elevators (per table 3.7.1)	Yes	Yes
3.7.2	Use of Partitions for Reducing Inside Net Platform Area (Partitions must be permanent and symmetrical)	N/A	N/A
3.7.3	Min. Rated Load for Freight Elevators (Class A = Not more than ¼ of total cap.; Class B = Motor Veh.; Class C = loading with industrial truck, etc.)	Yes	N/A
3.7.4	Capacity Plates (Every car must have one with rated load; Frt : one piece loads, loading and unloading; ¼” high for pass, 1” for frt.)	Yes	Yes
3.7.5	Signs on Freight Elevators (NOT A PASS ELEV...etc. ½” high letters)	N/A	N/A
3.8	DRIVING MACHINES AND SHEAVES		

Appendix “B”

A17.3 Code for Existing Traction/Hydraulic Elevators

A17.3	TRACTION PORTION	Complies Yes/No	Complies Yes/No
		Cars: 1-10	Cars: 11-13
3.8.1	General Requirements (Must be cast iron or steel, fin. Grooves no set screws)	Yes	Yes
3.8.2	Winding Drum Machines (Must have slack rope switch; Chain, belt, or rope-driven mechanisms shall not be used.)	N/A	N/A
3.8.3	Indirect-Drive Machines(Must be at least 3 belts, safety factor of 10)	N/A	N/A
3.8.4	Brakes (Must be released electrically and have spring or gravity and friction)	Yes	N/A
3.9	TERMINAL STOPPING DEVICES		
3.9.1	Normal and Terminal Stopping Devices (Locate at upper and lower terminals. If in machine room provide broken rope, tape or chain switch)	Yes	Yes
3.9.2	Final Terminal Stopping Devices (Winding drum machines- on machines and in hoistway; Traction – in the hoistway operated by the car.)	Yes	Yes
3.10	OPERATING DEVICES AND CONTROL EQUIP.		
3.10.1	Types of Operating Devices (Rope or rod devices shall not be used.)	Yes	Yes
3.10.2	Car-Switch Operation Elevators (If provided must return to stop position if released by hand)	N/A	N/A
3.10.3	Top-of-Car Operating Devices (Continuous pressure <150PPM; bet. Crosshead/door.	Yes	Yes
3.10.4	Electrical Provisions		
	(a) Slack Rope Switch	N/A	N/A
	(b) Motor-Generator Running Switch	N/A	N/A
	(c) Compensating Rope Sheave Switch	Yes	N/A
	(d) Broken rope, tape or chain	Yes	Yes
	(e) Stop Switch – Top of Car- marked “stop” & “run”	Yes	Yes
	(f) Car-Safety Mechanism Switch	Yes	Yes
	(g) Speed Gov. Overspeed Switch	Yes	N/A
	(h) Final Terminal Stopping Devices	Yes	Yes
	(i) Emergency Terminal Stopping Devices (reduced stroke)	Yes	Yes
	(j) Motor Generator Overspeed Protection	N/A	N/A
	(k) Motor Field Sensing Means (not required w/ static drive)	Yes	N/A
	(m) Buffer Switches for Oil Buffers (type c safety)	N/A	N/A
	(n) Hoistway Door Interlocks or Hoistway Door Contacts	Yes	Yes
	(p) Car Door or Gate Electric Contacts	Yes	Yes
	(q) Normal Terminal Stopping Devices	Yes	Yes
	(r) Car Side Emergency Exit Electric Contact	N/A	N/A
	(s) Electric Contacts for Hinged Car Platform Sills	N/A	N/A
	(t) In-Car Stop Switch (Must be keyed, if provided)	Yes	Yes
	(u) Emergency Stop Switch (Must be provided for freight cars)	Yes	Yes
	(v) Stop Switch in Pit	Yes	Yes
	(w) Buffer Switches for Gas Spring Return Oil Buffers	N/A	N/A
3.10.5	Power Supply Line Disconnecting Means (Provided w/ overcurrent protection, within site, and numbered)	Yes	Yes
3.10.6	Phase Reversal and Failure Protection (Means to prevent starting if out of phase)	Yes	Yes
3.10.7	Devices for Making Hoistway Door Interlocks or Electric Contacts, or Car Door or Gate Electric Contacts Inoperative (These devices are prohibited)	Yes	Yes
3.10.8	Release and Application of Driving Machine Brakes (If ungrounded or if stop switch is pulled shall release brake)	Yes	Yes
3.10.9	Control and Operating Circuit Requirements (The failure of any single magnetically operated switch)	Yes	Yes
3.10.10	Absorption of Regenerated Power (Provide means to absorb energy during overhauling)	Yes	Yes
3.11	EMERGENCY OPERATION AND SIGNALING DEVICES		
3.11.1	Car Emergency Signaling Devices (Audible signal, two-way communication, on emerg. power)	Yes	Yes
3.11.2	Operations of Elevators Under Standby (Emergency) Power (If provided must be able to absorb regenerative power)	Yes	Yes

