



PARK RIDGE-NILES
SCHOOL DISTRICT 64

Health Life Safety Survey and Master Facilities Plan

Community Presentation

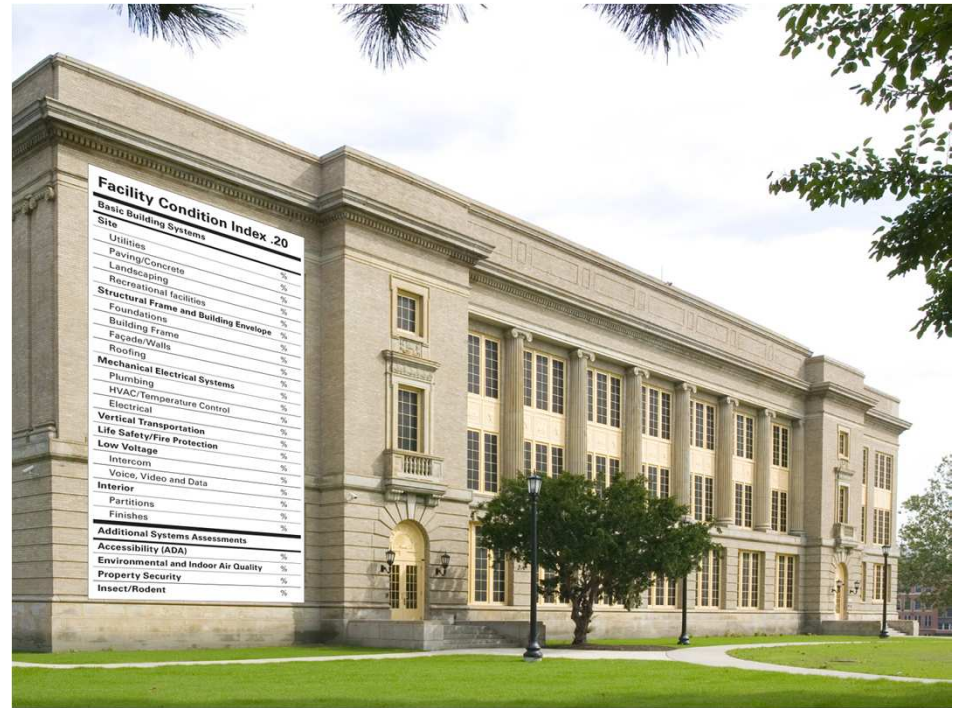
Board Meeting

March 23, 2015

FGM ARCHITECTS

Agenda

- Facilities
- Building Assessment
- Analysis and Strategies





PARK RIDGE-NILES
SCHOOL DISTRICT 64

FACILITIES



PARK RIDGE NILES
SCHOOL DISTRICT 64

Facility Condition - March 23, 2015

FGM ARCHITECTS

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



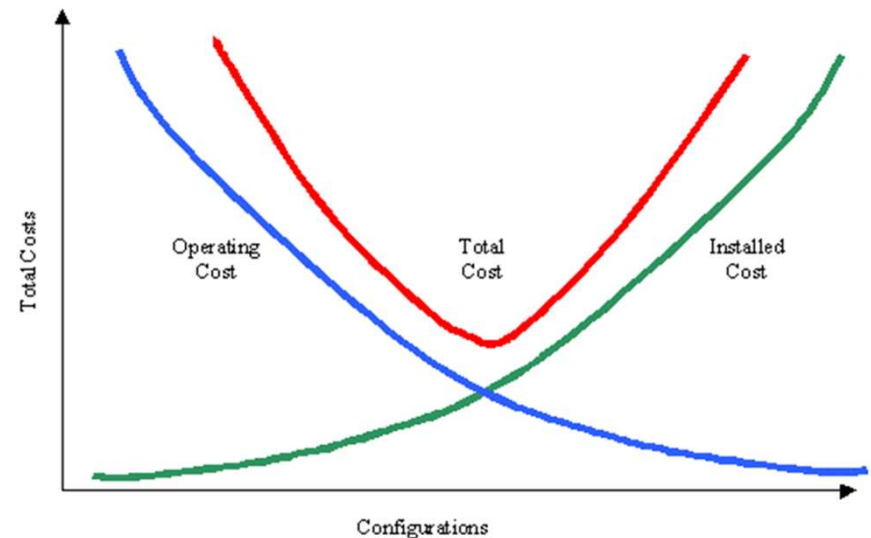
Useful Life

- 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

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

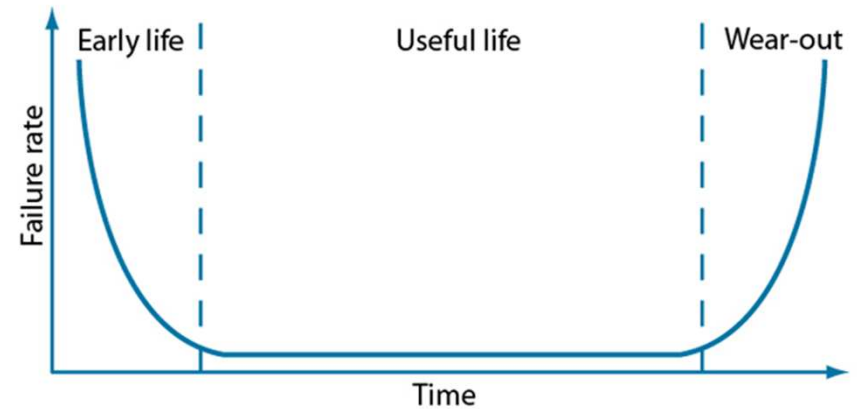
- **Capital Improvements**

Projects to extend the useful life of systems and the building or to make modifications to enhance or expand programs

