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I. Foreword

This Historic Structure Report (HSR) was prepared by Historic Resources Group, LLC at the request of the Doris Duke Foundation for Islamic Art. Its purpose is to document the current conditions of the property; summarize significance and history; and suggest recommendations for maintenance and rehabilitation.

Shangri La is located at 4055 Papu Circle in the City and County of Honolulu. It is owned by the Doris Duke Foundation for Islamic Art.

Shangri La is significant because of its association with Doris Duke; for the integration of her collection of Islamic Art; and the architecture of Marion Sims Wyeth. Its period of significance is 1938-93. The Secretary of the Interior’s Standards for Rehabilitation are recommended as the most appropriate criteria for treatment of this property.

The preparation of an Historic Structure Report represents a step forward by the Doris Duke Foundation for Islamic Art in the stewardship of the site. An HSR is the primary type of document used to guide treatment and use of historic structures. It does not provide the comprehensive history of the site, building, people, and events. However, the report draws from history to define the reasons that the site is significant and determine which spaces and features contribute to that significance. The long term survival of the site is dependent upon planning for the maintenance and repair of those character-defining spaces and features. The recommended treatments that will conserve the integrity of Shangri La range from housekeeping to physical repairs to administrative management and record-keeping.

The foundation of conservation planning is a documentary record of the site. This serves the purpose of “knowing the object,” in order to identify problem conditions and recommend effective solutions. Documentation provides a record of conditions for comparison over a period of time. This record assists in restoration and replication if there are unfortunate losses due to disasters such as storms, earthquakes, and fires. The existing conditions survey report details more than 1,600 features (e.g., doors, walls, windows). These records include condition descriptions, a determination of significance, and recommendations for treatment.

The primary “product” of this Historic Structure Report are digital files, an inter-relational database containing more than 1,600 records.
II. Introduction

A. Purpose

The purpose of this Historic Structures Report (HSR) is to provide a statement of significance of the site, document the architectural features of the site, evaluate existing conditions, and make recommendations for treatment. Analysis of Shangri La and its features will provide the stewards of the property with recommendations for the rehabilitation and maintenance of the extant architectural character-defining features of the site. The recommendations for treatment extend to maintenance of features that contribute to the safety and security of the existing buildings. The existing buildings should be accessioned as part of the museum’s collection. The buildings themselves serve two purposes: as important artistic artifacts, and as the containers for an important artistic collection.

With a firm commitment to preserve the historic elements of Shangri La, the Doris Duke Foundation for Islamic Art (DDFIA) sought to further investigate the conditions of the extant historic structure and site features. This Historic Structure Report will augment prior studies of the site to create a comprehensive record of the site’s current conditions and conservation needs. The DDFIA intends to utilize these reports to guide future preservation efforts, and inform future rehabilitation and adaptation of the buildings and site. The DDFIA has been a good steward of this historic resource and will continue to use accepted practices and standards for the stabilization of the historic structure and site features.

DDFIA was preparing a strategic plan during the preparation of this report. The two efforts were independent, but were informed by discussions between the staff and consultants about Shangri La’s programmatic needs and the fit of buildings and site for the future.

B. Approach

An Historic Structure Report is the primary type of document used to guide treatment and use of historic structures. Caretakers of historic sites and preservation organizations use such documents to provide base line data on the current condition of their facilities and to assist in analyzing rehabilitation options.

In 1991 revisions to the guidelines that direct cultural resource management activities allowed for greater flexibility in format and levels of research for Historic Structure Reports. The proposed ultimate treatment, level of significance of the resource, and threats to the condition of the resource were noted as variables to be taken into consideration when establishing the scope of such documents. At the same time, NPS emphasized that the documents:

    should focus explicitly on issues related to building fabric and should address all aspects of construction history—including recordation of preservation treatment…and recommends that the content and organization of an Historic Structure Report be structured to ease its use as a reference in decision-making.¹

The following policy statements direct the preparation of an HSR:

- Historic Structure Reports are reference documents for the purpose of minimizing the loss of significant fabric during restoration or rehabilitation work.
- Historic Structure Reports should be defined to include any of the following: physical history and condition, alternative ways to meet management objectives, and specifics of actual treatment.
- Historic Structure Reports should be restricted to information bearing directly on historic material and character. In particular, historical research should be focused on the development and use of the structure.
- Historic Structure Reports should not unnecessarily republish information available from other convenient sources.
- Historic Structure Reports should be required whenever existing information about the physical history and condition does not provide an adequate basis upon which to address anticipated management or owner issues and when impeding development could have a significant adverse effect.
- Historic Structure Reports should be prepared for the entire structure. Time and money spent on an Historic Structure Report should be limited by management or owner objectives and the structure’s significance.
- Historic Structure Reports should be written for primary audiences, maximize the use of existing reliable information, and minimize its reformatting.
- Historic Structure Reports may be undertaken on an incremental basis when time and resources are limited.
- Flexibility in formatting an Historic Structure Report is important to maximize communication between the professionals preparing the report and the management or the owner, to allow the use of existing information, and to use new information for other purposes.

The current definition of an Historic Structure Report was developed and refined by the National Park Service in the intervening years and published in technical materials and in the Association for Preservation Technology (APT) Bulletin of 1997. Discussion of Historic Structure Reports in that Bulletin uses a definition that was used as the basis for this report. This definition states that:

An Historic Structure Report is to provide a definitive analysis of the physical history of a structure through research and trained observation. In addition to documenting significance, history, and condition, the Historic Structure Report then serves as the vehicle to determine appropriate subsequent rehabilitation and maintenance efforts. The National Park Service, APT, ASTM, and others have prepared technical materials to assist professionals in preparing Historic Structure Reports according to current standards. In particular:

(The ASTM Guide) provides a list of reference documents related to Historic Structure Reports, a discussion of their significance and use, approaches and procedures for preparing and using Historic Structure Reports, and suggestions for the disciplines from which Historic Structure Report team members may be drawn. Historical research, site inspection, methods of documentation, field testing and sample review, laboratory testing and materials analysis, evaluation of research and inspection results, and development of treatment
More recently, in 2005, the National Park Service published Preservation Brief 43, “The Preparation and Use of Historic Structure Reports,”\(^3\) which is fundamentally consistent with the APT publication.

The Historic Structure Report for Shangri La presents an itemized review of elements of construction and an evaluation of conditions. The Treatment component of this report is critical in establishing standards for the retention, repair, and maintenance of existing historic elements and materials.

The effort which produced the present document consists of several elements: first, research into archival, published, and oral sources which illuminate the physical history of the building; second, on-site analysis of the current conditions of the building’s materials and features which would guide the recommendations for treatment; and third, creation of a database which allows users to easily access information about existing conditions and proposed treatments.

This consulting assignment was strongly focused by DDFIA during scoping and implementation on (a) multidisciplinary assessment of the condition of existing building features, and (b) delivery of the information in the form of an inter-relational database in “FileMaker” software. Sample “FileMaker” databases that HRG had produced for other properties were demonstrated to DDFIA prior to contracting the work, and the work delivered to DDFIA is consistent with those model projects.

After HRG was contracted to perform the HSR, DDFIA chose to investigate the technical feasibility of producing the HSR work in a software program titled “TMS” that is more familiar as a container for information about items in a museum collection that building features. It was determined through conferences with DDFIA staff that the HSR work produced by HRG should proceed with “FileMaker” format, and that the “FileMaker” data would be translated into the “TMS” software files already in use by DDFIA subsequent to completion of the HSR documents.

While the work plan for “FileMaker” and “TMS” migration may seem redundant, the process, under the circumstances, is as efficient as possible under these circumstances. “FileMaker” is simpler and easier for users; however, “TMS” has more capabilities and features, while not being easy for the novice to learn, program, and use. Ultimately, DDFIA will have a single database application that catalogues its art collection and its buildings, to the benefit of both in terms of documentation, maintenance, and records of treatments.

At the foundation of the “database” concept as the format for an HSR is an “open” approach to documenting conditions, treatments, and recommendations. The most efficient and sustainable approach to treatment of existing and culturally significant buildings demands the view that the work needed should not be a reaction to observed deterioration carried out in periodic campaigns, but rather a planned approach to housekeeping, inspection, maintenance, and replacement. In the long term, the continuous management approach, rather than


\(^{3}\) http://www.nps.gov/history/hps/tps/briefs/brief43.htm
the reactive project approach, protects historic fabric, costs less, and reduces the risk of failures and disasters that damage the buildings and collections contained therein. The digital, open database, can and should be a desktop facility management tool, easily accessible, and easily altered and augmented.

Without discounting the value of the information that has been delivered in the database, we emphasize that the thousands of “bits” of information delivered are not sacred. The most “sacred” part of this effort is to document existing conditions, current and future, to adjust priorities and tasks according to experience, and to make that record easily available for DDFIA’s current and future stewards.

Information about condition was collected at the site through field observation. First-hand inspection reports were compiled into a comprehensive database. Recommendations for treatment of the various materials and elements that compose the structure were developed through integrated analysis of the information contained in the database.

Following the field observation and preparation of initial reports, we prepared “bullet point” summaries that outlined primary issues and priorities. Cost consultants assisted in the preparation of budgets for repairs and cyclical maintenance work, resulting in a long range maintenance and capital improvements budget plan for DDFIA for the Shangri La site.

C. Organization of Report

This HSR contains the following parts:

History. This consists of a historical background and context which establishes a period of significance; a chronology of development and use which details the physical construction, alterations, and use of the building.

Architectural Evaluation. Refer to the digital database files. The intention of this section is to present the results of a detailed field research effort, and the documentation of existing interior and exterior conditions based upon visual observation. This includes a detailed evaluation of materials and features and their period of construction, installation or modification. All elements or features that are deemed character defining or significant should be specifically identified to ensure their retention and protection.

Recommendations. Refer to the digital database files. This is a statement of recommendations that are based on the observations and conclusions established by the earlier chapters. These may include general and specific treatment recommendations and alternatives, applicable programmatic recommendations, an outline of a prioritized scope of work, and cost estimates.

This includes review of the ultimate treatment and use of the building and site features; an outline of the requirements for treatment which includes building and safety codes and the criteria for recommendations, an evaluation of proposed treatment and alternatives which addresses the adequacy of alternative approaches in terms of impact on historic materials and the effect on historic character; and recommends a course of action and specific recommendations for preservation treatments.

Record of Treatment for the building and site features. This section documents work at the site. It consists of completion reports that summarize the intent of
the work, methods used to accomplish the work, time, and cost requirements. A description about the history of the site based on physical evidence discovered during construction is also part of the completion report.

**D. Administrative Data**

**Ownership**

The entity legally responsible for the building is the Doris Duke Foundation for Islamic Art.

**Cultural Resources Status**

In order for a building to qualify for listing in the National Register of Historic Places or the Hawaii Register, it must meet one or more identified criteria of significance. The property must also retain sufficient architectural integrity to continue to evoke the sense of place and time with which it is historically associated. An explanation of these designations follows.

**National Register of Historic Places**

The National Register of Historic Places, administered by the National Park Service (NPS), is “an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the nation’s cultural resources and to indicate what properties should be considered for protection from destruction or impairment.” However, the federal regulations explicitly provide that National Register listing of private property “does not prohibit under federal law or regulation any actions which may otherwise be taken by the property owner with respect to the property.” Listing in the National Register assists in preservation of historic properties through: recognition that a property is of significance to the nation, the state, or the community; consideration in the planning for Federal or federally assisted projects; eligibility for Federal tax benefits; considering in the decision to issue a surface coal mining permit; and qualification for Federal assistance for historic preservation, when funds are available.

To be eligible for listing in the National Register, a resource must possess significance in American history and culture, architecture, or archaeology. Listing in the National Register is primarily honorary and does not in and of itself provide protection of an historic resource. The primary effect of listing in the National Register on private owners of historic buildings is the availability of financial and tax incentives. In addition, for projects that receive Federal funding, the Section 106 clearance process must be completed. State and local regulations may also apply to properties listed in the National Register.

The Hawaii State Historic Preservation Office considers Shangri La eligible for placement on the National Register, though it is not formally listed on the Register.

**Hawaii Register of Historic Places**

The Hawaii Register of Historical Places is an authoritative guide used by State and local agencies, private groups, and citizens to identify the State’s historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change.

The criteria for eligibility for listing in the Hawaii Register are based upon National Register criteria. The list formally recognizes districts, sites, structures,
buildings and objects and their significance in Hawaii’s history, architecture, archaeology, engineering and culture.

The Hawaii State Historic Preservation Office considers Shangri La eligible for placement on the Hawaii Register, though it is not formally listed on the Register.

**Special Districts of the City and County of Honolulu**

The purpose of a special district is to provide a means by which certain areas in the community in need of restoration, preservation, redevelopment or rejuvenation may be designated as special districts to guide development to protect and/or enhance the physical and visual aspects of an area for the benefit of the community as a whole. Shangri La lies within the boundaries of the Diamond Head Special District.

**Recommendation for Cataloguing of Materials**

Copies of this Historic Structure Report should be archived in the offices of the Doris Duke Foundation for Islamic Art and the Doris Duke Charitable Foundation.
III. History

A. Statement of Significance

Shangri La’s Main Building, Playhouse, and Site features are significant in providing an optimum setting for the display and understanding of its collection and the study of Islamic art. The mission of the Doris Duke Foundation for Islamic Art is to improve the quality of peoples’ lives through the study, understanding and appreciation of Islamic arts and culture.

Period of Significance

The period of significance is used to inform the evaluation of existing spaces and features, in determining appropriate treatments, and in interpreting the site for visitors.

The period of significance for Shangri La is the residency of Doris Duke, which is the period from 1938 to 1993.

Statement of Significance

National Register criteria are applied to evaluate the significance and integrity of the Shangri La.

The National Register of Historic Places, administered by the National Park Service (NPS), is “an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the nation’s cultural resources.” A resource must possess significance in American history and culture, architecture, or archaeology.

Shangri La is significant for its association with Doris Duke, for the integration of her collection of Islamic art, and the architecture of Marion Sims Wyeth.

National Register Criteria

The criteria considered for Shangri La are:

- Criteria C, which states that a building embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

- There may be a possible secondary context for Criteria B. Criteria B states that a property associated with the lives of persons significant in our past may be eligible for the National Register.

