Coit Memorial Tower
Condition Assessment
San Francisco, California
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Project Introduction

Executive Summary

Architectural Resources Group, Inc. (ARG) was retained by The City and County of San Francisco Recreation and Parks Department (SFRP) to conduct a condition assessment of Coit Memorial Tower on Telegraph Hill in San Francisco. Although SFRP manages Coit Tower, the historic murals on the interior walls are managed by the San Francisco Arts Commission. SFRP requested a holistic approach to evaluating Coit Tower, not just as a building and monument, but as a repository of significant works of art that is visited by over 150,000 people each year. The condition of the Coit Tower murals is directly affected both by the condition of the building and by the presence and activities of visitors and building users; at the request of SFRP, the undertakings of this project were informed by the dynamic existing between the building, its artwork, and its users.

The purpose of this condition assessment is to support the conservation of Coit Tower and the murals within it by identifying needed repairs and improvements related to waterproofing, mural conservation and maintenance, climate control, fire protection, code compliance, and universal accessibility. The scope of work is limited to the tower structure, historic murals, and selected interior details, and does not include site landscaping, access trails, or parking areas.

Coit Memorial Tower is a City of San Francisco Landmark and is listed on the National Register of Historic Places. Recommendations in this report are made in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties, and with the Code of Ethics and Guidelines for Practice of the American Institute for the Conservation of Historic and Artistic Works (AIC).

Following are high priority recommendations developed by the project team:

1. Install new roofing at the second floor level
2. Repair severe concrete spalling at the top of the tower
3. Improve signage and mural barriers on the first floor
4. Install environmental monitoring in galleries
5. Stabilize frescoes at areas of severe water damage
6. Implement an inspection and maintenance program for the murals
7. Mitigate asbestos insulation at hot water pipes
8. Inspect historic water tanks and provide protective coating
9. Provide additional ventilation at the restrooms
10. Improve building circulation to protect the murals and enhance visitor experience
Recommendations for repair, maintenance and upgrades are outlined in this document and integrated into a prioritized treatment matrix at the end of the report narrative.

The following report includes a brief description of Coit Tower and the murals within, with a summary of previous repairs, conservation and alterations; describes the condition of historic murals and existing architectural, mechanical, electrical and plumbing systems; and provides recommendations for repairs and improvements to increase building code compliance and universal accessibility.
Methodology

Architectural Assessment
ARG reviewed background documents provided by SFRP, including scans of original construction drawings, the 1989 Historic Structure Report (appended to which are original construction specifications, a 1985 condition assessment, and the 1989 mural conservation report), and maintenance records from 2006 to 2012. ARG staff visited the site on several occasions in March and April 2012 to conduct a visual survey and condition assessment of exterior features, and to collect measurements for a building code analysis. The façade survey utilized a spotting telescope to visualize remote surfaces, and an infrared camera was used to examine the façade and interior for hidden deterioration. All site visits were documented with digital photographs. Paint samples were collected from ceiling surfaces of the first and second floor on April 20, 2012, and examined under microscope at ARG’s laboratory, in order to identify historic paint colors.

ARG contracted The Lawson Roofing Company (Lawson) to investigate and evaluate flat roofing systems at the Second Floor Observation Deck, the Belvedere Level, and the Lantern Level. Lawson visited the site on April 16, 2012 to examine the roofs and collect samples of roofing materials.

Murals Assessment
The San Francisco Arts Commission engaged the services of Anne Rosenthal Fine Art Conservation to conduct a detailed examination of the historic murals painted on the walls of the first and second floor galleries and the stairwell between the first and second floors. Mural conservator Anne Rosenthal visited Coit Tower in March 2012 and conducted a close-range visual survey of mural surfaces. She also took moisture readings of selected wall surfaces and ambient humidity in the first floor gallery. The Arts Commission provided Anne Rosenthal’s findings to ARG, which are included in this report.

Mechanical/Electrical/Plumbing Systems Assessment
ARG engaged the services of Interface Engineering, Inc. (Interface) to perform assessments of mechanical, electrical and plumbing systems at Coit Tower. Interface visited the site on April 6, 2012 and conducted a surface-based site investigation of building systems.
Coit Memorial Tower and Murals

Description

Tower
Coit Memorial Tower, also known as Coit Tower, is situated at the top of Telegraph Hill in San Francisco. The outer form of the 180-foot reinforced concrete tower is a fluted shaft crowned with two tiers punctuated by arched openings. The interior of the tower is formed by two concentric cylinders housing a series of curved stairways and an elevator shaft at the center. The elevator travels to the second floor and the Belvedere Level, where a narrow observation deck is protected by a pre-cast concrete balustrade. An open observation deck, known as the Lantern Level, is accessed by stairs from the top elevator landing and is 32 feet below the top of the tower. The tower rests on a rectangular base with outwardly curving colonnades and glazed walls to the east, south and west. A small structure, formerly the Keeper’s Quarters, is perched over the main entrance at the north. The north entrance is approached by a series of terraces and steps that lead from a circular parking lot. At the south, a small terrace overlooks a lawn and observation point. The building is managed by the City and County of San Francisco Recreation and Parks Department.

The tower base interior is the primary public space, which consists of a gallery wrapping around the tower shaft, with toilet rooms flanking the main entry lobby. Inside the shaft, an elevator lobby, gift shop, and mechanical room make up the outer ring of the first floor. The center ring is occupied by an elevator shaft. Curving stairs lead from the elevator lobby to the second floor, where a gallery, the former Keeper’s Quarters, and the tower base roof deck are accessed. The curving stairs and storage spaces continue to wrap around the elevator shaft, with landings at ten additional floor and mezzanine levels before terminating at the Lantern Level.

Murals
Gallery walls at the first and second floors, as well as the stairway between the floors, are covered with murals created by 26 artists and 19 assistants under the aegis of the Public Works of Art Project (PWAP), a New Deal program initiated during the Great Depression. Most of the murals are frescoes, meaning they were painted onto fresh plaster, and are therefore integrated with the walls. Murals in the elevator lobby are oil on canvas, and one mural on the second floor is executed in egg tempera on plaster. The murals are managed by the San Francisco Arts Commission.
Overview of Construction and Treatment

Tower
Designed by noted San Francisco architect Arthur Brown, Jr., the construction of Coit Memorial Tower was spurred by the generosity of Lillie Hitchcock Coit, who was an honorary member of the San Francisco Fire Department. In her will, Coit bequeathed nearly $100,000 to be used to beautify the city (she also required that a statuary monument be erected to the original volunteer fire department of the city). It was decided that a monument would be constructed on Telegraph Hill, and Brown won the competition to design the structure, which was completed in 1933.

The outer reinforced concrete surfaces of Coit Tower were shaped with plywood forms, a new technique of the time that facilitated the creation of the curving flutes of the tower. According to the original specifications, concrete was strengthened by adding diatomaceous earth. Exterior surfaces were coated with a dash coat of white cement. Flat roof decks at the second floor, Belvedere Level, and Lantern Level were finished with 6”x9” quarry roofing tiles. Fenestration includes steel windows at the first floor gallery and Lantern Level, slit windows illuminating upper stair landings and storage rooms, and round pivot windows at the elevator machine room and the stairway to the Lantern level.

In 1988, a restoration effort was undertaken to address cracking and spalling of concrete and stucco walls and the cast stone balustrade. Small cracks were repaired by epoxy injection, and larger cracks and spalls were patched with a cementitious compound. The original dash coat was removed by sandblasting and a new dash coat was applied. The original balustrade was removed and a new pre-cast balustrade was installed. A new elastomeric roof covering was planned at the second floor level, but was never installed. In the 1990s, composite Dex-O-Tex roofing was installed at the Belvedere and Lantern levels. A raised composite deck was installed over the Belvedere Level roofing at an unknown date.

Murals
Coit Tower was not originally designed to house murals, but in 1933 it was chosen as the venue for the first Public Works of Art Project (PWAP) endeavor in California. The murals were completed in July 1934 among controversy surrounding perceived Communist propaganda in the subject matter of some of the murals, exacerbated by political and social upheaval associated with labor disputes in San Francisco and the west coast. The tower and murals were opened to the public in October 1934.
Deterioration of the murals in the form of graffiti vandalism, water damage from building leaks, and mechanical impact from visitors and building users, has been an ongoing issue. Significant restoration and conservation efforts on the murals have been documented in 1960, 1975, and 1989. Fine arts conservator Anne Rosenthal completed a condition assessment of the murals for the San Francisco Art Commission in May of this year.

Coit Tower shortly after completion. (San Francisco Public Library, #AAC-1476, c. 1933-1935)

Detail of fresco inside Coit Tower painted by John Langley Howard and E. Olinstead. (San Francisco Public Library, #AAC-1519, 1934)
Condition Assessment

Following is an assessment of existing conditions at Coit Tower, observed during visual surveys of the building. Included in the assessment are exterior architectural features and roofing; historic murals at the first and second floors; mechanical systems including heating, ventilation and air conditioning (HVAC); electrical systems including power and lighting; and plumbing systems including domestic water and sewer; followed by a building code and accessibility analysis. Additional photographs of existing conditions are included in Appendix A.
Architectural Assessment

Exterior Walls
Concrete walls and dash coat stucco are generally in good condition; however, discrete areas of deterioration are evident. At the south elevation, a large incipient spall is visible at the very top of the tower. Incipient spalls are areas of cracking and deformation where detachment and loss are imminent. Because they are indicators of damage that is about to happen, it is important that they be addressed as soon as possible (especially where detaching and falling materials represent a potential life safety threat).

There are a number of cracks and instances of corrosion staining on the columns and walls of the Belvedere Level. Additionally, several sections of cast stone balustrade at the Belvedere Level exhibit long horizontal cracks at the base. Spalls and bulging stucco are visible at the tower base walls, particularly above window walls at the east and west elevations. Cracking and stucco loss is observed at the Lantern Level upper roof drains and next to windows. Sealants at expansion joints of the tower base walls at the second floor roof level are cracked and failing.

Traces of graffiti and overpaint are abundant at the walls of the base and surrounding site walls (according to maintenance records, graffiti is a recurring problem). Stucco surfaces are moderately soiled at parapets, and deposits of orange and green algae are visible on the Belvedere Level balustrade and near the Lantern level windows. Darkened patches are evident at the underside of arched openings, where soil is preferentially deposited as rain travels along the façade. The cast stone ornamental tablet and fasces above the main entrance are in good condition.
Windows

Galvanized steel windows are in fair condition overall. Paint coatings are worn and chipped at the interior, and exterior faces show minor to moderate corrosion. A slit window with cracked glass has been removed at the east elevation just below the Belvedere Level, and a slit window overlooking one of the stairway landings does not appear to close properly. The window in the women’s restroom has cracked glass and windows at the Keeper’s Quarters do not shut securely. Metal bars covering windows at the Belvedere Level and second floor roof are moderately to severely corroded. Non-historic steel casement windows at the Lantern Level are in good condition, showing only minor corrosion at the hinges. Glazed privacy or wind screens were added to the exterior deck outside the Keeper’s Quarters and the surfaces covered with stucco to match the building. Window sills at the Lantern Level are littered with coins. Cast stone grilles at the toilet rooms are in good condition.

