Regular Article

Nauvoo Illinois Historic Site: A Facilities Management Perspective

Casey Cluff,[1] Brian H Stone,[2] Kenneth Timothy Sullivan,[1] Jake Smithwick[3*]

[1]Arizona State University
[2]Western Illinois University
[3]University of North Carolina at Charlotte, UNCC Engineering Technology and Construction Management, 9201 University City Blvd., Charlotte, NC 28223, United States

*Corresponding Author: Jake.Smithwick@uncc.edu

ABSTRACT

As the execution of facilities management becomes more sophisticated, specialized skill in managing specific types of buildings has become necessary. Maintaining historic structures and sites falls into this type of specialized classification. This paper is a case study review of the unique "best practices" at the Nauvoo Historic Site located in Nauvoo, Illinois. It outlines a facilities management model of common core practices that was developed by the author following an assessment of various similar historic preservation campuses and their responsibilities to accurately display historic culture while observing modern-day facilities management techniques. Although these best practices are of great value in Nauvoo, they are proposed to be valuable to other sites as well. The current Nauvoo Facilities Management (NFM) organization will be reviewed and will focus on the unique challenges associated with historic restored and reconstructed structures. The paper will also examine the use of specific facilities management techniques, visitor events, livestock, workforce dynamics, finances, managing NFM within the corporate structure of a worldwide religious organization, and the part that NFM plays in community relations.

Keywords: Historic Facilities; Historic Preservation; Nauvoo Historic Site; LDS Church

INTRODUCTION

Facilities management is focused on the care, maintenance, and operations of the built environment. As facilities become ever more complex, sub-sectors of the types of facilities are emerging. Among these sub-sectors are historic facilities. Historical facilities management for the purposes of this study is defined as the care, operations, maintenance, and stewardship of structures and other valuable assets that are significant due to their historic nature. Through a case study of the unique facilities management practices at the Nauvoo Historic Site, valuable contributions to the facilities management body of knowledge are gained.

Table 1 details a brief cross-section of comparable sites to Historic Nauvoo and provides context for specific topics considered in this case study. Among the list are other sites owned by The Church of Jesus Christ of Latter Day Saints (LDS Church). Information in Table 1 was obtained through site visits, publications referenced, and individual websites.

A case study of the Historic Nauvoo Site works well in examining historic facilities management as it contains all the components detailed in Table 1. This nationally recognized historic site is in the city of Nauvoo, Illinois which is located near the point where the states of Illinois, Iowa and Missouri converge (Leonard, 1992). The unique history of Nauvoo draws thousands of visitors each year from around the world. In 2016, approximately 125,000 visitors came to Nauvoo (Orth, 2017). Many of the historical structures in Nauvoo have been restored with painstaking effort to replicate the originals. Others have been completely reconstructed at their original locations. The best practices of Nauvoo Facilities Management (NFM) regarding the care, maintenance, operations, and improvement of these facilities will be reviewed. The specific facilities management techniques regarding visitor events, livestock, workforce dynamics, finance, working within the corporate structure of a worldwide religious organization, and the role that NFM plays in community relations is also explored.

LITERATURE REVIEW

Facilities Management Today

Whether a facility is historic in nature or an ultra-modern skyscraper, the facilities manager (FM) has the responsibility of reducing or eliminating the downtime of the user. FM's work to maintain their physical assets and related services at a high level of quality, and strive to sustain them for longest time possible (Seeley, 1976; Sullivan, Georgoulis, and Lines, 2010).

TABLE 1.—Historic Preservation Campuses Comparison – See site references in bibliography

Historical Site	Ongoing Restoration	Ongoing Reconstruction	Full-time workforce	Volunteer Workforce	Livestock Program	Regularly Scheduled Entertainment	Tour guides	Funding Source
Nauvoo Historic Site, IL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Donations
Historic Kirtland, OH	Yes	No	Yes	Yes	No	No	Yes	Donations
Historic Palmyra, NY	Yes	No	Yes	Yes	No	Yes	Yes	Donations
Abraham Lincoln's New Salem, IL	No	No	Yes	Yes	No	No	Yes	Fee
Colonial Williamsburg, VA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fee
LDS Priesthood Restoration Site, PA	No	No	Yes	Yes	No	No	Yes	Donations
This is the Place Heritage Park, UT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fee

As defined by Seeley in his pioneering textbook on the subject, he states that FM's participate in "work undertaken to keep, restore, or improve every part of a building, its services, and surrounds, to a currently accepted standard, and to sustain the utility and value of the building" (Seeley, 1976).

