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A Cultural Resource Management Plan for Ephrata Cloister Historic Site

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A CULTURAL RESOURCE MANAGEMENT PLAN FOR EPHRATA CLOISTER HISTORIC SITE

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Introduction

The objective of this thesis is to develop a framework for a cultural resource management plan using available computer applications as tools to support it, which can be applied to various historic sites. The case study for this thesis is Ephrata Cloister, a National Historic Landmark, and a National Register Site, owned and administered by the Pennsylvania Historical and Museum Commission (PHMC). Ephrata Cloister provides an excellent opportunity to explore the various aspects of cultural resource management. Ephrata Cloister was selected as a case study because the site has been restored and all the properties stabilized and thus the preservation issues are more management related than requiring immediate conservation treatments. It contains both cultural and natural resources that are integral to the historic significance of the site and provides opportunities to integrate both resources in an overall management plan.

The management of cultural resources involves three basic components and is a continuous process rather than a static plan. The first component of a cultural resource management process is research and documentation. This involves information gathering and analysis leading to the definition of significance of all resources and their contributing values. The second component is the establishment of preservation policies, and the analysis and evaluation of the resources in order to identify preservation issues leading to the development of various preservation and management alternatives. These policies and analysis provide a rationale for making efficient management decisions.

Analysis and evaluation also assist in the interpretation of the site's significance for public information, which is a major management issue for publicly held properties. The third and the most crucial part of cultural resource management is the actual implementation of preservation plans and the management of the site. This includes all activities related to maintenance, conservation, interpretation, visitor control, and monitoring and evaluation of the site as well as of the management plan itself. Thus, management is a self-correcting and on-going process, which has to be monitored, evaluated, and modified periodically.

In this thesis, Chapter One aims to present a statement of need and how computer based geographic information system will assist in effectively managing a historic site. This chapter also includes a brief cultural and physical history of the site and the statement of significance. In Chapter Two, the aim is to provide a methodology on the first phase of management, that is, the documentation process and analysis of information collected for Ephrata Cloister. Chapter Three will present the analysis and identification of preservation issues based on research, documentation, site observations, and interviews as well as management strategies for effective implementation. Chapter Four will aim to provide the management policies, recommendations for the management of the site, and the use of computer applications to support the cultural resource management plan. This thesis attempts to incorporate all the above components of cultural resource management and utilize available information and technology to effectively manage a historic site.

Chapter One: Background and Intent

Statement of need

The management of cultural resources is a basic tool that provides plans and strategies for the preservation of a site's tangible and intangible values. Cultural resources include archaeological, historical, and architectural sites, structures, districts, towns, objects, traditions, and rituals associated with or representative of people, cultures, and human activities. The National Park Service (NPS) defines cultural resource management as

> "an umbrella term for activities affecting cultural resources; includes the preservation, use, protection, selective investigation of, or decision not to preserve, prehistoric and historic remains, including legislation and actions, to safeguard extant evidences or to preserve records of the past."[1]

In other words, cultural resource management is the synthesis of various conservation treatments, establishment of policies, and effective stewardship of heritage.

Cultural resource management places conservation within the larger perspective of planning. The objective of cultural resource management is to preserve and protect heritage for future generations against adverse changes due to natural decay and deterioration, development pressure, use, or visitation. It also has to balance preservation requirements with other needs imposed by use, conflicting interests, improper maintenance, and inappropriate management strategies.

[1] National Park Service, Cultural Resources Management Guidelines, NPS-28, ch. 1, p. 7.

The fundamental policy of the National Park Service on cultural resource management is to

> "locate, identify, evaluate, preserve, manage, and interpret qualified cultural resources in every park in such a way that they may be handed on to the future generations unimpaired... Consistent with the requirements of law, resource managers and professionals at all levels shall take positive action to perpetuate unimpaired the cultural resources of the National Park System; to prevent adverse effects on these resources by development, visitor use, or resource management activities; and to prohibit vandalism or unauthorized excavation, collection, or appropriation of cultural resources."[2]

In short, cultural resource managers must document and preserve the resource base and protect it against any threats. In recent years, with the adoption of the above policy the emphasis of NPS and other preservation agencies has shifted from extensive preservation development to one of preservation maintenance.[3] Cultural resource management has developed into a proactive and preventive conservation process rather than a reactive and remedial solution.

Pennsylvania Historical and Museum Commission is responsible for the preservation of Ephrata Cloister, the case study for this thesis. Although the Commonwealth of Pennsylvania History Code does not define cultural resources or management, the Historical and Museum policy holds the Commonwealth responsible for the historic preservation of Pennsylvania and the Pennsylvania Historical and Museum Commission

[2] National Park Service, Cultural Resources Management Guidelines, NPS-28, ch. 1, p. 1.
[3] Ibid. p. 77.

the executing agency.[4] PHMC has the responsibility and authority to identify, document, preserve, and manage the cultural resources of Pennsylvania.[5] It is also responsible for reviewing any undertaking that might have potential influence on these resources. Pennsylvania Historical and Museum Commission follows the Secretary of Interior's guidelines for the preservation, rehabilitation, restoration, and reconstruction of historic buildings.[6] PHMC also seeks advice from expert consultants for various preservation issues and treatments.

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[4] Pennsylvania Consolidated Statutes, Title 37, Historical and Museums (History Code), 1988 Special Edition, p. 2.

102. Declaration of policy.

It is hereby determined and declared as a matter of legislative finding and policy that:

1. Section 27 of Article I of the Constitution of Pennsylvania makes the Commonwealth trustee for the preservation of the historic values of the environment.
2. The conservation of Pennsylvania's historic and natural heritage and the preservation public records, historic documents and objects of historic interest, and the identification, restoration, and preservation of architecturally and historically significant sites and structures are duties vested primarily in the Pennsylvania Historical and Museum Commission.
3. The irreplaceable historical, architectural, archaeological, and cultural heritage of this Commonwealth should be preserved and protected for the benefit of all the people, including future generations.

[5] Ibid., p. 7.

303. Sites

The Commission shall have the power and duty to:

1. Museums and historic sites.- Control, direct, supervise, manage, and annually inspect the State Museum and those field or regional museums and historic sites authorized and created by statute; conduct continuing studies for the improvement of museum activity; and operate, control, direct, supervise, supervise and manage a public outreach program, including a mobile museum program or a program of travelling exhibits.
3. Management of historic properties.- Based upon accepted professional museum practices, assume the preservation, care and maintenance of historic property, including those properties listed in section 702 (relating to powers over certain historic property); promulgate and enforce rules and regulations for the visitation of historic properties by the public; and charge admission fees to historic property at its discretion, which fees shall be paid into the State Treasury through the Department of Revenue and credited to the Historical Preservation Fund.
4. Preservation and restoration of historical and archaeological sites.- Undertake the preservation or restoration of public buildings, military sites, or monuments connected with the history of this Commonwealth; contract with political subdivisions, historical societies or other associations, with proper bond or security, for the maintenance of these building sites or monuments as a consideration for assistance in their erection, restoration, preservation, or marking by the commission; and take title to sites of historical markers in the name of the Commonwealth.

[6] U.S. Department of the Interior, National Parks Service, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and

Computer applications in cultural resource management

Computer technologies are increasingly being applied to cultural resource management and historic preservation. Among the many applications available, geographic information system offers new ways to approach the management of resources for documentation, analysis, evaluation, monitoring, maintenance, and effective implementation. Geographic information system is a powerful tool which, when applied properly, can be an effective organizational as well as an analytical system for the management of historic sites.

Geographic information system is a computerized system within which elements a map are linked to their attributing textual database with the ability to organize the data. It is designed to collect, manipulate and analyze graphic information as well as the attribute database. It also performs queries, analysis, and calculations allowing for information to be displayed in various ways such as charts, graphs and statistics that are easy to interpret. These functions of a geographic information system provide a base for a comprehensive inventory of resources and other relevant information so that less time is spent looking for information, allowing more time to make useful management decisions. This will also ensure that pertinent information will not be overlooked accidentally in the planning process. It is also an excellent medium for data storage.

Reconstructing Historic Buildings, 1995.

Cultural resource management would benefit greatly from the ability of a geographic information system to generate maps with high accuracy that is more convenient to update and rectify than conventional methods. It can also be used as a persuasive presentation tool that can assist in the promotion of a site. A geographic information system can link multiple sites and make the information available for a wider user group. Although ideally the system would serve best if it was installed on site, it can also monitor several sites from a central terminal. A drawback in using a geographic information system is that the learning curve is relatively high when it is used as an analytical tool for management purposes and not just a repository. It also has the potential of conveying misleading impressions when more emphasis is given to attractive graphic presentations than to the relevant issues

Most historic sites prepare a general management plan (GMP) stating the significance of the site and establishing preservation and management procedures. Most of these plans are, however, too broadly defined and lack a strategy for their accomplishment. In many sites, preservation is carried out more in an ad-hoc manner than with long term preservation planning in mind. This in turn leads to the implementation of historic research and conservation treatments as emergency measures, or as funds become available, running the risk of turning into a political decision. Such short term measures also lead to the tendency of scattered information, and redundant work. A geographic information system can put the relevant information together allowing managers to effectively perform productive analysis and plan a sequence of treatments or actions that

will lead to the established objectives. It also helps to determine and measure the potential impact of any proposed action on the site's significance and integrity.

A computerized maintenance management system is already set up for the Cloisters. However, due to lack of staff, only the scheduling of ground maintenance work is being performed without using the system for preservation and maintenance planning. It is expected that a geographic information system will help integrate all relevant information available on the site and thus assist the site manager in making more efficient management decisions.