Paint is peeling at steel casement windows. (ARG, 2012)

A slit window at the east elevation is corroded, the pane is cracked, and it has been removed from the opening. (ARG, 2012)
Doors

Historic exterior doors are in fair to poor condition, exhibiting failing paint and corrosion. At the first floor gallery, galvanized steel French doors at the east elevation do not fully close, and maintenance records indicate that the exterior push button at the south elevation ADA doors needs frequent repair. Mortar at threshold joints is cracked and missing. Copper-clad Kalamein doors at the second floor, Belvedere Level, and Lantern Level are moderately to severely corroded and exhibit varying levels of alteration and damage. The overhead roll-down door at the building’s front entrance is in fair condition but is not sympathetic to the overall character of the building.

Detail of east elevation French doors: the doors do not fully close, and mortar is failing at the threshold joint. (ARG, 2012)

The Kalamein door at the Belvedere level is severely corroded. (ARG, 2012)
Roofing and Drainage
Rolled asphalt roofing at the second floor is in very poor condition, and exhibits wear and fading, separation of the seams, bunching and cracking. Water accumulates and ponds in many areas after rain events, and there are numerous patches where leaks have been repaired in the past. Roof drains are clogged, and there is a significant buildup of debris and tree litter in the triangular roof spaces. A sealant joint at a west elevation scupper has failed, possibly causing a concrete spall below. Copper flashing is in good to fair condition, but sealant joints are aging and beginning to fail. Physical investigation of the roofing layers indicates that the historic quarry tile pavers are no longer in place, and the existing deck mortar bed is covered with layers of fiberglass roofing, asphalt, 2-5 inches of insulation, and roll mineral roofing.

At the Belvedere Level, composite slab roofing is not visually accessible due to the board decking, but there are no apparent leaks at the slab. Catch basins beneath the light fixtures appear to be relatively new and in good condition; however, steel sleeves at the slab penetrations are corroding. At the Lantern Level, upper roof scuppers do not extend far enough from the parapet to adequately drain water, and composite roofing shows concentrated wear in high traffic areas.
**Metalwork**

Bronze signage and plaques show minor to moderate soiling and corrosion. Steel railings at the entrance, south terrace, and elsewhere at the tower base are in good condition.

*Bronze signage at the entry retaining walls is moderately corroded. (ARG, 2012)*

*The commemorative plaque near the entrance is in good condition. (ARG, 2012)*
Ceiling Paint

Ceiling paint at the first floor gallery is in fair to poor condition, exhibiting peeling, blistering and detachment in various areas, resulting from water intrusion. In addition, the existing ceiling coatings include lead-containing paint. At the request of SFRP, paint samples were collected from ceilings at the first and second floor galleries to conduct a paint analysis to identify historic paint colors.

The theoretical basis for paint analysis relies on the concept that the layer structure or stratigraphy of successive campaigns of paint or other finishes creates a visual template of how a given surface was treated over time: the closer to the substrate a finish is, the older the finish is. The finish directly over the substrate (assuming the stratigraphy is complete and finishes have not been stripped or weathered off) can be interpreted as the first or original finish.

Stratigraphies obtained from different areas or elements in a building can be compared to identify matching and contrasting finish sequences, often as a basis for determining historic color schemes. Stratigraphies may be examined in situ (i.e., in place) by scraping, abrading, or
stripping individual paint layers from the current surface to the substrate: this is known as creating an exposure window. Samples may also be taken of finish stratigraphies (including the substrate) and examined under microscope, where finishes are often observed that were not visible in situ. Also, sampling allows for a number of visual and analytical techniques that can identify binding materials and pigments in finishes and facilitate color matching.

Finishes in this study were sampled for visual microscopic analysis and color matching; no detailed examination took place in situ. Samples were examined at the ARG laboratory with a binocular stereoscope at 20x-40x magnification. The bulk samples were examined, and a portion of each was embedded in resin and cut and polished to view the cross section. Color matches were obtained by visually comparing finish layers exposed in cross section to color standards manufactured by Munsell.

Examination of ceiling paint samples reveals that the earliest two layers of paint directly over the concrete are dark yellow and a lighter yellow. Both historic yellow layers have a flat, chalky appearance and are easily dissolved in water, suggesting they may be calcimine or distemper paints. Subsequent paint colors are varying shades of off-white. At the second floor, the most recent ceiling color scheme is a greenish white color field with a maroon border adjacent to the murals. No evidence of this border scheme was detected in earlier paint layers.

![First floor gallery ceiling paint sample cross section at 25x magnification. Earlier paint layers including the first two yellow colors are at the bottom, with the most recent white paint layer at the top. (ARG, 2012)](image)

First and second floor gallery ceilings were both originally painted with two layers of yellow paint. The first dark yellow color is a visual match to Munsell 2.5Y 8/6. The subsequent light yellow layer is a visual match to Munsell 2.5Y 9/4.
Interior Finishes
Restroom floor and wall tile is historic and is in good condition although moderately soiled in some locations. Wood toilet partition doors do not operate or lock smoothly. The quarry tile flooring in the first floor gallery is historic and is in good condition overall; however there are isolated areas of stains and discolorations at the floor and baseboard; in addition, there are large but inactive settlement cracks near the east and south exterior walls. A small area in the northwest corner was patched with tile of differing size and color. At the gift shop, a yellow line has been painted on the concrete floor.

*Floor tiles at the first floor gallery are cracked. (ARG, 2012)*
Barriers and Signage
The existing mural barrier system installed in 1990 appears to function well and is aesthetically compatible with the building’s architecture. In the main lobby, the barrier rail extends 30 inches in front of the murals, creating a buffer between visitors and the murals to minimize contact. The barriers anchor only to the floor or bronze door surrounds, avoiding direct attachment to mural surfaces.

In the elevator lobby, murals are protected by ropes anchored at either end to the wall and supported by a freestanding stanchion in the center. Without rigid barriers, there is greater chance the murals can be damaged by impact. Murals in the second floor stair and lobby are unprotected. The stair and corridor are too narrow to permit installation of a barrier system similar to the first floor.

Existing directional and informational signage is in poor condition or is of poor design. The freestanding signs impede circulation flow and create hazardous tripping conditions. There is evidence the freestanding signs and stanchions impact the murals, causing damage. Currently, some signs and merchandise in the gift shop are suspended from pipes and ducts at the ceiling.
Murals Assessment
Anne Rosenthal Fine Art Conservation

Background
Coit Tower is one of the most recognized and beloved monuments on the San Francisco skyline. The Tower is an attraction to approximately 200,000 visitors each year who are drawn to its incomparable views, architecture, and for the unique collection of fresco paintings on its interior walls. The custodianship of this building with its frescoes is both a serious responsibility and a challenge for the City of San Francisco. The success or failure of this obligation is highly visible to both native San Franciscans and travelers from all over the world.

The frescoed interior is the achievement of some of the most gifted local artists during the era of its construction, 1933-34. These murals represent the largest assemblage of frescoes on the west coast of the United States, inspired in part by the revival of this ancient painting technique by such luminaries as Diego Rivera and Jose Clemente Orozco. Notable for being the first and largest Public Works of Art Project in California in 1934 under the New Deal, the subjects recall the realities of everyday life at a time of economic struggle and political change between the two great world wars. The frescoes are historically important and aesthetically significant, but are now in need of conservation treatment.
**Constraints**

There are some significant inherent difficulties to consider in the planning for the preservation of the frescoes within Coit Tower. Some of these are the following:

1. The building is an historic structure, and as such carries restrictions in terms of possible alteration made to its original design; the architecture dictates the parameters of both function and repair.

2. The design of the structure as an “art gallery” per se, is inherently flawed, but is nonetheless inseparable from the historic nature of the space. The Tower was not originally built to house and protect murals, but was soon identified as an exciting venue for a public art project, without regard to the exigencies of long term care. The close quarters within the public spaces, for example, do not lend themselves easily to the traffic of large numbers of visitors, especially since the walls are not to be touched.

3. The exterior maintenance of the structure greatly affects the soundness of the interior. Faulty drainage of rainwater is a major cause of deterioration of the frescoes. Factors to investigate which influence the condition of the frescoes include the structural integrity of both internal and exterior drains within the Tower. There may be cracks within the concrete body of the building, causing unexplained water movement and leaks. The basic configuration of the building, essentially a tall tubular structure seated into a rectangular base, may present inherent difficulties to shedding water. Typically, roof decks invite water penetration to interior spaces below. An open observation deck at the top of the Tower is an added complication. There may be aspects of capillarity in the “tube” structure contributing to water retention on the first floor. A study of water movement within the building by appropriately trained professionals is indispensible to a comprehensive fresco preservation program.

4. Coit Tower is a complex and unusual structure, as noted above. As the causative agents of deterioration become clearer, a best-effort for the preservation of the frescoes will require building repairs, reduction of risks, and unrelenting maintenance and monitoring of condition. A holistic perspective is needed. More than patching and painting, the preservation of the frescoes will require redefining an enlarged scope of protective care. Arguably, there may be need for some changes in building use.
**Conservation History**

It is axiomatic that any conservation treatment will fail with time, especially if not maintained. This fact follows laws of nature. While it is true that lack of sufficient maintenance of the building has exacted both old and new damage, there have been treatments in the past to preserve and restore the frescoes.

**1950s-60s.** It is reasonable to presume that by the 1950s some undocumented work addressed a portion of damage, since there are traces of early retouchings. By the 1960s, lack of security and building leaks resulted in an overwhelming amount of detrimental physical change. There were large areas of design loss, especially caused by water infiltration at the ceilings and window openings, and a huge amount of etched graffiti, and general wear. At this time there was an earnest campaign by several gifted artists to restore the murals, and some of this work was recorded with brief written and photographic documentation. While these past efforts were acceptable at the time, the methods and materials used did not follow present-day museum standards of practice, nor did they address the root causes of deterioration. Much of the restorative work consisted of (what is now considered) excessive repainting. The building suffered from deferred maintenance, and the appearance of the frescoes was dealt with in the most obvious way: cover over the worst visual disturbances.