Appendix “B”

A17.3 Code for Existing Traction/Hydraulic Elevators

A17.3	TRACTION PORTION	Complies Yes/No	Complies Yes/No
		Cars: 1-10	Cars: 11-13
3.11.3	Firefighters’ Service(A17.1-1987 Rules 211.3 through 211.8- appendix C; phase I and II switches shall be the same in each bldg)	Yes	Yes
3.12	SUSPENSION MEANS/CONNECTIONS		
3.12.1	Suspension Means (Must be wire rope made of iron or steel- Elevator ropes only)	Yes	N/A
3.12.2	Rope Data Tag (diameter, rated breaking strength, the grade of material, the month/year, preformed or non, construction classification, name of person or firm, name of rope manufacture, no. of ropes, the date resocketed, height of letters shall be 1/16”.	Yes	N/A
3.12.3	Factor of Safety(f = SxN/W or table 3.12.3)	Yes	N/A
3.12.4	Minimum Number and Diameter of Suspension Ropes (3 for traction; 2 for drum; minimum diameter = 3/8”)	Yes	N/A
3.12.5	Suspension Rope Equalizers (When provided shall be of the individual-compression spring type)	Yes	N/A
3.12.6	Securing of Suspension Wire Ropes to Winding Drums (rope must be secured by clamps or tapered babbitted sockets.)	N/A	N/A
3.12.7	Spare Turns on Winding Drums(Not less then one turn of the rope when car is on buffer)	N/A	N/A
3.12.8	Suspension Rope Fastenings(Spliced eyes by return loop)	Yes	N/A
3.12.9	Auxiliary Rope Fastening Devices	N/A	N/A
A17.3	HYDRAULIC PORTION		
4.1	Hoistway, Hoistway Enclosures, and Related Construction		Yes
4.2	Mechanical Equipment		Yes
4.2.1	Buffers or bumpers. (Shall be provided. Solid ok if 50FPM or less)		Yes
4.2.2	Car Frames and Platforms (conform with section 3.3)		Yes
4.2.3	Car Enclosures (Conform to Section 3.4)		Yes
4.2.4	Capacity and Loading (Conform to Section 3.7)		Yes
4.3	Driving Machines		Yes
4.3.1	Connection to Driving Machine (capable of withstanding, without damage, plunger stop)		Yes
4.3.2	Plunger Stop (If greater then 100FPM provide ETS)		Yes
4.4	Valves, Supply Piping, and Fittings		Yes
4.4.1	Pump Relief Valve (Between pump and check valve, preset to open at 125% of working pressure, sized to allow proper capacity, must be sealed, not required on centrifugal pumps.		Yes
4.4.2	Check Valve (Will hold the elevator with rated load when pump stops.)		Yes
4.4.3	Mechanically Controlled Operating Valves (These types of valves are prohibited.)		Yes
4.4.4	Supply Piping and Fittings (Must be in sound condition and secured in place.)		Yes
4.5	Tanks		
4.5.1	General Requirements (Must be of adequate size and have an indicator.)		Yes
4.5.2	Pressure Tanks (Tanks subject to collapsing shall be provided with vacuum relief valves., pressure gage, inspectors gage, liquid level detector, hand holes, and manholes.)		Yes
4.6	Terminal Stopping Devices(Shall conform to 3.9.1)		Yes
4.7	Operating Devices and Control Equipment		Yes
4.7.1	Operating Devices(Conform to 3.10.1 and 3.10.2)		Yes
4.7.2	Top of Car Operating Devices		Yes