Brief history of Ephrata Cloister

Cultural history

Ephrata Cloister National Historic Site is located along the north bank of Cocalico Creek in Ephrata Borough, Lancaster County, Pennsylvania, and covers 27.5 acres. The present site lies north of the creek and rises across a flood-prone meadow, where most of the extant buildings are located, to Zion Hill in the northwest section of the site (See Figure 1). The site includes several historic buildings and non-historic buildings built during and after the restoration of the Cloister. It also includes other features such as a cemetery, wells, two springs that supplied water to the community, the Cocalico Creek which was used for baptism, and an amphitheater built in the twentieth century.

The settlement at Ephrata began in 1732 as a religious communal society. A German separatist, Conrad Beissel was the founder and leader of this radical religious community. This community established by Beissel was one of the earlier experiments in religious sectarian communal living in Pennsylvania. He had escaped from Germany in search of religious freedom and believed in the celebration of the seventh day of the week as the Sabbath, which eventually led him to find retreat on the banks of Cocalico, still a frontier land for Philadelphians.[7]

Ephrata Cloister had three orders within its community: celibate Brotherhood, celibate Sisterhood, and married Householders. Marriage was not forbidden but celibacy was encouraged. In 1740, Beissel even experimented with voluntary separation for the married householders and built a monastery –Saron, the earliest extant building- with separate entries for male and female members. This experiment, however, soon failed and Saron was turned over to the Sisterhood. The community reached its peak during the 1750s when there were more than 300 members, including the householders living around the Cloister and joining in the religious services.[8]

The celibate orders lived a communal lifestyle that was quite unique at the time. The community led a rigorous and simple life filled with prayer services and community work. Besides praying, the community also produced a unique type of music, operated

[7] William, A. Steirer, New Look at Ephrata Cloister, Journal of Lancaster County Historical Society, 1966, vol. 70, no. 2, p. 101-116.
[8] Ibid.

one of the earliest printing presses, and established an excellent school. The community declined after its second leader Peter Miller died in 1796 and the communal lifestyle ended after the last of the celibate sisters died in 1812.[9] Following the death of the last solitary sister the householders moved in the Cloister and incorporated the Seventh Day Baptist Church, occupying the buildings until 1934.

For a brief period in the 1740s, Israel Eckerlin, a brother in the community ousted Beissel and assumed the leadership.[10] During Eckerlin's leadership, the economy of the community expanded taking advantage of its communal system. Members of the community did not have to surrender their personal property, but all property earned through common labor became communal property. By 1745, this system enabled Ephrata to become an important industrial society outside Philadelphia, with the fourth paper mill in Pennsylvania, a sawmill, fulling mill, flaxseed oil press, tannery, and flour mill. This sudden prosperity in an austere and simple religious society raised concerns on the direction of the community. After a leadership struggle, Eckerlin was forced to leave and Beissel again took control. Eckerlin's departure ended the economic development of Ephrata community.[11]

[9] Peter C. Erb, Johann Conrad Beissel and the Ephrata Community: Mystical and Historical Texts, Lewiston, NY: E. Mellon Press, 1985, p. 28.
[10] William, A. Steirer, New Look at Ephrata Cloister, Journal of Lancaster County Historical Society, 1966, vol. 70, no. 2, p. 101-116.
[11] Ibid.

This affair made Beissel realize that in order to retain leadership the community had to be isolated from outside influence. Beissel got rid of all members who supported Eckerlin and also performed rebaptism of the community. All industries, except the ones required for the community's use were closed down. Beissel also discontinued the printing business and other commercial relations with Philadelphia and any connection with other Pennsylvania German societies, such as the Moravians who had settled in the Lehigh Valley.[12] Beissel, by capturing the minds of the religious and impressionable people of Ephrata in need of a spiritual leader, enforced an isolation which excluded all cultural influences, even those from affinity settlements of Pennsylvania Germans. Even Ephrata's unique music was not heard outside of the community. Thus, early in Ephrata's history Beissel ended any hopes of it having significant influence in the rest of the country, in spite of its relative prosperity in the mid-18th century. The only close contact the Cloister had with the outside world was after the Battle of Brandywine, when wounded soldiers were sheltered and treated at the Cloister.[13]

Physical history

The buildings have undergone alterations over time and were constantly transformed even during occupation.[14] On casual observation the buildings appear mostly restored

[12] William, A. Steirer, New Look at Ephrata Cloister, Journal of Lancaster County Historical Society, 1966, vol. 70, no. 2, p. 101-116.
[13] Howard Pyle, *A Peculiar People*, Harper's New Monthly Magazine, 1889, Vol. 79, p.783.
[14] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron, Unpublished, John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission, 1988, p. 2.

with replacements. The upper floor interiors of the buildings, however, are largely unrestored and retain a significant degree of historic fabric. Since the community's decline the visual setting has also changed due to the subsequent development and restoration work. One important structure, Bethania, the Brothers' house was demolished in 1910. This building and other smaller structures torn down for various reasons were evidence of the communal life of Beissel's community that has been lost. The community also farmed on the Cloister property and the surrounding area, of which very little evidence is visible today. While Ephrata Cloister today gives the impression of a wooded park with scattered buildings, historical documents indicate that the Cloister was like a town with more buildings and farmlands and covered about 200 acres on both sides of the Cocalico Creek in the 18th century.[15]

There were three distinct, yet overlapping building phases during the development of the Cloister.[16] In the first phase, or solitary period, between 1732 and 1740, several cabins were built for the hermits. During the second phase, the monastic communal period, from 1740 to 1749 most of the buildings built were for communal use. In the third phase, or congregational community period, from 1750 to 1814, the community built or altered structures for purposes other than monastic and communal services.[17]

[15] Gentleman of America, A. An Account of a Society Called Dunkards in Pennsylvania, Royal Magazine. or, Gentleman's Monthly Companion, vol. 11, 1759, p. 61-63.
[16] Jeffrey A. Bach, Voices of the Turtledoves: The Mystical Language of the Ephrata Cloister, Unpublished, Ph. D. Dissertation, Duke University, Department of Religion. 1997, p. 258.
[17] Ibid.

There were a few significant changes made to the buildings during the early days of the community. When the sisters moved to Saron in 1745, they made alterations to the buildings for their convenience.[18] The middle wall that divided the building into male and female sections was removed. This has undermined the stability of the upper floors and caused them to slope towards the center because the removed wall was load bearing. The original configuration of Saal had a double-height meeting room on the first floor with balconies looking onto the main room. When married householders moved out of the Cloister back to their farms, the Sisterhood took over Saal and continued its function as a meetinghouse for religious services for the community. Due to the insufficiency for space, a second floor was added to the double-height main hall, which was again restored to its original configuration during the second phase of restoration.

When the householders moved in they adapted the building as rental apartments and also made some alterations. A few partitions were torn and down, others added, but the basic configuration, and the fabric of the buildings was not changed. The top floor of Saal and Saron were not occupied during this period and retain the original historic fabric.

Since the Pennsylvania Historical and Museum Commission acquired the site in 1941, there have been two major and a number of smaller restoration projects at Ephrata Cloister. G. Edwin Brumbaugh carried out the first restoration project from 1942 to 1964.

[18] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron, Unpublished, John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission, 1988, p. 7.

The next major restoration project lasted from 1964 to 1968 and was undertaken by John Heyl.

Brumbaugh stabilized the buildings by inserting poured concrete foundation.[19] He also removed virtually all siding from the building and replaced it with reproduction clapboards. Brumbaugh found original clapboards in the space between Saal and Saron and went to great lengths to duplicate them, both in material and methods using an antique tool "frow"[20] to split logs for the clapboards. [21] In addition, Brumbaugh repaired damaged and deteriorated interior and exterior structural members, mostly in the first floors.

John Heyl continued with the stabilization work on the upper floors of Saal. He repaired deteriorated plaster and structural elements. It was at this time that the main meeting hall was restored to its original double height configuration. Heyl also worked on the interiors of most of the other buildings, repairing plasters and other structural elements and mostly followed Brumbaugh's plans and procedures.[22]

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[19] Edwin Brumbaugh, "Medieval Construction at Ephrata," The Magazine Antiques, Jul. 1944, vol. 4, p. 18-20. Brumbaugh determined that the building was sliding off its foundation as the foundation had been laid on sharply sloping ledge rock, at some places less than a foot below grade and with simple clay between stones as mortar. He needle-shored the building, laid concrete foundation underneath, and lowered the building back into place in early 1945.

[20] This tool consists of a heavy blade, slightly less than a foot long, with the metal curled at one end to from an "eye," in which a stubby wooden handle is inserted at right angles to the back of the blade.

[21] Through research Brumbaugh found that the original clapboards were 5'-2" long, about 7" wide and an inch thick along one side and knife-edged along the other. G. Edwin Brumbaugh, "Medieval Construction at Ephrata," The Magazine Antiques, Jul. 1944, vol. 4, p. 18-20.

[22] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron, Unpublished, John Milner Associates, Inc. Submitted to: Pennsylvania

After these two major restoration projects several other smaller projects have been completed. Damaged and deteriorated roofing shingles have been replaced in all buildings in two phases: Saron and Saal roofing shingles were replaced in 1987; all other buildings after 1988. In 1990, a fire detection and suppression system was installed in all buildings except the Academy and the Associates' Barn. These two building only have detection systems installed. The fire suppression system will be installed in the next phase. Damaged and deteriorated clapboard siding on all buildings were replaced recently. Both the roofing shingles and the clapboard siding date from Brumbaugh's restoration project so they do not constitute historic fabric.

Statement of significance

Ephrata Cloister possesses significant architectural and cultural values. The Cloister was a unique expression of religious tolerance granted by William Penn that existed in Pennsylvania in the 18th century.[23] Conrad Beissel started a radical religious and communal society based at Ephrata on ideas drawn from many religious traditions. Those who entered the community came to contemplate God through meditation, composition of a unique music and poetry, artistic symbols, and charity work.

Historical and Museum Commission, 1988.