For the twenty odd years following the restoration of the 1960s, water seepage, graffiti and visitor traffic continued to take a toll on the frescoes. In addition, ongoing routine maintenance of the building, such as mopping of floors, dusting, changing of light bulbs, etc., by an ever-changing staff contributed to accidental damages, or to benign neglect. The chain of responsibility for the care of the frescoes appeared to be lax, either not well established or not upheld due to other financial or operational priorities.

**1980s-90s.** In 1988, a pilot study was conducted by two fine art conservators to document the material nature of the frescoes, and to assess damage. Testing was done to evaluate the use of products, materials, and techniques to be used in a full scale conservation project. At that time the most necessary structural concerns of the frescoes were remediated, such as removing efflorescence to the degree possible, strengthening plaster in eroded areas, and securing flaking paint. These efforts were accomplished under San Francisco Arts Commission supervision.

The comprehensive project to conserve, repair and fully document the first floor frescoes was completed in 1989; the second floor was completed in 1992. All work was done by a team of art conservators following museum standards of practice, as outlined by the American Institute of
Conservation of Historic and Artistic Works (AIC.) The actual restorative work, photographs, reports and line drawings of the frescoes produced during those years established a baseline of condition, by which to measure future condition changes. The conservation work consisted of removing some of the superfluous old retouchings (overpaints), filling of losses in the plaster, and inpainting (adding color to areas of loss only, retaining as much original surface as possible.)

Wisely, the conservation/restoration work on the frescoes in 1988-1992 followed lastly in a sequence of other necessary repairs to the building. The conservation advice of the day rightly acknowledged there would be no benefit in treating the frescoes if damage would simply return with the next season’s rain. Some major structural deficiencies of the building were upgraded; the decay of infrastructure such as roofing membranes and rusting rebar embedded in the concrete, received some attention. The extent and efficacy of these repairs are unknown to this conservator, however, and are not within the purview of this report. Despite the efforts, some of the leakage problems returned within a few years, as evidenced by the return of efflorescence and staining on the frescoes near the ceiling of the first floor. Hearsay was that the building had leaked since the first day of its construction.

The mechanical damage to the frescoes established a clear need for a barrier system to provide distance between visitors and the frescoes. The City contracted to have a barrier professionally designed and installed on the first floor after the conservation treatment. The barrier consists of brass rails, replacing the old dysfunctional rope and stanchion system; brass plates were installed to outline several of the doorways protecting fragile corners of the frescoed walls. Plexiglass panels were installed to protect two very vulnerable areas adjacent to the front door. The second floor was closed to unsupervised traffic, and admittance of the public to the second floor now follows a volunteer schedule of guided tours. The second floor stairs and hallways are too narrow to install a rail barrier system, and rely upon a shallow hand rail.

Several years after the completion of the two conservation projects there was a very short maintenance treatment, lasting several days, during which time two conservators dusted the surfaces and inpainted incidental scattered losses. This was the last known professional conservation assessment or treatment of the frescoes until now. The Arts Commission, meanwhile, continued to monitor the frescoes with photographic documentation of condition changes in 2008 and again in 2010, and continued to follow up on sightings of possible new damage.
Conservator’s Inspection Conditions (March 14-15, 2012)

This current inspection was carried out over a two day period, during two very rainy days in an otherwise dry winter. This was an opportune time to look at possible water infiltration and humidity, even if conditions did not represent the full expectation of dampness at the end of a very wet season. The conservator used head-loupe magnification, and lighting supplied by a 500 watt tungsten lamp. General measurements of temperature and relative humidity were taken on the first floor, and direct moisture readings were recorded with a Tramex Moisture Encounter meter along the top edge of each vertical surface of all the frescoed walls, just under the ceiling. Damages were recorded on line drawings of the frescoes. All losses of plaster and paint on both floors can be considered new since 1994, because there were no visible plaster losses on the frescoes at the conclusion of the last formal inspection.

The major damages to the frescoes consist of the following:

1. **Paint losses** exist as a result of impact and scratches to the plaster surfaces. Chips of the fresco are missing at some outside corners, exposing the bright white stucco beneath. Some of the design losses are in unfortunate locations, highly visible in areas of visitor traffic. One such area is directly across from the front door. Larger losses are found on outside corners at the opening of the elevator doors on the second floor, where access is limited. These losses are apparently due to moving bulky equipment through the narrow openings to the second floor storage or roof deck, without regard for protecting the fresco surfaces.

Chip losses opposite front door. (Anne Rosenthal, 2012)

Paint losses at elevator, second floor. (Anne Rosenthal, 2012)
Scratches and flake losses are similarly identified by bright white marks scattered across the walls. These are sometimes found in clusters, especially at locations near doorways and closets, and near the rounded terminations of the barrier rail. The losses are typically found at a height of 72” and below. These heights are within the range easily touched by visitors, and are within the distances of brooms or mops that might rest or scrape against the frescoes. There are some areas of confounding scratching at the bottom edge of the protective plexiglass enclosure to the right of the front entry. Other damages to the stairway and second floor appear to be caused by a combination of visitor accidents and by careless contact of personal articles (purses, backpacks, rings, buttons, umbrellas, etc.) with the fragile mural surfaces. Typical graffiti, however, was surprisingly not in evidence.
2. **Large areas of efflorescence, paint loss and staining** are found at the tops of the walls in scattered locations. Stains on the ceiling, or at the interface of the ceiling and fresco walls, are rust colored against the stark white of the ceiling. There are white semi-circular areas obliterating the design of the frescoes. Some of the design appears missing all together, and it is not clear if the paint is actively peeling or is lost in a loosely bound powder.

![Detail of water damage at ceiling/wall interface. (Anne Rosenthal, 2012)](image)

Metallic-colored stains probably result from rusted rebar in the concrete ceiling or bituminous roofing membranes. The locations of most of these stains are in return-sites of water leakage, and are generally where there has been conservation treatment before; some of the areas may be larger than in past years or some smaller, or in slightly lateral locations. Moisture readings taken during this assessment confirm dampness within the stucco. Most of the visible damage is actually less severe than it was twenty plus years ago prior to the 1989 treatments. These areas were inpainted in the past, and it is unclear whether the inpainting is more resistant to new staining and efflorescence, or whether building repairs actually slowed some of the progress of the damage.
Efflorescence consists of white, crystalline, salty precipitates carried by moisture from within the plaster wall. The type of deterioration caused by salty deposits depends upon where they form. If evaporation occurs above the paint layer, the design becomes obscured beneath a white salty “veil.” If crystals deposit below the paint layers, there is often enough pressure against fragile pore walls to explode the paint and plaster into a powder. In advanced circumstances, the intonaco (the top layer of plaster, which contains the painting) becomes pitted or sloughs off completely. Because salt crystals are hygroscopic, their presence invites repeated wet/dry cycles. The more porous the plaster becomes due to mechanical pressures, the more liquid is drawn to that evaporative site. Where there has been damage in the past, more damage is likely to return. With time, the margins of the affected areas enlarge.

In addition to water penetrating through the ceiling, there are water drip stains over the window sills from gaps and poor seals. Some of the damage may relate to gardening work outside, and some due to rain.
3. **Surface soil, foreign matter, and burnishing of the fresco surfaces** is noted in areas of public contact. Several of the most obvious locations include the left edge of the arched front entry where a line forms for the elevator. A portion of the fresco design is actually rubbed away by human touch, and is haloed by gray hand soil. There are a few other favorite spots of touching, including the mailbox on the south wall, cow udders within the dairy scene (left of the entrance on the north exterior wall), and the body parts of some of the standing figures.

![At front entrance, design loss and gray hand soil. (Anne Rosenthal, 2012)](image1)

*Detail of cow udders, repeatedly handled.*
*(Anne Rosenthal, 2012)*

![Foreign material under glass protection. (Anne Rosenthal, 2012)](image2)
Both the frescoes and the canvas paintings in the elevator lobby, ceiling beams and the window openings, are greatly marred by airborne dust and foreign splatters. Dust is hygroscopic, and when resting on the surface becomes more firmly fixed to the walls with environmental changes. Greater accumulations of dirt on these surfaces are attracted and built up over time.

![Detail of airborne dirt on painting near elevator. (Anne Rosenthal, 2012)](image)

4. **Insect infestation and droppings** on or around the frescoes are also noteworthy. Cobwebs are numerous over the fresco surfaces in the upper registers of the walls, where currents of warmer air rise. Where there are indentations in the wall surface (such as at the windows or shelters near ceiling beams), insect nests thrive and are protected against the wind forced through the front door. The droppings of insects are noticeable as grey deposits on the window sills. In the elevator lobby, the upper portions of the canvas paintings are fuzzy with pills of cobwebs and dust collected in that sheltered location. Types of insects found in the Tower consist of, but are not limited to, book lice, spiders, daddy long legs, flies, and mosquitoes. As with other particulates, the bodies of insects attract others. Their bodies and droppings erode painted surfaces. Some of the infiltration and harboring of insects is likely due to attractive materials found in the concession and storage areas. Others make their simple entry with the public from the outside, directly through the doors.
5. Deterioration of Peripheral Surfaces:
Conservation of the surfaces surrounding the frescoes has never been considered part of the fresco conservation project, even though they have both structural and aesthetic importance to the frescoes. Maintaining the transfer of moisture through these surfaces helps maintain the environmental equilibrium of the frescoes, and the perception of their condition influences how the condition of the frescoes is perceived.

Further, the continuity and color of the surrounding surfaces forms a frame around the frescoes which contributes to (or detracts from) the viewer’s focus on their design.

Red Fresco Border
The red plaster surrounding the frescoes is technically also a fresco, as it has an integral mineral pigment contained within the stucco. These borders have never been cleaned or properly repaired. Some of the borders are greatly defaced by water seepage, and by residues of cleaning agents. Drip marks through the borders direct one’s attention to water stains across the surface of the frescoes. There are many splash stains on the lower portions, apparently from mops cleaning the tile floor, and some from ceiling leakage.

Red stucco border, stairway. (Anne Rosenthal, 2012)
Old repairs in the borders are poorly mismatched, as they do not match the stucco in color or texture. Other losses in the stucco, such as corner nicks or drilled holes from the old stanchion system, remain unrepaired. The red stucco (fresco) border has been much overlooked in the importance it plays in framing the frescoes, as it provides a deep earth color to finish and to connect each artist’s work. The mottled appearance of the borders draws detrimental attention to itself, rather than acting as a supportive aesthetic feature.