From the early days of break/fix maintenance, also referred to as "corrective maintenance" or "reactive maintenance", work was typically carried out in an "ad hoc" response procedure when site breakdowns occurred. This tended to arbitrarily tax the resources of the property maintenance groups who needed to formulate and execute repair plans on the fly (David and Arthur, 1989; Sullivan and McDonald, 2011). One problem with such an approach is that the repairs were done at untimely schedules disrupting the intended timetable of the facility purpose with costly down time.

Key Factors in Maintaining Historic Structures

Narrowing the focus to historic facilities, the Whole Building Design Guide (WBDG) states the following: "Operating and maintaining historic structures must take into account the following factors: history, significance of features, original and later construction components and materials, current or future (planned) use, treatment objectives, technical information about appropriate O&M processes and products, and specialized preservation skills training. Further, if available, a Historic Structure Report (HSR) will provide a summary of a structure's history and development, dating from original construction. It usually contains a complete assessment of the condition of the structure at the time of the report and recommendations to address physical condition problems as well as recommendations to restore, preserve, rehabilitate, or otherwise treat the historic and character defining features of the structure. It may have a section that addresses operations and maintenance (O&M) and may contain information regarding the structure's listing on the National Register of Historic Places or Landmarks. If an HSR exists, it should form the basis for O&M requirements development. Should an HSR not exist, it is strongly recommended that one be developed before performing any extensive efforts to preserve, repair, and/or maintain the structure.

Authenticity vs. Functionality

Authenticity versus functionality is often the predicament of the FM of historic sites. In her paper entitled "Building Information and Facilities Management in Historic Buildings", Annette McGill highlights this interesting dilemma which is often overlooked in the retrofitting or renovating of historical buildings. She notes, "Old buildings vs. Modern priorities should consider work to be done on the best way to measure the energy performance of older buildings, work to be done on identifying and communicating good practice in retrofitting, and work to be done on assessing the impact of retrofitting and the resulting environmental changes on older materials and finishes" (2012). As effort is focused on maintaining the architectural authenticity of a historical structure, modern objectives and even code requirements may be overlooked. There is inherent conflict in this regard, as life safety, accessibility, and environmental awareness cannot be ignored when rebuilding, restoring, or maintaining historical buildings.

Preservation of Existing Historic Data

Another factor to consider when restoring or reconstructing historic sites is the preservation of existing historic data in proximity to the given project. Disturbing the soil or infrastructure where there is potential for historic data is of major consideration in the world of historical archaeology. Great care is taken to not disrupt existing conditions when doing so may destroy historical evidence or prevent piecing together clues of what may have happened in the historical record (U. S. Department of Veterans Affairs; Office of Acquisition, Logistics and Construction; Office of Construction and Facilities, 2013).

Historic Facilities Management Training

Another element to consider when reviewing historic sites management are the sources of education required for successful results. There are many organizations that provide facilities training in the historical and preservation arena. The National Historical Preservation Institute provides training and states that "historic property management combines preservation maintenance with modern systems management" ("Historic Property Management," 2011). "Reading" a building, searching for solutions, and then caring for the building by maintaining its historic materials is a balance between the environmental needs of the building and its users. Further, understanding the impacts on the historic fabric of the building's systems is vital to the proper care of these structures. Through proper training, the FM learns not

only how to answer preservation questions, but also learns the right questions to ask.