We recommend that the Statement of Significance for Shangri La read:

“Shangri La is a significant site because it possesses high artistic values.”

We have distilled the criteria of significance in conference with the DDFIA staff in order to best represent the unique character of Shangri La’s buildings and site features as parts of, containers of, and settings for the Doris Duke collection of Islamic Art.
Criteria of Significance

Significant spaces and features are those that contribute substantially to the historic character of the site and fall within the period of significance. The removal or substantial alteration of a significant space or feature may result in an incremental loss of the historic character of the site.

The spaces and features of significance are considered character-defining. Character-defining features may include major architectural spaces and features as well as the smaller details of the building. All of the character-defining features of the building are important because they contribute to the understanding of the development of the property.

The following are categories of significance for the tangible spaces and features of Shangri La.

Primary Significance
Primary significance means that the space or feature is character-defining and contributes substantially to the historic nature of the site. The removal or alteration of these spaces or features would result in a substantial loss of historic character, material and workmanship of the site.

Secondary Significance
Secondary significance means that the space or feature is character-defining, but its removal or alteration results in a lesser loss of historic character of the site. This is true of spaces and features of similar type. Functional or service spaces that fall with the period of significance may have features and finishes that are less significant but still contribute to the understanding of the property.

Not Significant
Not significant means that the space or feature was built or added outside the period of significance and is not considered to be character-defining. Its removal or alteration would have no impact on the historic character of the site. This is true of substantially altered interior space configurations.
B. Chronology of Development and Use

Built in Honolulu, Hawaii in 1937, Shangri La overlooks the Pacific Ocean and Diamond Head and houses Doris Duke’s collection of Islamic art. Of Duke’s many residences, Shangri La is the only one that she built from the ground up and furnished from the inside out. There is no individual, including the architect, who had a comparable role in the conception, design, and execution of Shangri La. Miss Duke was directly responsible for the site selection, selected architectural models from Islamic architecture for design consideration, collaborated with the architect, commissioned architectural features that were an integral part of the building design, selected and acquired historic Islamic art and artifacts that were installed in the building, directed the continued development of the site during seven decades of the twentieth century, and participated manually in the creation and installation of elements of the property. The high artistic values embodied in Shangri La are the work of Doris Duke.

Doris Duke decided to build a seasonal home in Honolulu after her honeymoon in 1935, during which she visited the Islamic world and Hawaii for the first time. The honeymoon “discoveries” had a profound effect on Miss Duke’s life. Finding herself captivated by Islamic cultures and enamored with Hawaii, Doris Duke redirected planning for a new home in Palm Beach, Florida, to a site she acquired in Honolulu. However, she retained the Palm Beach architect, Marion Sims Wyeth, help her create a suitable estate, in a Honolulu setting, for an Islamic collection.

Shangri La borrows architectural elements and artistic sensibilities from regions of the Islamic world, and blends them with a distinctly Hawaiian landscape that features sweeping ocean views, exotic gardens and a 75-foot saltwater pool.

For nearly 60 years, Doris Duke commissioned and collected artifacts for Shangri La, ultimately forming a collection of about 3,500 objects. Massive painted ceilings, elaborately carved doorways, intricate mosaic tile panels, colorful textiles and ceramics, and numerous other art forms enliven the interiors and create an environment rich in texture and pattern.

Doris Duke transformed five acres of Hawaii into her own private Shangri La, a place for creative self-expression and a haven from the unwanted publicity that came with being one of the wealthiest women in the world.

Today, Shangri La is recognized as one of Hawaii’s most architecturally significant homes. It is owned and supported by the Doris Duke Foundation for Islamic Art (DDFIA), which Doris Duke created in her will to promote the study, understanding, and preservation of Islamic art and culture.4

Doris Duke

Doris Duke’s interest in Hawaiian and Islamic cultures was far removed from the East Coast social circle in which she was reared. The financial success of her father, James Buchanan Duke, propelled her into the society of other wealthy families of the industrial age. Doris Duke’s position was one of privilege, and her life was, consequently, of great public interest.

When her father died in 1925, she inherited the bulk of his estate, and was dubbed “the richest girl in the world.” The sobriquet was one of both sympathy

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and censure, yet this new identity provided Duke with a rare independence for a woman of her time. Adventurous, intelligent, independent and athletic, Duke was determined not to be defined by social expectations or her wealth. At the same time, she enjoyed the freedom her wealth provided to pursue her many interests, which included travel, the arts, historic preservation, environmental conservation, wildlife and horticulture.

In 1935 at age 22, Doris Duke married James Cromwell and embarked on a honeymoon tour of the world. Traveling through the Middle East and South Asia for the first time, Duke was fascinated by the rich cultural traditions she encountered, particularly the Islamic ones. These early travels sparked her lifelong passion for collecting and living with Islamic art. Her appreciation and interest in the Islamic world grew during repeated travels to Morocco, Egypt, Syria, Iraq, Iran, Turkey, Uzbekistan, Indonesia, Pakistan, Lebanon, India and other countries.

In August 1935, Doris Duke and James Cromwell arrived at the final stop on their honeymoon tour – the U.S. Territory of Hawaii. Attracted by the islands’ natural beauty and relaxed social environment, they extended their stay by four months. In the company of the multitalented Kahanamoku family and a small circle of Hawaiian friends, Doris Duke enjoyed surfing, paddling canoes, sailing, playing Hawaiian music and traveling around the Hawaiian Islands. In April 1936, she purchased a spectacular, 4.9-acre property for a seasonal residence in Honolulu. It was the same spot where she had spent leisurely days picnicking, surfing and swimming.

**Shangri La**

Inspired by her travels, Duke decided to build a home in Honolulu, where she felt comfortable and relaxed, and to fill it with Islamic art and architecture, the aesthetics of which she so keenly admired. Together, this pairing of cultures was her “Shangri La,” as her estate soon came to be called.

In the initial stages of inspiration and construction, both Duke and her husband were involved in planning the estate. But Cromwell’s influence decreased as the couple experienced marital problems and separated in 1940. Architect Marion Sims Wyeth, design supervisor Drew Baker, and others also provided input. Duke, however, always relied on her own instincts when reviewing designs submitted by professionals. She frequently requested amendments to ensure that the estate evolved to coincide with her vision. In her own words, “it isn’t the product of any one person, but a number of architects and decorators from all over the world, finally put together by me.”

Perhaps the most successful aspect of Shangri La’s design is its understated architectural plan. Together, Wyeth and Duke decided that there should be few structural and decorative embellishments. This approach allows Shangri La’s two “stars” to shine – the surrounding landscape and Duke’s Islamic art collection. Indeed, it is the Islamic works of art embedded within the estate – and the way Duke chose to display them – that truly define Shangri La’s unique character.

In February 1937 the final plans were approved, and construction began the next month. At that time, Duke and her husband Cromwell traveled back to North Africa and the Middle East to purchase furnishings for Shangri La and to study the architecture first-hand. They returned with a large collection of art and artifacts, and also home movies, photographs, and other renderings for the
estate’s architectural design to ensure it was based on historic models, rather than exotic fantasies.

The scale of the building project received considerable attention in Hawaii’s newspapers. According to the Honolulu Star Bulletin, about 150 workmen were involved in the construction of Shangri La. The cost of the project, $1.4 million, may seem modest by today’s standards, but Shangri La was the most expensive home built in the Territory of Hawaii at the time.

Duke never really considered the house to be complete and she continued renovations and transformations throughout the estate, and to collect Islamic art for Shangri La until her death in 1993. For nearly 60 years, Duke was inspired by the landscape and her collection, frequently undertaking renovations and transformations. Shangri La was both her retreat and a place for creative self-expression.

While Duke’s estate is very much a product of its creator, many hands – including American architects and Muslim artisans – contributed to its appearance. It borrows architectural elements and artistic sensibilities from regions of the Islamic world, and blends them with a Hawaiian landscape and early-20th-century Western notions of modernism. Shangri La’s collection reflects the personal tastes of a single collector, but it also provides a thought-provoking introduction to the diversity of Islamic cultures, eras, and lifestyles that are often encompassed in the monolithic term “Islamic art.”

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C. Outline Chronology

The following chronology provides a brief outline of important events in the history of Shangri La.6

November 22, 1912  Doris Duke is born in New York City. Her father, James Buchanan Duke, had already amassed two large fortunes, one from tobacco products and the other from hydroelectric power.

1925  James Buchanan Duke dies. Doris Duke became the primary heir to his fortune.

1935  Marriage to James Cromwell leads to a honeymoon around the world.

1935  A visit to the Taj Mahal inspires Miss Duke to commission an inlaid marble bed and bathroom suite.

1935  The Cromwells extend their planned short visit in Honolulu to four months.

1936  Purchase of ocean front property at Kaalawai near Diamond Head.

1936-38  Design and construction overseen by the architectural firm Wyeth and King.

1937  Moroccan designer Rene Martin creates furniture, colored-glass windows, ceilings, and screens.

1938  Travels in Egypt, Syria, Iraq, Iran, and Turkey result in numerous purchases, and the founding of a large collection of Iranian tiles.

1940  Purchase of the Veramin mihrab (prayer niche) from the tomb of Imamzada Yahya at Veramin, Iran.

1941  Purchases at the Hearst sales prompt transformations in the Living Room.

1942-46  Unable to return to Hawaii after the bombing of Pearl Harbor, Miss Duke allows the U.S. Military to use Shangri La’s grounds for officers’ recreation.

1950s  Reconstruction of the Mughal Garden. The garden mimics the four part garden scheme typical of historic Mughal gardens, but on a much smaller and narrower scale.

1954  Travels to Iran, Iraq, Lebanon, and Syria result in the purchase of an 18th-century Syrian interior. In 1955, the painted and gilded wood panels, ceiling, vitrines, and doors were installed in the Damascus Room at Shangri La. The Damascus Room originally served as a bedroom for Miss Duke’s stepdaughter.

1963-66  The Dining Room is transformed as a result of Miss Duke’s travels in Egypt and Lebanon in the 1950s and 1960s.

1979-83  Acquisition of a 19th-century Syrian interior that would be installed in the Turkish Rooms.

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October 28, 1993  Doris Duke dies at age 80 at her home in Los Angeles.
D. Maintenance History & Archives

Maintenance information is crucial in understanding the current condition of Shangri La, and in guiding future treatment. Having a record of maintenance activities forms the process of evaluating conditions and determining the most appropriate treatment alternatives.

The HSR database references and utilizes much information about past condition and treatment of the site and buildings at Shangri La. Full reference and transcription of the Shangri La archives is beyond the scope of this study. The long term conservation and interpretation of the site will benefit from the remarkably large amount of information that retained in documents by Doris Duke, the Duke estate, and now the Doris Duke Charitable Foundation and affiliated organizations. Archival documents include photography, drawings, and receipts. The DDFIA stores a great deal of material concerning Shangri La under controlled environmental conditions at the site, has other digital documents, and has catalogued much of the material as of this date.
IV. Architectural Evaluations

A. General Description

Shangri La is composed of two large buildings: the low, rambling main house and a guesthouse known as the Playhouse. These white plastered buildings are separated by a 75-foot swimming pool with a diving board and diving platform. The buildings and the pool are parallel to a high sea wall with a lava rock veneer, which protects the estate from the surf just beyond. A sinuous jetty was built into the ocean to shelter a yacht.

On a secluded section of the property, separated from the residential areas by a tennis court, stand a modest caretaker’s cottage and garage. The rest of the property is lushly landscaped with gardens, fishponds, grass, palm trees, and a variety of other plants.

The plan of Shangri La follows three main principles, all of which show sensitivity to the beauty of the surrounding Hawaiian landscape. First, the house is essentially a single story, a design that ensures the built environment does not overwhelm the natural environment. Both the main house and grounds are terraced across the property to provide variation in appearance. Second, the rooms and wings of the main house radiate around an interior, central courtyard. This courtyard-and-wing plan provides most rooms in the house with views of the ocean and Diamond Head. Third, the main structures follow the orientation of the coastline, resulting in a strong visual axis that reinforces the Hawaiian locale from key areas of the property. Diamond Head, the Playhouse, the pool, the Living Room, and a magnificent luster mihrab (prayer niche) – which is considered Shangri La’s most important work of art – are all aligned on this axis.

The glass wall on the west side of the Living Room, also on the principal axis, descends into the basement. When the glass wall is down, the axis is reinforced, for one can then walk through the Living Room onto a grassy terrace, stroll past the enormous pool, and arrive at the Playhouse, all while admiring the splendid ocean and mountain views beyond.

Various principles of Islamic domestic architecture can be seen in the plan and appearance of Shangri La, such as the unassuming façade, Central Courtyard, and abundance of gardens. Though Duke and her husband originally called for a “Hispano-Moresque”–style home, Shangri La’s design resonates with Islamic domestic architecture from a larger sphere, especially the Middle East, South Asia, and North Africa.

In crowded urban centers such as Cairo, for example, family homes, possessions, and lifestyles were shielded from street life by presenting a simple façade to the public. Inside, however, rooms were as elaborate as a family could afford. These urban homes were often built around inner courtyards, providing for ventilation and sunlight. The courtyard plan was also practical, for it separated female spaces from male ones and the family’s private spaces from those of guests.

At Shangri La also, the Central Courtyard separates guest areas from private quarters. Private spaces, such as Doris Duke’s Bedroom and the Service Wing, were built along hallways connecting to the courtyard and fitted with lockable doors to limit access. In contrast, rooms intended for guests’ use, such as the
Turkish Rooms, Living Room, and Dining Room, are connected directly to the courtyard.

**Living and Mihrab Rooms**

The original appearance of the Living Room was suggested by Moroccan designer Rene Martin, who, in 1937, painted watercolors to show the architectural features he would create for it. Doris Duke largely followed Martin’s design, but as with all work she commissioned, Duke modified aspects to suit her own aesthetic taste.

In the 1940s, she purchased several works of art for the Living Room at the Hearst sales in New York City. Her purchases prompted renovations in the Living Room not long after the original installation. In the space of a few years the look of the Living Room changed several times as Duke experimented with different arrangements of her new collection.