*Red stucco border, northwest corner. (Anne Rosenthal, 2012)*
Ceiling
The ceiling is pocked with blisters of paint, some of which have cracked open, and are peeling. The behavior of the ceiling paint indicates that it does not adequately “breathe”. Trapped moisture de-laminates paint layers from the concrete, thus forming blisters. This is not merely a cosmetic problem; this lack of permeability is harmful to the frescoes. When moisture is trapped, it will seek an evaporative escape through the more porous surface of the frescoes. This phenomenon is visible in several water damaged areas at the ceiling interface.

Micro chemical tests confirm the presence of lead in the under layers of the ceiling paint. One area of the south wall ceiling had been (now repaired) leaking rainwater directly to the floor through broken blisters, and another area of active flaking is close to the security camera in the northwest corner. Other areas of cracked/lifted paint are scattered.

Of lesser concern structurally, but important historically and aesthetically, the color of the ceiling has been greatly changed from its original two toned color scheme. The color relationships of the frescoes to their surrounding “frame” have thereby been greatly altered. One result of the frescoes standing in stark contrast to a white ceiling is that they appear more soiled than they would be surrounded by their softer, original palette of color.

Flaking paint and blisters on ceiling. (Anne Rosenthal, 2012)
Window Casings
Paint is peeling from the window frames where cold air leaks through. Gaps between the metal and stucco allow dampness to accumulate in the surrounding stucco (evidenced by moisture readings). Gaps also permit entry of insects. The flaking paint so near the frescoed surface, also disturbs the continuity of the design, and draws unwanted attention to the need for repairs.

Tile
The tile baseboard at floor level is caked with gray grime; this is found almost everywhere in an “L” shape extending up and onto the red stucco border. Grout lines are also badly soiled. The impression is one of lack of maintenance, although the floors are superficially mopped every day along with the floors of the public rest rooms. Cleaning products and methods need review to help curtail staining and grime buildup.

Woodwork
Woodwork around door openings is roughly worn, pitted, scratched and gouged. The brown color is probably not original, so is not consistent with the original intent to work chromatically with the frescoes.
**Movement within the Tower**

The light-filled hallways on east, south and west are fortunately wide. The gift shop is claustrophobic with merchandise, and path to the elevator (after ticket purchase within the shop) is against the constricted flow of human traffic when crowded. Formation of lines is confusing, and visitors wait dangerously close with their backpacks and umbrellas, sometimes leaning onto the surfaces of the art in the front hallway. Review of procedures and flow of traffic may be of considerable benefit to reduce inadvertent abrasion to the frescoes.

*Tight quarters for visitors in shop. (Anne Rosenthal, 2012)*
6. The environment within the Tower during the two rainy days of this inspection was excessively damp. Temperatures were in the range of 59-62 degrees F, and the humidity was between 90-97%. Starting with the mopping of the floors in the morning, visitors entered with raincoats and umbrellas, leaving the hallways wet and slippery. A study of the interior climate through the seasons, and its impact on the frescoes, has never been undertaken. Door openings on the south side hallway cause gusts of wind and uncontrolled entry of moist air. A review of the interior climate should include consideration of door openings and climatic spikes.

*Interior wet by visitor traffic on a rainy day. (Anne Rosenthal, 2012)*
Building Systems Assessment

*Interface Engineering, Inc.*

**Fire Protection**
- There is no existing sprinkler system serving the Building. A fire hose connection and a hose rack are present at the Keeper’s Quarters, however there is no hose available.

**Plumbing**
- The 40 gallon storage tank electric water heater was installed approximately on February of 2004. It is in good working condition.
- The sanitary sewer pipe system appears to be in good condition; however no investigation was conducted to verify condition of the underground pipes and the inside of the pipes.
- Rust is building up to the interior surfaces of the water storage tanks located at the mezzanine tank floor.
- The pressure tank and pump located at the water storage tank area are in good condition.
- Domestic cold water and hot water pipes are surface mounted on walls and ceilings.
- The hot water pipe insulation appears to be an asbestos material and on some sections of the pipe is damaged or missing. This material should be tested and if confirmed to be asbestos, abatement will be necessary.
- The rain water leaders in the building are in good condition.
- Stainless steel drain pans under the light fixtures at the Belvedere Floor are in good shape. Signs that water leaks at the pipe connection to these pans are evident.
- Toilet fixture, urinal and lavatories at the public restrooms are working. These are the older fixture and are not water efficient.
- The bath tub at the 2nd floor Keeper’s Quarters has been used as storage appears not to be in working condition. The Toilet in this room is working.
- Kitchen plumbing system could not be evaluated since the room is full of stored materials.

**Heating, Ventilating, and Air Conditioning (HVAC)**
- The existing HVAC system only serves the Gift Shop and Elevator Lobby. It is a 19 year old Split AC dx system with electric heating. It is in poor condition with condensate being drained in a plastic bucket in the storage room. The outdoor Condensing unit is in poor condition with evidence of rust and dirt.
**Electrical**

Normal Power and Distribution System

- Based on the manufacturing date of the existing electrical equipment, the electrical system was upgraded in 1990.
- The tower is served by a Main Switchboard rated for 400A, 120/240V, 3‐phase, 4‐wire. The switchboard is located in the main electrical room behind the Gift Shop.
  - The following electrical panelboards are existing and fed by the Main Switchboard.
      - i. Subfeeds Elevator Room Panel in elevator machine room via 100A/2P breaker.
  - Additional loads fed by the Main Switchboard include:
    - b. Water Pump (Bldg Supply) – 20A/3P
    - c. Water Pump (Block House) – 60A/3P

- There is an existing Uninterruptible Power Supply (UPS) system that has been abandoned in place. The system consists of a UPS, battery racks, transformer, and enclosed circuit breaker.
- The elevator has been upgraded and new feeder and panel were provided. The existing transformer and associated enclosed circuit breaker for the old elevator has been abandoned in place.
- The Main Switchboard and associated branch circuit panelboards are just over 20 years old; but based on surface investigation appear to be in good working condition.
- The main electrical room is used for storage which does not provide the code required clearances in front of electrical equipment.

**Emergency Power System**

- There is no emergency generator for the site. Emergency egress lighting consists of wall mounted emergency fixtures with integral battery back-up. Emergency lighting appears antiquated.

**Lighting System**

- Lighting for the first and second floors consists mostly of incandescent luminaires. A mixture of luminaire types are installed ranging from decorative wall sconces, decorative ceiling mounted luminaires, and track lighting. Some fluorescent striplights exist in the Gift Shop.
and electrical room. Lighting on the first two floors appears antiquated and does not provide good lighting quality to highlight the murals.

- Lighting on the upper levels of the tower was in the process of being retrofitted with new luminaires using compact fluorescent lamp sources.
- The exterior lighting used to light the walls of the tower consists of metal halide luminaires. Colored plastic is used as filters to change the colors of the lighting during special occasions. The luminaires on the Belvedere level are direct uplights and are not sealed properly. As a result, water enters the luminaire housing. The housing for all luminaires is corroded and it is questionable how long the luminaires will function.
- There is no automatic lighting control system for the interior of the building.

**Wiring Devices**

- Receptacle quantity and locations is adequate throughout the tower with the exception of the Gift Shop. Power strips are used throughout the store to accommodate their needs.
Building Code and Accessibility Analysis

Applicable Building Codes and Regulations
Governing codes for Coit Tower are the California Building Code (CBC), including the California Historic Building Code (CHBC). Compliance with current building codes is not required unless there is a change in use for the building. Additions, alterations, or repairs to historic buildings are required to comply with the current code, but compliance can be met using historic resource codes and regulations that provide alternative methods for meeting the code. Use of the historic resource codes often requires the review and acceptance of alternative methods of compliance with the local building official or State Historic Preservation Officer.

Building Summary
Name(s): Coit Memorial Tower; Coit Tower
Location: 1 Telegraph Hill Boulevard, San Francisco
County: San Francisco
Designations: National Register of Historic Places; San Francisco Landmark
Owner: City of San Francisco
Building Occupancy: A-3 Assembly
Current Occupant Load:
First Floor 114
Second Floor (interior) 33
Second Floor (exterior deck) 154
Belvedere Level (interior) 8
Lantern Level 35

Code Assessment
The following is a limited assessment of Coit Tower in relation to current California building codes. There is no obligation for building owners to perform code upgrades unless the building changes use or there are repairs, upgrades, or additions to the building. Voluntary code upgrades can always be considered, however, to improve fire and life safety.

Posting of Occupant Load
Per CBC 1004.3, every room or space that is an assembly occupancy should have the occupant load posted in a conspicuous place. Currently there are no signs posted that indicate occupant loads.
Doors
Per CBC 1008.1, each egress door shall have a minimum clear width of 32 inches. CHBC 8-603.3, states historic buildings may alternately have door widths as small as 29 ½ inches if strict compliance with code would threaten or destroy the building’s historical significance or character-defining features. Exterior doors to the second floor deck are 31 ½ inches wide but provide only a 28 ½ inch clear width. The doors are further restricted because they are set in 36 inch deep recesses. At the Gift Shop, the east and west doors are 32 inches wide but provide only a 29 inch clear width. The door clearance, however, is partially impeded by merchandise displays near or attached to the doors which reduce clearance.

Panic Hardware
Per CBC 1008.1.10, doors serving an occupant load of 50 or more in an assembly occupancy shall be provided with panic hardware or fire exit hardware. Currently neither exit at the first floor has panic or fire exit hardware. The front door is kept propped open during business hours which seems to be a reasonable practice to continue.

Handrails
Per CBC 1009.12, stairways shall have handrails on each side. Currently, the circular exit stair from the Belvedere Level to the third floor has only one handrail on the outside wall.

Ramps
CBC 1010 gives requirements for ramp slope, width, landing, handrails, and edge protection. Currently, the ramp on the south side of the building appears to meet all current requirements.

Guardrails
Per 1013, guardrails are required along open-sided walking surfaces located more than 30 inches measured vertically to the grade below at any point within 36 inches horizontally. The exterior pathway adjacent to the building has only a 27 inch wall with a significant drop to grade below. Guardrails are required to extend a minimum of 42 inches above walking surfaces. At the Lantern Level, the guardrail around the open stair is only 37 ½ inches high.

Exit Signs
Per CBC 1011, exit doors shall be marked with an approved exit sign readily visible from any direction of egress travel. Currently, the building does not have any exit signs.
Exits
Per CBC 1015, two exits are required from assembly spaces with an occupant load over 49. The first floor has an occupancy over 49 and is in compliance with two existing exits. The existing second floor has an occupancy under 49 and is in compliance with one exit.