Religious Perspective on Historic Site Maintenance

A religious perspective from the LDS Church states the following: "The purpose of the Church Historic Sites Program is to strengthen the faith of members and to interest others in the restored gospel by increasing visitors' understanding of the significant events, buildings, sites in Church history and the gospel principles associated with them. Among the specific objectives of the Historic Sites Program are the following:

1. **Preserve historic buildings and sites** where significant events in the Restoration of the gospel took place by selecting, marking, restoring, caring for, and interpreting them.
2. **Help visitors understand the unique history of the building or site** by teaching them about the important events and people associated with the site.

Each site is unique and offers a collection of modern, restored, and reconstructed buildings, memorials, and markers. Even more powerful, however, is the intrinsic authenticity of walking on the same ground where significant events took place. Therefore, developing, renovating, and maintaining historic sites is determined by the Church's commitment to protect historic structures, landscapes, and materials, and to preserve them for the future" (Historic Sites Operations Committee, 2009, p. 7).

METHODOLOGY

First, providing context, a brief history of Nauvoo is given. Next, the management practices at NFM are examined. Information gathered on other comparable historic sites throughout the United States is assessed in table format showing related features. This compilation is reviewed as it relates to the Nauvoo site. In addition to facilities management techniques, other common areas of emphasis are reviewed including visitor events, livestock, and labor force. NFM's position within the framework of a global, religious organization and community relations is also reviewed. Finally, the value of this study as it contributes to the overall body of facilities management knowledge is affirmed.

BRIEF HISTORY OF NAUVOO

Nauvoo played an important role in the migration of early settlers to the western United States. It was also the headquarters of the LDS Church for approximately seven years from 1839 – 1846. During these years, the industrious members of this faith constructed hundreds of buildings and created a city out of a swamp in only 7 years which rivaled the size of Chicago at the time (Esplin, 2009). The remnants of a handful of these structures continue to exist today. They have been restored with painstaking effort to replicate the originals. Others have been completely reconstructed in their original locations.

NFM COMPOSITION & WORKFORCE

From meager beginnings in the 1960's when there were just a few pole barns and a tractor or two, NFM has grown to be a full-service operation with the resources required to maintain a significant historical site (Hill, 2011). Many historic facility campuses tend to be a mixture of paid employees and volunteer laborers. The volunteers at NFM are missionaries belonging to the LDS faith. They are also involved in a host of other missionary related activities such as serving as tour guides, performing in live shows, and participating in community outreach programs. The complement of these missionaries at NFM ranges from about 25 individuals in the winter off-season months to 35 individuals during the summer months. The other component of the workforce at NFM is the paid or full-time employees. Currently, there are 25 permanent, full time employees at NFM. They are required to be members of the LDS Church in good standing and are expected to have the skills and aptitude required to perform the functions of their respective positions.

With two different "types" of workers in a workforce, occasionally there are issues that need to be resolved such as building means and methods, equitable treatment of the overall staff by management, dealing with an ever-changing volunteer staff, compensation vs. non-compensation, work schedules, and holiday schedules. Inequality in the system requires the manager, the full-time work force, and the volunteers to be flexible and understanding. Group activities and events, such as daily devotionals together, luncheons, and holiday parties, foster closeness among the workforce, and have proven beneficial in creating a positive environment.

Since the 1960's, the NFM manager came from among the ranks of the volunteer missionaries. This presented a problem in line of authority reporting and the paid staff not receiving consistent direction due to the constant change of the volunteer manager. This lead to frustration as new policies were continually being put into place in a relatively short period of time as managers were called and released as missionaries. In 2011, this situation was changed as a full-time paid manager was installed by the leadership of the Church resolving many of these issues and creating a sense of stability for the workforce and the community. The current structure of NFM is to have the facility manager receive direct reports from the heads of operations. Each head serves as their particular shop or trade steward, with paid employees staying indefinitely and volunteer missionaries rotating in and out of that shop.