The renovations in the Living Room led to changes in the Mihrab Room as well. Objects, such as a collection of 100 luster star and cross tiles, were moved from the Living Room to the Mihrab Room to complement several luster tiles she purchased in 1940 from the dealer Hagop Kevorkian, including the Veramin mihrab.

**Damascus Room**

During travels in the Middle East in the early 1950s, Duke purchased an 18th-century Syrian interior. She decided to install the interior in a room that had served as the only guestroom in the main house. The room was completely transformed. Carved, painted, and gilded wood panels now cover the walls and ceiling of the room, which she re-named the “Damascus Room.”

**Dining Room**

In the 1960s, she transformed her Dining Room – which was originally Hawaiian in inspiration – into a space inspired by Islamic traditions. Saltwater aquariums, a glass fishing ball and rope chandelier, and a shell collection were replaced with a tile panel, an Indian-export Baccarat chandelier and Iranian ceramics. Textiles now draped the ceiling and walls creating a tent-like effect.

**Turkish Rooms**

In the late 1970s and early 1980s, Doris Duke transformed yet another area of the house to accommodate a second Syrian interior she acquired, which came to be known as the “Turkish” and “Baby Turkish Rooms.”

She had the existing foundation excavated to permit a step down into the room, so that the floor was sunken slightly from the adjacent Central Courtyard. The dirt from the excavation was piled up along the east wall to make a base for the large marble platform that would be used as the main seating area.

Following the structural renovations, marble flooring and a fountain were set down. Most of the floor panels were designed and cut by Duke and the Shangri La house staff. The last elements installed were the wooden wall panels and ceilings. The lavender frames, not originally part of the interior, were retouched and regilded as needed, and Duke herself took an active part in some of this restoration work. Estate employee Jin de Silva remembers how Duke and her
artisans would sit around a table in the Central Courtyard, working in an assembly-line manner and consulting one another about their respective tasks.  

B. Detailed Description and Existing Conditions

The database that accompanies this report contains a list of most of the spaces in all of the buildings (except for the garden shed) and features in Shangri La, including narrative descriptions and as-found conditions of each. The list is organized by building, floor level and space. Each space has been assigned a space code number and name. These codes are reflected in the keyed floor plans on the following pages. The Main Building is coded “MB”, the Playhouse is coded “PH”, the Cottage is coded “CO”, and the Site is coded “SI”. Within each building the space codes for spaces in the basement begin with “B”, spaces on the first floor begin with “1”, spaces on the second floor begin with “2”, areas on the roof begin with “R”, and stairways begin with “S”. Space codes for the exterior facades begin with “3”.

To locate a record from a specific space, first identify the space code from the keyed floor plans. Once the correct space code is found, refer to the records in the database to view all of the features associated with the particular space.

Each record contains a determination of significance and an assessment of condition. These determinations were made upon close observation in the field, and subsequently verified by comparative analysis of features in the entire residence. The levels of significance were divided into primary significance, secondary significance and not significant. The criteria used to categorize conditions were good, fair, and poor.
C. Space Codes and Keyed Floor Plans
# Shangri La Space Names

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## Main Building (MB)

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| MB 301 | North Elevation | Elevation |
| MB 302 | South Elevation | Elevation |
| MB 303 | East Elevation | Elevation |
| MB 304 | West Elevation | Elevation |
| MB 305 | Service Court | Elevation |

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## Shangri La \ Space Names

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<tr>
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<tr>
<td>CO 201</td>
<td>Hall</td>
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</tr>
<tr>
<td>CO 202</td>
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<tr>
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</tr>
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<td>CO 207</td>
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<td>CO 208</td>
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<td>CO 210</td>
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<td>CO 213</td>
<td>Storage</td>
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<td>CO S01</td>
<td>Stair 1 - up to upper floor</td>
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<td>Stair 2 - down from upper floor</td>
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<tr>
<td>CO R03</td>
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<tr>
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<td>Electrical Vault</td>
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<td>Tennis Court</td>
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<td>Shed</td>
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<tr>
<td>SI 105</td>
<td>Mughal Garden (upper)</td>
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<tr>
<td>SI 106</td>
<td>Mughal Garden (middle)</td>
<td>Site</td>
</tr>
<tr>
<td>SI 107</td>
<td>Mughal Garden (lower)</td>
<td>Site</td>
</tr>
<tr>
<td>SI 108</td>
<td>Marble Steps (upper)</td>
<td>Site</td>
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<td>Marble Steps (lower)</td>
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<td>East Boundary Wall</td>
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D. Specialized Evaluations

Specialized evaluations in addition to the architectural assessment of the structure included building envelope evaluation, building systems evaluation and materials conservation analysis. These findings were incorporated into the database.

- Building Envelope Evaluation – Documents archival and physical research of the building envelope, the evolution and existing conditions.

- Materials Conservation Analysis – Documents primary building materials, characteristics, and composition. It also records the results and interpretation of field and laboratory analysis of materials, identifying causes of material failures, and hazardous or dangerous conditions and substances. This analysis also sets forth basic available conservation measures.

- Building Systems Evaluation – Documents archival and physical research of the mechanical, electrical, plumbing, fire detection and suppression systems, and intrusion security systems, their evolution, and the existing conditions of systems features and components.
V. Recommendations

A. Proposed Treatment and Alternatives

To aid the Doris Duke Foundation in planning for the future use and development of Shangri La, this section provides recommendations and guidelines for the repair and rehabilitation of the property and the many features and spaces that it contains. All of the recommendations and guidelines are based, in part, on the Secretary of the Interior’s Standards.

General Principles

The following are recommended guiding principles for the treatment of the property:

(1) Criteria for Treatment

(a) The New Orleans Charter for the Joint Preservation of Historic Structures and Artifacts is an internationally nationally recognized set of principles for the stewardship of historic structures with artifacts within them.

(b) The Secretary of the Interior’s Standards for Rehabilitation and the Guidelines to the Standards for Rehabilitation should provide the basis for any work proposed for the property.

(c) The Ethics of the American Institute for Conservation should guide the treatment of artistic features.

(2) Period of Significance

This report establishes a period of significance for Shangri La of 1938-1993. This is the period of Miss Duke’s residence in the house. The period of significance should be used to inform the evaluation of existing spaces and features, in determining appropriate treatments, and in interpreting the site for visitors.

(3) Adaptive Uses

Shangri La was constructed as a residential estate with an artistic collection of architectural features, installed art, and contained art. The property was adapted for use as a museum after the death of Doris Duke, in execution of her estate. The fulfillment of the estate, through articulation of the mission of the DDFIA, and implementation of the program, may require alterations and additions.

Changes in management, access, literal occupancy to accommodate the new uses such as administrative and curatorial offices, and collections storage and handling, for example, present problems of security, wear and tear, safety and liability, and may make it necessary to introduce new features, or new structures. The demands of the standards of environment and handling for a museum are very different than those of a residential estate. The Standards for Rehabilitation contemplate such adaptations.

The fundamental significance of the Shangri La is in the artistic value of the site, as embodied in features of the exterior, buildings, and integrated art. Therefore, there is a distinction between those features that may be considered as part of the artistic expression, and those that are not. This distinction is articulated in this report by the designation of some features as being of “primary significance,”
whereas others are designated as being of “secondary significance,” or “not significant.” More than 1,600 individual features are listed and categorized in this way.

Where the new use requires these kind of changes, the building should be adapted for the new use in a manner that retains the integrity of the structure and its character-defining features and spaces to the greatest extent possible. As a general guideline, primary features should almost always be retained and conserved, whereas secondary features may be selectively removed or altered with less impact on the fundamental significance of the property.

There are few areas of the site and few aspects of the existing buildings that can accommodate major additions without the potential for unmitigatable visual impacts on the character of the site and buildings. The one area that can potentially accommodate a new building envelope, wholly or partially subterranean, on the site is the footprint of the tennis court.

Balancing the conservation of significant materials with the accommodation of uses requires thoughtful and creative solutions to the constraints presented by code requirements, regulations, and other issues typically found in rehabilitation projects.

(4) Interpretation

The use of spaces and displays in the building to interpret the associated significant themes in the history of Shangri La is encouraged. Museum spaces, displays of artifacts, signage, historic photographs, videos, and interactive media are some of the applicable elements of an interpretive program.

(5) Historic Fabric

Rehabilitation of the property should respect the historic significance and architectural character of the structure by retaining significant features, spaces, and materials. Features of primary significance should be respected on a higher priority.

(6) Historic Setting

The historic setting of the building is part of its character and should be respected when introducing new structures and additions to the site. Walls, fences, landscape, paving, lighting, seating, and any features and materials added to the exterior spaces adjacent to the site should be appropriate and compatible with the historic building, the yards, and setting.
B. Requirements for Treatment

There are a number of applicable laws, regulations, and functional requirements that must be considered when contemplating the development, rehabilitation, and/or future use of Shangri La. Any work conducted on the property should follow the Secretary of the Interior’s Standards for Rehabilitation, the Ethics for the Conservation of Historic and Artistic Works, and must conform to local planning, zoning, and building and safety codes.

Accessibility

The Americans with Disabilities Act was signed into law in July 1990. This civil rights statute applies to employment, as well as access to public structures and services or “public accommodations” owned or operated by private entities. In general, Americans with Disabilities Act provides for the application of special rules and minimum access requirements where an alteration “would threaten or destroy the historic significance” of an historic building. Historic buildings include those eligible for listing in the National Register of Historic Places or designated under State or local law. To use the minimum requirements, consultation is required with the Hawaii State Historic Preservation Office.

New Orleans Charter for Joint Preservation of Historic Structures and Artifacts

The New Orleans Charter is the product resulting from the two symposia: Museums in Historic Buildings held in Montreal, Quebec (1990) and New Orleans, Louisiana (1991) and co-sponsored by the American Institute for Conservation of Historic and Artistic Works (AIC) and The Association for Preservation Technology International. This Charter has been officially adopted by the Board of Directors of both AIC and APTI. This Charter provides at the broadest and highest level, nationally and internationally recognized criteria for the stewardship of artistic collections in artistic buildings—which aptly describes Shangri La.

The New Orleans Charter was subsequently adopted by the National Conference of State Historic Preservation Officers at its Annual Meeting in Washington, D.C. in March, 1992. In 1992 this Charter was presented by a panel of symposium participants at a half-dozen conferences.

American Institute for Conservation, Buffalo, June 1992
American Association of State and Local History, Miami, Sept 1992
International Council of Museums, Sept 1992
Association for Preservation Technology, Philadelphia, Sept 1992

Arising from a concern for the coexistence of historic structures and the artifacts housed within them; Recognizing our responsibility as stewards to provide the highest levels of care for the structures and other artifacts placed in our care; Recognizing that many significant structures are used to house, display and interpret artifacts; Recognizing that historic structures and the contents placed within them deserve equal consideration in planning for their care; Recognizing that technologies and approaches will continue to change; and Recognizing that those involved in preservation are part of a continuum, and are neither the first nor the last to affect the preservation of historic structures and artifacts; We, therefore, adopt these principles as governing the preservation of historic structures and the artifacts housed in them:
1. Institutions’ statements of mission should recognize the need to preserve the unique character of both the historic structure and artifacts.

2. The preservation needs of the historic structure and of the artifacts should be defined only after study adequate to serve as the foundation for the preservation of both.

3. Requisite levels of care should be established through the interdisciplinary collaboration of all qualified professionals with potential to contribute.

4. Appropriate preservation must reflect application of recognized preservation practices, including assessment of risk before and after intervention, and the expectation of future intervention.

5. Measures which promote the preservation of either the historic structure or the artifacts, at the expense of the other, should not be considered.

6. Regarding public use, the right of future generations to access and enjoyment must outweigh immediate needs.

7. Appropriate preservation strategies should be guided by the specific needs and characteristics of the historic structure and artifacts.

8. Appropriate documentation of all stages of a project is essential, and should be readily accessible and preserved for the future.

9. The most appropriate action in a particular case is one which attains the desired goal with the least intervention to the historic structure and the artifacts.

10. Proposed preservation strategies should be appropriate to the ability of the institution to implement and maintain them.

The Secretary of the Interior’s Standards for the Treatment of Historic Properties

The preservation and protection of historic objects and sites, is guided in the United States by principles known as the Secretary of the Interior’s Standards for the Treatment of Historic Properties. These Standards provide four primary treatments to be used in the protection of cultural resources listed in or eligible for listing in the National Register of Historic Places. The treatments are “Preservation,” “Rehabilitation,” “Restoration,” and “Reconstruction.” The Standards and guidelines are intended as general guidance for any historic preservation project. They are designed to promote responsible preservation practices and to provide philosophical consistency in an approach to the work.

Choosing the most appropriate treatment for a building requires careful decision-making. The Hawaii State Historic Preservation Office considers Shangri La eligible for listing in the National Register of Historic Places. For this reason, use of federal standards and guidelines developed for the preservation and protection of historic resources is the most appropriate starting point for developing an approach to further work at the site.

The United States Department of the Interior has established standards and guidelines for four basic treatments used on historic properties. They consist of the following:

**Preservation** is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property.

**Restoration** is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period.

**Reconstruction** is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

**Rehabilitation** is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

Choosing the appropriate treatment for the continued protection of Shangri La should be the result of carefully inquiry, research and data gathering; analysis of the collected information; and informed decision making.

The original distinctive spaces and features of Shangri La are substantially intact and convey the building’s historic significance. Retaining and repairing these spaces and features are important to the overall protection of the building’s historic integrity. Therefore, it is important to adopt a treatment standard that preserves the original spaces and features, while allowing the compatible use and adaptation of the site from a residence to a museum with compelling programmatic facility needs in order to fulfill its mission and protect its collection. In contrast to “historic house museums” that are whole and unitary in preserving and interpreting an as-found living environment, Shangri La was created as much a museum as a home, and the stated legacy of its creator was Shangri La as a museum of Islamic art.

Based on the findings of this Historic Structure Report, **Rehabilitation** is recommended as the guiding principle in preparing a treatment plan for protection, repair, and maintenance.

