HELPING GRADUATE LEVEL ADMINISTRATIVE COURSES SUPPORT THE IMPORTANCE OF THE SCHOOL ASSET

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Facilities management, preventive maintenance, and capital improvements are the concern of many principals, presidents, and boards. University preparation programs for school administrators often lack serious concentration on these areas, mostly due to the increased standards for licensure, certification, and academic degrees. This article attempts to fill that void by inviting school leaders to consider preventive maintenance as an integral part of facilities management.

Graduate programs in educational administration have long been known to suffer a void in the basic understanding of the mundane world of bricks, mortar, timber, concrete, asphalt, and how these natural components live and work together in the life of a building. Fitch, in his work *Historic Preservation* (1998), a dialog of curatorial management of the built world, speaks of "antiquarians; that is laymen who, whatever their training or erudition in other fields, were usually amateurs in architecture and building" (p. ix). Accordingly, the analysis could be made that educators whose talents make them desirable candidates for an administrative role could be antiquarians when it comes to fully understanding the physical plant.

Friedman, in a practical book, *The Investigation of Buildings* (2000), writes, "Ordinary buildings resist easy definition as man-made objects. Even the most sophisticated are essentially handmade on site, even the most similar contain differences, even the most obvious contain hidden surprises" (p. 7). The truth of Friedman's words alluding to the potential frailty, esoteric qualities, and vulnerability of buildings challenges not only the novice but also the experienced leader. Therefore, without guidance, the administrator, principal, and pastor all have the potential to accelerate demise when, in fact, they are entrusted with sustaining the asset of their charge. Such practical void can be significant when the life of an asset is compromised by lack of understanding.

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Newman (2001) reflects quite candidly in his book *Structural Renovation of Buildings* about the "R" words of renovation, restoration, rehabilitation, repair, and remodeling as well as the lack of shared understanding of what these words mean. Yet they are critical for those responsible for the longevity of a school. Interestingly, Newman's index is void of the words preventive maintenance, two words to which further attention will be given, as they are of great significance in the life of a building.

Brand, in *How Buildings Learn* (1994), offered this challenge:

> All of the biological sciences make sense—and make sense of each other—in the light of one unifying concept, Darwin's theory of evolution. Something similar could unify the disciplines, professions, and trades that have to do with buildings. They could become, like biology, one organic body of knowledge and inquiry. The missing link is time. (p. 210)

Additionally, it could be argued that the missing link is education, and in the case of scholars-turned-administrators, mandatory education. Brand further explained the words *synchronic* and *diachronic* to make the point that "designers should study the present the way historians study the past—diachronically, in terms of change over time" (p. 210). Such intellectual pursuit could well benefit academia as it works to understand the complexity of facilities and the challenges involved in maintenance.

The past is a portent for the future. Those who articulate the chemistry of the physical plant, such as Fitch, Friedman, Newman, Brand, and others, offer sound philosophical advice that can be the bedrock and springboard for educators maturing in their professional development.

PREVENTIVE MAINTENANCE: MAINTAINING ASSET INTEGRITY

The words *preventive maintenance*, while self-descriptive, leave an untold story and serve as a curiosity for the uninitiated. Even experienced leaders often do not comprehend the function and true purpose of the preventive maintenance process. Preventive maintenance is the catalyst that ensures sustained security, safety, property integrity, faculty acceptance, user satisfaction, and reasonable ongoing expenditures within the physical plant. Preventive maintenance is a process in which the identification of minor issues in building systems and equipment result in repair, as well as the avoidance of major future catastrophic expenditures due to system failure. Through preventive maintenance, systems and components receive inspection and service in order to prevent breakdown or total failure. This process is similar to routine vehicle service. A successful preventive maintenance pro-

gram would categorize elements of a building into service frequencies of biweekly, monthly, semiannually, annually, and every five years. Each component of an element is inspected, repaired, or serviced on a defined schedule. For example, it is recommended that lighting systems be inspected every two weeks. The preventive maintenance program for lighting would consist of the following protocol, which includes documenting the inspection and its findings, and filling out a preventive maintenance checklist. It is an area that can contribute to building deterioration, the knowledge of which could prove helpful to administrators and potential leaders.