Appendix “B”

A17.3 Code for Existing Traction/Hydraulic Elevators

A17.3	TRACTION PORTION	Complies Yes/No	Complies Yes/No
		Cars: 1-10	Cars: 11-13
	(Conform with 3.10.3, unless travel is less than 15'.)	/	
4.7.3	Anti-Creep Leveling Devices(Maintain car within 3”, special requirements)	/	Yes
4.7.4	Electrical Protective Devices	/	Yes
4.7.5	Power Supply Line Disconnecting Means (Shall conform to 3.10.5)	/	Yes
4.7.6	Devices for Making Hoistway Door Interlocks or Electric Contacts, or Car Door or Gate Electric Contacts Inoperative	/	Yes
4.7.7	Control and Operating Circuit Requirements (Conform to 3.10.7)	/	Yes
4.7.8	Emergency Operation and Signaling Devices (Conform to rule 3.11)	/	Yes
4.8	Additional Requirements for Counterweighted Hydraulic Elevators (Do not require buffers)	/	N/A
4.9	Additional Requirements for Roped Hydraulic Elevators.	/	N/A

Appendix “C”

Performance Review and Maintenance Deficiency List

Performance Review:

In this section we provide the results of randomly reviewing 50% or more of the performance of all elevators.

Part A: Definitions

A stopwatch, tachometer, and spring gauge are utilized to measure the performance of each elevator. Original equipment design, national and local codes and other factors govern these times. The following is an explanation of each item that was reviewed.

- Car Door Dwell Time: When an elevator is responding to a car call, the code requires the elevator doors to stay open a minimum of 3.0 seconds. This is to allow ample time for the passengers to exit.
- Hall Call Dwell Time: When an elevator is responding to a hall call, the code requires the elevator doors to stay open a minimum of 5.0 seconds. This is to allow ample time for the passengers to enter the elevator.
- Floor-To-Floor Time: This measures the time that it takes an elevator to go from one floor to the next floor. Door open and close times are calculated into this time to provide a meaningful measurement. The stopwatch is started when the doors start to close and is stopped when the elevator is level at the next floor with the doors $\frac{3}{4}$ open for center opening doors, and $\frac{1}{2}$ open for side opening doors.
- Door Open Time: The door open time is measured when the doors start to open until they are fully open.
- Door Close Time: The door close time is measured when the doors start to close until they are fully closed.
- Full Speed: Full speed of an elevator is measured in the machine room utilizing a tachometer or in the car using an accelerometer.
- Door Closing Pressure: The force required to prevent the doors from closing. This pressure is measured with a spring gauge.
- Ride Quality: Acceleration, deceleration, side-to-side sway and noise level are evaluated in this section.

On the following page the results of the elevators checked are provided.

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Performance Review and Maintenance Deficiency List

	PERFORMANCE TIMES	Design	Car 1	Car 2	Car 3	Car 4
7.1	Door Open Time	1.6	2.2	1.7	2.6	1.9
7.2	Door Close Time	2.4	3.4	3.1	3.6	2.9
7.3	Floor to Floor Up (7 to 8)	8.7	13.6	13.9	14.0	14.0
9.6	Floor to Floor Down (8 to 7)	8.7	13.8	14.0	13.8	14.0
7.5	Full Speed Up	450 FPM	444	442	445	445
7.6	Full Speed Down	450 FPM	438	437	441	443
7.7	Jerk Rate Up	< 7.0	9.0	8.8	7.7	7.6
7.8	Jerk Rate Down	< 7.0	8.5	6.5	10.0	6.8
7.9	Power Closing of Door (Pressure Gauge)	<30lbs	25lbs	-	28lbs	20lbs
7.10	Interrupted Ray	.5sec	5.1	3.5	3.4	2.8
7.11	Car Dwell Time	3.0	4.9	5.7	5.0	4.8
7.12	Hall Call Dwell Time	5.0	5.2	8.7	5.3	4.8
7.13	Hall/Car Lantern Time	8.0	12.3	15.5	13.6	12.9
7.14	Nudging	20.0	>20 sec	>20 sec	>20 sec	>20 sec
7.15	Test Emergency Phone	Yes	Yes	Yes	Yes	Yes