The Secretary of the Interior’s **Standards for Rehabilitation** are as follows:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristic of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of
Shangri La
Historic Structure Report

historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

REHABILITATION AS A TREATMENT. When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment. Prior to undertaking work, a documentation plan for Rehabilitation should be developed.

Ethics for the Conservation of Historic and Artistic Works

To guide conservation professionals and others who care for a cultural property, the American Institute for Conservation of Historic and Artistic Works (AIC) has issued a standard code of ethics. These guidelines should be considered in any work that is proposed for the property.
The Code of Ethics and Guidelines for Practice of the American Institute for Conservation of Historic and Artistic Works is as follows:

1. The conservation professional shall strive to attain the highest possible standards in all aspects of conservation, including, but not limited to, preventive conservation, examination, documentation, treatment, research, and education.

2. All actions of the conservation professional must be governed by an informed respect for the cultural property, its unique character and significance, and the people or person who created it.

3. While recognizing the right of society to make appropriate and respectful use of cultural property, the conservation professional shall serve as an advocate for the preservation of cultural property.

4. The conservation professional shall practice within the limits of personal competence and education as well as within the limits of the available facilities.

5. While circumstances may limit the resources allocated to a particular situation, the quality of work that the conservation professional performs shall not be compromised.

6. The conservation professional must strive to select methods and materials that, to the best of current knowledge, do not adversely affect cultural property or its future examination, scientific investigation, treatment, or function.

7. The conservation professional shall document examination, scientific investigation, and treatment by creating permanent records and reports.

8. The conservation professional shall recognize a responsibility for preventive conservation by endeavoring to limit damage or deterioration to cultural property, providing guidelines for continuing use and care, recommending appropriate environmental conditions for storage and exhibition, and encouraging proper procedures for handling, packing, and transport.

9. The conservation professional shall act with honesty and respect in all professional relationships, seek to ensure the rights and opportunities of all individuals in the profession, and recognize the specialized knowledge of others.

10. The conservation professional shall contribute to the evolution and growth of the profession, a field of study that encompasses the liberal arts and the natural sciences. This contribution may be made by such means as continuing development of personal skills and knowledge, sharing of information and experience with colleagues, adding to the profession’s written body of knowledge, and providing and promoting educational opportunities in the field.

11. The conservation professional shall promote an awareness and understanding of conservation through open communication with allied professionals and the public.
12. The conservation professional shall practice in a manner that minimizes personal risks and hazards to co-workers, the public, and the environment.

13. Each conservation professional has an obligation to promote understanding of and adherence to this Code of Ethics.
C. Guidelines for Material Conservation

The following tables provide general guidelines for the conservation and rehabilitation of common materials, including those found at Shangri La.

Concrete and Masonry

Exterior features as well as exterior surfaces and their treatment (modeling, tooling, bonding patterns, joint size, and color) are important in defining the historic character of the building. Buildings that have concrete exteriors or masonry detailing may exhibit the following conditions and, therefore, require maintenance and rehabilitation: impact damage at building corners; cracks; damage due to spalling; damaged ornamentation on friezes and columns; peeling paint; inappropriate patching methods; inappropriate treatments such as sandblasting which exposed softer inner materials; and repointing of brick mortar joints by inappropriately composed and colored materials applied with non-matching tooling.

Guidelines for Concrete and Masonry:

1. Repair walls and other features where there is evidence of deterioration such as spalling, damp walls, or damaged concrete or masonry.

2. Sandblasting shall not be used to prepare or clean exterior concrete or masonry. Blasting by any media, including liquids, shall not be used unless it can be demonstrated that no surface material is removed by application. Application of any liquid media shall not exceed a pressure of 150 pounds per square inch measured where the liquid leaves the application nozzle. Use non-abrasive tools, such as natural bristle brushes; do not use abrasive or gouging tools, such as wire brushes and scrapers.

3. Repair concrete or masonry features by patching, piecing-in, or consolidating the concrete or masonry. Repair may also include the limited replacement in kind, or with compatible substitute material, of those extensively deteriorated or missing parts of concrete or masonry features when there are surviving prototypes, such as brackets, pilasters or chimneys.

4. Install a new concrete or masonry feature such as steps, door pediments, detailing, or chimneys when the historic feature is completely missing. This should be an accurate reconstruction using historical, pictorial, and physical documentation when available. If documentation is not available, this may be a new design that is compatible with the size, scale, material, and color of the historic building.

5. It is recommended, but not required, that the building be repainted with colors that are identified through examination of strata by a qualified architect or conservator, or which are historically appropriate to the building.

6. Testing and application of treatments to stabilize historic concrete, stone and masonry materials is encouraged, provided that any consolidants or coatings can be demonstrated to have a minimum permeability rating of 12 perms, and to have no long term detrimental effects on the historic materials.
7 Repointing of historic masonry mortar joints shall utilize mortar mixes formulated to match the composition and color of historic mortar based on laboratory analysis and reporting of the composition and color of the matrix and aggregate in the historic mortar. Tooling of mortar repairs and restorations shall match historic mortar tooling as identified by the HSR or a qualified preservation architect or building materials conservator. Removal of deteriorated or inappropriate mortars prior to repair shall be accomplished with the utmost care, preferably using hand tools, and shall cause no damage or change to the historic masonry.

8 Do not permit plants or weeds to grow on the building. Uproot all weeds as soon as possible. Remove climbing plants from walls.

9 Provide sound roofs and flashing, and proper drainage so that water does not infiltrate, wash down, stand or accumulate. Provide inconspicuous site drainage.

References:
Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief06.htm

Preservation Brief 15: Preservation of Historic Concrete
http://www.nps.gov/history/hps/tps/briefs/brief15.htm

Preservation Brief 16: The Use of Substitute Materials on Historic Buildings Exteriors
http://www.nps.gov/history/hps/tps/briefs/brief16.htm

Preservation Brief 22: The Preservation and Repair of Historic Stucco
http://www.nps.gov/history/hps/tps/briefs/brief22.htm

Preservation Brief 39: Controlling Unwanted Moisture in Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief39.htm

Preservation Brief 41: The Seismic Retrofit of Historic Buildings: Keeping Preservation in the Forefront
http://www.nps.gov/history/hps/tps/briefs/brief41.htm

Preservation Brief 42: The Maintenance, Repair and Replacement of Historic Cast Stone
http://www.nps.gov/history/hps/tps/briefs/brief42.htm
Wood

Buildings with wood features exhibit the following conditions which may require maintenance and rehabilitation: repair of deteriorating material; sealing or painting, eaves, or trim due to weathering, water damage, fungal or insect damage.

Guidelines for Wood:

1. Evaluate the overall condition of the wood to determine the extent of protection and maintenance required.

2. Repair wood features by patching, piecing-in, consolidating, or otherwise reinforcing the wood using recognized preservation methods. Repair may also include the limited replacement in kind, or with compatible substitute material, of those extensively deteriorated or missing parts of features where there are surviving prototypes such as brackets, moldings, or sections of siding.

3. Use matching species wherever feasible when replacing unrepairable historic painted elements. Utilize wherever possible wood which is naturally resistant or treated to be resistant to water, fungus and insect damage. Utilize wood which is naturally dried or kiln dried and relatively free of knots and checks in order to assure a longer life for replacement materials.

4. Design and install a new wood feature such as a cornice or doorway when the historic feature is completely missing. This should be an accurate restoration using historical, pictorial, and physical documentation. Where documentation does not exist, a new design that is compatible with the size, scale, material, and color of the historic building may be used.

5. Apply compatible paint coating systems following proper surface preparation. Sandblasting shall not be used to prepare or clean historic wood exterior elements. Blasting by any media, including liquids, shall not be used unless it can be demonstrated that no surface material is removed by application. Application of any liquid media shall not exceed a pressure of 150 pounds per square inch measured where the liquid leaves the application nozzle. Paint shall match existing surface coating thickness. Use non-abrasive tools, such as natural bristle brushes; do not use abrasive or gouging tools, such as wire brushes and scrapers.

6. It is recommended, but not required, that the building be refinished with colors that are identified through examination of strata by a qualified architect or conservator, or which are historically appropriate to the building.

References:
Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief06.htm

Preservation Brief 10: Exterior Paint Problems on Historic Woodwork
http://www.nps.gov/history/hps/tps/briefs/brief10.htm

Preservation Brief 16: The Use of Substitute Materials on Historic Building Exteriors
http://www.nps.gov/history/hps/tps/briefs/brief16.htm

Preservation Brief 39: Controlling Unwanted Moisture in Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief39.htm
Preservation Tech Note: Exterior Woodwork, Number 1, Proper Painting and Surface Preparation
(not available on-line; see Appendix A)

Preservation Tech Note: Exterior Woodwork, Number 2, Paint Removal from Wood Siding
(not available on-line; see Appendix A)
Architectural Metals

Architectural metal features may require rehabilitation and maintenance due to weathering and corrosion.

Guidelines for Architectural Metals:

1. Identify, retain, and preserve architectural metal features such as columns, capitals, window hoods, canopy cladding or fascia, stairways, light fixtures or gates that are important in defining the overall historic character of the building. Also identify and preserve their finishes and colors. If originally painted, it is recommended, but not required, that the architectural metals be repainted with colors that are historically appropriate to the building.

2. Clean architectural metal, when necessary, with gentle non-abrasive cleaning methods to remove corrosion. Sandblasting shall not be used to clean historic metal surfaces.

3. Apply appropriate paint or other coating systems after cleaning in order to decrease the corrosion rate of metals or alloys.

4. Repair architectural metal features by patching, splicing, or otherwise reinforcing the metal. Repairs may also include the limited replacement in kind, or with a compatible substitute material, of those extensively deteriorated or missing parts of features when there are surviving prototypes such as porch balusters, column capitals or bases, or roof ornaments.

5. Design and install a new architectural metal feature such as an entry door or sheet metal cornice when the historic feature is completely missing. It may be an accurate reconstruction using historical, pictorial, and physical documentation; or be a new design that is compatible with the size, scale, material, and color of the building.

References:

Preservation Brief 16: The Use of Substitute Materials on Historic Building Exteriors
http://www.nps.gov/history/hps/tps/briefs/brief16.htm

Preservation Brief 27: The Maintenance and Repair of Architectural Cast Iron
http://www.nps.gov/history/hps/tps/briefs/brief27.htm
Doors, Entrances and Porches

Doors, entrances, and porches are often the principal features of historic buildings, particularly when they occur on primary elevations. Their functional and decorative features, such as the type of door, steps, balustrades, and entrances or porches are extremely important in defining the overall historic character of a building. Their retention, protection, and repair should always be carefully considered when planning rehabilitation work.

Doors and porches are subject to weathering and deterioration and may require maintenance and rehabilitation, which could include cleaning and repair of attachments, flashing and hardware.

Guidelines for Doors, Entrances and Porches:

1. Identify, retain, and preserve entrances, and their functional and decorative features that are important in defining the overall historic character of the building such as doors, transoms, sidelights, pilasters, entablatures, columns, balustrades, and stairs.

2. Protect and maintain the masonry, wood, and architectural metal that comprise entrances and porches through appropriated surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems, replacement of broken glass, and replacement of deteriorated sealants or glazing compounds.

3. Repair entrances and porches by reinforcing the historic materials. Repair will also generally include the limited replacement in kind, or with compatible substitute material, of those extensively deteriorated or missing parts of repeated features where there are surviving prototypes such as balustrades, cornices, entablatures, columns, sidelights, and stairs.

4. Design and construct a new entrance or porch if the historic entrance or porch is completely missing. It may be a reconstruction based on historical, pictorial, and physical documentation; or be, a new design that is compatible with the historic character of the building.

5. Design and install additional entrances or porches when required for the new uses in a manner that preserves the historic character of the building. In general, such alterations should be limited to non-character defining elevations. New entrances and porches shall be compatible and may be of contemporary design provided they do not destroy character-defining features. To the extent visible, new entrances and porches shall be reversible.

References:

Preservation Brief 10: Exterior Paint Problems on Historic Woodwork
http://www.nps.gov/history/hps/tps/briefs/brief10.htm

Preservation Brief 39: Controlling Unwanted Moisture in Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief39.htm

Preservation Brief 45: Preserving Historic Wooden Porches
(not available on-line; see Appendix A)

Preservation Tech Note: Exterior Woodwork, Number 1, Proper Painting and Surface Preparation (not available on-line; see Appendix A)
Windows

The type and size of window openings are extremely important in defining the overall historic character of a building. Their retention, protection, and repair should always be carefully considered when planning rehabilitation work. Wood windows may deteriorate from hard use, warping, or settling, and metal windows are susceptible to water damage. Glazed openings may shatter.

 Guidelines for Windows:

1. Identify, retain, and preserve historic window features that are important in defining the overall historic character of the building. Such features include frames, sash, muntins, glazing, sills, heads, and hood molds.

2. Protect and maintain the wood and architectural metal which comprise the window frame, sash, muntins, and surrounds through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

3. Make windows weather tight and improve thermal efficiency by recaulking and replacing or installing weather stripping.

4. Construct and install new windows if the historic windows (frame, sash and glazing) are completely missing, have been replaced with non-original materials, or are too deteriorated to repair. The replacement windows shall be an accurate reconstruction using historical, pictorial, and physical documentation.

5. Replace broken clear glass with clear non-reflective glass to match historic materials and configuration.

References:

Preservation Brief 3: Conserving Energy in Historic Buildings  
http://www.nps.gov/history/hps/tps/briefs/brief03.htm

Preservation Brief 9: The Repair of Historic Wooden Windows  
http://www.nps.gov/history/hps/tps/briefs/brief09.htm

Preservation Brief 33: The Preservation and Repair of Historic Stained and Leaded Glass  
http://www.nps.gov/history/hps/tps/briefs/brief33.htm

Preservation Brief 39: Controlling Unwanted Moisture in Historic Buildings  
http://www.nps.gov/history/hps/tps/briefs/brief39.htm

Preservation Tech Note: Exterior Woodwork, Number 1, Proper Painting and Surface Preparation  
(not available on-line; see Appendix A)
Roofs

The roof is a contributing factor in defining the building’s overall historic character. In addition to the design role it plays, a weather tight roof is essential to the preservation of the entire structure. Thus, protecting and repairing the roof as a “cover” is a critical aspect of a rehabilitation project.