Accessibility Assessment
California Building Code has accessibility requirements that closely parallel ADA guidelines. Building owners are not required to perform CBC accessibility upgrades unless the building changes use or there are repairs, upgrades, or additions to the building. Under the Americans with Disabilities Act (ADA) however, building owners have an ongoing obligation to remove accessibility barriers as resources become available. Easily accomplished measures are expected to be taken immediately. The following is a limited assessment of existing conditions at Coit Tower.

Toilet Facilities
Per CBC 1115B, toilet facilities are required to be accessible. In existing buildings or historic buildings, were space is limited or alteration could threaten historic significance, accessible toilet facilities may be located within a reasonable distance of the building. Currently, one accessible toilet is located near the parking lot which appears to satisfy the requirements of equivalent facilitation.

Toilet Accessories
Per CBC 1115B, toilet accessories should be located within specified reach ranges. Although the existing restrooms in Coit Tower are not required to be accessible, voluntary upgrades could improve accessibility for many individuals.

Elevator
While CBC 1116B requires passenger elevators be accessible, exception is allowed for existing buildings were equivalent facilitation is provided. Currently, the size of the elevator cab and the elevator cab controls do not meet current accessibility requirements. The size of the elevator is limited by the hoistway structure which could not be altered without significant expense and impact to the historic building. The cab is of sufficient size however to allow transport of an individual in a wheelchair. While the controls do not meet requirements, the elevator is operated full-time by a trained attendant and visitors are not permitted to utilize elevator cab controls. In both instances, the current arrangement appears to satisfy the requirement of equivalent facilitation and ensures the elevator’s historic fabric is maintained.
The elevator call buttons located in the halls are utilized by visitors however and the mounting height does not meet current accessibility standards.

**Signs and Identification**
Signs and identification devices are required to meet requirements of CBC 1117B.5 and CBC 1127B. This section provides requirements for sign placement as well as size, font and graphics. Currently, few exterior or interior signs meet the requirements.

**Automated Teller Machines (ATM)**
CBC 1117B.7 specifies that if an ATM is provided for the public, it must meet accessibility requirements. Currently there is an ATM in the gift shop which is not accessible.

**Wheelchair Passage**
Per CBC 1118B, the minimum clear width for single wheelchair passage shall be 32 inches at a point and 36 inches continuously. Currently, roped stanchions are often placed at the elevator lobby entrance to aid visitor circulation and queuing. The stanchions split the door opening however and reduce clear passageway to just 25 inches.

**Sales and Service Counters**
Per CBC 1122B, in retail stores where counters have cash registers and are provided for sales, at least one shall have a portion which is at least 36 inches in length with a maximum height of 34 inches. In existing buildings, equivalent facilitation may be provided, such as an auxiliary counter in close proximity or a folding shelf attached to the main counter. Currently, the sales counter in the gift shop does not meet width and height requirements.

**Changes in Level**
Per CBC 1124B, changes in level greater than ½ inch shall be accomplished by means of a ramp, elevator, or lift. Currently the second floor roof deck is 8 inches lower than the interior finish floor.

**Maneuvering Clearance at Doors**
Per 1133B.2, the width of the level area on the strike side shall extend 24 inches for exterior doors and 18 inches for interior doors. Per CHBC 8-603.4, power-assisted doors may be considered equivalent facilitation to level landings, strikeside clearance, and door-opening force at historic buildings. Currently strike side clearance is not provided at the gift shop or second floor exterior doors.
Powered Doors
Per CBC 1133B.2, powered doors shall be controlled on both the interior and exterior sides by sensing devices, push plates, vertical actuation bars, or similar operating devices. At each location there shall be two push plates; the centerline of one shall be at 7-8 inches above the floor and the centerline of the second shall be 30-44 inches above the floor. Currently only one push plate is located on either side of the accessible door at the south ramp.

Corridors
Per CBC 1133B, corridors serving an occupant load of 10 or more shall not be less than 44 inches in width. Corridors serving an occupant load of less than 10 shall not be less than 36 inches in width. Currently, corridors at the first and second floor meet the 44 inch minimum requirement.

Stairways
Per CBC 1133B, the top of handrail gripping surface shall be mounted between 34 and 38 inches above the nosing of the treads. Handrails shall extend a minimum of 12 inches beyond the top nosing and 12 inches plus the tread width beyond the bottom nosing. Handrail handgrips shall be 1¼- 1½ inches in cross-sectional nominal dimension or the shape or an equivalent gripping surface. Existing handrails are historic and most lack compliant handrail extensions. At the second floor, handrails are anchored to mural surfaces and an exemption may be pursued from building officials. At the tower, the existing handrails can likely remain if new compliant handrails are added to the inside wall. The existing 2 inch cross section is likely within an acceptable margin and can remain.

Stair Treads
Per CBC 1133B, interior stairs shall have the upper approach and lower tread marked by a stripe providing clear visual contrast. Exterior stairs shall have the upper approach and all treads marked by a stripe providing clear visual contrast. Most existing stairs do not have tread striping and the addition of striping is recommended.

Hazards
Per CBC 1133B, abrupt changes in level shall be identified by a curb, handrail, or guiderail. At the Lantern Level stair, the top tread creates a curb from which visitor must step down. The curb prevents water from flowing down the stairs from the exterior deck. The stair does not have handrail extensions but there is a warning sign painted on the top riser.
Access to Lantern Level
Currently, accessible access to the Lantern Level is limited because the elevator does not extend to that level. When a disabled individual is not able to access the Lantern Level, staff provides them exterior access to the Belvedere Deck, an open air deck just one level below where views are similar. Per CHBC 8-604, equivalent facilitation is permitted when compliance with the regular code would threaten or destroy the historical significance or character-defining features of the building. The current practice appears to satisfy the requirement of equivalent facilitation.
Conservation and Improvement Recommendations

The following pages contain recommendations for the maintenance, repair and conservation of historic architectural features and artwork, actions to increase building code compliance, upgrades to building systems, concepts for protecting murals, and for improving universal access, visitor flow, and programming for Coit Tower.

Prior to the implementation of recommended treatments, it would be beneficial to install environmental monitoring at gallery spaces in Coit Tower. Data gathered on conditions such as ambient and artificial light levels, as well as daily and annual fluctuations of temperature and humidity, will inform decisions on appropriate conservation measures for the historic murals. Environmental monitoring should be carried out for at least one year to identify potential needs for additional lighting, ventilation, heating, or air conditioning.

Maintenance

Maintenance refers to actions undertaken to prolong the life of materials, and tends to encompass remedial repairs that have a preventive function. Historic building maintenance differs from conventional maintenance because it has to respond to goals related to the preservation of materials and elements original to the building’s construction. Furthermore, Coit Tower contains works of art that are integrated with the building fabric; appropriate maintenance procedures are crucial to protect the historically significant painted murals.

In general, any repair, restoration, rehabilitation, replication, or maintenance should have a minimal impact on the historic fabric of Coit Tower, and should have no impact on the historic frescoes and paintings. Deficiencies threatening life and safety, or that may cause further deterioration should be corrected immediately. The value of any other improvements should be weighed against potential impacts to the building’s historic integrity. Care must be taken to make upgrades and maintenance with the overall character and integrity of Coit Tower in mind. Development and training of staff is necessary if they are to acquire specialized skills for preservation maintenance. The historic murals should receive care that includes periodic inspection and maintenance as well as daily housekeeping procedures carried out by qualified personnel. In addition, staff and concessions personnel should receive training and written guidelines for cleaning surfaces that are adjacent to the murals.
**Inspection**

Routine inspection and maintenance are preventive actions that are carried out one or more times a year on building elements that are generally stable and in good repair. Regularly scheduled inspections detect gradual deterioration as well as sudden changes in building conditions, and thus aid in prioritizing and planning necessary repairs. In addition to identifying repair needs, inspections are a means of evaluating the performance and durability of previous repairs, and can be tools to assist managers in selecting appropriate repair methods. Re-establishing regular inspection and maintenance of buildings protects investments made in previous repair campaigns and helps to keep future repair and rehabilitation projects small, resulting in cost savings over time.

Concrete and stucco should be inspected twice a year to identify structural cracking, erosion or surface spalling, and heavy soiling or biological growth. Windows should be inspected every year for hardware operation and general deterioration, preferably in spring when the weather is optimal for repairs. Roof inspections should take place semi-annually in spring and fall. The drains should be inspected and cleaned at least twice a year; four times a year would be optimal.

Murals should be examined by a fine arts conservator at least every six months.

*Roof drains should be inspected and cleaned 2-4 times a year. (ARG, 2012)*

*Murals should be inspected at least twice a year. (ARG, 2012)*
Architectural Treatment Recommendations

Exterior Walls

Repairs and Maintenance
Repair cracks as well as active and incipient spalls at the top of the tower at the south elevation, at the Lantern Level near upper roof scuppers and windows, at walls and balustrade sections at the Belvedere Level, above the windows at the tower base east and west elevations, at the west elevation tower base parapet adjacent to the north roof drain, and isolated areas of minor spalling at the tower base. Balustrade bases at the Belvedere Level may require pinning or reinforcement to prevent future cracking. Open cracks and cut back areas of deterioration to sound concrete. Where reinforcing metal is corroded, remove rust to sound metal and coat with a rust inhibitive paint before patching concrete. Inject cracks with a sealant or epoxy material to stabilize the crack. Fill cracks and spalls flush with surrounding concrete (recessing the patch from existing stucco) using concrete patching material matching the physical and visual characteristics of the historic concrete, including hardness, permeability, color and texture. Apply new stucco over the patch to match the existing stucco color, texture, and permeability. Failed sealants at expansion joints should be replaced and painted to match the stucco.

Concrete spalling at the northwest tower base. The roof scupper above the spall has a failed sealant joint. (ARG, 2012)

Detail of cracking at Belvedere Level balustrade. (ARG, 2012)
**Graffiti Mitigation**

Although the tower base walls and site retaining walls were designed to be unpainted stucco, removing graffiti from rough, relatively porous surfaces is problematic and potentially damaging in the long term. Graffiti in prominent locations should be removed using the gentlest means possible. The current practice of painting selected surfaces to cover graffiti is a practical response to a chronic problem of recurring vandalism. Graffiti overpaint should match the color of a clean example of the existing stucco and should have a flat, matte finish. In addition, overpaint should be as breathable as possible to prevent deterioration and detachment of underlying stucco. Over the years, paint buildup at areas of frequent overpainting may need to be stripped off.