UNIQUE CHALLENGES WITH HISTORIC RESTORED AND RECONSTRUCTED STRUCTURES IN NAUVOO

In a facilities management world where the normal course of operations in preserving the asset is to maintain it

until the end of its useful life, the management of historical structures requires a different approach. It is not acceptable to see a building though to obsolescence and then tear it down and start over. The asset must be preserved indefinitely while maintaining its historical accuracy. Components of a structure can be replaced, but should be done in such a way that the casual observer will be satisfied that the entire structure is of historic origin. With historic preservation, there are two choices. Either a site can be *reconstructed* presenting a finished product that appears to be authentic, or the remains of an existing site can be *restored* with as much of the original fabric as possible remaining intact. The latter, restoration, is a painstaking effort, but the result is more authentic. Reconstruction, on the other hand, often begins with journal entries that identify a site or the remains of a foundation. Verification of the location is paramount in telling the story of a historic building that has been reconstructed. Many consider "the space" where the newly reconstructed building will stand to be of great significance. Nauvoo is a hybrid of restored and reconstructed sites. See Table 2 (Pykles, 2010).

Once reconstruction or restoration of a structure is complete and ready for public viewing, the O&M needs to be addressed. Bearing in mind that the construction process directly influences the maintenance process, the stark difference between maintaining a historic structure and maintaining a conventional facility will now be reviewed by looking at the building components.

Foundations: Many of the foundations of 1840's structures were constructed with loose rock or stone. Over time these foundations fail. Shoring up these foundations from the interior basement of the structure with grout or plaster is acceptable. If stones are missing, "like" stones may be used as replacements. Another approach is to infill the voids with concrete. At times, these foundations are remarkably preserved requiring limited attention. Usually, the foundations of the buildings in Nauvoo are not viewed on the public tour and consequently the painstaking effort to authenticate the foundation is not as essential as it would be in other areas of the structure.

Framing: Framing of 1840's structures was usually done with rough cut timber. There are some structures in Nauvoo that have retained some of the original timber. Because the lumber in walls is covered up, it is not critical in a reconstruction situation that the lumber be of historic origin. However, the dimensions of the lumber can be critical, and in such cases the lumber must be custom milled to historic dimensions. If the lumber is exposed, it is imperative that it be as true to historic form as possible and the exposed connectors be as authentic as possible as well.

Roofs: Homes in early Nauvoo were weatherproofed by whatever means available. Common weatherproofing materials were grass sod (earthen), pine pitch, batten and board roofs and of course wood shake shingles (Historic Sites Operations Committee, 2009). Wood shakes are generally used for new roofs historic structures in Nauvoo. Liquid wood sealers that give the appearance that the roofs have weathered are also used adding to the historic appearance.

Exterior Wall Coverings: In the 1840's in Nauvoo, there were generally two options for exterior siding, brick or wood. Sub-categories of wood siding included rough logs, tongue and groove, shiplap, and flat plank edge (Historic Sites Operations Committee, 2009). An abundance of brick-quality clay is native to Nauvoo, and in early Nauvoo there were as many as seven brickyards in operation (Thomas, 2005). Most of the historic sites that are visited today are of the brick variety. If siding or brick must be replaced, every effort is made to replicate the original material. Some of the historic homes in Nauvoo still carry the red brick that was common of the time. Finishing the exterior wood siding consisted of paint, stain, or faux grain (Historic Sites Operations Committee, 2009).

HVAC (Heating, Ventilation, Air-conditioning): This was a term that was non-existent in the 1840's. Heating and cooling in early Nauvoo consisted of a fireplace(s) in the winter and opening the doors and windows in the summer. Today, most of the sites have modern HVAC systems in place with ducting, furnaces, condensers, and coils hidden from the view of the casual observer.

Plumbing & Electrical: Indoor plumbing and electricity were non-existent in Nauvoo in the 1840's. Today most of the sites in Nauvoo have a small bathroom in the basement with modern fixtures that can be used by site guides. Buildings were generally illuminated with candles, gas lamps, or light from the fireplace. Today, care must be taken to procure the type of light fixture that most closely approximates the original light source.

Windows: Historic, restorative glass is available at a premium price. The window frames were made of various types of wood species depending on availability. If glass needs to be repaired or replaced, every effort should be made to procure glass with the same appearance as the original. The window framing material should also be of the original wood species or a moisture resistant wood local to the area. Further, historic construction of windows often requires that a film be applied to the surface of the glass to prevent UV light from penetrating into the interior of the structure and exposing historic furniture and artifacts to the damaging UV rays of the sun (Historic Sites Operations Committee, 2009).