Guidelines for Roofs:

1. Protect and maintain a roof by cleaning and refinishing coping, cleaning the gutters and downspouts, and replacing deteriorated flashing. Roof sheathing should also be checked for proper venting to prevent moisture condensation and water penetration; and to insure that materials are free from insect infestation.

2. Provide adequate anchorage for roofing material to guard against wind damage and moisture penetration.

3. Repair a roof by reinforcing the historic materials which comprise roof features, including cornice lines, exposed rafter tails, brackets, and soffits. Replacement or repairs should use replacement in kind, or with compatible substitute material. When replacing the roof, remove existing membrane down to wood decking. Inspect exposed decking and replace deteriorated wood members; retain historic sheathing materials such as board sheathing.

4. Install mechanical and service equipment on the roof so that they are inconspicuous from the public right-of-way and do not damage or obscure character-defining features.

5. Repair broken gutters and downspouts. If repair is not possible, replace in kind to match existing. Re-solder broken joints. Where missing, replicate historic gutters and downspouts or provide compatible new gutters and downspouts.

References:

Preservation Brief 4: Roofing for Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief04.htm

Preservation Brief 39: Controlling Unwanted Moisture in Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief39.htm

Preservation Brief 30: The Preservation and Repair of Historic Clay Tile Roofs
http://www.nps.gov/history/hps/tps/briefs/brief30.htm
Structural and Mechanical Systems

Structural systems of historic buildings may need repair due to deterioration, fire, or seismic activity.

Guidelines for Structural and Mechanical Systems:

1. Protect and maintain the structural system by cleaning the roof gutters and downspouts; replacing roof flashing; keeping masonry, wood, and architectural metals in a sound condition; and assuring that structural members are free from insect infestation.

2. Repair the structural system by augmenting or upgrading individual parts or features. For example, weakened structural members such as floor framing can be spliced, braced, or otherwise supplemented and reinforced.

3. Install new work as a requirement of current seismic or code requirements so as not to adversely impact exterior facades. Provide seismic reinforcements as required to an historic building in a manner that avoids damaging the structural system and character-defining features, including window and door openings.

4. Design and install new mechanical or electrical systems which minimize the number of cutouts or holes in structural members.

References:

Preservation Brief 3: Conserving Energy in Historic Buildings  
http://www.nps.gov/history/hps/tps/briefs/brief03.htm

Preservation Brief 24: Heating, Ventilating and Cooling Historic Buildings  
http://www.nps.gov/history/hps/tps/briefs/brief24.htm
Interior Spaces

The building retains much of its interior character-defining features and materials, such as space configurations, interior walls, painted finishes, wood trim, and decorative elements.

Guidelines for Interior Spaces:

1. Interior character-defining spaces and features should be retained.

2. Construction of new interior floor plans or arrangement of spaces shall not adversely impact the exterior historic character of the building facade, i.e. infill of window or door openings, or the creation of new inappropriate openings. Where doors or windows are no longer needed, the existing doors and windows should be retained in place, and if necessary made inoperable in a reversible manner which would allow for later reuse. If in the reuse of existing spaces, the covering of door and window openings cannot be avoided by alternate uses or interior space design, then interior coverings shall be added in such a manner that any glazed openings match the appearance of uncovered glazed openings in both daylight and at night.

3. Retention, protection, and repair should be given prime consideration and caution exercised in pursuing any plan that would radically change character-defining spaces or obscure, damage or destroy interior features or finishes.

4. Materials, surfaces and finishes on ceilings, walls, floors and trim which pre-date 1960 shall be retained in the course any alterations or additions.

5. It is recommended, but not required, that the building be repainted with colors identified through examination of strata by a qualified architect or conservator, or which are historically appropriate to the building.

References:

Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief06.htm

Preservation Brief 10: Paint Problems on Historic Woodwork
http://www.nps.gov/history/hps/tps/briefs/brief10.htm

Preservation Brief 18: Rehabilitating Interiors in Historic Buildings
http://www.nps.gov/history/hps/tps/briefs/brief18.htm

Preservation Brief 21: Repairing Historic Flat Plaster – Walls and Ceilings
http://www.nps.gov/history/hps/tps/briefs/brief21.htm

Preservation Brief 28: Painting Historic Interiors
http://www.nps.gov/history/hps/tps/briefs/brief28.htm

Preservation Tech Note: Museum Collections, Number 2, Reducing Visible and Ultraviolet Light Damage to Interior Wood Finishes (not available on-line; see Appendix A)
Decorative Arts

The presence of decorative arts adds to the character and significance of a building by providing rare and unique elements of artistic creation. These decorative arts can represent the work of a master artisan, the development of important artistic techniques, and the depiction of cultural taste at a particular period in time. Retaining, repairing, and protecting decorative arts requires careful work and proper documentation.

Guidelines for Decorative Arts:

1. If significant decorative painting or wall papering is discovered during the course of work on the buildings, then those elements should be protected, and stabilized to retard or prevent future deterioration, preferable left visible for display and interpretation, or documented if covered by reversible finishes.

2. The element shall be photo-documented and the location described precisely.

3. Surface dust shall be removed. Excess dirt and grease shall be removed only where necessary and only using gentle methods. General cleaning shall occur, if at all, after assessment and specification of methods and materials by a qualified art or materials conservator.

References:

Preservation Brief 33: The Preservation and Repair of Historic Stained and Leaded Glass
http://www.nps.gov/history/hps/tps/briefs/brief33.htm

Preservation Brief 40: Preserving Historic Ceramic Tile Floors
http://www.nps.gov/history/hps/tps/briefs/brief40.htm
Site Characteristics

The relationship between historic buildings and landscape features helps to define historic character and should be considered an integral part of planning for rehabilitation project work.

Guidelines for Site Characteristics:

1. Identify and evaluate building site features important in defining its historic character. Site features can include walkways, lighting, fencing, signage, fountains, plants, trees, paving, sidewalks, and curbs.

2. Retain the historic relationship between buildings, landscape features, and open space to the extent feasible.

3. New plantings shall be compatible with the historic landscape character of the site and may be of contemporary design provided such alterations and additions do not destroy character-defining features. Important resources, such as healthy large specimen trees, shall be retained if feasible. All planted areas shall reflect the need for water conservation.

4. In general, the existing streets and their elements (curbs, sidewalks, and street paving) should be retained where possible. Where changes are made, the new design shall reflect the traditional elements of the existing streets by referencing elements of street, curb, and sidewalk. These references may be made by delineating materials, colors, or texture of paving.

5. New paving, if any, should not overwhelm or detract from the colors and architectural features of the building. Use of street furniture and movable landscaping are appropriate for enhancing the setting and pedestrian use of the site.

References:

Preservation Brief 36: Planning, Treatment and Management of Historic Landscapes
http://www.nps.gov/history/hps/tps/briefs/brief36.htm
Health and Safety Code Compliance

It is often necessary to make modifications to a historic building so that it can comply with current health, safety and code requirements. Such work needs to be carefully planned and undertaken so that it does not result in a loss of interior or exterior character-defining spaces, features, and finishes.

The Americans with Disabilities Act (ADA) applies to employment, as well as access to public structures and services or public accommodations owned or operated by private entities. In general, there are special rules and minimum access requirements where an alteration would threaten or destroy the historic significance of an historic building. To use the minimum requirements, consultation is required with the State Historic Preservation Office.

Guidelines for Code Compliance:

1. Identify the historic building’s character-defining spaces, features, and finishes so that code-required work will not result in their damage or loss.

2. Comply with health and safety codes, including seismic codes and barrier-free access requirements, in such a manner that character-defining spaces, features, and finishes are preserved.

3. If alterations for code compliance result in the loss of historic character due to the substantial alteration of character-defining features and spaces, study alternatives to demonstrate whether or not there are other designs that would provide both code compliance and retention of historic character.

4. If there are not alternatives under general application codes allowing historic character to be retained, use of the State Historical Building Safety Code shall govern code requirements. Study alternatives to demonstrate whether or not there are other designs which would provide both compliance and retention of historic character using this code.

5. New structural or seismic reinforcement members, including anchor bolts, shall be hidden from view whenever possible.

References:

Preservation Brief 32: Making Historic Properties Accessible
http://www.nps.gov/history/hps/tps/briefs/brief32.htm
D. Feature Specific Recommendations

Having a firm knowledge of the condition of materials and systems in a historic property is essential to planning maintenance and other treatments. Deteriorated materials and non-operating systems not identified as significant could be lost during an insensitive rehabilitation, thereby reducing a property’s historic integrity. Poor and deteriorated conditions, if left uncorrected, could likewise result in even further damage to the structure and its contents.

The database included with this report is a detailed record of the individual spaces and features that comprise Shangri La, and the primary content of this HSR. The materials and finishes have been documented for each feature in a written narrative format. The condition of each feature has also been recorded and categorized as being “good,” “fair,” or “poor.” Specific recommendations for the treatment of the individual features are provided, as appropriate, to be used in future rehabilitation and planning on the property.

Each feature has been assigned a prioritized ranking of “high,” “medium,” or “low.” These are general rankings assigned by the individual project consultants, depending on their areas of expertise. The rankings reflect the condition of each feature, applicable criteria for the health and safety of the occupants, and the conservation of the building and its contents. The rankings should be considered when planning and implementing repairs or rehabilitation. Features with a “high” ranking should receive the most immediate attention, while features with a “low” ranking are considered to have a lower priority. The rankings are not based on the comfort and convenience of the building’s potential users, or the relative cosmetic appearance of the building features.

Shangri La is generally in fair to good condition, with instances of poor conditions that require further attention. The building has a good level of integrity.
VI. Record of Treatment

A. Completion Report

The completion report summarizes (a) the intent of the work, (b) the way in which the work was approached and accomplished, (c) the time required to do the work, and (d) the cost of the work.

The database format provides for the inclusion of all of the information in a “completion report.” In concept this HSR contemplates an open and continuous process of inspection, assessment, and work, not a unitary project.

B. Technical Data

This section is reserved for field reports, material data sheets, field notes, correspondence, accounting, and contract summaries pertinent to the project. This information is included in the database.
VII. Sources

The following sources were used to determine significance of spaces and features at Shangri La. Unless otherwise noted, all archival holdings at Shangri La are owned by the Doris Duke Charitable Foundation and the Doris Duke Foundation for Islamic Art.

www.shangrilahawaii.com

Hibbard, Don. “Shangri La: The House.” Repositories of Information and Records Held at the House. Bibliography on the research conducted by Don Hibbard on Shangri La construction. N.D.


Shangri La Room Diagrams.


Shangri La Photograph Index. Organized by area and date.
VIII. Appendices

Appendix A
Preservation Tech Notes

Appendix B
Estimated Budget

Appendix C
“High Level” Summary Outline of Prioritized Recommendations

Appendix D
Codes and Regulations
Appendix A
Preservation Tech Notes

Initiated in 1984, the Preservation Tech Notes series provides practical information on traditional practices and innovative techniques for successfully maintaining and preserving cultural resources. With over 45 Tech Notes published by Technical Preservation Services, this publication series provides a wealth of information for practitioners in the preservation field, including architects, contractors, and maintenance personnel, as well as for owners and developers of historic properties.

The Tech Notes are organized by categories. Current categories include windows, doors, finishes, masonry, mechanical systems, metals, museum collections, site, temporary protection and historic glass.

The notes are no longer available on-line at the TPS website. Most TPS publications are sold by the Government Printing Office (GPO). GPO stock numbers are listed for all publications available through GPO and are required for all GPO orders. To place a GPO order:

- Call 866-512-1800 (toll-free) or 202-512-1800 (Washington, DC area).
- Mail or fax the GPO order form. http://www.nps.gov/history/hps/tps/download/gpo_order_form.pdf

http://www.nps.gov/history/hps/tps/technotes/tnhome.htm
Appendix B

Estimated Budget
## SHANGRI-LA HSR SUMMARY PLANNING BUDGET FOR CYCLICAL MAINTENANCE AND CAPITAL IMPROVEMENTS

April 11, 2008

### Capital Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>High Priority: Immediate Repairs</th>
<th>Medium Priority: 0 - 5 Years</th>
<th>Low Priority: 5 - 10 years</th>
<th>Total all phases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural conservation:</td>
<td>$ 77,427</td>
<td>$ 678,063</td>
<td>$ 151,466</td>
<td>$ 906,956</td>
</tr>
<tr>
<td>Building and site repairs:</td>
<td>$ 526,823</td>
<td>$ 2,369,408</td>
<td>$ 873,983</td>
<td>$ 3,770,214</td>
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<tr>
<td>Site improvements (driveway, fence):</td>
<td>$ -</td>
<td>$ -</td>
<td>$ 604,153</td>
<td>$ 604,153</td>
</tr>
<tr>
<td>Bedroom wing repairs and improvements</td>
<td>$ -</td>
<td>$ 136,547</td>
<td>-</td>
<td>$ 136,547</td>
</tr>
<tr>
<td>HVAC and plumbing</td>
<td>$ 451,490</td>
<td>$ 205,045</td>
<td>$ 35,800</td>
<td>$ 692,335</td>
</tr>
<tr>
<td>Electrical</td>
<td>$ 319,002</td>
<td>$ 68,113</td>
<td>$ 459,177</td>
<td>$ 846,292</td>
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<tr>
<td><strong>Subtotal hard costs</strong></td>
<td>$ 1,374,742</td>
<td>$ 3,457,176</td>
<td>$ 2,124,579</td>
<td>$ 6,956,497</td>
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<tr>
<td>Soft costs @ 50%</td>
<td>$ 687,371</td>
<td>$ 1,728,588</td>
<td>$ 1,062,290</td>
<td>$ 3,478,249</td>
</tr>
<tr>
<td><strong>Total project costs</strong></td>
<td>$ 2,062,113</td>
<td>$ 5,185,764</td>
<td>$ 3,186,869</td>
<td>$ 10,434,746</td>
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### Cyclical Maintenance

**Recurring costs, for 30 years**

<table>
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<tr>
<th>Description</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Exterior paint at 5, 10, 20, and 30 years</td>
<td>$ 1,034,089</td>
</tr>
<tr>
<td>Interior paint at 5, 10, 20, and 30 years</td>
<td>$ 929,640</td>
</tr>
<tr>
<td>Reroofing at 15 and 30 years</td>
<td>$ 951,883</td>
</tr>
<tr>
<td>Termite treatment, every 2 years</td>
<td>$ 115,866</td>
</tr>
</tbody>
</table>

**Total**                                     | $ 3,031,478 |
Preface: This budget information will assist in planning for prioritized cyclical maintenance costs over several decades and prioritized capital improvement costs over the next decade. Prior to undertaking construction activity, costs will be estimated from the construction drawings and specifications that will be prepared in the future.