*Surface inconsistencies may be avoided by choosing appropriate paint systems for graffiti overpaint and carefully matching the wall color. (ARG, 2012)*
Cleaning
Concentrations of dark soiling and biological growth at the tower base should be spot cleaned annually using warm water at low pressure. If warm water is not sufficient, a gentle detergent such as D/2 Biological Solution or Prosoco Bio Wash may be used. Orange and green algae deposits at the Lantern and Belvedere Levels may be cleaned using the same methods; alternatively, algae may be killed using isopropyl alcohol before rinsing the deposits off with warm water. The entire surface of Coit Tower may be cleaned with warm water at low pressure every 3 to 5 years.

Soiling should be spot cleaned on an annual basis. (ARG, 2012)
Windows

Rehabilitation
Steel windows should be cleaned and rehabilitated as needed to restore smooth operation. Deformed metal should be straightened, and any broken hardware components replaced. Loose hardware should be re-secured, and moving parts lubricated. Cracked panes should be replaced in kind. Paint coatings at all metal windows and grilles should be renewed by removing corrosion, loose paint and putty, and sanding substrates before applying a primer and paint system formulated for galvanized metal. Prior to the painting project, a paint analysis should be undertaken to determine historic paint colors used at the Coit Tower windows. Privacy screens should be removed from the north second floor deck near the Keeper’s Quarters. Coins should be removed from Lantern Level sills and should not be allowed to accumulate.

*Fixed and operable steel windows at the tower base should be rehabilitated and painted.* (ARG, 2012)

*Corrosion should be removed from grilles and windows at the Belvedere Level.* (ARG, 2012)
Doors

Rehabilitation

Steel and Kalamein doors should be rehabilitated as needed to restore smooth operation. Deformed metal should be straightened, and any broken hardware components replaced. Loose hardware should be re-secured, and moving parts lubricated. The power assist operator at the south ADA doors should be replaced, taking care to select an opener with minimum visual impact. Install weather stripping at French doors to minimize air leakage. Cracked panes in glazed doors should be replaced in kind, and wire glass at French doors should be replaced with glass matching historic. Paint coatings at French doors should be renewed by removing corrosion, loose paint and putty, and sanding substrates before applying a primer and paint system formulated for galvanized metal. Prior to the painting project, a paint analysis should be undertaken to determine historic paint colors used at the Coit Tower doors. Coatings should be removed from the second floor Kalamein door at the west elevation, and the pet door at the east elevation door should be removed and the area patched. Torn copper cladding at the Belvedere level door should be patched. Kalamein doors should be cleaned by a qualified conservator, so as not to damage the historic patina, and then coated with an appropriate protective clear coating. Replace overhead door at the front entrance with a style more appropriate for the historic building.

Doors and opening mechanisms at the ADA entrance should be rehabilitated. (ARG, 2012)

Torn copper cladding at the Belvedere Level door should be repaired. (ARG, 2012)
Roofing and Drainage

Replacement
Rolled asphalt roofing at the second floor is well beyond its serviceable life, and should be replaced as soon as possible. The primary concern is waterproofing and the prevention of leaks and water damage to historic murals, which may be accomplished by installing a new membrane. Alternatively, it may be desirable to reinstate the historic function of the second floor roof as a deck and walking surface. There are several approaches to this option, including the restoration of the original appearance by installing new quarry tile pavers matching the historic, with an improved waterproofing and drainage underlayment system. A less costly alternative would involve a new roof membrane and concrete pavers placed on pedestals. During the roof replacement, arrangements should be made for full-time construction supervision, to ensure that details such as flashing, sealant and reglet details are carried out properly. In addition, all roof drains and pipe penetrations should be inspected for leaks.
Rehabilitation and Maintenance
Steel sleeves housing the floodlight fixtures and catch basins at the Belvedere Level should be rehabilitated by removing corrosion and then painting the sleeves with an appropriate primer and paint system. The protective coating at the Lantern Level composite roofing should be renewed, using the manufacturer’s recommended materials and methods. Roof scuppers at the upper Lantern Level roofs should be extended to minimize moisture penetration at adjacent concrete and stucco surfaces. Roof drains should be kept clear by regularly removing vegetation, debris and tree litter from roof surfaces. The triangular roofs at the second floor are difficult to access, but debris may be cleared by using long-handled tools, leaf blowers, and hoses. While the raised decking at the Belvedere level is in good condition, the composite material is not compatible with the building’s existing materials palette. When replaced in the future, alternative materials should be considered. Colored concrete pavers on pedestals, for example, would more closely recall the historic quarry tile.

Steel sleeves at the Belvedere floodlight fixtures should be rehabilitated. (ARG, 2012)

Scuppers at the Lantern Level upper roofs should be extended. (ARG, 2012)
Metalwork

Maintenance
Bronze signage and plaques should be cleaned by a qualified conservator, so as not to damage the historic patina, and then coated with an appropriate protective clear coating.

Bronze plaques should be cleaned by a qualified conservator. (ARG, 2012)
Ceiling Paint

Lead Abatement
Based on microchemical tests performed by mural conservator Anne Rosenthal, ceiling paint layers contain lead. Future abatement of lead-containing ceiling paint should be carried out according to recommendations and specifications for protecting the murals submitted by ARG Conservation Services in a report to the San Francisco Arts Commission dated September 27, 2011 (included in Appendix D).

Historic Paint Color
Based on examination of ceiling paint sample cross sections, the earliest paint layers are dark yellow, followed by light yellow. Either one of these colors could be interpreted as historic. Because calcimine paints have the potential to affect adhesion of subsequent paint layers, the composition of the historic paint layers should be confirmed; if they are calcimine, they should be removed before painting the ceilings. The ceilings should be painted with a flat or matte paint, using the historic paint color (either Munsell 2.5Y 8/6 or 2.5Y 9/4).
**Interior Finishes**

Restrooms finishes should be thoroughly cleaned. Toilet partition doors and hardware should be repaired to operate smoothly. Cracked and poorly matched tile at the first floor gallery should be replaced. Care should be taken to ensure that floor tile and grout matches existing in color, size, and texture. Carpet in the Keeper’s Quarters should be removed and the concrete floor left exposed. The ceiling in the Keeper’s restroom should be repaired and all previously painted surfaces in the restrooms, gift shop, and Keeper’s Quarters should be repainted. Prior to painting, a paint analysis should be conducted to identify historic colors employed at interior finishes, including walls and doors.

*Restroom finishes should be cleaned, and partition doors rehabilitated. (ARG, 2012)*

*The ceiling in the Keeper’s Quarters restroom should be repaired. (ARG, 2012)*
Signage and Barriers

The freestanding stanchions and ropes in the elevator lobby should be replaced with a rigid metal barrier to match the system in the lobby. Similar barriers are also recommended in the east and west niches of the second floor. At doors and openings on the second floor, bronze door surrounds can be installed to protect jambs from impact.

At the second floor stairs and corridors, clear protective coverings should be considered at the murals. Design and installation may involve significant cost but care should be taken to ensure that ventilation, light, and glare issues are thoroughly addressed.

Locations of all new signage should be carefully coordinated to minimize visual impact on the historic space. New signs should meet all accessibility guidelines and be designed in a style that is compatible with the building’s art and architecture. Signs should be located to help improve visitor flow but should not impede visitor traffic or create hazardous tripping conditions. Freestanding signs should be weighted and positioned so that they do not risk impact with the murals. Signs should not be anchored directly to murals or historic surfaces.

Currently, very little information is available to visitors that describe the murals or the muralists. Informational plaques could be mounted on the metal rail in front of each mural, however the plaques may create visual clutter. Information could be provided in alternate media such as written pamphlets, smartphone applications, or displays in an interpretive area.

Freestanding stanchions and ropes should be replaced with a rigid barrier. (ARG, 2012)
Mural Conservation Recommendations

Anne Rosenthal Fine Art Conservation

Public Perception and Treatment Urgency
This conservator acknowledges that there are damages to the frescoes immediately apparent to any visitor. There may be other damages identified by conservators which are not easily recognized by an untrained eye. Aspects of the condition of the interior may also be contributing to a visual impression of abuse or neglect to the frescoes, which are not truly attributable to the condition of the frescoes themselves. The perceived damage to the frescoes may be somewhat exaggerated by the existing damage to other surrounding surfaces. Similar to a damaged painting within a damaged frame, the appearance of the two together create a strong impulse for immediate conservation attention.

Sequencing of Treatments
While need of immediate conservation treatment is arguably strong, treatment should proceed in stages, and in an appropriate sequence for long-lasting remediation. Since the frescoes are inseparable from the architecture, there will be need for a discovery phase, to identify all the factors contributing to the deterioration of the frescoes. The best sequence of repair will take into consideration the immediate needs of the frescoes, followed by the protection of the frescoes while other parts of the building are repaired, and finally full conservation and restoration of the frescoes after all structural work is completed. Patience may be required during the many phases of work required, so that the most efficient and complete work can be directed toward the frescoes. Inpainting (commonly thought of as “retouching”) may be one of the last procedures of the fresco repair.

Summary of Findings and Recommendations

1. The current condition of the frescoes warrants immediate conservation attention.

2. The state of preservation of the frescoes is inseparable from the health and repair of the building as a whole. There are numerous pathologies of the building structure that are not fully understood, requiring appropriate specialists to investigate further.

3. Water infiltration remains the most perplexing and serious cause of deterioration of the frescoes. The entry points and movement of water within the building remain elusive.
Seepage of water causes decay of the plaster, and permanent losses of original fresco design.

4. Visitor traffic has continued to take a toll on the frescoes. Graffiti and malicious mischief has decreased, but losses due to scratches and impact are plentiful. Most losses appear to be accidental or careless. Some are due to objects carried by the visitors, or their clothing, or are the result of routine building maintenance. It appears that the speed of return damage may be somewhat slower than in preceding decades due to the effective barrier railing, plexiglass coverings and security camera.

5. A limited conservation treatment of the frescoes to help stabilize areas of acute water damage should precede or be concurrent with the start of other building repairs. Dry surface cleaning should also be done at that time as a preventative measure. Full treatment to clean and repair areas of paint loss will be a more lengthy process, which can be addressed after other building repair is concluded.

6. The condition and maintenance of each part of the building’s interior finishes requires review. A deep cleaning of tile floors is overdue. A project to resolve problems of the ceiling paint is urgently needed. Remediation of leaking window openings, and repainting of casings is recommended. The quality and standards of maintenance should be upgraded, and a framework of accountability put in place. All these aspects of the interior have an impact on the longevity of the frescoes.

7. Insect problems are moderately severe. An integrated pest management review (IPM) to determine the best method of decreasing habitat is suggested.

8. The red stucco surrounds of the frescoes require additional study to determine a method of diminishing stains and compensating losses. This stucco should not be traditionally painted; it is a plaster with integral color, which gives it a distinctive appearance, unlike paint. The texture and color of coatings or fillers will require review to determine the best materials and methods to use. Color compensation, too, must be carefully done, and in a manner allowing transmission of moisture. This treatment should be performed by a conservator, or have a conservator’s review.