Interior Walls & Ceilings: Wallboard or sheetrock was not introduced until 1916 (Rae, 2016). In early Nauvoo, the least expensive option was to leave the walls with no finish at all. Due to little or no insulation value, this was not ideal for the long cold winters of Nauvoo. A second option was to finish the interior walls and ceilings with (wood) lath and plaster. The plaster material often contained horsehair which served as a type of binding ingredient (Lamachio, 2014). Many times, the authenticity of the plaster can be verified by the presence of horse hair in the mixture. The void between the exterior siding and the interior lath could be filled with insulation. Everything from blankets to hair to newsprint to bricks has been found serving as insulation material in historic buildings. A third option was to use the

TABLE 2.—Chronology and Classification of Nauvoo Excavations

UNIQUE CHALLENGES WITH HISTORIC RESTORED AND RECONSTRUCTED STRUCTURES IN NAUVOO

Site	Year(s)	Sponsor	Director(s)	Result
Nauvoo Temple	1961-1962	LDS	M. Fowler and D.F. Green	Reconstructed
	1966-1969	LDS	V.S. Harrington & J.C Harrington	
	*1999-2002	LDS	Special Projects - LDS Church	
Brigham Young Home	1965-1968	LDS	C. Dollar & J.C Harrington	Reconstructed & Restored
Wilford Woodruff Home	1966-1967	LDS	J.C. Harrington	Restored
Webb Blacksmith & Wagon Shop	1967-1968	LDS	J.C. Harrington & V.S. Harrington	Reconstructed
North Unit of Times and Seasons Complex	1968	LDS	V.S Harrington	Reconstructed
Jonathan Browning Home and Gun Shop	1968-1969	LDS	D. Berge	Reconstructed & Restored
Winslow Farr Home	1969	LDS	D. Berge	Restored
Chauncey Webb Home	1970	LDS	D. Berge	Restored
Seventies Hall	1970	LDS	D. Berge	Reconstructed
Lorin Farr Home	1970	LDS	D. Berge	None
Stillman Pond	1970	LDS	D. Berge	None
Alvah Tippets	1970	LDS	D. Berge	None
Daniel Butler Jr.	1970	LDS	D. Berge	Exposed Foundation
Joseph Smith Stable	1970	RLDS	R. Bray	Exposed Foundation
Joseph Bates Nobel - Lucy Mack smith Home	1971	LDS	D. Berge	Restored
Scovil Bakery	1971	LDS	D. Berge	Reconstructed
Joseph Smith Homestead Summer Kitchen and Bee House	1971	RLDS	R. Bray	Reconstructed
Joseph Smith Red Brick Store	1972	RLDS	R. Bray	Reconstructed
Theodore Turley	1973	RLDS	R. Bray	None
Hyrum Smith	1974	RLDS	R. Bray & G. Waselkov	None
Masonic Hall	1975	LDS	D. Berge	Reconstructed & Restored
Riser Boot and Shoemaker Shop	1975	LDS	D. Berge	Reconstructed
Kimball-Heywood Store	1975	LDS	D. Berge	None
Stoddard Tinsmith Shop	1975	LDS	D. Berge	Restored
Times and Seasons Print Shop	1975	RLDS	R. Bray	Exposed Foundation
Outbuildings at Joseph Smith Homestead	1976	RLDS	P. DeBarthe	None
Joseph Smith Mansion and Hotel	1977-1978	RLDS	P. DeBarthe	Exposed Foundation
	1980-1983			
Levi Hancock	1979	RLDS	P. DeBarthe	Exposed Foundation
James Brinkerhof	1979	RLDS	P. DeBarthe	Exposed Foundation
Windsor P. Lyon Home and Store	1980	LDS	J.T. Walker & R. Stamps	Restored
Sarah Granger Kimball Home	1981	LDS	D. Berge	Restored
William Law Store	1984	RLDS	P. DeBarthe	None

* Note added to original Pykles table

exterior siding on the interior walls as well. In most cases, a coat or two of white wash paint was applied. Maintaining and repairing these walls requires the work to be done so that the appearance of a "patch" is not readily viewable. Since the walls and ceilings are very visible to the public, it often requires that a craftsman specializing in historical structures be employed to make these types of repairs (Historic Sites Operations Committee, 2009).