**SUMMARY OF COSTS**

<table>
<thead>
<tr>
<th>HISTORIC STRUCTURE REPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPITAL IMPROVEMENTS FOR MAJOR REPAIR AND RECONSTRUCTION</td>
</tr>
<tr>
<td>CYCLICAL MAINTENANCE</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

Note(s):
1. Life Cycle Cost Analysis - Annual cyclical maintenance represents Present Worth Values for a 30 Year Period for the listed repair and maintenance.
2. Hazardous Materials abatement (ACM, PCB, & LCP) is not included.
## CAPITAL IMPROVEMENTS

<table>
<thead>
<tr>
<th>QUANTITIES</th>
<th>ITEMS OF WORK</th>
<th>DESCRIPTIONS</th>
<th>0-5 Years/Medium Priority</th>
<th>+5 Years/Low Priority</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO OF UNITS</td>
<td>UNIT</td>
<td>Indirect costs</td>
<td>Escalation 2.5%</td>
<td>UNIT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COST</td>
<td></td>
<td></td>
<td>COST</td>
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</table>

**SUBTOTAL** $73,427 $674,217 $151,466
**PROJECT TITLE:** SHANGRI-LA HISTORIC STRUCTURE REPORT  
**LOCATION:** HONOLULU, OAHU, HAWAII  
**CLIENT:** Doris Duke Foundation for Islamic Art  
**CONSULTANT:** Historic Resources Group, LLC  
**ESTIMATOR:** Cost Engineering of Hawaii, Inc.

**Abbreviations:** MB = Main Building; PH = Playhouse; CO = Cottage; SI = Site

**PROJECT TITLE:**  
**CLIENT:** Design Stage  
**ESTIMATOR:** FY08  
**ABBREVIATIONS:** MB = Main Building; PH = Playhouse; CO = Cottage; SI = Site

---

### Items of Work

<table>
<thead>
<tr>
<th>NO. OF UNITS</th>
<th>DESCRIPTIONS</th>
<th>QUANTITIES</th>
<th>Immediate Repair/High Priority</th>
<th>0-5 Years/medium Priority</th>
<th>5+ Years/Low Priority</th>
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<tbody>
<tr>
<td></td>
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<td>UNIT COST</td>
<td>Direct costs</td>
<td>Escalation 2.50%</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>UNIT</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>1 is</td>
<td>Status quo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB200</td>
<td>Entry Foyer - Railing [Code-compliance]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB100</td>
<td>Entry Foyer - Floor [Investigate surface coating]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB101</td>
<td>Court Yard - Walls [Repair west wall leak, repaint all]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB102</td>
<td>Courtyard - Columns [Investigate and treat for termites, investigate structural integrity, restore finishes]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB304</td>
<td>West Elevation - Wood (for electrical conduit)</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB110</td>
<td>Bathroom (Moroccan Room) - Wood Windows [Status quo]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
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<tr>
<td>MB114</td>
<td>Moorish Room - Perforated Wood (south wall)</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB139</td>
<td>Kitchen - Wood Windows (south wall)</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB159</td>
<td>Living Room Lanai - Columns &amp; Corinie [Status &amp; restore finishes]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB160</td>
<td>Dining Room Lanai - Columns [Remove rust and repaint as needed]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
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<tr>
<td>MB161</td>
<td>Dining Room Lanai - Column Bases [Investigate cause of cracks]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB162</td>
<td>Dining Room Lanai - Column Bases [Investigate cause of cracks]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB163</td>
<td>Library - Floor [No treatment required]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB164</td>
<td>Pass Thru (Dining Room to Pantry) - Floor [No treatment required]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB202</td>
<td>Damascus Room - Door (south wall) [Study, Repair &amp; Restore wood members]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB202</td>
<td>Damascus Room - Door (west wall) [Study, Repair &amp; Restore wood members]</td>
<td>1 is</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>MB208</td>
<td>Porch (Damascus Room) - Porch [Repair decayed wood, Study &amp; Restore finish]</td>
<td>1 is</td>
<td>$ -</td>
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<tr>
<td>MB209</td>
<td>Jai-Pavilion - Walls [Test concrete, repair and/or replace damaged concrete]</td>
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<tr>
<td>MB209</td>
<td>Jai-Pavilion - Jai Screens [Test marble, repair and/or replace damaged marble]</td>
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<tr>
<td>MB201</td>
<td>Stair 3 (Jai Pavilion) - Stairway [Repair &amp; Restore concrete and cast stone]</td>
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</tr>
</tbody>
</table>

---

**Notes:**  
- Included with Single Expenditures  
- Included w/ ACI Report/Survey
**REPORT**

**4 APRIL 2008**

**HONOLULU, OAHU, HAWAII**

**Doris Duke Foundation for Islamic Art**

**Historic Resources Group, LLC**

**Design Stage:**

**Construction Period:** N/A

**Bid Opening on or Before:** FY08

---

### ITEMS OF WORK

<table>
<thead>
<tr>
<th>DESCRIPTIONS</th>
<th>QUANTITIES</th>
<th>IMMEDIATE REPAIR/HIGH PRIORITY</th>
<th>0-5 YEARS/MEDIUM PRIORITY</th>
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<tr>
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<td>$4,800</td>
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<tr>
<td>MB301 North Elevation - Wall (Reroofing &amp; Tile Replacement)</td>
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<tr>
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<td>$3,406</td>
<td>$205</td>
</tr>
<tr>
<td>MB302 South Elevation - Wall (Spalls &amp; Cracks)</td>
<td>1</td>
<td>$4,800</td>
<td>$3,406</td>
<td>$205</td>
</tr>
</tbody>
</table>

---

**ABBREVIATIONS:**

- MB = Main Building
- PH = Playhouse
- CO = Cottage
- SI = Site

---

**TOTAL UNI costs:** 2.50%

**TOTAL T costs:** 12.50%

**Indirect costs:** 25.00%

**Escalation:** 2.00%
### Items of Work

<table>
<thead>
<tr>
<th>DESCRIPTIONS</th>
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<tr>
<td>PH113 Bathroom (north) - Window [Investigate water intrusion &amp; Repair]</td>
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<td>PH202 Stair 2 (south) - Stairway [Investigate &amp; Repair cracks]</td>
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<td>PH304 Roof [Cyclical repair and replacement]</td>
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<tr>
<td>PH303 East Elevation - Wall</td>
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<td>PH303 East Elevation - Wall (Reroofing &amp; Tile Replacement)</td>
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</tr>
<tr>
<td>PH303 East Elevation - Wall (Site Specific)</td>
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<td>Included with Single Expenditures</td>
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<tr>
<td>PH304 West Elevation - Wall</td>
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</tr>
<tr>
<td>PH304 West Elevation - Wall (Reroofing &amp; Tile Replacement)</td>
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<td>Included with Single Expenditures</td>
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<tr>
<td>PH304 West Elevation - Wall (Exterior Painting)</td>
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<tr>
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<tr>
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### Items of Work

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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Description:

- **CO202 Room 2 (north) - Window (east wall)**: Repair & Refinish
- **CO204 Kitchen - Window (north wall)**: Refinish as needed
- **CO204 Kitchen - Window (west wall)**: Repair & Refinish
- **CO205 Lanai Addition - Framing**: Investigate for termites and structural integrity
- **CO207 Bathroom - Window**: Repair & Refinish
- **CO208 Room 1 (south) - Window**: Repair & Refinish
- **CO210 Textile Conservation - Windows (east and west walls)**: Investigate for termites, Repair & Refinish
- **CO211 Lanai - Framing**: Investigate for termites and structural integrity
- **CO213 Storage - Posts**: Investigate for termites and structural integrity
- **CO201 North Elevation - Wall**: No treatment
- **CO207 Bathroom - Window**: Repair & Refinish
- **CO207 Bathroom - Window**: Repair & Refinish
- **CO301 North Elevation - Wall**: No treatment
- **CO302 South Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO302 South Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO301 North Elevation - Wall**: No treatment
- **CO302 South Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO302 South Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO302 South Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO303 East Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO303 East Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO303 East Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO303 East Elevation - Wall**: Inspect & Repair cracks in concrete
- **CO304 West Elevation - Siding**: Investigate for termites, Refinish when needed
- **CO304 West Elevation - Siding**: Investigate for termites, Refinish when needed
- **CO304 West Elevation - Siding**: Investigate for termites, Refinish when needed
- **CO304 West Elevation - Siding**: Investigate for termites, Refinish when needed
- **COR0X - Roof**: (Cyclical repair and replacement)

#### Unit Costs:

- **2.5% Cost escalation**: $2,500
- **5.0% Cost escalation**: $2,500
- **7.5% Cost escalation**: $2,500
- **10.0% Cost escalation**: $2,500
- **12.5% Cost escalation**: $2,500
- **15.0% Cost escalation**: $2,500
- **17.5% Cost escalation**: $2,500
- **20.0% Cost escalation**: $2,500
- **22.5% Cost escalation**: $2,500
- **25.0% Cost escalation**: $2,500

#### Total Costs:

- **Immediate Repair/High Priority Costs**: $5,172
- **0-5 Years/Medium Priority Costs**: $43,722
- **+5 Years/Low Priority Costs**: $20,033
- **Total Costs**: $25,003

#### Abbreviations:

- **MB**: Main Building
- **PH**: Playhouse
- **CO**: Cottage
- **SI**: Sit
**PROJECT TITLE:** SHANGRI-LA HISTORIC STRUCTURE REPORT  
**LOCATION:** HONOLULU, OAHU, HAWAII  
**CLIENT:** Doris Duke Foundation for Islamic Art  
**CONSULTANT:** Historic Resources Group, LLC  
**ESTIMATOR:** Cost Engineering of Hawaii, Inc.  

### Abbreviations:  
MB = Main Building; PH = Playhouse; CO = Cottage; SI = Site

<table>
<thead>
<tr>
<th>ITEMS OF WORK</th>
<th>QUANTITIES</th>
<th>Immediate Repair/High Priority</th>
<th>0-5 Years/Medium Priority</th>
<th>+5 Years/Low Priority</th>
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</thead>
<tbody>
<tr>
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<td>NO OF UNITS</td>
<td>UNIT COST</td>
<td>Indirect costs</td>
<td>Escalation 2.50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IT</td>
<td></td>
<td></td>
</tr>
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</table>

**SI104 Shed - Siding & Framing**  
1 is  
|   | $50,000 | $39,546 | $2,239 | $91,785 |

**SI105 Mughal Garden (upper) - Pavers** (Limit further damage, Regrout, Investigate staining)  
1 is  
| Issue addressed | $5,000 | $3,955 | $1,119 | $10,074 |

**SI106 Mughal Garden (middle) - Brick Paving** (Investigate cause of deterioration)  
1 is  
| None Required | $183,400 | $145,053 | $41,057 | $369,510 |

**SI106 Mughal Garden (middle) - Water Feature with Fountains**  
1 is  
| Repair coating as needed, Recoat in future | $3,750 | $2,966 | $840 | $7,556 |

**SI107 Mughal Garden (lower) - Concrete Foundation** (Remove ferrous posts, Patch & Repair)  
1 is  
| $11,250 | $8,898 | $2,519 | $22,687 |

**SI108 Marble Steps (upper) - Pavers** (Investigate movement, Regrout, Repair, Investigate staining)  
1 is  
| $38,275 | $30,272 | $8,586 | $77,115 |

**SI109 Marble Steps (lower) - Pavers** (Investigate movement, Regrout, Repair, Investigate staining)  
1 is  
| $47,650 | $37,687 | $10,667 | $96,004 |

**SI110 Pool Terrace - Pavers** (Investigate staining, Reset displaced)  
1 is  
| $49,525 | $39,170 | $11,087 | $99,782 |

## SUBTOTAL  
$526,823

### REPORT

**DATE:** 4 APRIL 2008  
**Design Stage:** REPORT  
**Construction Period:** N/A  
**Bid Opening on or Before:** FY08

---

Page 7 of 9
# Project Title: Shangri-La Historic Structure Report

**Location:** Honolulu, Oahu, Hawaii  
**Client:** Doris Duke Foundation for Islamic Art  
**Consultant:** Historic Resources Group, LLC  
**Estimator:** Cost Engineering of Hawaii, Inc.