[23] Everett Gordon. Aldelfer, The Ephrata Commune: An Early American Counterculture. Pittsburgh, PA: University of Pittsburgh Press, 1985, p. 27.

The two earliest extant buildings Saal and Saron are the main structures that contribute to the architectural significance of the site as a National Historic Landmark (See Figure 2). These buildings are excellent early examples of Germanic and medieval architecture found in North America.[24] Saal and Saron, built in 1741 and 1743 respectively, are unusually large for their period. Saal is a four and half-story half-timbered building with fillings of stones and clay protected on the outside by split and shaved clapboards. Saron is a three-story timber building laid out at right angles to Saal. The small casement windows, steep gable roof, and the multiple rows of shed dormers give these buildings a medieval appearance (See Figure 3). The exposed beam-ends with protective shingle covers are also a distinctive feature of these two buildings (See Figure 4).

The historic significance of Saal is that this is the only extant building directly associated with the religious services of the Ephrata community. It was originally named Penial and built as a prayer house. Religious services and love feasts were held here until 1746.[25] After the solitary sisterhood ceased to exist, Saal continued to be used as a meeting hall by the Seventh Day Baptist Church. As mentioned earlier, the exterior and the first floor of Saal have been restored heavily and the main hall also restored to its original configuration of double height but retain original structural elements. The upper floors also retain a significant degree of authentic 18th century fabric.

[24] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron, Unpublished, John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission, 1988, p. 6.
[25] Ibid.

Saron housed one of the most significant and influential orders of the Ephrata community, the celibate Sisterhood (See Figure 5). This largest original extant building and originally known as Hebron, was built as a convent for married householders, and later was turned over to the Sisterhood. Thus, it has direct links to the communal life Beissel established and presents a manifestation of the life of the community. This building is also evidence of the sophisticated level of craftsmanship of the time and demonstrates how the community adapted the building to suit their purposes. The exterior and first floor of Saron has been extensively restored; the upper floors have not been restored and retain authentic historic material.

Other contributing historic buildings: There are a total of eight other extant historic buildings built between 1734 to 1749 (See Figure 6, 7). These buildings are associated with various aspects of the monastic and communal lifestyle such as solitary houses, printing shops, bakery, almonry, barn, etc. These buildings contribute to the significance of the setting and present the various expressions of communal life at Ephrata. The exterior and first floors of all historic buildings have been restored and repaired but the structural elements and upper floors are largely original material.

Chapter Two: Documentation

Objectives of documentation

The first task in the management of Ephrata Cloister is to identify, document, and analyze the resources and determine the significance of each feature that contributes to the importance of the site. A comprehensive inventory of the resources and the understanding of their significance are crucial to formulate accurate and informed management decisions to protect and preserve the values inherent in the site. The purpose of the documentation in a cultural resource management process is to gather, organize, manage, and more importantly use the information available to protect the resources. This documentation will be the foundation for all preservation planning and a guide for the day-to-day maintenance as well as long term preservation plans.

Methodology for documentation

The issues that have been considered for comprehensive documentation, identification, and determination of significance of Ephrata Cloister to develop a management plan are:

1. Site history and physical conditions
2. Archaeological investigations
3. Past interventions
4. Visitation and interpretation
5. Vegetation, topography, and services
6. Environment, tourism, and surrounding development

1. Site history and physical conditions

In order to understand and identify the architectural and cultural significance of Ephrata Cloister, the physical as well as social, cultural, and political history was explored. A number of studies have been done on the cultural history of the site including an annotated bibliography done prior to the first restoration project.[26] There are numerous works on the life of Conrad Beissel, the founder of the Cloister and the lifestyle at the Cloister.[27] These studies provide the social, religious, cultural, and political structure and history of the community at Ephrata. The primary source of information for most studies is the *Chronicon Ephrata*, the official history of the community published in 1786. However, accurate information on the architecture and physical descriptions of the site is lacking. The available sources focus more on the religious aspects of Cloister and present idealistic view of site describing them as "odd-looking, antiquated buildings."[28] Ephrata Cloister Building Chronology has been recently compiled from information extracted from primary sources.[29] A major aspect in the management of Ephrata Cloister is organizing of all available information pertaining to the resource. Most of the historical information on Ephrata is located in the archives at the site.

A comprehensive photographic and graphic survey for the Cloister was done in 1934 as part of the Historic American Building Survey (HABS). These photographs and drawings

[26] Eugene E. Doll and Anneliese M. Funke, The Ephrata Cloisters: An Annotated Bibliography, Philadelphia: Carl Schurz Memorial Foundation, 1944.
[27] See Bibliography, p. 51.
[28] Oswald Seidensticker, A Colonial Monastery, The Century Magazine, v. 23, Dec. 1881, p. 211-223.
[29] Michael Showalter, Ephrata Cloister Building Chronology extracted from primary sources, unpublished.

are stored at the site but need to be catalogued. These documents have to be scanned and stored in the geographic information system, which will protect these fragile paper drawings. At the same time, it will provide easy access to the information.

During the first restoration campaign, Edwin G. Brumbaugh documented all the buildings and their physical condition. Most of Brumbaugh's surviving documents, drawings, sketches, correspondence, and photographs on Ephrata Cloister are stored at the Joseph Downs Memorial Collection of the Winterthur Museum in Winterthur, Delaware. These drawings and notes provide information on the condition of the site before the restoration. They also provide information on the restoration work Brumbaugh carried out, which is a good source for identifying original fabric and replacements. This information also needs to be catalogued and verified on site.

The three volumes of the historic structures report (HSR) done for Saal and Saron in 1987 provides the historical and architectural history and evolution of the two buildings including an annotated bibliography.[30] As part of this report, a thorough and comprehensive historical research and physical condition survey were done for Saal and

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1998.

[30] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume One, The History and Archaeology of Ephrata Cloister. Unpublished. John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission. 1988.

_____. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron. Unpublished. John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission. 1988.

_____. Ephrata Cloister: A Historic Structures Report, Volume Three, Annotated Bibliography. Unpublished. John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission. 1988.

Saron. This report also provides recommendations and guidelines for their preservation. It also includes a Architectural Inventory Form intended for a documentary record of the existing conditions and a Building Maintenance and Inspection Form designed to provide an evaluative record of existing conditions.[31] It has been twelve years since this survey and due to the lack of staff and expertise the buildings have not been inspected as recommended in this report. Currently, another historic structures report for the remaining buildings on site is in progress. This report will provide historical background and condition survey of all those buildings. A quick condition survey of both the exterior and interior materials was done for verification purposes as part of this thesis. The buildings appear to be structurally stable and the finishes are in fairly good condition.[32]

The current maps for Ephrata Cloister were obtained from Lancaster County GIS Department.[33] These maps are the result of a countywide survey by the Lancaster County Planning Department and contain different maps or layers, each with specific features, such as buildings, contours, geology, soil, etc.[34] The buildings no longer standing have been mapped out giving their approximate location based on the descriptions in the building chronology, archaeological research, and other sources. Detailed information

[31] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron. Unpublished. John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission. 1988, Appendix E.

[32] The historic structures report in progress will be performing a more thorough investigation and this information can be easily entered in the same database with modifications if necessary.

[33] The maps were digitized from a 1993 aerial photograph taken in 1:200 scale. The aerial photograph was scanned and digitized in a stereograph and rectified to State Plane Coordinates using concrete monuments for markers. (Lancaster County GIS Department)

[34] The relevant data for Ephrata Cloister has been extracted from the larger section of the data received from Lancaster County GIS Department. However, all information is retained in a separate layers.

such as vegetation, facilities, site improvements, etc., has been added to the site. The issues selected to be mapped were determined after studying the site and the management issues for the preservation of the site. A multi-element database was also created with several categories such as resource inventory, exterior building conditions, interior building conditions, vegetation, archaeological deposits, etc. Chapter four will describe these maps and database in the geographic information system and their application in the management of the site.

2. Archaeological research

There have been two major phases of archaeological investigations at the Ephrata Cloister grounds. In the first campaign three excavations were carried out in 1963, 1965, and 1966. The principal archaeologist for this investigation was Dale E. Beiver.[35] These investigations discovered the exact location of the Zion Saal, Bethania, and Bethania Saal. The second campaign began in 1993 and is still on going annually during the summer months. The principal investigator for this phase is Stephen G. Warfel. A number of excavations have been done and documented in a series of publications.[36] The accurate location of Kedar, the first communal structure, remains of Bathaus, a prayer house adjoining Kedar, and remains of a solitary cabin and bake oven were discovered during this phase. The two campaigns used different grid system for locating the deposits.

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[35] Dale E. Biever, A Report of Archaeological Investigations at the Ephrata Cloister, 1963-1966, Publications of the Pennsylvania German Society. Vol. 3. 1970.

[36] Stephen G. Warfel, Historical Archaeology at Ephrata Cloister: A Report on 1993 Investigations. Pennsylvania Historical and Museum Commission, Harrisburg, 1994.

During the second campaign, a remote-sensing survey was executed to determine sites with potential archaeological deposits. Ground penetrating radar, proton magnetometer, and soil conductivity surveys were performed. This information will assist in predicting potential archaeological deposits and plans for archaeological preservation and interpretation.

The remote-sensing survey data are included as different maps in the geographic information system. These different maps provide the location of underground disturbances providing information on areas with potential archaeological interest. The known locations are documented and include photographs in the archaeological investigation database. This information with the date of construction and demolition of lost buildings also provides information for the building chronology and interpretation of Ephrata Cloister during various phases in its history.

3. Past interventions

As explained in chapter one, the two major restoration projects stabilized the buildings at the Cloister and also repaired damaged materials. The clapboard siding and roofing shingles are the mostly the result of these and subsequent restorations. The Brumbaugh documentation mentioned in chapter two will provide more information to identify historic materials and treatments used. A green pigment is being used with the solvent for wood treatment, which gives the buildings a color that is historically inaccurate.

