Health Life Safety Survey and Master Facilities Plan

Community Presentation

Board Meeting

March 23, 2015
Agenda

– Facilities
– Building Assessment
– Analysis and Strategies
FACILITIES
Buildings are an Assembly of Systems

– Existing buildings are assessed by separating a building into component systems

– A systems approach is used for budgeting
  • New construction costs
  • Life cycle cost analysis
  • Maintenance and repair costs

– Budget management begins with targeted costs based on systems
Building Systems

– Foundations are the **Substructure System**
– Structure, walls, roof and windows are the **Shell System**
– The arrangement of rooms along with the finishes are the **Interior System**
– HVAC, Fire Protection, Electrical, Plumbing, and **Low Voltage** are all Systems
Useful Life

– Substructure and Shell are slow systems that change very little over the life of a building
– Low Voltage Systems are fast systems that change many times over the life of a building
– Over the life of a building you will replace some systems or sub-systems in their entirety
  • The roof sub-system of a 50-year building may have a 20-year useful life and be replaced twice during that 50-year period
Life Cycle Costs

– Life-cycle cost analysis is a method for assessing the total cost of facility ownership
  • Acquiring
  • Owning, operating and maintaining
  • Disposing of a building or building system
– Understand long-term impact of decisions
– Plan and budget for replacement
Total Costs

– Construction Costs
– Operation Costs
– Maintenance and Repair Costs
– Capital Improvement Cost

“Pay me now or pay me later”
## Construction Costs

<table>
<thead>
<tr>
<th>Systems</th>
<th>Cost /SF</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Substructure</td>
<td>$15.00</td>
<td>6.7%</td>
</tr>
<tr>
<td>2 Shell</td>
<td>$75.00</td>
<td>33.3%</td>
</tr>
<tr>
<td>3 Interiors</td>
<td>$25.00</td>
<td>11.1%</td>
</tr>
<tr>
<td>4.1 Conveying</td>
<td>$1.00</td>
<td>0.4%</td>
</tr>
<tr>
<td>4.2 Plumbing</td>
<td>$10.00</td>
<td>4.4%</td>
</tr>
<tr>
<td>4.3 HVAC including BAS</td>
<td>$30.00</td>
<td>13.3%</td>
</tr>
<tr>
<td>4.4 Fire Protection</td>
<td>$3.00</td>
<td>1.3%</td>
</tr>
<tr>
<td>4.5 Electrical</td>
<td>$24.00</td>
<td>10.7%</td>
</tr>
<tr>
<td>4.6 Low Voltage</td>
<td>$4.00</td>
<td>1.8%</td>
</tr>
<tr>
<td>5 Equipment and Furnishings</td>
<td>$11.00</td>
<td>4.9%</td>
</tr>
<tr>
<td>6 Special Construction / Demolition</td>
<td>$1.00</td>
<td>0.4%</td>
</tr>
<tr>
<td>8 General Conditions / OH &amp; Profit</td>
<td>$26.00</td>
<td>11.6%</td>
</tr>
<tr>
<td><strong>Building Cost/SF</strong></td>
<td><strong>$225.00</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

7 Building Site varies

In addition to building costs and site costs, total project cost includes soft costs and contingencies.
Operations and Maintenance Costs

- Operation Costs
  Reoccurring costs to provide the necessary services to keep the building open and habitable

- Maintenance and Repair Costs
  Expected costs to off-set the normal deterioration of building elements based on age, wear and tear, weather and water
Operations and Maintenance Costs

- Operating costs include energy consumption, changing filters and small repairs
  - If a repair is below $1,000 to $5,000 it is often considered an operating costs
- Operating costs can vary based on several factors:
  - Quality of original materials
  - Efficiency of systems
  - Past procedures
Operations and Maintenance Costs

– Building Maintenance and Repair Costs
  • Studies recommend 2% to 4% annual expenditures for maintenance and repair
  • On a building with a 50-year useful life a minimum of 2% of the cost to replace the building is desired for an annual budget

– In addition to the building, there are site maintenance costs that should be budgeted

– A more sophisticated analysis can be conducted on an individual system basis
Capital Improvement Costs

- Capital Improvements
  Projects to extend the useful life of systems and the building or to make modifications to enhance or expand programs
Building Age and Facility Needs

- Time, use, and the elements take their toll on a building
- What has been done, or has not been done in the past, affects what you need to do

Chance of system failure over time
Building Age and Facility Needs

Typical system deterioration or failures can be expected based on the age of a building or system.
BUILDING ASSESSMENT
Health Life Safety Survey

- Safety Reference Plans
- Building Descriptions
- List of Violations and Recommended Corrections
  - Code citation
  - Budget
- Violations
  - Urgent
  - Required
  - Recommended
Health Life Safety Survey