The campus has serious liability in the area of lighting. Accordingly, extreme care must be taken to both identify and correct deficiencies.

Replacement of flickering or burned out bulbs or lamps must be immediate.

The inspection process should include a general awareness of factors that cause demise in lighting systems such as:

- Poor fixture support
- Incorrect fixture for a given situation
- Cracking or broken stanchions or luminaries
- Overheating
- Exposed wires
- Deficient ballasts
- Arcing
- Dirt or moisture
- Excess voltage of 5% or more
- Bandit/unauthorized connections

The following is a preventive maintenance checklist that facilities professionals could use to inspect lighting systems. Each component would be inspected, and any deficiencies noted.

Check: **Frequency:** *Every 2 weeks performed after dark*

Building lighting
- Interior
- Exterior

Common area lighting
Field lighting
Illumination levels (Maintain record at key points based on design standard. Use foot-candle meter.)
Junction box covers
Junction boxes
Landscape lighting
Outlets—overloading, grounding, dirt, defective contacts
Parking area lighting

Parking lot light standards and appliances for integrity, stability
Pedestrian lighting
Safety of lighting (potential to cause a fire)
Sensors
Soffit lighting
Sports activity lighting
Switches
Voltage (Maciha, 2000, p. 215)

The age-old saying "a stitch in time saves nine" is truly appropriate to the preventive maintenance process. Case studies (Maciha, 2002) reveal significant awards in litigation because preventive maintenance was deferred and such deferral resulted in serious injury or death. In several cases (Maciha, 2001), the institution was held liable. Lighting, again, is perhaps a good example of an area of liability. Without proper illumination there is a great potential of "slip and fall" incidents or crimes against the property.

Beyond the elements of personal and facility safety lie the responsibility and mandate of stewardship to sustain the asset for future generations. Good stewardship is not an issue that professionals take lightly, nor would they be expected to skirt such responsibilities. Unfortunately, as one enters the graduate field, education becomes specialized, narrow, and focused on one's field of concentration. Such focus is crucial for the professionalization of various disciplines, yet there must be some resilience if one is to grow in later years. Accordingly, the educational steward has the need to become the maintenance steward in the area of administration and therein embrace a new world of experience. The maintenance steward need not be an expert technician, but rather a prudent manager whose intelligence engages in questioning and resolution not unlike the dynamics of the classroom situation.

Unfortunately, recent findings (Maciha, 2002) within the community of Catholic schools, primarily elementary and secondary facilities, reveal that preventive maintenance is not only at a low priority, it is also gravely underemployed and in some cases receives no attention whatsoever. This is not an indictment of gifted administrators whose focus on educational excellence, fund raising, and staff development are exemplary, but rather a statement that the discipline of maintenance often is frequently bypassed in a climate where there are already too many other challenges. Thus, facility demise does occur, not by slothfulness, but rather by perceived queue value importance.

If the queue factor is low, one might wish to visit media headlines and evening news clips of public schools where toilets are nonfunctional and children must wait for relief until they go home. Does this occur in Catholic schools? It does. One might also wish to consider the fact that defective heating systems can generate carbon monoxide, a serious health risk that also can cause death. Inadequate heating, ventilating, and air conditioning systems

can leave students so uncomfortable that they cannot absorb the intended lessons. These situations are not isolated and could be prevented within the guidelines of a good preventive maintenance program. If schools fail to meet the basic criteria of physiological needs (e.g., food, water, shelter) as identified by Maslow (Chernow & Vallais, 1993), then advanced self-actualization, like achievement, creativity, development, use of potential, self-expression, and self-fulfillment, again as espoused by Maslow, will never achieve fruition. Therefore, for educators whose present role or intended goal is to be an administrator, it is incumbent to recognize that the stewardship of the physical plant can relate to the ultimate quality and effectiveness of the learning process. In *Preventive Maintenance Guidelines for School Facilities* (Maciha, 2000), the following preventive maintenance procedures are outlined.