**Abbreviations:** MB = Main Building; PH = Playhouse; CO = Cottage; SI = Site

## Items of Work

<table>
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<th>QUANTITIES</th>
<th>Immediate Repair/High Priority</th>
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<th>+5 Years/Low Priority</th>
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<td>$ -</td>
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<tr>
<td>Site - Main Driveway</td>
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<td>$ -</td>
</tr>
<tr>
<td>Site - Perimeter Fencing</td>
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<td><strong>SUBTOTAL</strong></td>
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<td>Mason Architects, Inc.</td>
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<td>MBXXX - Bedroom Wing - Security equip/wiring</td>
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<td>$ -</td>
<td>$ -</td>
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<td>MBXXX - Steel Windows - Repair/Rebuilding</td>
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<td><strong>SUBTOTAL</strong></td>
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<td>Bennett Engineers, Inc.</td>
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<td>$ 130,500</td>
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</table>

**Indirect Costs:**

- MB: 0.709505  
- PH: 0.790910  
- CO: 0.628100  
- SW: 0.790910

**Location Factor:** MB 5.00%, PH 10.00%, CO N/A, & Sitework 10.00%

**Design Contingencies:** 20.00%

**General Conditions:** 12.50%

**Overhead & Profit:** 20.00%

**Bond:** 0.50%

**SUBTOTAL OF BUDGETED COSTS:** $ 1,370,742

**SOFT COSTS:**

- SUPERVISION, ADMINISTRATION, CONSULTANTS (A&E, ETC.), CONSTRUCTION MANAGEMENT & 20% CONSTRUCTION CONTINGENCY: AT 50.00% OF GENERAL CONTRACTOR COSTS

**SUBTOTAL:** $ 685,371

**TOTAL BUDGET, INCLUDING SOFT COSTS:** $ 2,056,113

---

**Indirect Costs: (products of the factors below, for each area of the property)**

- **MB:** 0.709505  
- **PH:** 0.790910  
- **CO:** 0.628100  
- **SW:** 0.790910

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**SUBTOTAL OF BUDGETED COSTS:** $ 1,370,742

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**SUBTOTAL:** $ 685,371

**TOTAL BUDGET, INCLUDING SOFT COSTS:** $ 2,056,113
### CYCLICAL MAINTENANCE

**ESTIMATED ANNUAL REPAIR & MAINTENANCE COSTS - 3% Discount Factor, 30 yr**

<table>
<thead>
<tr>
<th>NO OF UNITS</th>
<th>UNITS</th>
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<th>QUANTITIES</th>
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<th>+5 Years/Low Priority</th>
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<tbody>
<tr>
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<td>Indirect costs 2.50%</td>
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<td>12.50%</td>
<td>25.00%</td>
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<td>$951,883</td>
<td>$115,866</td>
<td>$3,031,478</td>
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<tr>
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<td>Reroofing, 15, &amp; 30 yr</td>
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<tr>
<td></td>
<td></td>
<td>Termite Treatment , 2, 4, 6, 8, 10, 12,…, &amp; 30 yr</td>
<td>$115,866</td>
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**Notes regarding indirect factors added to direct costs and rationale for soft costs:**

1. General comments: the indirect factors and soft costs were assigned by a conference of Shangri-La staff, HRG, Heath Construction Services, and Mason Architects, based on general experience, experience in Oahu, and experience at Shangri-La; these factors were not provided by CEH.

2. Location factor: construction costs are increased by 5% for the Main Building (MB), 10% at the Playhouse (PH), and 10% for sitework due to localized construction difficulty and level of care required for protection of existing buildings and features.

3. Design contingency: 20% is added to all items to account for the uncertainties of scope during the pre-design phase.

4. General conditions: 12.5% is added to all items for the general contractors overhead for onsite facilities such as construction officers, supervision personnel, etc.

5. Overhead and profit: 20% is added to each cost item for the general contractor's cost of operations and profit.

6. Bonding: .5% is added to each cost item for the expense of a performance bond to guarantee completion of the work.

7. Soft costs: 50% is added to the general construction budget to provide for the owner’s additional project costs for consultants, construction management, and a "hidden" contingency during the construction phase of 20%. This percentage is determined in part by review of the soft costs during the previous phases of work.
Appendix C
“High Level” Summary Outline of Prioritized Recommendations

Prepared for DDFIA and DDCF presentation at Shangri-La, December 2007

COTTAGE

HIGH PRIORITY

• Temporarily limit access to lanai deck, bench and west porch
• Open lanai framing to inspect for termite damage; calculate structural capacity; make necessary repairs
• Open west wall framing to inspect for termite damage and make necessary repairs
• Implement an aggressive mitigation program for prevention of termite damage
• Replace corrugated metal roofing, tile roof underlayment, reinstall/replace barrel clay tile, and replace all flashing
• Commission industrial hygienist to inspect pipe wrapping under the kitchen sink

MEDIUM PRIORITY

• Investigate condition and calculate gravity and lateral capacity of stone piers and arches at the east wall
• Closely inspect roof framing in attic for termite and beetle damage; replace and/or augment framing if needed

LOW PRIORITY

• Replace “plain” overhead garage door with door to match the other three doors
• Fill holes & spalls at tinted & stained scored concrete floors with aesthetically integrated patches
• Repair or replace kitchen sink countertop
• Replace lamp cord suspension at lanai pendant lighting fixture
• Repair wood window tracks and broken glass, including replacement of deteriorated trim and missing hardware
• Study “restoration” design scheme for south wall: lanai, stairs, work room and storage rooms

HVAC, PLUMBING, & ELECTRICAL

• Replace electrical panels
• Replace plumbing supply and waste systems
• Replace all plumbing fixtures and fittings; add lavatory at staff toilet on first level
PLAYHOUSE

HIGH PRIORITY

- Lanai railing: keep visitors away from railing due to code non-compliance
- Bathroom window: epoxy consolidate; paint; maintain frequently
- Exterior stairs: repair concrete and rebar; recoat; add sealant joint at building wall; repaint with permeable elastomeric
- Roof penetrations: reseal flashing and reinstall hose clamp
- Deck coating (roofing) due for inspection and patching in 2007
- Install temporary sealant over backer rod between the south crenellation units (above the water-damaged ceiling)
- North roof: remove all roofing and topping down to membrane over structural deck; install new polymer-modified mortar topping slab, flashing to scupper, and new roofing
- North roof: remove pre-cast components that form the crenellated parapet; repair concrete damage; add slope to top of structural parapet; add membrane; reinstall crenellations
- Repair open seams in recessed roof drain boxes at lower main roof
- East (front) and west (rear) walls: make inspection openings to determine cause of cracks at corners under the roofs

MEDIUM PRIORITY

- Lanai railing: design and code compliance studies for safety at sea wall
- North wall: regrade site to lower soil level, or excavate and install below-grade waterproofing and drainage system
- North wall: repaint with BMC II at next repainting, after coating removal, if the south wall continues to perform well

LOW PRIORITY

- Test coral sandstone paving for coating; remove coating; clean stains
- Budget for replacement of fluid applied deck coat roofing in 5 to 7 years
- Budget for replacement of single membrane roofing in 7 to 10 years
- Budget for replacement of deck coating roofing in 5 to 7 years; specify a high quality coating to reduce maintenance and extend replacement cycle.
- Add slope to the top of flat parapet tops (aesthetically difficult addition) before re-roofing
- When re-roofing lower roof, install roof drains with clamping rings

HVAC, PLUMBING, & ELECTRICAL

- Replace electrical subpanels
- Repair plumbing fixture fittings and traps as needed
- Pump room: replace old motor starters
- Replace lanai sprinkler head covers
- Repair shower mixing valve
- Replace inoperative exhaust fan in pump room
- Replace pool fill pump, primer pump, and cascade pump
- Repair leak in crawl space piping under Bath 113 (water at electrical conduit)
MAIN BUILDING

HIGH PRIORITY

- Courtyard: repair roof leak at east wall
- Courtyard: remove bottom portion of column cladding for investigation and treatment of wood condition (termites; structural capacity); restore mirror and masonite grill finishes
- Dining room floor: do not roll candelabras across the floor
- Dining room lanai iron columns: immediate and annual paint touch-up
- Dining room lanai column bases: investigate cause of cracking before repair; possible replacement/provision for thermal expansion
- Dining room lanai railing: replace missing screws; keep visitors away from railing
- Damascus Room pergola: replace damaged components; annual finish maintenance
- Jali Pavilion concrete & plaster: complete testing of material and coverage; optimal alternative is conservation of marble screens and replacement as required of concrete and reinforcing, including careful design of setting for marble
- Jali Pavilion pierced marble screens: QUALIFIED CONSERVATOR EVALUATION AND TREATMENT REQUIRED (cracking, bad patches, and possible marble expansion)
- Stairs from Jali Pavilion to garden: remove cracked and spalling concrete; treat and patch
- Exterior walls: Investigate & repair recurring horizontal crack just above roof flashing termination
- Exterior walls: Investigate & repair recurring horizontal crack just above roof flashing termination
- North façade: monitor tile displacement on interior tiles at Space 200
- Exterior living room architrave/window hoods: immediate stabilization of loose pieces; testing and repair/replacement of steel reinforcing and concrete; repairs to present moisture intrusion at Living Room windows
- Living Room lanai roof: re-roof, incorporate flashing at rake, repair wall, replace broken tiles
- Adjust fertilizer application adjacent to Living Room windows
- Service wing roof: seal unsealed laps
- Service wing roof penetration flashing: replace sealant
- Clean roof scuppers monthly
- Courtyard roof: add pads under mechanical equipment supports
- Courtyard roof flashing: redesign flashing; replace sealants
- Courtyard roof: replace drain box; seal roof membrane to drain boxes
- Courtyard cornice skylight: inspect for termites throughout; redesign perimeter flashing (actively leaking)
- Main building roof: extend termination bar; install reglet-set flashing
- Damascus Room roof: repair unsealed seam at center drain
- Moroccan Room: repair cracked and peeling conditions at fluid-applied membrane roofing (replacement at a later date)
- Investigate cracks at east wall of Damascus Room
- Investigate detached frame trim at north end of Damascus Room west door
- Refer to July 30, 2007, letter for immediate roof repair recommendations
- Cut out lightweight concrete and create sump for roof drain at bedroom wing
- Redesign flashing and underlayment, replace roofing at Living Room lanai
- Repair termite and fungal damage in wood framing at Living Room lanai
MEDIUM PRIORITY

- Entry foyer wood screen: repair finishes on wood & steel; replace salt-damaged wood components
- Utility window: seal gap between window and frame
- Bathroom windows: consolidate and refinish salt-damaged wood frame and trim
- Damascus room wood doors, screens & frames: consolidate and refinish salt-damaged wood frame and trim
- Dining room and lanai basalt tile floor: investigate (petrography; tile thickness); optimal option is to fill joints and repolish
- Dining room lanai railing: design alternative studies for improved life safety
- Service court walls: replace window sealant joints; add coping over lintel at gate
- Study, clean and restore Living Room Window-Doors, pocket window, and pocket doors, including west wall; repair and adjust operating hardware and locksets
- Study, clean and restore Dining Room windows and doors; repair and adjust operating hardware and locksets on doors only.
- Maintain, study, clean, and restore finishes on Dining Room Lanai railing.
- Service wing roof: install reglet-set flashing over termination bars & membrane edges
- Built-in gutter at Dining Room: further investigate; possible reconstruction for reliability
- Main Foyer roof: investigate possible frame movement on south side
- Design and specify roof repair and/or replacement
- Foyer clerestory window grills: renew finishes
- Courtyard roof: install reglet-set flashing over termination bars and membrane edge; reconfigure rain leaders; replace pitch pockets with witches’ hats

LOW PRIORITY

- Entry foyer, courtyard, bedroom lanai coral sandstone floors: investigate coating; optionally remove coating; do not recoat
- Moroccan Room wood screens: repair salt-damaged components; renew all finishes
- Dining Room lanai basalt tile floor: long term need to lift tile and install waterproof membrane & drainage system
- Repair cracked concrete at expansion joint
- Service court stairway: remove corroding embedded railing post bases
- Exterior walls: periodic painting and maintenance; add coping to tops of walls
- East wall: replace 6 cracked concrete window sills
- Service wing roof: add slope at next roof membrane replacement
- Roof penetration flashing: replace pitch pockets with “witch’s hats” at next re-roofing
- Roof mechanical roof penetrations: reconstruct to provide 8” flashing at next re-roofing
- Add copings to top of concrete parapets (requires careful detailing to maintain clean visual presentation)
- At next reroofing, replace non-clamped roof drains
- Fluid-applied roof membranes (Damascus Room to Master Bedroom areas): replace in 5 years
- Raise threshold at Damascus Room balcony door
- Remove all lightweight concrete decks at next re-roofing at fluid-applied membrane roofs
HVAC, PLUMBING, & ELECTRICAL

- Replace electrical subpanels
- Replace motor starters
- Replace GFI receptacles (exterior)
- Relocate & replace breakers in crawl space
- Replace sink traps with code conforming units
- Provide make-up air for storage room
- Replace undersized exhaust fans
- Specify more durable replacement for “Greenheck” roof exhaust fans
- Specify and replace solar-powered exhaust fans
- Replace toilet tank valve mechanisms with new technology
- Modify HVAC system at “Wine Cellar” space
- Design & engineering study for centrally located HVAC units to replace “condenser row” at east yard with landscape-screened durable central system
- Retain and refinish lavatory fittings at “primary” bathrooms
- Disconnect gas service to all non-HVAC appliances
- Consider disconnecting gas service to Main Building
- Commission an alternatives study for cooling systems: centralized, less frequent replacement, discreet site locations
- Repair water leak at pipe & electrical conduit penetration in crawl space below Bathroom 113
Appendix D
Codes and Regulations

Accessibility: Americans with Disabilities Act (ADA)

Introduction
ADA provides specific guidelines for physical accessibility that are relevant to identifying barriers at the site. It is important to review in minute detail the application of this public law to determine which parts of a facility must be accessible, and what are the specific guidelines for that facility.

Prior to proceeding with a design for barrier removal, consult with the City’s building official, the property owner’s legal advisor (ADA is a civil rights statute enforced by the United States Department of Justice), and individuals or organizations who are interested in accessibility at Shangri La.

ADA Title III
Under Title III of the ADA, owners of “public accommodations” (theaters, restaurants, retail shops, private museums) must make “readily achievable” changes; that is, changes that can be easily accomplished without much expense. This might mean installing a ramp, creating accessible parking, adding grab bars in bathrooms, or modifying door hardware. The requirement to remove barriers when it is “readily achievable” is an ongoing responsibility. When alterations, including restoration and rehabilitation work, are made, specific accessibility requirements are triggered.

Recognizing the national interest in preserving historic properties, Congress established alternative requirements for properties that cannot be made accessible without “threatening or destroying” their significance. A consultation process in outlined in the ADA’s Accessibility Guidelines for owners of historic properties who believe that making specific accessibility modifications would “threaten or destroy” the significance of their property. In these situations, after consulting with persons with disabilities and disability organizations, building owners should contact the State Historic Preservation Officer (SHPO) to determine if the special accessibility provisions for historic properties may be used. Further, if it is determined in consultation with the SHPO that compliance with the minimum requirements would also “threaten or destroy” the significance of the property, alternative methods of access, such as home delivery and audio-visual programs, may be used.

New Construction and Alterations
Each facility or part of a facility altered by, on behalf of, or for the use of a public entity in a manner that affects or could affect the usability of the facility or part of the facility shall, to the maximum extent feasible, be altered in such manner that the altered portion of the facility is ready accessible to and usable by individuals with disabilities, if the alteration was commenced after January 26, 1992.