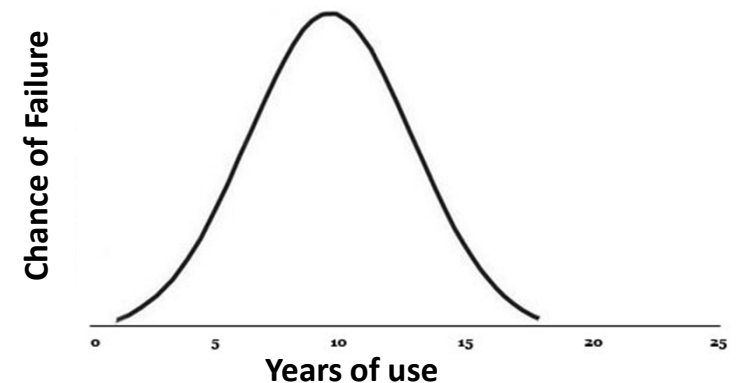


Building Age and Facility Needs

- 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



Useful life and system failure

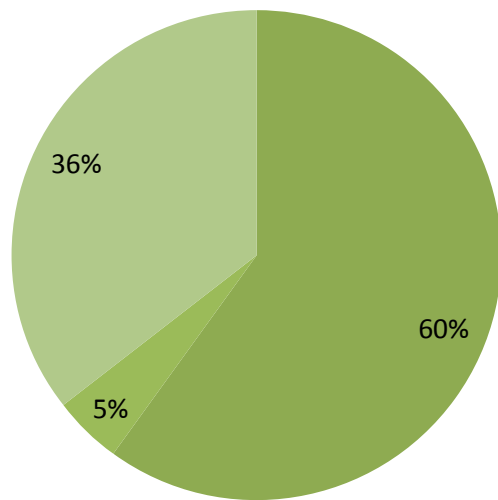


Chance of system failure over time



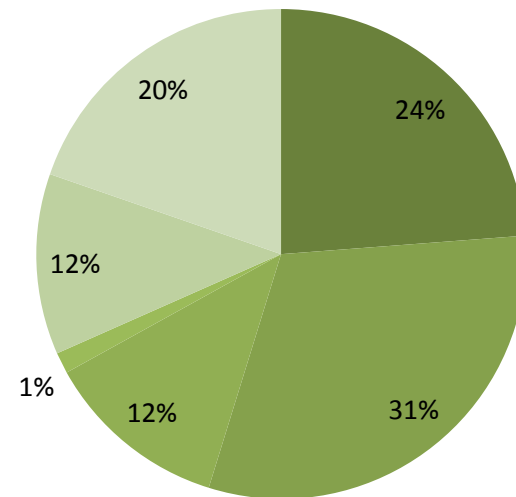
Building Age and Facility Needs

- Typical system deterioration or failures can be expected based on the age of a building or system



Age of One Building by Area

80 to 90 years
70 to 80 years
60 to 70 years
40 to 50 years
20 to 30 yrs
10 to 20 years
0 to 10 years



Age of District by Area

Over 80 years
70 to 80 years
60 to 70 years
50 to 60 years
40 to 50 years
30 to 40 years
20 to 30 yrs
10 to 20 years
0 to 10 years