9. A study of the interior environment is recommended. There may be some changes of visitor entry and traffic flow which would be helpful. If changes within the building are not possible, perhaps some change just outside the front door can be considered. (A glass shelter against
the weather, an anteroom of sorts would diminish environmental spikes; an “air curtain” might be considered to diminish pest entry at the front door. Umbrellas and backpacks might be checked. Tickets to the elevator might be sold outside, or lines might be re-directed, etc.) These are a few of the possible ways to decrease wear and tear on the building and the frescoes, and are matters that need to be implemented in some form.

10. The frescoes should be examined by a fine arts conservator at least every six months. Need for repair should be acted upon immediately when it is first noticed. Annual or biannual monitoring of moisture content is advised. Cooperative consultations with others who maintain the building is strongly advised, to identify and solve condition/maintenance issues holistically.

11. The public also needs to become more aware of the impact of visitors, and to behave in a respectful and careful manner within the building. Having a live guard staff would help minimize any negative impact of visitors, and be a benign reminder of the value and importance of the artwork.
Building Systems Recommendations:

Interface Engineering, Inc.

Fire Protection
- Provide fire hose and nozzle at existing fire hose connection at Keeper’s Quarters.

Plumbing
- Application of rust converter and fresh coat of paint would be necessary to extend the life of the water storage tanks.
- The hot water pipe insulation appears to be an asbestos material and on some sections of the pipe is damaged or missing. This material should be tested and if confirmed to be asbestos, abatement will be necessary.
- Stainless steel drain pans under the light fixtures at the Belvedere Floor are in good shape. Pipe connection to these pans will need to be repaired for leaks.
- Toilet fixture, urinal and lavatories at the public restrooms are working however we recommend updating these fixtures with newer more water efficient fixtures.
- The bath tub at the 2nd floor Keeper’s Quarters has been used as storage appears not to be in working condition and needs to be updated and provided with new cold water and hot water connections.
- The Toilet in 2nd floor Keeper’s Quarters is working however we recommend updating with water efficient fixture.

Heating, Ventilating, and Air Conditioning (HVAC)
- Replace the Heating/cooling system serving the Gift Shop and Elevator Lobby. The 19 year old Split AC dx system with electric heating is in poor condition. Outdoor Condensing unit will need to be replaced as well. This is the only heating and cooling system in the building’s public area.
- Per the observations of the Art conservator, the ambient conditions in the building are generally adequate for the maintenance of the murals. No further air conditioning is required on a day-to-day basis, however the conservator observed very high RH levels on a rainy day. To prevent mold growth, we recommend to provide supplemental air conditioning in the first floor Gallery to maintain RH levels below 69%.
- Provide new restroom exhaust fans with minimum of 10 Air Changes Per Hour and/or as required by code whichever is greater.
- Provide heating and cooling system in the Keeper’s Quarters.
**Electrical**

**Normal Power and Distribution System**
- Remove abandoned electrical equipment associated with the UPS system.
- Remove abandoned electrical equipment associated with the old elevator.
- Provide separate storage room for Gift Shop to achieve proper working clearance for electrical equipment in main electrical room.

**Emergency Power System**
- Replace existing emergency luminaires with new luminaires that go along with aesthetic feel of the space. Provide integral battery packs to luminaires where appropriate. Egress lighting to be 1 footcandle minimum throughout.

**Lighting System**
- Provide adequate lighting levels on the first floor to properly illuminate murals.
- Provide new luminaires on the first and second floors to along with the aesthetic feel of the space. Or restore existing luminaires if part of historical preservation of the tower.
- Provide new permanent lighting system on the second floor deck to illuminate the Tower during special events.
- Provide new lighting throughout Gift Shop to go along with the aesthetic feel of the space.
- Provide proper sealing of luminaires on the Belvedere level to prevent continued corrosion. Or replace existing luminaires with new fully gasketed luminaires.
- Provide new low voltage lighting control panel to control lighting in public areas such as restrooms, hallways, and Gift Shop.
- Provide occupancy sensors to control lighting in electrical room and storage rooms.

**Wiring Devices**
- Provide additional receptacles in Gift Shop to accommodate their needs and eliminate power strips.
- Inspect all electrical outlets and confirm that they are properly grounded and operational.
Building Code and Accessibility Recommendations

With no change in use, code upgrades to the building are considered voluntary, with the exception of disabled access compliance. As a public historical site, the California Building Code (CBC), including the California Historic Building Code (CHBC), would govern requirements for accessibility. The Americans with Disabilities Act (ADA) provides additional parallel requirements. Although not a building code, the ADA is a federal civil rights law. Non-compliance with the requirements of the law can put the building owner at risk to potential litigation. Where alterations are undertaken to a qualified historic building and where the State Historic Preservation Officer or Advisory Council on Historic Preservation agrees that full compliance with the requirements for accessible routes, ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility, alternative requirements of compliance may be used.

Code Recommendations
Following are recommendations for upgrades in relation to current California building codes. There is no obligation for building owners to perform code upgrades unless the building changes use or there are repairs, upgrades, or additions to the building. Voluntary code upgrades can always be considered, however, to improve fire and life safety.

Posting of Occupant Load
The current occupant load should be posted in the first floor gallery, including the elevator lobby, and at the Lantern Level.

Doors
By utilizing offset hinges or altering door stops, it may be possible for existing doors to achieve a wider clear passage. Merchandise should be removed from doors and kept clear of doorways.

Panic Hardware
The front door is kept propped open during business hours which seems to be a reasonable practice to continue. The south door does not have any operable hardware however, and consideration should be given to installing fire hardware which is compatible with the historic character of the building.
Handrails
Consideration should be given to installing a second handrail on the inside wall of the circular exit stair leading from the Belvedere Level to the third floor.

Ramps
No upgrades are recommended at this time.

Guardrails
Consideration should be given to adding a guardrail to the low wall at the exterior pathway adjacent to the building. Design studies are recommended to ensure the guardrail does not affect the historic character of the site.

At the Lantern Level, consideration could be given to adding an extension to the guardrail at the open stair.

Exit Signs
The requirement for exit signs may be waived by building officials if the exit is obvious and clearly identifiable. Locations of all new exit signs should be carefully coordinated to minimize their visual impact on the historic murals and space. Exit signs should not be attached to any mural surface.

Exits
The first floor has an occupancy over 49 and is in compliance with two existing exits. The existing second floor has an occupancy under 49 and is in compliance with one exit. The second floor exterior deck- if used for public events- would require two exits. If existing doors cannot be modified to provide required clearances, an alternate second exit would be required for the deck.

Accessibility Recommendations
Based on the limited assessment conducted for this report, following is a summary of upgrades necessary in order to meet current accessibility standards, as prescribed by the California Building Code and the Americans with Disabilities Act.

Toilet Facilities
The accessible toilet located near the parking lot appears to satisfy the requirements of equivalent facilitation. While it may be possible to convert the existing restrooms in Coit Tower
into two single-occupancy toilets, design studies are recommended to ensure design clearances can be met and the historic significance is maintained. Conversion would reduce the plumbing fixture count for the building however and additional toilet facilities may need to added elsewhere on site.

**Toilet Accessories**
Although the existing restrooms in Coit Tower are not required to be accessible, voluntary upgrades could improve accessibility for many individuals. The paper towel dispenser in the women’s room, for example, is currently mounted at 58 inches above the floor. Lowering the dispenser to 40 inches would improve access for people of short stature or individuals with limited mobility.

**Elevator**
The current operation of the elevator appears to satisfy the requirement of equivalent facilitation and ensures the elevator’s historic fabric is maintained. However, it is recommended that hall call buttons be lowered to 42 inches above finish floor.

**Signs and Identification**
Upgrades with regard to sign placement, font and graphics are recommended. Care should be taken to ensure that signs are designed to complement the architecture and art of the building. Locations of all new signs should be carefully coordinated to minimize their visual impact on the historic space. Signs should not be affixed in any way to mural surfaces or sensitive historic finishes.

**Automated Teller Machines (ATM)**
The ATM should be upgraded to meet CBC requirements including speech output, tactile symbols, display height, and clear floor space.

**Wheelchair Passage**
Stanchions at the elevator lobby should be removed or queuing reconfigured so a 36 inch passageway is maintained. At the Gift Shop, sales merchandise displays should be rearranged to achieve adequate clearance.

**Sales and Service Counters**
It is recommended that the sales counter be altered or a folding shelf to added to provide compliant facilitation.
Changes in Level
Currently the second floor roof deck is 8 inches lower than the interior finish floor. If the deck were to be made accessible, a ramp could be installed to bridge the difference. Alternately, a raised deck could be installed over the roofing to raise the finish floor of the entire deck—similar to the existing decking at the Belvedere level. The deck material, however, should better complement the building’s existing material palette. Instead of composite deck, colored concrete pedestal pavers could be considered.

Maneuvering Clearance at Doors
Adequate strike side clearance should be provided at the Gift Shop and second floor exterior doors. If the second floor deck is to be made accessible, doors may require power assist to substitute for strikeside clearance. In the gift shop, while the doors are typically kept propped open, moving merchandise away from the doorways would improve accessibility.

Powered Doors
Lower level push plates should be added at the accessible door at the south ramp.

Corridors
No upgrades are recommended at this time.

Stairways
Existing handrails are historic and most lack compliant handrail extensions. At the second floor, handrails are anchored to mural surfaces and an exemption may be pursued from building officials. At the tower, the existing handrails can likely remain if new compliant handrails are added to the inside wall. The existing 2 inch cross section is likely within an acceptable margin and can remain.

Stair Treads
Striping at upper stair approaches and lower treads should be applied in a manner that does not damage the historic concrete paths and flooring, and is reversible in the future.