Historical documents show that these buildings were whitewashed.[37] Except for cleaning and the installation of fire suppression system, the upper floors have not been restored.

The records of past interventions should be documented and their conditions recorded in the treatments and interventions database by the date of intervention, type of treatments used, description of treatments, and the rationale for the use of the particular treatment. This information will provide information on the behavior and performance of the treatments for future work.

4. Visitation and interpretation

Ephrata Cloister National Historic Site receives about 60,000 visitors annually. Visitation is higher in the summer months and in the fall. For the past three years the busiest month has been October when the number of visitors in one day sometimes reaches its peak of 800. The average number of visitors per day is 120-150 and the maximum 300. This is not a significant number to cause any concerns. However, because of space limitations inside the main buildings, a large group at a given time can be detrimental not only to the historic fabric but also to visitor experience. On average there are about 30 visitors in each group and on busy days the number goes up to 50.[38]

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[37] Patrick W. O'Bannon, at el. Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural Evaluation of Saal and Saron, Unpublished, John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission, 1988, p.53

[38] Phone interview with Steve Somers, Curator of Collections at the Ephrata Cloister on Mar. 28th, 1999.

Visitors to Ephrata Cloister are given the option of a guided tour for a fee, or a free self guided tour with a booklet provided. The guided tour begins with a documentary video on the history of the unique religion practiced at Ephrata during its period of significance. The tour group then proceeds to Saal or Saron, depending upon the size of the group with a Custodial Guide in period dress who talks about the interpretive themes while giving a tour of the historic buildings. The visitor is then free to explore the rest of the site with the help of a brochure that gives a brief description of most of the resources at the site.

The primary interpretative theme is the eighteenth century lifestyles at Ephrata Cloister as a radical religious communal society with strong German traditions within the context of colonial society. It focuses on its religious history, lifestyle, as well as the musical compositions, religious writings, printing, and surviving historic buildings. This is interpreted with exhibits in the various buildings around the site that reproduce different aspects of the Ephrata community. The Visitor Center also houses the museum collection, and exhibits portraying the different phases of activities at the Cloister. The secondary interpretive period is the 19th and 20th centuries to illustrate the incorporation of the Seventh Day Baptist Church and later developments. This information is narrated to the visitors during the guided tour. The museum exhibition also exhibits few photographs and written descriptions from this period. Other related interpretive themes are the position of Ephrata Cloister in comparison to other communal societies in America, the European antecedents for the Cloister community, and the Cloister as a major contributor

to the Germanic culture in south central Pennsylvania.[39] The guided tour touches briefly on all these topics.

5. Vegetation, topography, and services

Topographic contours, soil types, and geology maps were obtained from the Lancaster County GIS Department and are included in the geographic information system for the Cloister as different layers of maps. The vegetation map has recorded most of trees near the historic buildings and the vegetation database contains information on the tree species, date planted, pruned, etc.[40] This map provides the location of the trees in relation to significant buildings. The utilities including sanitary lines, location of floodlights, and waterlines have been mapped. The layout of utilities such as electrical wiring, waterline, drainage, etc. should also be updated periodically before management decisions are made, especially concerning any new construction or archaeological excavations.

6. Environment, tourism, and surrounding development

The Borough of Ephrata and the historic site are mutually beneficial to each other and the development of one affects the other. Ephrata Cloister Historic Site, with more than 60,000 visitors annually is a revenue source for the local community. With proper promotion of other attractions in town, the historic site, as well as the town can continue

[39] Clarence E. Spohn, Ephrata Cloister Interpretation Manual: A Guide to the Interpretation of the Ephrata Cloister. Unpublished. Pennsylvania Historical and Museum Commission. 1996.
[40] Trees were digitized from the drawing for the Ephrata Cloister Fire Water Line, Bureau of Engineering

to benefit from tourism. However, tourism puts increased demands on local facilities and resources and should be well planned and managed so that resources are protected from erosion and visitor experience is enhanced.

Preservation of cultural resources is an essential part of local and regional planning for the Borough of Ephrata. To effectively involve preservation issues in the planning process, it is essential to document, inventory, and evaluate all resources. Once identified the preservation of cultural heritage has to be one of the main concerns in the planning process and should be articulated into a written preservation policy that can be shared with other agencies involved in the process. Environmental quality and its effects on historic fabric should also be considered during the planning process. The maps obtained from Lancaster County GIS department also include the immediate surrounding community of Ephrata town. The site can also be placed in a countywide context for future planning as well as to promote the site on a regional level.

As the current use and the proposed zoning are different, zoning and other land use changes will impact the integrity of the Cloister (See Figure 22). The development plans and land use patterns of the surrounding area will also influence the long-term preservation plans. Thus, management should be aware of the proposed development plans for the surrounding community.

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and Architecture, DGS, Harrisburg, PA. 1988.

Chapter Three: Preservation Issues

Objectives of preservation management

The objectives of the management plan for Ephrata Cloister are to insure the preservation of the site and its context, provide adequate facilities to the visitors to enhance their experience with accurate interpretation, as well as coordinate with local planning agencies, and promote the site. The conservation of original fabric and the integrity of the setting are the most significant and critical issues to consider in developing preservation strategies. The development patterns of the surrounding community that have direct influence on the integrity of the site have to be coordinated so that any new development does not adversely affect the resources.

The principal preservation planning philosophy applied to Ephrata Cloister should be the retention of the authenticity of historic fabric and values with minimum intervention. Once the original fabric is removed, integrity is diminished. Thus, it should be avoided. When replacement is inevitable, new material must be compatible with the existing material and discernible from the historic fabric. Any new treatment should also be reversible so that erroneous interventions may be removed without affecting the historical evidence of conditions prior to the intervention.

In order to prepare a comprehensive management plan for Ephrata Cloister, it is essential to understand how the historic fabric performs. Once this has been determined

preservation procedures and treatments can be assessed. The principal resources and concerns for Ephrata Cloister are building preservation, archaeological resources, and the setting and landscape. The issues that challenge and affect these preservation resources are maintenance of these resources, interpretation of the site, and staffing.

Preservation issues

1. Maintenance

The historic structures are the principal preservation concern for the staff at Ephrata Cloister. As the buildings have been stabilized and are in sound condition the priority is to continue routine inspection and maintain the building against damage or deterioration. The preferred solution to control damage is to remove the cause of decay. In order to accomplish this, the sources and causes of deterioration have to be identified. This can be achieved through periodic inspection of the buildings and documentation of conditions and following a maintenance plan. Maintenance plans also ensure that work is carried out periodically based on the priorities of the site. Improper maintenance on both the buildings and its surroundings can lead to irreversible damage and even accelerate decay. Maintenance should be supplemented by weekly housekeeping. Housekeeping is that branch of maintenance, which removes undesirable or harmful deposits of soil from the surface of the building elements in such a manner so as to do the least amount of harm to the surface treated with the gentlest and least radical methods.[41]

[41] Patrick W. O'Bannon, at el., Ephrata Cloister: A Historic Structures Report, Volume Two, Architectural

The building exterior is exposed incessantly to the forces of nature. As most of the buildings have clapboard siding, they are very susceptible to the weathering, and water or moisture damage. The steep shingle roof is a natural protection, as it does not allow accumulation of water. A gutter system was recently installed in all buildings. Although the gutters are not original features of the buildings they collect and drain water from the building. Because of the concrete sidewalks surrounding the buildings and the grading of the landscape, however, water is directed back to the building. This causes dampness to raise from the ground and also splashes water back to the clapboard siding accelerating the process of decay.

Another management concern at Ephrata Cloister is that the trees are planted too close to the historic buildings. Most of the trees were planted during the restoration projects and are fruit bearing varieties that attract animals such as squirrels and rodents. These trees also provide a natural pathway from the trees to the shingled roofs of the buildings for the squirrels. This has created major problems, as it does not take very long for a squirrel to chew through the shingled roof. Presently, the staff has dealt with this problem by placing wire mesh on the holes to prevent the squirrel from entering the building.[42] A wire mesh door has also been placed on the top floor of Saron to prevent the animals from getting down.

Evaluation of Saal and Saron. Unpublished. John Milner Associates, Inc. Submitted to: Pennsylvania Historical and Museum Commission. 1988, Appendix E.

[42] Interview with Michael Ripton, Museum Director at the Ephrata Cloister on March 01, 1999.

2. Staffing

There are seven permanent full-time staff and three part-time staff plus two Ephrata Cloister Associates volunteers, a volunteer group, working at the Cloister. The permanent staff consists of the Museum Director, Curator of Collections, Museum Educator, Tourist Custodial Guide Supervisor, Building Maintenance Supervisor, Building Maintenance Repairman, and Park Ranger. Three part-time state staffs are the Custodial Guides and the two part-time staff from the Associates' is the Volunteer coordinator and Bookkeeper. Two seasonal custodial guides, one research intern, and sometimes one seasonal maintenance repairman is added to the staff during the summer months.

The number of staff presently working at the Cloister is not adequate for the preservation and management of the site. There is no preservation specialist on staff and no regular schedule to inspect and monitor the buildings that are the principal asset to the site. The management of the site is more focused on keeping the grounds immaculate than inspecting the buildings regularly for maintenance. This is due to lack of staff, lack of relevant expertise, and an overriding concern on presenting the site to the public rather than preserving it. The Building Maintenance Supervisor and Building Maintenance Repairman are responsible for keeping the site accessible for visitors all year round and therefore, their concern is more on maintaining the grounds up to the standard required for visitations.

3. Visitation and interpretation

The number of visitors Ephrata Cloister receives annually is not a major management concern. However, during the peak visitation season, the number of visitors at a one time may place excessive load that is detrimental to the historic fabric as well as the visitor experience. The guided tour only includes three buildings and the visitors have to rely on the brochure provided to visit the other structures, which gives brief history and description on the exhibits. There is no system in place to monitor the visitors and assess visitor experience.