	Car 1
1.1	Machine room door in not labeled “elevator equipment”
1.2	Controller cabinet is dirty- clean
1.3	Machine room fire extinguisher is expired
1.4	Machine room floor is dusty with carbon dust from motor brushes- clean
1.5	Car top is very dirty
1.6	Floor to floor times are slow and need to be adjusted to meet design times
1.7	Door open and close times are slow –adjust to meet design time
1.8	Adjust car so it has smooth starts and stops.
1.9	Pit is dirty
1.10	No documentation for annual or five years tests
1.11	Annual permit/inspection is overdue
	Car 2
2.1	Machine room door in not labeled “elevator equipment”

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Performance Review and Maintenance Deficiency List

2.2	Controller cabinet is dirty- clean
2.3	Machine room fire extinguisher is expired
2.4	Machine room floor is dusty with carbon dust from motor brushes- clean
2.5	Car top is very dirty
2.6	Floor to floor times are slow and need to be adjusted to meet design times
2.7	Door close time is slow –adjust to meet design time
2.8	Adjust car so it has smooth starts and stops.
2.9	Pit is dirty
2.10	No documentation for annual or five years tests
2.11	Annual permit/inspection is overdue
	Car 3
3.1	Machine room door in not labeled “elevators equipment”
3.2	Controller cabinet is dirty- clean
3.3	Machine room fire extinguisher is expired
3.4	Machine room floor is dusty with carbon dust from motor brushes- clean
3.5	Car top is very dirty
3.6	Floor to floor times are slow and need to be adjusted to meet design times
3.7	Door open and close times are slow –adjust to meet design time
3.8	Adjust car so it has smooth starts and stops.
3.9	Pit is dirty
3.10	No documentation for annual or five years tests
3.11	Annual permit/inspection is overdue
	Car 4
4.1	Machine room door in not labeled “elevators equipment”
4.2	Controller cabinet is dirty- clean
4.3	Machine room fire extinguisher is expired
4.4	Machine room floor is dusty with carbon dust from motor brushes- clean
4.5	Car top is very dirty
4.6	Floor to floor times are slow and need to be adjusted to meet design times
4.7	Door close time is slow –adjust to meet design time
4.8	Adjust car so it has smooth starts and stops.
4.9	Pit is dirty
4.10	No documentation for annual or five years tests
4.11	Annual permit/inspection is overdue

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Performance Review and Maintenance Deficiency List

4.12	Hoist machine gear box is making noise
4.13	Hall dwell time is too short- adjust to 5.0 seconds minimum

	PERFORMANCE TIMES	Design	Car 5	Car 6	Car 7	Car 8	Car 9
7.1	Door Open Time	1.6	2.2	1.8	2.4	2.8	2.3
7.2	Door Close Time	2.4	3.3	4.0	3.8	4.0	3.9
7.3	Floor to Floor Up (7 to 8)	8.0	13.7	14.6	14.8	13.9	16.5
9.6	Floor to Floor Down (8 to 7)	8.0	13.4	14.3	14.8	14.6	16.7
7.5	Full Speed Up	800 FPM	799	803	800	702	803
7.6	Full Speed Down	800 FPM	799	805	800	702	803
7.7	Jerk Rate Up	< 7.0	11.0	8.0	11.6	5.7	8.9
7.8	Jerk Rate Down	< 7.0	8.9	7.2	9.5	13.3	11.5
7.9	Power Closing of Door (Pressure Gauge)	<30lbs	<30 lbs.				
7.10	Interrupted Ray	.5sec	2.8	4.0	3.4	2.6	3.4
7.11	Car Dwell Time	3.0	4.8	5.1	4.8	4.2	5.7
7.12	Hall Call Dwell Time	5.0	6.2	5.4	6.1	5.0	6.7
7.13	Hall/Car Lantern Time	8.0	15.4	13.6	16.4	14.8	15.2
7.14	Nudging	20.0	>20	>20	>20	>20	>20
7.15	Test Emergency Phone	Yes	Yes	Yes	Yes	Yes	Yes