Floors: In early Nauvoo, hardwood floors were the only option for flooring. Initially, some church members first arriving lived in dugouts with dirt floors. All historic sites in Nauvoo use hardwood for flooring. It is rare to find an original wood floor that is over 150 years old. Every effort is made, however, to assure that the floor appears as it might have in the 1840's. As with the window frame material, the species of wood is important. Today restored floors of oak,

maple, cherry, walnut and even some soft wood pine floors can be found. The key to these floors is to provide the appearance of an 1840's floor through proper tooling, scraping, sanding and finishing.

Doors: As with windows, doors often withstand a substantial amount of abuse. Historic doors are made from the same species of wood as the floors. With bullet holes or knife marks, doors often tell a story and replacement doors should be presented in a way that does not distract from the original narrative. When a door has failed, it is generally replaced with a replica. These replicas are works of art and the skill required to reproduce them comes only after many years of experience. The wood species, door component assembly, tooling and finishing must all be accurate to achieve the desired result.

MODERN FM PRACTICES AND TECHNIQUES

For many years, FM practices in Nauvoo involved a reactive approach to work requests and complaints. As late as 2011, work requests were filled out by hand and reviewed by management to consider approval. With the formation of NFM and the employment of a full-time, long-term manager, in lieu of a volunteer missionary, changes occurred. No longer was it necessary to fill out a paper forms. To expedite the multiple work requests received each day, and to introduce an improved preventative maintenance program, the use of Computer Maintenance Management Software (CMMS) was explored. Beginning in 2011, a simple, locally designed, web-based software was used. All users and occupants of the historic sites and modern homes need only enter their work request online and the request is relayed directly to NFM for resolution. No longer is it necessary to have management review every work request for approval. NFM exists to resolve these issues and a cultural mental change has occurred with the use of this software providing more automation, flexibility, and freedom.

VISITOR EVENTS

Historic preservation sites often have video productions, live shows, and outdoor pageants. Behind the scenes there are many resources required to successfully execute these events. In Nauvoo, visitors from all over the world come to view these productions (Orth, 2017). In the event of a breakdown, it is important that the show be up and running again as soon as possible. Avoiding situations where the public gets the sense that things are broken or "out of order" is imperative. Outstanding entertainment is critical to high visitation. There are also a variety of live shows in Nauvoo that require constant attention on the part of NFM, including shows on the outdoor stage, short vignettes performed around town, a horse-drawn live band wagon, nightly performances in the historic Masonic Hall, and the annual Nauvoo Pageant.

Of all the outdoor productions, the annual Nauvoo Pageant requires the most NFM resources. It is a full-scale, Broadway-type production with families and core cast members coming from all over the world. The show runs Tuesday through Saturday during July and draws crowds of up to 3500 spectators per night (Orth, 2017). The pageant venue requiring facilities attention consists of the stage itself, the dressing rooms, the seating area, the lighting towers, the portable restrooms, the concessions stand and a variety of support services. Further, in addition to the performing venue itself, there is a newly constructed 20,000 square-foot practice facility that is located three miles east of Nauvoo where the entire cast practices in air-conditioned space. Although these shows typically occur in the summer months, maintenance is required all year long and is most efficient when many visitors are not on site.