Ephrata Cloister is located in a community where the German heritage is a popular tourist attraction. The Cloister needs to coordinate more with the Ephrata Borough and Lancaster County to promote the site with other heritage sites in a regional level. It is one of the three most visited sites owned by Pennsylvania Historical and Museum Commission in Lancaster County.[43] Promoting the site as a unique community in a regional level will provide a wider audience for the site to develop optimum visitation level. At the same time, studies should also be done on the optimum number of visitor that the site could manage without adversely affecting the resources. The Ephrata Cloister Associates provides volunteers, funding, and also assist in running the interpretation programs. With a membership of nearly 500, the Associates is a resourceful organization to promote more activities at the Cloister.

Preservation objectives

1. Building preservation

- The exterior building survey form provides basic information on the condition of the exterior materials. This survey should be performed seasonally supported by photographic documentation taken from the same station point. This will provide information on how the materials are performing in different seasons and the change in condition annually can observed. Mapping this information will assist in calculating damage and deterioration, and estimating cost for maintenance work.

- The restored first floors are accessible to visitation and thus undergo constant wearing. Rope barriers are used to protect the displayed collection. During peak visitation season large numbers of visitors are allowed in the building at a given time. Interiors should be inspected at least twice a year, preferably before and after the peak visitor season and the condition recorded in the survey forms with photographic documentation of all interior walls. This provides a comparative analysis of the affects of visitation on the interior fabric and alerts management to changes in the condition of the materials. In addition, the most crucial action to maintain the interior in good condition is weekly housekeeping.

[43] Interview with Michael Ripton, Museum Director at the Ephrata Cloister on March 01, 1999.

- Most of the original historic fabric is located in the upper floors of the buildings, which is not accessible to visitors and require special attention. These unrestored interiors appear deteriorated with fallen and patched plaster, flaking paint, uneven flooring, etc. Most of the damage is limited to the surface finishes. The management policy has been to preserve the original interior fabric by replacing damaged and deteriorated clapboard siding and roof shingles, thus preventing water infiltration and also limiting visitor access. This practice of controlling the cause of damage should be continued. As the structure is in stable condition, regular housekeeping will protect the historic fabric from further deterioration. A periodic survey is required to monitor the performance of the historic elements and materials. Recording the existing condition and taking photographs from the same station point at least once every two years will provide information on any change in the fabric, extent of damage or deterioration, and alert the management to take measures to arrest the deterioration.

- These condition survey forms are basic and do not require great amount of time to perform. The maintenance crew has to assign time for a periodic survey of the buildings. Management should prioritize its concerns and the focus should be the preservation of the resources, that is, the buildings.

2. Archaeological resource

- A number of structures were torn down for various reasons throughout the history of the site. The site still retains information underground that would provide a better understanding of the lifestyle of the Cloister. The on going research is expected to provide additional accurate information of the historic setting and lifestyles. Further excavation should be allowed only if convincing information to fill the gaps in understanding the site better is to be found. The only rationale for further investigations would be to get a better understanding or new knowledge of the setting and lifestyle during the Cloister's period of significance or earlier. As things stand, this can be drawn from the existing survey and descriptive information. Unless new construction is required for areas where the anomaly map shows major disturbances, further excavation should be avoided.

- Currently, the interpretation of archaeological discoveries is inadequately presented for visitors. The on-going archaeological investigations exhibit the excavations and findings every summer in one of the reconstructed buildings. This research is discovering additional information on the location of the buildings no longer standing and physical evidences of the lifestyle at the Cloister. Bethania, the Brothers' House demolished in 1910 is the only site marked by a sign showing the plans of the building and historic photographs before it was torn down. This provides inadequate interpretation of an important building. The locations of other buildings are not sufficiently presented to provide a better understanding of the historic setting to the

public. The buildings should be represented on the ground so as to give a sense of the historic town-like setting. This can be accomplished through very low walls or markers on the ground.

3. Setting and Landscape

- The banks of the Cocalico Creek was still frontier land when Beissel came to settle here from Philadelphia. As more followers arrived, cabins were built to house the new arrivals. The woods were cleared to build the community and in its height of popularity there were more than 300 members. As described in chapter two, the landscape at Ephrata Cloister today does not provide accurate setting of the site during its period of significance. It was a busy little town with printing press, bakery, and mills with buildings clustered together. The sylvan appearance of the site today does not convey the austere and rigorous atmosphere of the monastic life at the Cloister. The Cloister members also engaged in farming for their own consumption and also grew fruit trees. Studies should also be done on the indigenous vegetation at Ephrata so that the current trees can be slowly replaced by more suitable vegetation that are not destructive to the historic buildings.

- Ephrata should not aim to go back to its period of significance, however further studies are required to fully understand the earlier landscape and how it influenced the lifestyle of the monastery and try to recapture the general atmosphere of the

period. As most of the historic buildings are situated on the flood plain, further research on the landscape will also provide information to protect the resources against flooding.

Chapter Four: Management Policies and Strategies for Implementation

Objectives of Management Policy and planning

The mission statement of Ephrata Cloister as stated in the General Management Plan (GMP)[44] is to

> "preserve and interpret the national landmark and its history as a meaningful example of religious toleration and intellectual freedom in the New World and its relevance to everyday life today."

The management intends to achieve this mission through the different interpretive themes described in chapter two. The plan further states that the "mission will be accomplished through efforts in collections acquisition, preservation and conservation maintenance, research, educational programs and public participation."[45] The mission statement does not address the architectural importance of the site that is the physical manifestations of its history and focuses instead in the historical and associative significance and interpretation of the site. The mission statement should focus on the preservation of the resources as a national landmark and interpretation of its associative history to protect and better understand the site.

The first priority in developing strategies to accomplish its mission is the preservation of historic buildings and collections and the generation of funds to ensure the success of this

[44] The Ephrata Cloister General Management Plan 1997-2002, Pennsylvania Historical and Museum Commission and the Ephrata Cloister Associates, Lancaster, Pennsylvania, June, 1997.
[45] Ibid.

program by continuing research and building inspections.[46] It intends to achieve this by continuing "the documentation of buildings through research and study," monitoring change, and recording all of the preservation actions as permanent documents. A second historic structures report is in progress to continue the documentation, however, despite earlier recommendations and mentioned as the first priority in the general management plan, there is no periodic monitoring of the structures in place.

As explained in chapter three, due to the lack of staff, funds, and expertise at the Cloister the priority of the building maintenance staff has been to maintain the grounds rather than carry out building inspections or maintenance. While the landscape is an important component for the preservation of Ephrata Cloister, it is the historic buildings and collections that should take precedence in the management of the site. The management of the Cloister should involve two different levels of operation. The first involves day-to-day management that the present Ephrata staff can be responsible for. This involves housekeeping, periodic inspections, and documentation. For more specialized preservation and treatment issues, which is outside the scope of the maintenance staff responsibility, it is recommended to seek professional consultants.

Management policy

A clear management policy is required to preserve the resources at Ephrata Cloister and effectively implement its preservation plans. The challenge is to preserve the significance

[46] The Ephrata Cloister General Management Plan 1997-2002, Pennsylvania Historical and Museum

of the site within the constraints of technical expertise and funding available for its implementation. The principal concerns for a preservation management policy are conservation, maintenance and monitoring, function, presentation and interpretation, documentation, research, and the administration and housekeeping. The management policy should give direction for the preservation strategies and management of the site.

1. Conservation policy: The first priority of the management is the preservation of historic buildings and collections and to take necessary actions to preserve extant historic fabric and its integrity with continued research, documentation, maintenance, and monitoring and seek expert advice on treatment and preservation of the historic fabric.
2. Use policy: To interpret and exhibit all aspects of the unique architectural and cultural significance of the site, to promote the site, and develop local community participation through collections, educational programs, research, and preservation and maintenance without adversely effecting the historic fabric and its values.
3. Maintenance and monitoring policy: To regularly inspect, maintain, and record the condition of the resources to prevent deterioration or decay and to keep records of conditions and preservation activities for future reference and work.
4. Documentation and research policy: To determine the areas of research and documentation that need to be further investigated and revise interpretation to include all new findings.

Commission and the Ephrata Cloister Associates, Lancaster, Pennsylvania, June 1997.

5. Administration: To find the necessary financial resources and technical expertise in order to preserve, maintain, and interpret the site.

Implementation of geographic information system

The geographic information system has put together all relevant information for the management of Ephrata Cloister. All resources are represented in a series of maps and brought into ArcView®. These maps are supported by a database created in Microsoft Access®, which contains the attribute information on these resources. This system is expected to assist in the daily management of the Cloister as well as a tool for future planning to preserve the resources. Visual analysis of these maps was done for this study to identify preservation issues. This system can be further expanded to use as a tool to prepare plans to address these issues.

1. Building preservation

- Ephrata Cloister 18th century: The 18th century Ephrata Cloister plan presents the site in its first phase of development, from 1732 to 1815. This site plan was created from written descriptions and the archaeological survey and lacks the accuracy of the current map. It presents a view of the Cloister during its religious and communal experimentation period and the buildings are grouped into the three building phases described in chapter two (See Figure 8). This building phase map shows that the early building were built close to the creek and later extended towards the Zion hill.

- Ephrata Cloister 1815: The 1815 site plan shows the Cloister when the Seventh Day Baptist Church occupied the site. This site plan is based on the 1815 sketch, archaeological investigations, and the current site plan. This site plan shows the Cloister mills and the boundary extends further south than the current boundary (See Figure 9).

- Ephrata Cloister 1940: The 1940 site plan is digitized from an aerial photograph taken in the same year. The site boundary in this photograph is not clear, though it shows that it covered a larger area than the current boundary (See Figure 10). This photograph also shows very few trees, with the land surrounding the buildings extensively used for farming. The paths during this period are different from the current trails. The entrance has also been relocated.