	Car 5
5.1	End bearing on shaft is making a noise.
5.2	Floor to floor times are slow and need to be adjusted to meet design times
5.3	Door open and close times are slow –adjust to meet design time
	Car 6
6.1	Ride quality is poor, car shakes a lot.
6.2	Eliminate roll back. Car will drift down before going up.
6.3	Car top is very dirty and has grease.
	Car 7
7.1	Car top is very dirty.
7.2	Door restrictor is in-operative, just misses bracket.

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Performance Review and Maintenance Deficiency List

	Car 8
8.1	Brushes making a noise on the motor.
8.2	Pit is dirty.
8.3	Car has an abrupt stop preceded by slow leveling time.
8.4	Full contract speed is only 700 FPM should be within 3% of 800 FPM.
	Car 9
9.1	Floor to floor times are extremely slow.

	PERFORMANCE TIMES	Design 10	Car 10	Design 11-13	Car 11	Car 12	Car 13
7.1	Door Open Time	1.7	5.6	1.6	2.9/3.1	3.7/1.9	2.4
7.2	Door Close Time	2.7	4.7	2.4	3.4/3.8	3.8/3.1	3.4
7.3	Floor to Floor Up (7 to 8)	8.7	18.3	8.7	17.9	19.8	19.8
9.6	Floor to Floor Down (8 to 7)	8.7	18.4	8.7	20.3	24.8	20.8
7.5	Full Speed Up	350 FPM	347	150 FPM	156	155	152
7.6	Full Speed Down	350 FPM	348	150 FPM	123	108	130
7.7	Jerk Rate Up	< 7.0	5.7	< 7.0	21.0	21.8	7.7
7.8	Jerk Rate Down	< 7.0	7.6	< 7.0	13.7	12.5	6.4
7.9	Power Closing of Door (Pressure Gauge)	<30lbs	20 lbs	<30lbs	27lbs	25 lbs	22 lbs
7.10	Interrupted Ray	.5sec	6.4	.5sec	5.9	5.0	3.5
7.11	Car Dwell Time	3.0	6.2	3.0	7.4	7.0	5.7
7.12	Hall Call Dwell Time	5.0	11.8	5.0	8.6	7.4	5.7
7.13	Hall/Car Lantern Time	8.0	11.8	8.0	12.8	11.0	21.1
7.14	Nudging	20.0	>30	20.0	>20	>20	>20
7.15	Test Emergency Phone	Yes	DNC	Yes	DNC	DNC	DNC

	Car 10
10.1	Machine has minor oil leaks on housing.

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Performance Review and Maintenance Deficiency List

10.2	Fire extinguisher expired Nov 2013
10.3	Emergency phone operator could not tell car number or location information.
10.4	While mold in pit. Must have been wet.
10.5	Need car top handrails cab is greater than 12”.
	Car 11
11.1	Controller cabinet needs to be cleaned, raceway parts are loose.
11.2	Pump unit has an oil leak between valve and pump.
11.3	Pick up roller is missing at the roof level.
11.4	Car guide rollers are making a noise – adjust or replace.
11.5	Car top is dirty.
11.6	Pit is dirty.
	Car 12
12.1	Hoistway sills are dirty.
12.2	Car top is dirty.
12.3	No rear hoistway door numbers installed inside the shaft.
12.4	No car top handrails.
12.5	Hoistway pick up rollers damaged at 3 rd floor.
12.6	Pit is dirty.
	Car 13
13.1	Oil is leaking under tank and drip pan is full.
13.2	Parts are all over the machine room.
13.3	Compute disc inside controller and parts all over machine room.
13.4	Permit expired on 11/28/14
13.5	Car top is dirty
13.6	No door restrictor.



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