– Construction Area, Construction Types and Fire Separations

– Code calculated exiting capacity of rooms, corridors, stairs and exits
Applicable Codes

|------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|

<table>
<thead>
<tr>
<th>PART</th>
<th>185</th>
<th>175</th>
<th>180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois School Building Codes</td>
<td>Retroactive Code for Existing Buildings</td>
<td>Model Code</td>
<td>Chapter 7 - Means of Egress</td>
</tr>
<tr>
<td>ISBE Retroactive Codes</td>
<td>1993 BOCA FP and PM Codes + Part 185</td>
<td>Pre-7/1/60 to 7/10/98</td>
<td>1993 BOCA FP and PM Codes + Part 175</td>
</tr>
<tr>
<td>Sprinkler Requirements</td>
<td>Illinois School Sprinkler Law</td>
<td>1996 BOCA FP and PM</td>
<td>2003 IFC and IPMC</td>
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<tr>
<td>Accessibility Standards</td>
<td>1973 Rehabilitation Act of 1973, Section 504</td>
<td></td>
<td>2010 - ADA</td>
</tr>
<tr>
<td>Energy Conservation Code</td>
<td></td>
<td></td>
<td>2004 - IECC</td>
</tr>
</tbody>
</table>
Need for a Building Assessment

- Allows the district to understand the condition and performance of the building and of the individual systems
- Establishes a base line condition
- Allows long-term maintenance and repair budgets to be developed
- Necessary to determine the impact of deferring required maintenance
Building Assessment Process

– Building and District staff interviews
– Facility questionnaire
– Review of drawings, reports and other studies
  • Verify all information at buildings
– Architects and Engineers Building Review
  • All rooms and spaces
  • Readily observable conditions
– Building security review
Building Assessment Process

– Prepare list of possible items and review each item with District

– Work with Nicholas & Associates to prepare budgets
  • Health Life Safety Items
  • Building Assessment Items

– Review all identified items in the context of any educational and program needs
Existing Facility Information

- Original building construction documents
- 2013 Cook County Regional Office of Education Annual Facility Inspection Reports
- 2013 Reta Security Report
- Structural Evaluation of Stages
- Maintenance Plan dated December 12, 2012
- List of completed projects from Maintenance Plan
- Appraisal Information
Systems with Significant Costs over Time

− HVAC System
  • Building Automation Sub-system

− Shell System
  • Roof sub-system
  • Masonry maintenance

− Site Paving
  • Drives
  • Parking

− Low Voltage Systems
## HVAC Systems

<table>
<thead>
<tr>
<th>SCHOOL NAME</th>
<th>SYSTEM DESCRIPTION</th>
<th>MAJOR UPGRADES</th>
<th>YEAR</th>
<th>ANTICIPATED LIFESPAN</th>
<th>USABLE LIFE REMAINING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenter</td>
<td>VRF cassette system</td>
<td>New System</td>
<td>2012</td>
<td>25 years</td>
<td></td>
</tr>
<tr>
<td>Emerson</td>
<td>VAV boxes served by boilers, chillers and AHUs</td>
<td>None; original to the building</td>
<td>1998</td>
<td>20 years</td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td>VAV boxes served by boilers and condensing units</td>
<td>New System</td>
<td>2014</td>
<td>20 years</td>
<td></td>
</tr>
<tr>
<td>Franklin</td>
<td>VAV boxes served by boilers and condensing units</td>
<td>New Boilers and reheat coils, New condensing units</td>
<td>2013 - 2005</td>
<td>20 years - 20 years</td>
<td></td>
</tr>
<tr>
<td>Jefferson</td>
<td>Unit Ventilators served by boilers (assumed)</td>
<td>New steam traps (2014), All other equipment is original</td>
<td>1954 - 1960's</td>
<td>20 years</td>
<td></td>
</tr>
<tr>
<td>Lincoln</td>
<td>Unit Ventilators served by boilers and chillers</td>
<td>New UVs, AHU, Chiller and pumps</td>
<td>2004</td>
<td>20 years</td>
<td></td>
</tr>
<tr>
<td>Roosevelt</td>
<td>Unit Ventilators served by boilers and chillers</td>
<td>New UVs, AHU’s, Chiller, Boilers and pumps</td>
<td>2010</td>
<td>20 years</td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td>Unit Ventilators served by boilers and chillers</td>
<td>New UV's, RTU’s, Chiller, Boilers and pumps</td>
<td>2009</td>
<td>20 years</td>
<td></td>
</tr>
</tbody>
</table>
Maintenance Strategies

Reactive  - Run it till it breaks

Preventative  - Based on time or use, maintenance is performed to extend the life

Predictive  - Measurements to detect onset of systems degradation

Reliability Centered  - Perform required maintenance in a system’s operating context
Deferred Maintenance

– There is a distinction between deferred maintenance and ignored maintenance
– Intentionally deferring needed maintenance after a careful assessment of facilities condition is a strategy
– Ignoring maintenance is a problem

From the work of Faramarz Vakili, Associate Director of the Physical Plant, University of Wisconsin-Madison
Project Prioritization

– **Priority One**
  Violation of the code or a health / safety concern or significant additional costs if item is not addressed

– **Priority Two**
  Necessary to comply with a recommended standard or increase operating efficiency or extend the useful life of the building or a system

– **Priority Three**
  Improve the quality of materials or systems or reduce the risk of future failures or the enhance performance of a system
Continual Improvement

- Each student has best facilities
- Better fiscal management of resources
- Adapt school to changing pedagogy
- Offset normal deterioration by catching facility problems early