- Ephrata Cloister 1999: The current site plan includes the buildings, site improvements, utilities, vegetation, paths, etc. (See Figure 11). An aerial photograph taken in 1993 shows the surrounding development intruding upon the site supplements this map (See Figure 23). The current site plan is rectified to the world co-ordinate system and is very accurate. Both aerial photographs have also been

rectified to the world coordinates.[47] As additional information on demolished building become available, the new maps can be easily added.

- Resource inventory: The inventory database is linked to this series of building chronology maps by a common identifying field and provides information on the status of the buildings and the other features on the site.[48] This database can be viewed with the site plan and also mapped out according to the management requirements. This database provides the options to view the site plan according to the date of construction, the level of architectural significance, use, etc.

- Survey forms: Survey forms intended to document and monitor the exterior, interior, and historic fabric condition and also observe the treatments are linked to the site plan.[49] The exterior condition survey records the condition of all exterior materials, date of inspection, weather conditions, etc. This gives management the options to view different information regarding the condition of the resources as required such as the urgency of repairs, inspection schedule, etc. Cost estimates for repair can also be calculated based on this information. This information provides the manager with quick review of the condition of the resources and the schedule of inspections.

[47] The 1993 aerial photograph was received rectified from Lancaster County GIS Department. The 1940 aerial photograph was obtained from the Pennsylvania Historical and Museum Commission and rectified by Lancaster County GIS Department.
[48] See Appendix B: Database Report, p. 87.
[49] See Appendix B: Database Report, p. 87.

- Other functions: Overlaying different maps such as the contour map with the building and drainage maps help in identifying problem areas. Appropriate plans for re-grading surrounding areas or reconfiguring concrete walkway can thus be designed using this information. The impact of vegetation on the buildings can be viewed and analyzed combining the vegetation map and the current site plan (See Figure 20).

2. Archaeology

- 50 feet archaeological grid: A 50' grid based on the 5' grid established by Stephen G. Warfel during the second archaeological campaign has been created to map the excavated sites (figure 15).[50] This gives the accurate location of the buildings remains excavated during this investigation and the earlier investigations done by Beiver. The excavated sections are included in the building chronology maps to give the exact location of these buildings demolished for various reasons. The approximate location of early eighteenth century buildings was determined based on the descriptions and the evidence of underground disturbances in the anomaly map.

- Remote sensing surveys: The remote-sensing survey information is also added as different map layers; geophysical survey coverage, major electro-magnetic anomaly locations, and major magnetic anomaly locations (See Figures 16, 17, and 18). The results of these three surveys have been combined to create the anomaly map, which

[50] The 50' grid can easily be changed to any scale required for more precise location of the archaeological

provides information on the potential location of underground disturbances (See Figure 19). The 50' grid overlaid on this map gives the accurate location of areas of interest underground for future investigations.

- Archaeological investigations database: The database for the archaeological investigations provides information on the date of construction, demolition, and excavation of the structure, the investigator, historic use, location of references for this site, and also includes photographs taken during excavation.[51] These investigations have assisted in mapping the demolished buildings for the building chronology site plans. The anomaly map also provides information on the potential areas of interest to be avoided in future development plans for the site.

3. Interpretation

- Building chronology maps: The building chronology maps supplemented with the aerial photographs provide an excellent graphic description of the site during its various phases, which can also be used to regain the character of the historic setting. These maps supported by markers on the ground could help in better interpreting the setting and the buildings no longer standing, providing a better sense of historic Ephrata. This potential tool is demonstrated with three-dimensional presentation of the site showing both demolished buildings and extant buildings in different

deposits. The 50' was selected to make the map graphically comprehensible.

transparency levels (See Figure 27). This image can also be rotated and viewed from different angles to get an overall view of the site. These maps can also be used to illustrate various interpretive themes for visitors. The daily activities of the solitary orders could be mapped to interpret the monastic lifestyles.

- Visitor control: The geographic information system can also be used to study the route and interest of the visitors and develop plans to enhance visitor experience. The effects of visitation patterns on extant historic fabric and landscape features should also be monitored. As mentioned before, the historic buildings at the site are open only partially to the public because the upper floors do not have the load bearing capacity for large group of visitors. However, the upper floors are the only places that retain surviving original fabric and configuration. Geographic information system can be used to simulate and demonstrate the upper floors for the visitors.

4. Landscape

- Setting: The aerial photographs display the change in the use patterns of the current site and in mid-twentieth century during the Seventh Day Baptist Church occupation of the Cloister (See Figure 13). The aerial photograph from 1940 clearly shows that during that time farming was a major activity in the site. There are very few trees visible. Overlaying the vegetation map on the 1940 aerial photograph provides a clear

[51] See Appendix B: Database Report, p. 87.

picture of trees erroneously planted as part of the restoration projects (See Figure 24). The map and database for vegetation also includes the species of tree found today (See Figure 20). This information can assist in selecting alternative tree species and locations to replace those detrimental to the historic buildings and character of the site. Historic documents indicate that there was an orchard during the 18th century that was cut down perhaps as early as 1745.[52] However, further research is required to locate the exact location of this orchard. The current orchard is a representation of one of the Cloister community's various activities. The concrete walkways are also intrusive and do not present historic appearance. Alternative material that is compatible in appearance to the natural walkways should be considered for replacement to provide a more accurate visitor experience.

- Topography: The erosion caused by the Cocalico Creek can be observed by comparing the two aerial photographs (See Figure 13, 14). The creek also floods the nearby land during heavy rains. As most of the extant buildings lie on this low flood-prone meadow, the erosion pattern of the creek needs to be monitored. The three-dimensional topography of the site shows the location of these extant building in these low lands (See Figure 25). This map is a tool to plan for the natural drainage of the site to avoid flooding in the historic buildings, and also for verification of additional erosion after each future floods.

[52] Peter C. Erb, Johann Conrad Beissel and the Ephrata Community: Mystical and Historical Texts, Lewiston, NY: E. Mellon Press, 1985, p. 26.

- Surrounding development: The 1993 aerial photograph and the supplementary building footprint map show the development of the surrounding community (See Figure 23, 24). Comparison between these maps and the 1940 aerial photograph indicates that land use patterns have changed drastically in the past fifty years. It also shows the increasing encroachment of the surrounding community upon the Cloister site, which has already lost its adjoining lands to development and highways. This information should be made available to the local and regional development agencies to prevent further encroachment, which would result in additional loss of integrity of the Cloister. The aerial photograph with the three-dimensional topographic representation also provides the viewpoints to protect the integrity of the setting of the historic site.

Conclusion

- The principal management concerns at Ephrata Cloister is the preservation of the historic buildings, archaeological deposits, and the landscape. As the structures are in stable condition, periodic monitoring and maintenance will ensure the continued preservation of the buildings. This thesis has attempted to put together all the relevant information pertaining to the preservation of Ephrata Cloister for the management of the site. The framework created for preservation management using the geographic information system is intended to assist the maintenance staff survey, record the condition of the resources, and provide information in making informed and efficient management decisions. This system should be further expanded and used as an analytical tool to assist in preparing preservation plans.

- The General Management Plan mentioned in chapter four has identified a number of issues to make the interpretive program better. These include the revision of the interpretation program to include the research findings of the last two decades and improvements to visitor services as well as a new guidebook for visitors. This new guidebook should include a suggested route for the visitor representing a typical day at the Cloister during its period of significance. This interpretation should also include the two springs and the Cocalico Creek, which has not been represented well in the current guidebook. The three dimensional presentation of the Cloister using the

geographic system at various periods will assist in the interpretation and presentation of the historic setting.

- Ideally the geographic information system would best serve the management if the system were set up at the site. However, because technical, managerial, and financial constraints this system would assist equally well if it were set up in a central terminal. The site staff could perform the inspections periodically and record the information in a database that can be easily converted to the database set up with the geographic information system. This will allow the technical and preservation staffs at the central terminal to monitor more than one site and also compare the different sites.

- Alternatively, the geographic information system should be expanded and used as a repository of data for all the historic sites owned by the Pennsylvania Historical and Museum Commission. This will allow the Commission to identify preservation and management issues and compare the various sites. This system will also provide a standardized methodology for the management of all sites.