Prioritizing Preventive Maintenance (PM) Procedures

School facilities consist of a multitude of areas in need of PM, but staff to perform these tasks is usually limited. The American School and University's Annual Maintenance and Operations Cost Study found that in the 1998-1999 school year the median number of maintenance employees in public schools was four. This statistic emphasizes the need to prioritize procedures. Even with a realistically scheduled and funded PM program in place, large projects, unplanned work, and special events can interrupt or temporarily postpone normal PM tasks and require the attention of all personnel. In such cases, the least critical task that poses the least threat to life safety is deferred. That being said, any critical preventive maintenance task that if not completed on time could threaten facility function or life safety must not be deferred.

The following list suggests the order in which PM tasks should be implemented if no protocol has previously been established.

1. Life safety: Items that, if not addressed, have the potential to threaten the lives of the school's occupants. Some examples are exposed live wires, asbestos fibers, or missing stairs.
2. Overall safety: Items that jeopardize the general safety of occupants, such as tripping hazards or light malfunctions.
3. Regulatory requirements: Items that are not in compliance with building codes and other regulations, such as National Fire Protection Association (NFPA), ADA, Environmental Protection Agency (EPA), and Occupational Safety and Health Agency (OSHA). Examples include a lack of exit signs or exit doors swinging in the wrong direction.
4. Known requirements: Items that have the potential to violate code and regulation requirements. Examples include some ADA issues, posting signage, or maintaining 36 inches of clear space in front of electrical panels.
5. Equipment life cycle: Items that require routine life cycle maintenance.
6. Energy efficiency: Items that have the potential for energy savings through PM, such as lighting fixtures and heating, ventilation, and air

conditioning (HVAC) equipment.
7. Other: Items that do not fit into the above categories, but need attention when possible. (p. 18)

Maciha also helps erase the myth that buildings and systems have indeterminate life spans. Table 1 illustrates the useful life in years of building components.

Table 1
Suggested Useful Life of Building Components
(Construction and Materials Consolidated and Averaged)

Item	Years
Major Construction	
Reinforced Concrete	42.5
Steel Frame	31.0
Wood Frame	26.0
Electrical and Mechanical Equipment	
Electrical Systems	20.0
HVAC System	17.0
Plumbing Systems	21.0
Miscellaneous Items	
Bulkheads	25.0
Chimneys	27.0
Culverts	28.0
Curbing	25.0
Fencing	21.0
Incinerators	18.0
Paving and Walks	15.0
Platforms	26.0
Sheds	25.0

Source: Liska, R. (1988). Means Facilities Maintenance Standards.

Some offer the hypothesis that educational excellence can exist without much attention to the physical asset or its surroundings. *The Los Angeles Times* on April 1, 2002, in an article by Colvin about reading excellence cites that:

> Seaton Elementary School within the District of Columbia is a school that doesn't look like a model for anything except urban decay. The windows of the beige building are barred, the garden out back is littered with beer bottles and the adjacent blocks are scarred by the crumbling hulks of once graceful brownstones.... Test scores have soared at Seaton, as has the enthusiasm for reading. (p. A-1)

Is this an anomaly? Most likely the specific learning progress referred to was supported by a "federally sponsored study of the effects of a structured phonics program bolstered by intensive teacher training" (p. A-1). The premise, as identified by Colvin in the article, is for schools to "begin teaching lessons grounded in cognitive and educational science" (p. A-1). There is no suggestion by the *L. A. Times* that poor school facilities are good partners with new educational theory or practice. Yet, at face value, the article has the potential to slight the value of facilities integrity. Even H. Ross Perot is quoted in *21st Century Leadership* by McFarland, Senn, and Childress (1994) as saying, "It doesn't matter what the facility is, as long as it is safe" (p. 273). While children can and do learn in less than admirable surroundings (as did Abraham Lincoln), one would be hard-pressed to make a case that the environment of a school should be less than supportive of the human condition.