Any alterations to Shangri La therefore must be readily accessible to and usable by people with disabilities. However, no major modifications or additions to Shangri La are recommended or anticipated.

Accessibility for Existing Buildings

1. Provisions that apply to renovation, structural repair, alteration, change in primary function, or addition to existing buildings, including those identified as historic buildings; minimum standards for removing architectural barriers, and providing and maintaining accessibility to existing buildings and their related facilities.

2. All existing buildings and facilities, when alterations, structural repairs, or additions are made to such buildings or facilities, shall comply with all provisions except where otherwise modified by the regulations.

3. These requirements shall apply only to the area of specific alteration, structural repair, or addition and shall include the following additional and facilities: a primary entrance to the building or facility; the primary path of travel to the specific area of alteration, structural repair, or addition; sanitary facilities, drinking fountains, and public telephones serving the area.

Priorities, Hardships, and Equivalent Facilitation

The following provisions appear to be primarily applicable to commercial facilities rather than publicly owned facilities and programs.

In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, by providing code compliance in the following order:

1. An accessible entrance
2. An accessible route to the altered area
3. At least one accessible restroom for each sex
4. Accessible telephones
5. Accessible drinking fountains
6. When possible, additional accessible elements such as storage and alarms

EQUIVALENT FACILITATION is an alternate means of complying with the literal requirements of these standards and specifications that provides access in terms of the purpose of these standards and specifications.

The purpose of this code is to ensure that barrier-free design is incorporated in all buildings, facilities, site work, and other developments to which this code applies and to ensure that they are accessible to and usable by persons with disabilities.
EXCEPTIONS:
An unreasonable hardship exists when the enforcing agency finds that compliance with the building standard would make the specific work of the project affected by the building standard unfeasible, based on an overall evaluation of the following factors:

1. The cost of providing access.
2. The cost of all construction contemplated.
3. The impact of proposed improvements on financial feasibility of the project.
4. The nature of the accessibility that would be gained or lost.
5. The nature of the use of the facility under construction and its availability to persons with disabilities.

In existing buildings, these regulations shall not apply when legal or physical constraints would not allow compliance with these regulations or equivalent facilitation without creating an unreasonable hardship as determined by an appeals process.
Chapter 1  Introduction

1-1  Scope

This document describes principles and practices of fire safety for historic structures and for those who operate, use, or visit them. It covers ongoing operation and rehabilitation and acknowledges the need to preserve historic integrity.

Chapter 3  Identification and Evaluation of Existing Conditions

3-4  Fire Hazards

Ignition Sources
- Electricity
- Arson
- Smoking
- Overheated materials
- Open flames
- Exposures
- Spontaneous ignition and chemical reactions
- Lightning

Combustibility of Materials
- Material properties
- Flame spread
- Environmental factors
- Structural fire hazards
- Fire spread
  - Horizontal
  - Vertical
  - Structural integrity

3-5  Means of Egress

- Occupant evacuation
- Egress codes
- Number of exits
- Exit capacities
- Exit arrangement
- Remoteness
- Travel distance
- Dead-end travel
- Egress route identification
- Construction details
Chapter 4  Code Enforcement

4-1.2  Administrative and Review Requirements

4-1.2.2  Code Enforcement

Proposed rehabilitation projects should be discussed with the appropriate building and fire code officials as early as possible in the planning stages to determine if code or safety conflicts exist. Many codes have special provisions for historic buildings and for the consideration of alternative methods or systems that will provide levels of safety equivalent to those required for new construction. In some cases, special appeal or variance boards exist and should be requested to address those situations where fire safety and protection concerns and historic preservation goals cannot be resolved acceptably by the standard review process. Most building code officials are willing to work with owners, architects, and engineers and will consider alternative construction methods, provided a reasonable or equivalent level of life and property protection is proposed.

4-2  Concepts of Fire Safety Planning

4-2.1  Management Responsibility

Fire safety is an essential and permanent part of historic structure operations and should be a key consideration when that structure is scheduled for rehabilitation. Owners and others entrusted with the management or operation of buildings having historic significance have prime responsibility for ensuring that the historic structure is protected against the disastrous effects of fire.

Using advice from qualified fire safety professionals, the management team should develop fire safety objectives and a fire safety plan for the complete facility. As part of this plan, the management should decide how the building, its contents, and the occupants are to be protected during the rehabilitation process as well as when it is completed.

4-3.6  Detection and Alarm

Significant improvement in protection from fire can be achieved by installation of a detection and alarm system connected to an alarm monitoring service or a fire department.

4-3.7  Fire Extinguishment

4-3.7.1  General

Management must make critical decisions as to the type of fire suppression capability that will be provided in the building.

4-4.1.3  Elements of a Fire Safety Plan

- Prevention
- Limiting combustibility
- Coating
- Compartmentation
- Structural protection
Chapter 5 Fire Protection and Safe Practice in the Construction

5-4 Fire Protection

5-4.3 Fire Fighting

5-4.3.1 Access

A suitable location at the site should be designated as a command post and provided with plans, emergency information, keys, communications, and firefighting, salvage and medical equipment, as needed. The person in charge of fire protection shall return to the location immediately if a fire occurs.

Pre-fire planning should be updated periodically with local authorities. For large projects, a fire safety coordinator for the site should be provided. The duty of this coordinator should be to ensure that all procedures, precautionary measures, and safety standards are laid down, understood, and complied with by all personnel on the construction site.

Chapter 6 Operations and Maintenance

6-1 General

Management has the primary responsibility to periodically review fire hazards within their respective facilities and implement appropriate maintenance and protection programs.

6-2 Operations

- Heating plants
- Electrical systems
- Structure
- Fireplaces and wood stoves
- Lightning protection
- Cooking and beverage systems
- Fire protection systems
- Fire life safety

6-3 Maintenance

- Heating plant
- Electrical plant
- Electrical systems
- Structure
- Fireplaces and wood stoves
- Lightning protection
- Clothes dryers
- Cooking and beverage systems
- Fire protection systems
- Life safety systems
Appendix D Guidelines on Fire Ratings of Archaic Materials and Assemblies

Appendix D is not part of the recommendation of this NFPA document, but is included for informational purposes. Nevertheless, Appendix D is a potentially very useful part of NFPA 914, as it offers data and a methodology for the alternative analysis of fire safety issues in historic structures.

Figure 1, “Preliminary Evaluation Field Notes,” is a blank form for organizing information about building elements and materials. Figure 2, “Preliminary Evaluation Worksheet,” is a blank form for organizing information about the required and estimated fire resistance of existing elements, as well as proposing upgrades.

“Harmathy’s Ten Rules” (T.Z. Harmathy, “Ten Rules of Fire Endurance Ratings,” Fire Technology, May 1965) are included as one theoretical method to provide a foundation for extending the data with the Appendix Tables to analyze or upgrade current as well as archaic building materials or assemblies.

Most important for the practicing architect or fire protection engineer are extensive tables of data on the fire resistance of materials and assemblies (walls, ceilings, floors) of materials. Characteristics of archaic materials and assemblies are usually not published in current model codes and fire protection manuals since those materials and assemblies may no longer be allowed.
NFPA 909 provides model outlines for inspections, management, and fire safety plans.

Chapter 1  General

1-1  Scope

This standard shall apply to culturally significant structures and their contents. Such structures include, but are not limited to, buildings that store or display museum or library collections, historic buildings, and places of worship. It also includes spaces within other buildings used for such culturally significant purposes.

Chapter 2  Fire Emergency Planning

2-1  Fundamental Requirements

2-1.1  Responsibility

2-1.1.1 Fire emergency planning responsibilities include the following:

1. The facility’s governing body or those responsible for the institution shall establish and maintain plans and programs to protect against the disastrous effects of fire.
2. In carrying out this responsibility, a fire risk assessment shall be conducted.

2-1.1.2 The facility’s governing body or those responsible for the institution shall appoint a fire safety manager who is responsible for the protection of the site from fire. The fire safety manager’s duties include (but are not limited to) the following: life safety systems, fire prevention, fire inspections, periodic property surveys, proper operation of fire protection equipment such as fire detection and fire suppression equipment, and portable fire extinguishers. Other duties shall include plans review for fire safety of new construction, renovations, or installation of displays or exhibits.

2-2  Planning for Fire Protection

2-2.2  Fire Hazard Analysis

1. A thorough survey shall be made to determine existing and potential fire hazards.
2. Fire hazards shall be evaluated and classified for their severity and the difficulty and cost of abating them.
The survey shall include the following:

- Identification of cultural properties, special hazards, and action plan against hazards
- Identification of fire risks and means-of-egress problems that can be created by special events and action plan for each event
- Recognition that public visitation can increase during special events, etc. and that creation of provisions for identifying and taking action to prevent problems and corrective actions if problems arise

2-2.3 Fire Protection Plan

1. Format of Plan

A fire protection plan shall be developed for systematic achievement of fire safety goals and updated annually. This shall include a yearly comprehensive facility inspection procedure with a documentation and corrective action process to ensure that all problems and hazards identified during the inspection are documented and corrected as soon as possible.

2. Fire Safety Log

The fire safety manager shall be responsible for maintaining a permanent, current file of the cultural resource facility’s or institution’s fire protection program. As a minimum, permanent records documenting the following shall be kept:

- Training of staff and volunteers, including fire evacuation drills and use of portable fire extinguishers
- Testing, inspection, and maintenance reports for all fire safety equipment and systems
- “As-built” plans, specifications, wiring, and layout diagrams
- Fire protection plan
- Emergency plan
- Inspection reports by local code enforcement officials
- Fire alarm reports
- Full reports of all fire incidents

3. Arson

Implement precautions to prevent arson.

4. Locking Devices

Provisions for use of delayed exit locking systems.
2-3 Planning for Response

2-3.1 The governing body and the fire safety manager shall develop and implement an emergency management plan. There shall be an annual exercise to ensure that management and staff can implement and work with the plan and incorporate lessons learned from the exercise into an updated plan.

2-3.2 An emergency evacuation plan shall be prepared in cooperation with the local fire department and other applicable authorities and updated annually.

2-3.3 Fire exit drills required by NFPA 101, Life Safety Code, shall be conducted at regular intervals, but no less than twice per year.

2-4 Salvage Plan

A salvage plan shall be prepared in cooperation with the fire department, appropriate building staff, police, and insurance representatives. This plan shall be updated annually and shall include the following:

1. Procedures to identify and prioritize collections and other valuable materials in accordance with the facility’s policy
2. A list of salvage equipment suppliers (e.g., pumps, freezing equipment, storage facilities, and so forth) and tradespeople
3. A current list of disaster recovery specialists
4. A list of people assigned to assist with salvage operations
5. Measures to maintain up-to-date copies of important documents in a secure, off-site location
6. Procedures to identify and handle hazardous materials

2-5 Training

2-5.1 The facility’s governing board and its fire safety manager shall ensure that all staff, including volunteers and interns, receive periodic and regular training pertinent to their assigned responsibilities, reinforced by annual drills.

2-5.2 Training shall include emergency evacuation of mobility-impaired individuals.

Chapter 3 Fire Prevention

3-2 Decorations

3-2.1 Decorative materials used for special events, occasions, and holidays shall be noncombustible or shall be treated with an approved fire-retardant coating.

3-3 Fire Spread Control

Interior doors shall be kept closed with the building is not occupied.
EXCEPTION: Where doors are required to remain open for interior ventilation and air movement concerns are critical to the conservation of historic building fabric, collections, or both, and where the interior doors are themselves part of the historic fabric, careful and professional analysis shall be performed and documented and alternative methods to control fire spread shall be implemented.

3-4 Housekeeping

3-4.1 Stairwells, corridors, doorways, and any other portions of the means of egress for a building shall be free of combustibles, trash containers, and other materials.

3-5 Smoking

3-5.1 Smoking shall be prohibited inside buildings except in designated areas that meet the following requirements: publicly identified, provided with suitable ashtrays, separated by minimum one-hour fire resistance, and provision of fire extinguishers.

3-7 Open Flames

3-7.1 Approval

Use of open flames and flame-producing devices, such as candles, oil lamps, fireplaces, forges, kilns, glassblowers, cook stoves, and so forth, shall be approved by the authority having jurisdiction.

3-7.2 Precautions

The following precautions shall be taken to control open flame and flame-producing devices:

- Train employees in proper use and emergency response
- Constant monitoring by a trained person
- A fire extinguisher located nearby
- Candles kept minimum four feet from combustible window treatments and wall or ceiling hangings
- Fireplaces shall be covered with a fire screen when not used for cooking or similar demonstrations
- Open flames within 100 feet of the building shall not be left unattended
- Open flames shall be extinguished prior to shut-down of the facility

3-7.3 Chimneys

2. Chimneys shall be lined, provided with a spark arrestor, and maintained
3. Chimneys serving active fireplaces or stoves shall be inspected and cleaned annually

Chapter 6 Inspection, Testing, and Maintenance

6-4 Heating and Cooking Equipment

1. Heating and air conditioning systems and cooking appliances shall be maintained in accordance with the manufacturer’s specifications and the applicable NFPA standards.

2. Heaters and ductwork, including hoods and ducts for ranges, shall be kept free of flammable and combustible deposits.

Chapter 7 Historic Structures and Sites

7-1 Introduction

Two important goals of historic preservation shall be to provide adequate fire protection to all historic buildings while protecting those elements, spaces, and features that make them historically or architecturally significant.

A building survey shall be conducted to identify significant historic elements, spaces, and features; code deficiencies; and existing fire and life safety hazards and to establish restoration and preservation objectives. The building survey shall provide the basis for all fire protection and preservation planning decisions. It shall be conducted by a qualified professional experienced in fire protection and the preservation of architecturally significant structures.

7-3 Preservation and Renovation

7-3.2 Historic Preservation

Historic buildings shall be treated with the sensitivity prescribed by conventional historic preservation criteria and standards, such as the Secretary of the Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, or other nationally recognized documents.

7-3.3 Preservation Authority Review

Projects shall be discussed with the appropriate preservation authorities as early as possible in the planning stages.