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APPENDICES

Appendix A: Illustrations

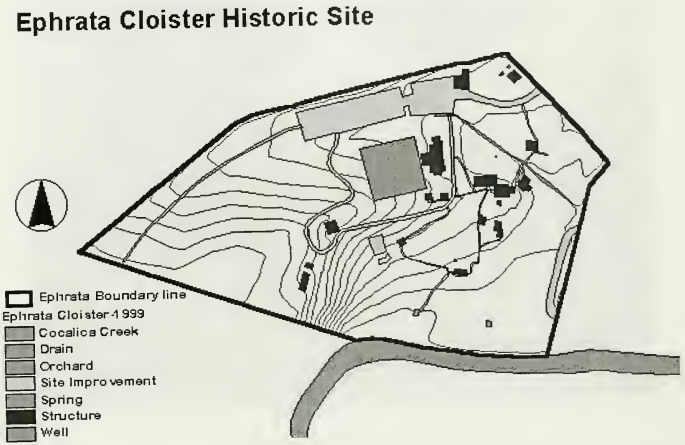


Figure 1: Site Plan of Ephrata Cloister Historic Site

Figure 2: Saal and Saron

Figure 3: Multiple Rows of Shed Dormers

Figure 4: Exposed Beam-ends with Protective Shingle Covers

Figure 5: Saron 1743

Figure 6: Bake Oven 1734

Figure 7: Almonry 1734

Ephrata Cloister Historic Site

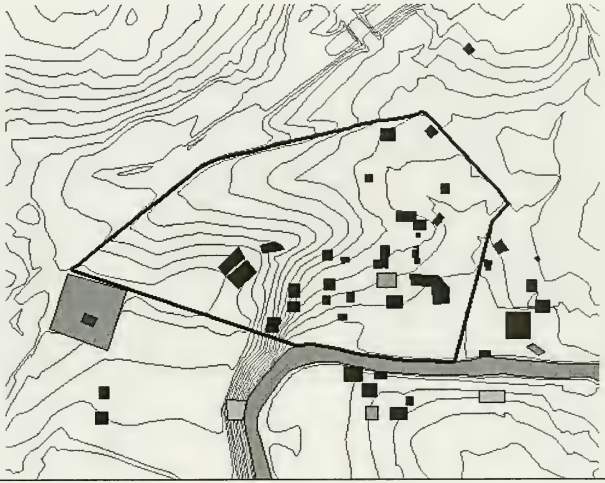
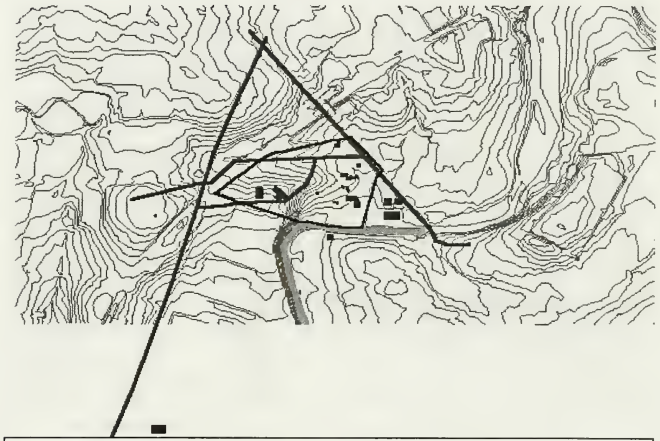


Figure 9: Ephrata Cloister 18th Century: Approximate locations based on M. H. Heinicke History of Ephrata, PA and archaeological investigation drawings

Ephrata Boundary line
Ephrata Cloister 18th Century
Cemetery
Cocalico Creek
Dam
Monument
Quarry
Structure

Ephrata Cloister Historic Site



Ephrata Boundary line
Roads-1815
Ephrata Cloister-1815
Cocalico Creek
Structure

Figure 9: Ephrata Cloister 1815 based on the 1815 Land Draft

Ephrata Cloister Historic Site

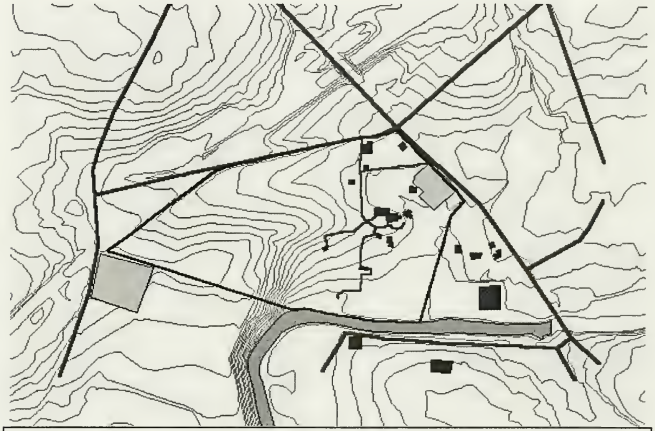


Figure 10: Ephrata Cloister 1940 based on 1940 Aerial photograph

Ephrata Boundary line
Ephrata Cloister-1940
Cemetery
Cocalico Creek
Structure
Paths-1940
Roads-1940

Ephrata Cloister Historic Site

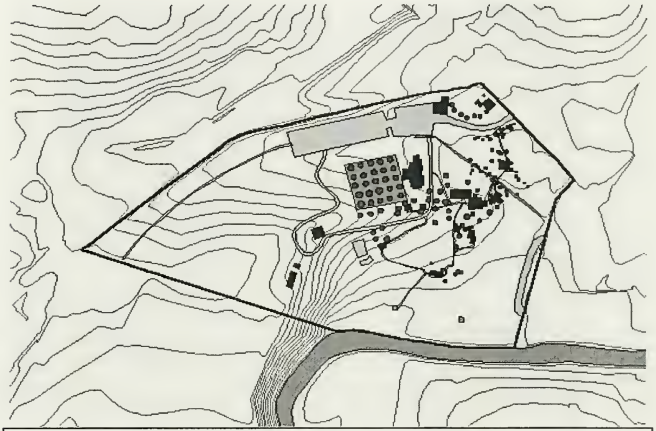


Figure 11: Ephrata Cloister 1999

Ephrata Boundary line
Vegetation
Ephrata Cloister-1999
Cocalica Creek
Drain
Orchard
Site Improvement
Spring
Structure
Well

Ephrata Cloister Historic Site

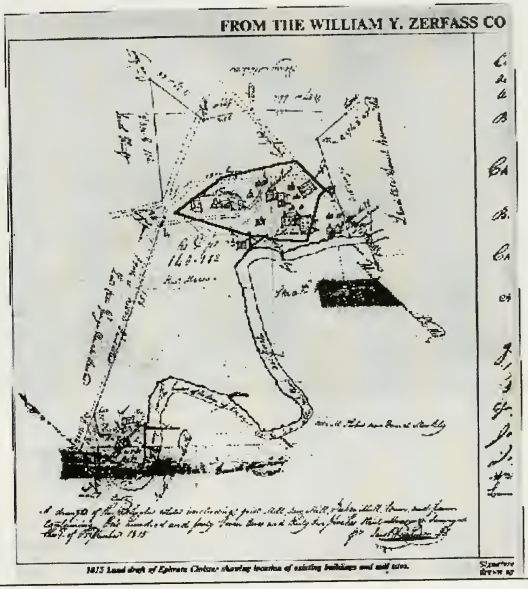


Figure 12: 1815 Land Draft of Ephrata Cloister Showing Existing Buildings and Mill Sites

Ephrata Boundary line
1815 Land Draft of Ephrata Cloister
:Layer_1

Ephrata Cloister Historic Site

Figure 13: Aerial View of Ephrata Cloister 1940

Ephrata Boundary line

Ephrata Cloister Historic Site

Figure 14: Aerial View of Ephrata Cloister 1993

Ephrata Boundary line

Ephrata Cloister Historic Site

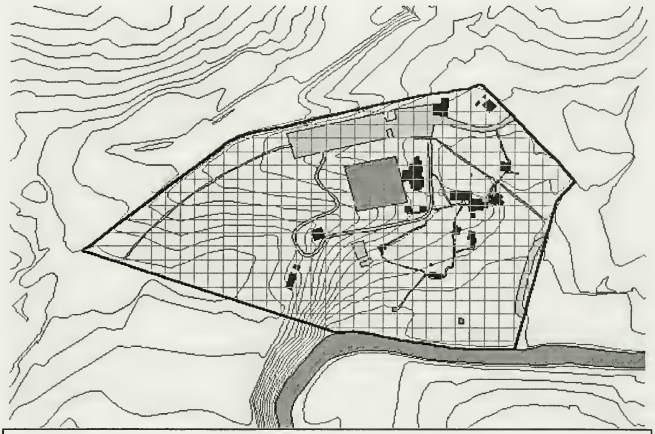


Figure 15: 50 Feet Archaeological Grid

Ephrata Boundary line
Archaeological Grid
50' Grid
Ephrata Cloister-1999
Cocalica Creek
Drain
Orchard
Site Improvement
Spring
Structure
Well

Ephrata Cloister Historic Site

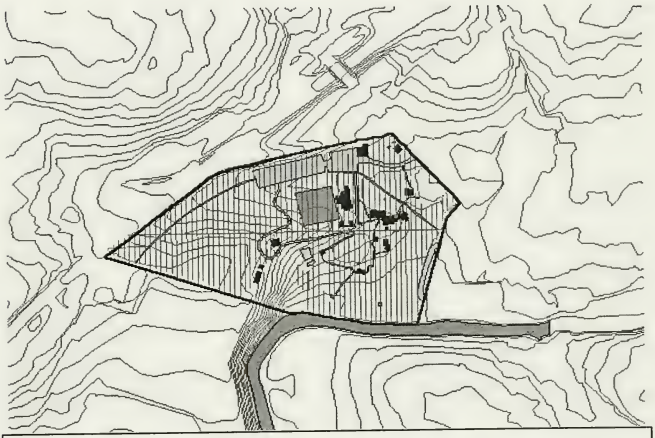
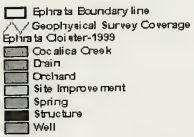


Figure 16: Geophysical Survey



Ephrata Cloister Historic Site

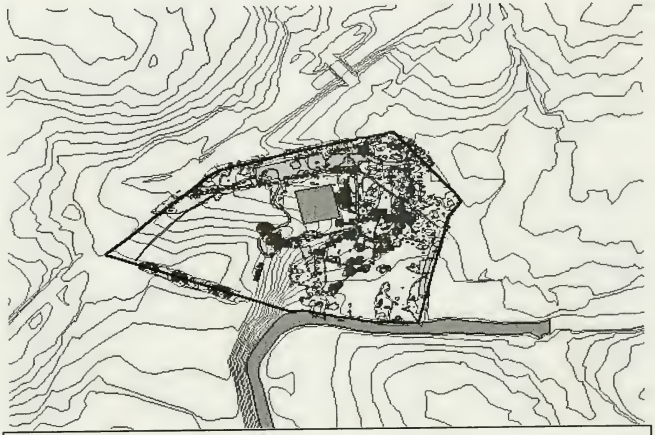
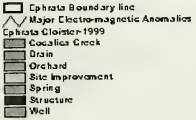