PARK RIDGE-NILES
SCHOOL DISTRICT 64

BUILDING ASSESSMENT



PARK RIDGE NILES
SCHOOL DISTRICT 64

Facility Condition - March 23, 2015

FGM ARCHITECTS

Health Life Safety Survey

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

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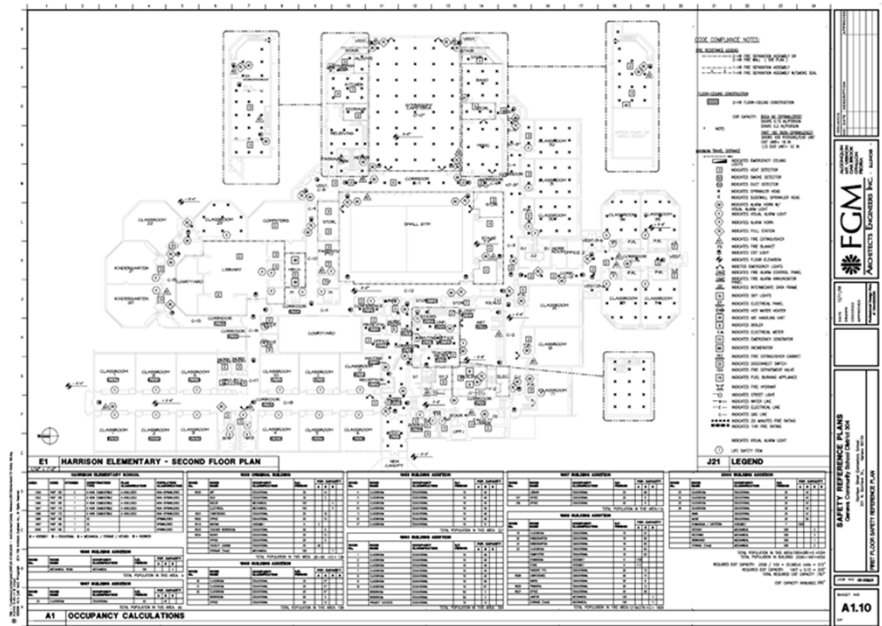
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Health Life Safety Survey

- Construction Area, Construction Types and Fire Separations
- Code calculated exiting capacity of rooms, corridors, stairs and exits



Applicable Codes

YEAR	1928-29	1930's	1940's	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
ELEMENTARY SCHOOLS				1950 - George B. Carpenter Elementary School 1954 - Addition 1955 - Addition										1967 - Addition										1994 - Addition																																												
	1928 - Eugene Field Elementary School 1930 - Addition			1951 - Addition										1963 - Addition 1967 - Addition																																																						
				1955 - Benjamin Franklin Elementary School 1956 - Addition																				1990 - Addition																																												
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MIDDLE SCHOOLS																																		1998 - Ralph Waldo Emerson Middle School																																		
	1928 - Abraham Lincoln Middle School 1931 - Addition			1946 - Addition										1956 - Addition																																																						
OTHER FACILITIES	1936 - Hendee Educational Service Center																																																																			
				1954 - Thomas Jefferson School 1960 - Addition 1963 - Addition										1967 - Addition																																																						
BUILDING CODES AND STANDARDS	Health/Life Safety Survey													1965-67 Initial Inspection										1983-85 Resurvey										1993-95 (or every 10 years) Resurvey										2003-05 (or every 10 years) Resurvey																								
	Illinois School Building Codes			PART 185 Retroactive Code for Existing Buildings										PART 175 Model Code										PART 180 1993 BOCA 1996 BOCA										2003 IBC 2006 IBC 2009 IBC																																		
	NFPA 101 Life Safety Code													Chapter 7 - Means of Egress 1967 Edition																																																						
	ISBE Retroactive Codes			Pre-7/1/65 1993 BOCA FP and PM Codes + Part 185										7/1/65 to 7/6/98 1993 BOCA FP and PM Codes + Part 175										7/6/98 to 10/3/05 1996 BOCA FP/PM										10/3/05-Present Most Recent IFC and IPMC																																		
	Sprinkler Requirements																							Illinois School Sprinkler Law 1991, Repealed 2005										Part 180, Section 180.250 IBC Requirements																																		
	Illinois Plumbing Code													1969 Initial Adoption										1983 Amendment										1993 Revision										1998 Amendment										2004 Amendment														
	Accessibility Standards													1973 Rehabilitation Act of 1973, Section 504										1990 ADA										1997 Illinois Accessibility Code										2010 - ADA UPDATE																								
	Energy Conservation Code																																											2004 - IECC																								



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





PARK RIDGE-NILES
SCHOOL DISTRICT 64

ANALYSIS AND STRATEGIES



PARK RIDGE NILES
SCHOOL DISTRICT 64

Facility Condition - March 23, 2015

FGM ARCHITECTS

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

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



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