LIVESTOCK

Horse drawn wagon and carriage rides through the streets of Historic Nauvoo are offered all year long. These attractions, along with oxen rides, draw large numbers of visitors. Providing these services requires that NFM maintain the livestock including acquiring the animals, procuring feed, medical care, foot cfare, tack (harnesses, bridles, blankets, etc.), grooming and a host of other incidental issues. The daily care of the horses and oxen, and the actual driving of the animals is tasked to volunteer missionaries called "teamsters." Currently in Nauvoo there are 20 draft horses These horses weigh around one ton each. Each wagon or carriage is pulled by a team of two horses. Effort is made to acquire fully trained teams of horses aged about four years and use them until they reach the age of 20. Horses are acquired from local Amish farmers. Currently there are two teams of oxen in Nauvoo acquired from the New England area of the USA where many youth raise them for programs such as 4-H and then sell them. Also, included in the livestock operation is the management of approximately 100 acres of hay-producing fields. NFM usually produces enough hay to sustain the livestock through the winter months. In the summer, the animals graze on the summer grass.

BUDGETING AND FINANCE

The required monetary funds to support NFM come from the general tithing funds of the LDS Church. The governing bodies of the Church regard these funds very seriously, approve budget proposals, and allocate a portion of these funds to NFM. There are basically two "buckets" of money that are budgeted for expenditures throughout the fiscal year. One bucket is labeled "operations", the other "capital expenditures". Operational funds are required to run the day-to-day operations, including payroll, administrative expenses, travel expenses, material and supplies, equipment expenses, cleaning, utilities, etc. Capital expenditures are funds required for new projects or to purchase capital equipment. Capital funding requires a more rigorous proposal to the Corporation of the Presiding

Bishop (CPB), the management group within the LDS Church with responsibility for the Nauvoo Historic Site.

NFM makes every effort to recycle and reuse resources as much as possible. Hay production for the livestock is locally grown and maximized with very little need to purchase hay from outside vendors. Trees that are no longer viable are converted into wood chips and used to beautify the landscaping. Various species of trees are processed to manufacture cabinets. Clay for the bricks is locally excavated in Nauvoo. Through these efforts and a myriad of others, NFM reaches evermore for the ultimate idea of self-sustainment and cost effectiveness.

WORKING AS A SUBSIDIARY TO A GLOBAL RELIGIOUS ORGANIZATION

The Church of Jesus Christ of Latter-day Saints is a worldwide religious organization. Within the organization are various entities, some being for profit and others classified as nonprofit. The CPB is of the nonprofit variety. When NFM was officially moved under the CPB in 2011, procedures had to be adjusted. NFM was required to observe applicable procedure and policies published by the parent organization. It also opened direct lines of support and communication. This was also the time that the full-time manager of NFM was put in place with direct reporting lines to the CPB. The cultural shift was very observable and perceived as positive within the organization and to the community. This has provided support and defensibility for NFM and has opened the door for further development and restoration in Nauvoo.

As a general rule of historic facilities preservation observed by the LDS Church, any project on a property that requires "soil to be disturbed" requires a historical assessment. For example, if the construction of a sidewalk is anticipated, a study would need to be done of the proposed path to assure that historical artifacts, building foundations or other items of historical significance are not disturbed (Historic Sites Operations Committee, 2009). If historic valuables are encountered or there is a likelihood they will be revealed, the project will either be cancelled or an alternate means to accomplish the desired purpose would be necessary. It is the desire of the LDS Church that any new, modern construction within the Nauvoo Historic Site be kept to a minimum to preserve the overall historic atmosphere. At times, there is a conflict in this regard as modern restroom facilities, entertainment venues and visitor support services are required. Coordination and communication between all parties is the key to successful outcomes. This can be achieved through project pre-planning with the team, accompanied by action item lists (with names) and tracking changes from the expectations.

CONCLUSION

The purpose of this study was to provide a model outline of common core practices among comparable historical preservation sites and a case study on historical facilities management at the Nauvoo Illinois Historic Site as it relates to this model. An overview was given of the current FM practices with essential components of the comparable sites distilled into topics as they pertain to the Nauvoo model. In addition to general facilities management techniques, areas of emphasis that are more common across other historic preservation campuses were reviewed, including workforce labor, unique challenges managing historic sites, visitor events, livestock management, finances, NFM's position working within the framework of a global, religious organization, and community relations. The worth of this case study is the value that it offers to other facilities managers and owners of historic sites. By studying and utilizing facets of the NFM model, other historic sites can gain valuable insight into improving their own sites.