Figure 17: Major Electro-Magnetic Anomaly Locations



Ephrata Cloister Historic Site

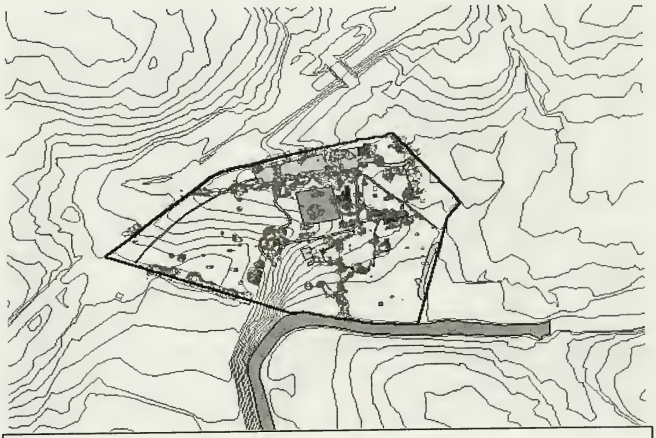


Figure 18: Major Magnetic Anomaly Locations

Ephrata Boundary line
Major Mag Anomalies
Ephrata Cloister-1999
Cocalica Creek
Drain
Orchard
Site Improvement
Spring
Structure
Well

Ephrata Cloister Historic Site

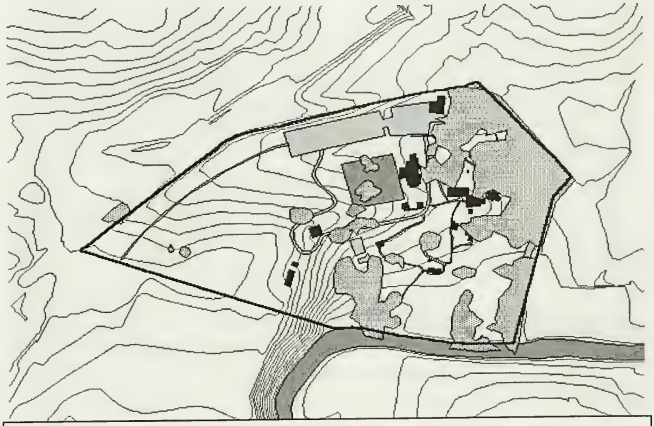


Figure 19: Anomaly Locations

Ephrata Boundary line
Anomaly locations
Ephrata Cloister-1999
Cocalico Creek
Drain
Orchard
Site Improvement
Spring
Structure
Well

Ephrata Cloister Historic Site

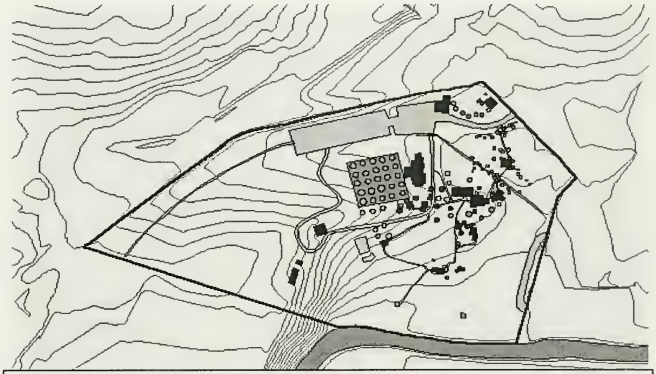


Figure 20: Current Vegetation

Ephrata Boundary line

Vegetation

- Apple
- Birch
- Cherry
- Crabapple
- Dogwood
- Dogwwod
- Hemlock
- Holly
- Locust
- Maple
- Oak
- Pine
- Rose-O-Sharch
- Sassafras
- Shrub
- Syc
- Tree
- Twin Hemlock
- Walnut

Ephrata Cloister Historic Site

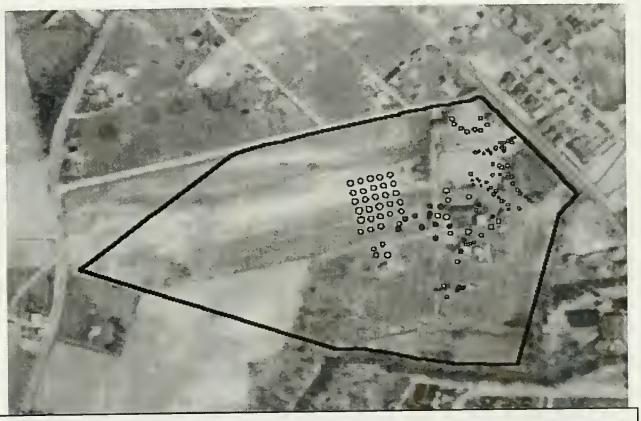
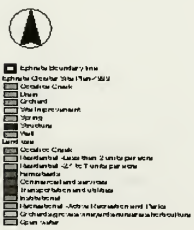


Figure 21: Comparison Between Current Vegetation and 1940 Landscape

Ephrata Boundary line
Vegetation
Apple
Birch
Cherry
Crabapple
Dogwood
Dogwwod
Hemlock
Holly
Locust
Maple
Oak
Pine
Rose-O-Sharch
Sassafras
Shrub
Syc
Tree
Twin Hemlock
Walnut

Ephrata Cloister Historic Site

Figure 22: Current Land Use



Ephrata Cloister Historic Site

Figure 23: Comparison Between Current Development and 1940 Landscape

Ephrata Cloister Historic Site

Figure 24: Comparison Between Highways and 1940 Landscape

Figure 25: Three Dimensional View of Ephrata Cloister 1999

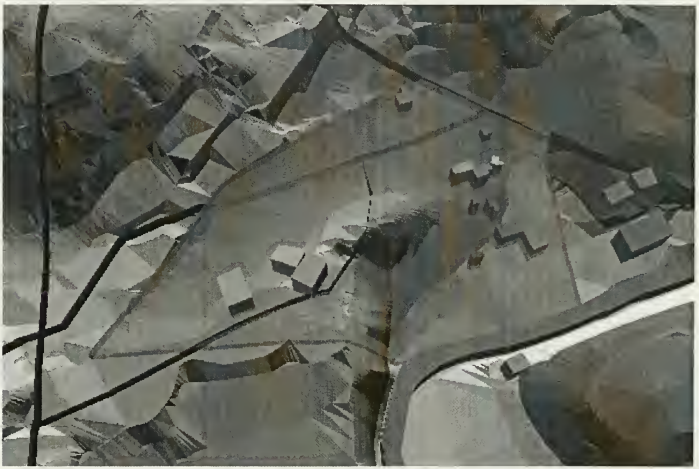


Figure 26: Three dimensional view of Ephrata Cloister 1815

Figure 27: Three Dimensional Presentation of Ephrata Cloister today with the buildings existing in 1815 shown as transparent

Appendix B: Sample Database Reports

Archaeological Investigations

ID	1
Feature Name	Deposit_1
Feature Type	
Feature Location	North side of Beissel Cabin
Feature Description: Secondary	Small masonry foundation
Feature Description: Primary	Shallow cellar hole depression
Feature Interpretation: Primary Dates	ca. 1732-1748
Feature Interpretation: Secondary Functions	Remains of Solitary Cabin
Investigation Dates	June-July 1993
Principal Investigator	Stephen G. Warfel
References/Reports	
Reports Location	

Photographs: Feature

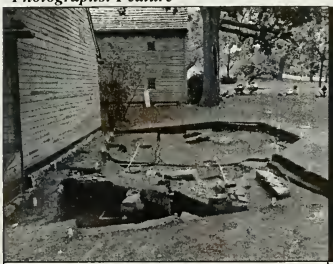


Figure 2 Completed cellar hole excavation

Photographs: Artifacts

Figure 1 Reconstructed Staffordshire cups

Resource Inventory

ID	24
Resource Name	Saron
Construction Date	1743
Original To Site	Yes
Architectural significance	Contributing
Historical Significance	Yes
Historic Use	Monastery
Current Use	Museum
Access	Partial
Resource Type	Building

Photograph

Figure 4. Saron

Interior Conditions Survey

ID	1
Number of Stories	
Resource Name	Academy
Interior Wall	
Plaster Condition	
Interior Finish	
Ceiling Material	
Ceiling Condition	
Interior Floor	
Interior floor	
Stairs material	
Stair Condition	
Painted	
Paint Condtion	
Fireplace Material	
Fireplace Condition	
Miscelleneous	
Comments	

Photograph

Treatments and Interventions

ID	
Resource Name	
Retsoration Date(s)	
Principal Restorer	
Resotration Type	
Restoration	
Treatment used	

Photograph

Comments

Vegetation

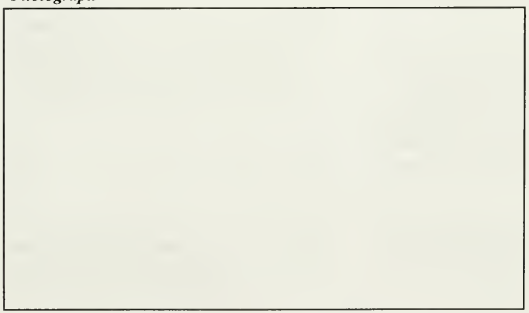
ID	101
Tree Name	Dogwood
Date(s) surveyed	
Tree Type	
Tree Condition	
Age	
Indigenous	
Tree size	

Photograph

Exterior Conditions Survey

BLDGS_ID		*Resource Name*	Stable
ID	25	*Date(s) Surveyed*	
Weather		*Site Work*	
Concrete		*Masonry: Brick*	
Masonry: Stone		*Masonry: Mortar*	
Metals Wood:		*Framing*	
Wood: Sheathing		*Wood: Trim*	
Wood: Misc			
T & M Protection: Doors			
T & M Protection: Windows			
T & M protection: Finishes			
Mechanical			
Electrical			
Specialties			
Miscellaneous			

Photograph



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