CHALLENGES THAT EXIST IN CONCERT WITH PREVENTIVE MAINTENANCE

Large schools frequently have an adequate maintenance staff. Yet some college campuses, elementary schools, and high schools are understaffed in maintenance and have little or no supervision in that discipline. In such situations, the band-aid is the routine fix; and in the case of a school I recently visited chewing gum was the routine fix. It may sound ludicrous, but it is true. So, too, there exists an alleged Christian philosophy that looks at tenured and underpaid workers as "lifers" without the need for supervision, accountability, or performance. Often workers just show up, do what they want, and dare to be told that they have a just responsibility. Firing is out of the question based on the ethic that values underperforming longevity as some kind of insurance policy. Industry has no sensitivity in eliminating those who perform poorly, regardless of tenure. Schools could be well served to route out those who do not attend to their job responsibilities. Successful academic institutions have addressed such issues by outsourcing, using specific position descriptions and measurement criteria to ensure performance. Additionally, prudent administrators establish a chain of command with a specific faculty member held accountable for the maintenance operation. While these principles seem fundamental, there is little evidence to suggest that they are widespread. Christianity embraces fairness. Teachers are held within strict guidelines. Logic suggests that the maintenance staff should be held to the same standard.

MANAGING THE PLANT: KEEPING THE STANDARDS HIGH, UNDERSTOOD, VISIBLE, AND SIMPLE

The school environment, be it large or small, retains its charter and stays within the stewardship mandate when goals are high, clearly stated, comprehended, underscored in simplicity, and organized in an atmosphere of accountability. If the little things are addressed in a timely fashion the big occurrences rarely happen.

The Marine Corps management principles offer a succinct guide to effective facilities management, particularly Principle 6, "Build authority on demand into the hierarchy." Freedman (2000) in *Corps Business: 30 Management Principles of the U.S. Marines*, further amplifies the meaning of the principle when he states, "Retain a strong management pyramid, but encourage people even at the lowest levels to make whatever decisions are necessary to accomplish the mission when management guidance isn't at hand" (p. 207). Unfortunately, in many schools I have seen just the opposite: dictatorial and egocentric management where schools are adrift and in decay due to lack of delegation and empowerment. Most certainly, such vantage is not a wholesale indictment against Catholic education, but rather an occupational hazard of hierarchical organizations. In other words, absolute centralization without acknowledgement of localized concerns. Highly centralized management of the school plant is a defeat for stewardship. Perhaps the words of General Patton can provide another slant on the ill that epidemiologizes some school plant management, "Too much of if'n, perhaps'n and maybe'n will never win a battle" (Williamson, 1988, p. 178).

MANAGING THE ASSET IN A THROW-AWAY SOCIETY

It can be argued that many consider it more prudent to discard than repair. Accordingly, we see school districts from California to Texas and in the East and the South pressing for school bonds to build and rehabilitate schools, as opposed to the routine repair and maintenance of existing facilities.

A prime example of the imposition of school bonds vests with the Fort Worth Independent School District, where it has committed bond funds of approximately $398 million to be expended by 2004. A question being researched by the local media is, what percentage of the expenditure could have been prevented through prudent maintenance? *The Dallas Morning News* wrote at length in an effort to resolve this troubling question. The Fort Worth Independent School District is not unique, but rather symbolic of the magnitude of expenditure needed across our land to maintain proper school plants. Some of the cost is perhaps preventable through prudent stewardship

of the existing asset. Education about the brick and mortar whose destiny is in the hands of administrative leadership merits attention.

If indeed a stitch in time saves nine, the prudent steward will act with responsibility in the implementation of a preventive maintenance program. Then not only is the physical asset retained for future generations, but also a rich architectural heritage is established and preserved. The good steward accomplishes more than meets the eye. Understanding the role of buildings and grounds, their inherent chemistry, and the impact of environmental factors make educators and administrators rich in value to those who follow and to those constituents called today's students and tomorrow's leaders.

REVISITING AND REMEMBERING THE WHYS OF MAINTENANCE

As educators, we remember that the reinforcement of truth and fact has merit in the memory process. The benefits of a preventive PM system include:

- Increase the life of a building and its support systems.
- Insure the safety of the building's occupants and capital equipment.
- Insure that the building's occupants are exposed to sanitary conditions.
- Make the building acceptable for sociological and psychological reasons.
- Insure that the work flow of the building's occupants and equipment is not impeded, thus insuring the highest rate of return for the productive activity being carried on in the building. (Liska, 1988, p. 3)

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