REFERENCES

Colonial Williamsburg (2017). Take Time To Go Back. (n.d.). Retrieved March 2, 2017, from https://www.colonialwilliamsburg.com/

David, W., & Arthur, B. (1989). *Management to maintain quality in buildings. Proceedings of Implementation of Quality Construction*, 212-18.

Esplin, S. (2009). *The Mormons Are Coming: The LDS Church's Twentieth Century Return to Nauvoo*. Mormon Historical Studies

Hill, C. (2011). Carol Hill Interview.

Historic Kirtland Visitors' Center. (n.d.). Retrieved March 6, 2017, from https://www.lds.org/locations/historic-kirtland-visitors-center?lang=eng

Historic Palmyra. (n.d.). Retrieved March 6, 2017, from https://history.lds.org/section/historic-palmyra?lang=eng

HISTORIC PALMYRA of Palmyra, New York. (n.d.). Retrieved March 6, 2017, from http://www.historicpalmyrany.com/

National Preservation Institute (2011). *Historic Property Management: Materials to Systems*. Retrieved March 6, 2017, from https://www.npi.org/sem-hpm.html

Historic Sites Operations Committee. (2009). General Maintenance Standards - For Historic Sites of The Church of Jesus Christ of Latter-day Saints.

Lamachio, P. (2014). *When did plasterers stop using horse hair in plaster?* Retrieved March 19, 2017, from https://www.quora.com/When-did-plasters-stop-using-horse-hair-in-plaster

Leonard, G. (1992). *Nauvoo*. The Encyclopedia of Mormonism.

Lincoln's New Salem State Historic Site. (n.d.). Retrieved March 6, 2017, from http://www.lincolnsnewsalem.com/

McGill, A. (2012, November). Building Information and Facilities Management in Historic Buildings. Retrieved March 6, 2017, from http://www.cotac.org.uk/conf_2012_pres/amcgill.pdf

Operations and Maintenance for Historic Structures | WBDG Whole Building Design Guide. (2016, November 18). Retrieved March 6, 2017, from http://www.wbdg.org/resources/operations-and-maintenance-historic-structures

Orth, K. (2017, March). Nauvoo Tourism Office Interview.

Priesthood Restoration Site. (n.d.). Retrieved March 6, 2017, from /subsection/priesthood-restoration-site

Pykles, B. C. (2010). *Excavating Nauvoo: The Mormons and the Rise of Historical Archaeology in America*. Lincoln: University of Nebraska Press.

Rae, H. (2016, July 29). An Exciting History of Drywall. *The Atlantic*. Retrieved from https://www.theatlantic.com/technology/archive/2016/07/an-exciting-history-of-drywall/493502/

Seeley, Ivor. *Building Maintenance*. 4th ed. London: Macmillan Press Ltd, 1976.

Sullivan, K., Georgoulis, S., and Lines, B. (2010). "Empirical Study of the Current Facility Management Profession." Journal of Facilities Management, Vol. 8 (2), pp. 91–103

Sullivan, K. and McDonald, D. (2011). "Leadership Principles and Performance Measurement in Facilities Management: A Case Study." ASCE Leadership and Management in Engineering, Vol. 11 (4), pp. 302–309.

The Restoration of Williamsburg. (n.d.). Retrieved March 7, 2017, from http://www.history.org/history/teaching/enewsletter/volume4/july06/restoration.cfm

This Is The Place Heritage Park. (n.d.). Retrieved March 6, 2017, from http://www.thisistheplace.org

Thomas, J. (2005). Nauvoo: On the Banks of the Mississippi - New Era May 2005 - new-era. Retrieved March 8, 2017, from https://www.lds.org/new-era/2005/05/nauvoo-on-the-banks-of-the-mississippi?lang=eng

U. S. Department of Veterans Affairs; Office of Acquisition, Logistics and Construction; Office of Construction and Facilities, M.(2013, July). Historic Preservation - Office of Construction & Facilities Management [General Information]. Retrieved March 6, 2017, from http://www.cfm.va.gov/cfm/historic/index.asp