Hazards
To improve visibility, additional or enhanced warning signage could be installed at either approach to the Lantern Level stair, and the curb could be painted a contrasting color.
Access to Lantern Level
The current practice of providing wheelchair access to the Belvedere Level appears to satisfy the requirement of equivalent facilitation, and no upgrades are recommended at this time.
### Treatment Matrix: Integrated Treatment Priorities

<table>
<thead>
<tr>
<th>ANNUAL TASKS / MAINTENANCE</th>
<th>PRIMARY TASKS</th>
<th>SECONDARY TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect and clean roof surfaces and drains 2-4 times / year</td>
<td>Repair incipient concrete spall at top of tower</td>
<td>Repair cracks and spalls at tower base, Belvedere and Lantern Levels</td>
</tr>
<tr>
<td></td>
<td>Replace second floor roof</td>
<td>Repair cracks in cast stone balustrade at Belvedere Level</td>
</tr>
<tr>
<td></td>
<td>Rehabilitate windows and doors</td>
<td>Renew roof coating at Lantern Level</td>
</tr>
<tr>
<td>Inspect concrete and stucco for cracks and spalls twice a year</td>
<td>Paint ceilings at first and second floor (abate lead-containing paint)</td>
<td>Rehabilitate steel floodlight sleeves at Belvedere Level</td>
</tr>
<tr>
<td></td>
<td>Install new directional signage at first floor and metal barriers at elevator lobby</td>
<td>Repair cracked floor tile at first floor gallery, clean restroom finishes</td>
</tr>
<tr>
<td></td>
<td>Stabilize acute areas of water damage, dry clean murals</td>
<td>Carry out comprehensive conservation of murals and stucco borders</td>
</tr>
<tr>
<td>Inspect windows and doors for smooth operation annually</td>
<td>Install environmental monitoring at galleries and stairway</td>
<td>Develop permanent protection system for murals at second floor and stairway</td>
</tr>
<tr>
<td></td>
<td>Establish maintenance program for murals and housekeeping guidelines for galleries</td>
<td>Upgrade restroom fixtures to improve water efficiency</td>
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<tr>
<td></td>
<td>Conduct an Integrated Pest Management (IPM) review</td>
<td>Install new heating and cooling at Keeper’s Quarters</td>
</tr>
<tr>
<td>Inspect murals and bronze plaques every 6 months (conservator)</td>
<td>Inspect water tanks, install protective coating</td>
<td>Remove abandoned electrical equipment</td>
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<tr>
<td></td>
<td>Remove asbestos hot water pipe insulation</td>
<td>Improve emergency power systems and fixtures</td>
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<tr>
<td></td>
<td>Install fire hose at Keeper’s Quarters</td>
<td>Upgrade interior lighting and exterior tower lighting at second floor</td>
</tr>
<tr>
<td>Spot clean soiling at exterior walls annually</td>
<td>Install ventilation at restrooms</td>
<td>Provide additional electrical receptacles at Gift Shop</td>
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<tr>
<td></td>
<td>Install illuminated exit signs</td>
<td>Install guardrails at east and west tower pathways</td>
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<tr>
<td></td>
<td>Post signs with occupancy loads at public spaces</td>
<td>Add striping at exterior and interior stair treads</td>
</tr>
<tr>
<td>Comprehensive cleaning of tower exterior every 3-5 years</td>
<td>Install panic hardware and lower push plates at South exit / ADA doors</td>
<td>Add second handrail at stair to Lantern Level</td>
</tr>
<tr>
<td></td>
<td>Establish clear passageways at Gift Shop</td>
<td>Lower elevator call buttons at hallways</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upgrade ATM and sales counter to be ADA compliant</td>
</tr>
</tbody>
</table>

### Task Categories:

- **Architectural**
- **Building Systems (MEP)**
- **Murals Conservation**
- **Building Code / Accessibility**
Appendix A:

Existing Conditions Photographs
Tower north elevation. (ARG, 2012)

Tower platform at north elevation main entrance. (ARG, 2012)
Tower south elevation. (ARG, 2012)

Tower platform south elevation and ADA entrance. (ARG, 2012)
Tower east elevation. (ARG, 2012)

Oblique view of tower platform east elevation. (ARG, 2012)
Tower west elevation. (ARG, 2012)

Tower platform west elevation. (ARG, 2012)
Second floor roof, south elevation. (ARG, 2012)

Interior of triangular court at second floor roof. (ARG, 2012)
East elevation of Keeper’s Quarters at second floor roof. (ARG, 2012)

West elevation of Keeper’s Quarters at second floor roof. (ARG, 2012)
Roof over Keeper’s Quarters, looking northeast. (ARG, 2012)

Roof over Keeper’s Quarters, looking east. (ARG, 2012)
Column and balustrade at Belvedere Level. (ARG, 2012)

Balustrade and recessed floodlight at Belvedere Level. (ARG, 2012)
Lantern Level at the stair landing. (ARG, 2012)

Observation windows at the Lantern Level. (ARG, 2012)
First floor gallery, showing metal barrier rails. (ARG, 2012)

Elevator lobby, with stair entrance to left and Gift Shop to right. (ARG, 2012)
Gift Shop, with curving stairway form above. (ARG, 2012)

Stairway to second floor, with frescoes on either side. (ARG, 2012)
Murals at second floor, with entrance to Keeper’s Quarters at left. (ARG, 2012)

Main room of Keeper’s Quarters, currently used for storage. (ARG, 2012)
One of four steel water tanks at a mezzanine above the fourth level. (ARG, 2012)

Interior of tank, showing low water level and corrosion. (ARG, 2012)
Appendix B:

Drawings: Existing Conditions
TOWER LEVEL, TYPICAL

EXISTING CONDITIONS

SCALE: 1/8" = 1'-0"
MAY 14, 2012
LANTERN LEVEL
Appendix C:

Sources Consulted

City and County of San Francisco, Recreation and Park Department. Various historic drawings and administrative records pertaining to Coit Tower.


Appendix D:

Specifications for Protection of Coit Tower Historic Elements

*Prepared by ARG Conservation Services,*
*September 2011*
COIT TOWER

SECTION 01351

PROTECTION OF HISTORIC ELEMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes special procedures for historic treatment on the Project including, but not limited to, the following:
   1. Installation of protection at interior surfaces to prevent damage to all historic elements due to construction activities.
   2. Removal, cataloging, and storage of selective historic elements as required during construction.
   3. Protection of historic elements during application of chemicals.
   4. Installation of protection done in a matter that does not damage adjacent surfaces or finishes.

1.2 REFERENCES


1.3 DEFINITIONS

A. “Historic Elements” are defined as those materials, finishes, components and areas identified as historic elements on the Contract Documents and as recognized by landmark agencies having jurisdiction on this project.
   1. Historic elements include, but are not limited to, all original historic materials and finishes including murals, carved stone, plaster walls and ceilings, tile flooring, doors, frames, and hardware.

B. “Salvage Elements” are defined as any Historic Element to be removed from the existing construction and to be retained, mothballed, repaired and/or modified for reinstallation and potential reuse.

C. “Off-Site Facility” is defined as the storage facility to be provided by the contractor or subcontractor for storage of salvage and mothballed elements.

D. “Artifact Log” is defined as the log form supplied by the contractor and used to catalog historic elements that are removed from the building.

E. "Renovation": To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

1.4 SUBMITTALS

A. Submit Contractor Qualifications as listed in Quality Assurance section below.
B. Work Description. Submit work description detailing proposed methods and operations for removal of elements, cataloging, and transportation of items to off-site storage, protection of elements in storage, and protection of elements to remain on site.

C. Off-site Storage Facilities. Submit detailed description of building and/or other areas proposed for storage of removed historic elements. Include location, size, physical attributes, security techniques and procedures and other pertinent information relating to the storage of salvaged elements.

D. Shop Drawings. Submit shop drawings of proposed methods and operations of protection procedures for review prior to the commencement of work.

E. Mock-up: Prepare on-site mock-up of proposed protection at the following areas for review by the Architectural Conservator prior to the commencement of work:
   1. Protection at murals on the 1st floor and stairwell.
   2. Protection of floors.

F. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.

G. Photographs: Document the condition of all existing historic elements and the adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by historic treatment operations. All photographs to be taken with 35mm SLR camera and submitted before work begins.

1.5 QUALITY ASSURANCE

A. Contractor Qualifications: Contractor shall have a minimum of ten (10) years experience specializing in conservation and construction projects of historic buildings and murals that follow the Secretary of Interior Standards for Historic Buildings and the Code of Ethics of the American Institute for Conservation.

B. Contractor Principals shall have degrees in architectural conservation and historic preservation architecture and have a minimum of 30 years combined experience.

C. All work shall be performed by skilled contractors having not less than ten (10) years satisfactory experience in comparable protection, abatement, painting operations including work on at least seven (7) projects similar in scope and scale to this project.

D. Contractor is hereby directed to recognize the value and significance of the building and exercise special care during the work to ensure that the existing building, its details, materials and finishes which are to remain are not damaged by the work being performed.

E. Contractor shall be responsible for protection of all existing materials and components to remain in place throughout the duration of construction. Extent of protection is to cover all historic elements to remain that are in the vicinity of construction activities, or may be harmed by the movement of materials through the building and project site, whether specifically called out on the drawings, or not. It is the Contractor's responsibility to provide any additional protection required to prevent soiling and damage to existing finishes and elements to remain. All questionable protection requirements should be identified for Architectural Conservator's review. In the event of damage, such items shall be repaired or replaced by the contractor at his expense, to the satisfaction of the Architectural Conservator and Owner.
F. Protection is to be secured adequately so as to maintain a safe environment for workers throughout the duration of the project.

G. Hazardous Materials
   1. Contractor is notified that lead paint exists and Contractor needs to protect workers accordingly. Refer to other sections for handling hazardous materials.

1.6 PROJECT-SITE CONDITIONS

A. Owner will occupy portions of building immediately adjacent to historic treatment area. Conduct historic treatment so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Coordinate the performance of work of this section with related or adjacent work. Removal and protection of items shall be completed prior to commencement of demolition or new construction activities in each area. At a minimum, install protection in its entirety for a given area prior to commencement of any demolition activities in that given area.

C. Protection of historic elements shall remain in place for the duration of the entire project.
   1. Do not store construction materials on or inside of protection.

D. Ensure safe passage of persons around areas of protection. Conduct operations to prevent injury to adjacent buildings, structures, other facilities and persons.

PART 2 - PRODUCTS

2.1 PROTECTION MATERIALS

A. Polyethylene sheets: 4 mil.

B. Lumber: Species to be selected by contractor, sizes to fit field conditions. All lumber to be fire retardant.

C. Plywood: ½", ¾" or 1" fire retardant, as required.

   1. ½" homasote 440
   2. ½" homasote NCFR for applications requiring fire ratings

E. Neoprene: ¼" or ½" strips, stock lengths

F. Ethafoam: ½" thickness with a density of 2.3 to 3.3 pounds/cubic foot

G. Semi-rigid polyurethane foam sheets (roof insulation rigid foam): 2" thick

H. Brown paper: Kraft paper

I. Non-abrasive glassine paper

J. Preservation tape: 3M Scotch brand, number 4811

K. Zip wall poles: ZipWall.
L. Accessories: Fasteners, nails, screws, bolts, anchors or other devices required to complete installation, sizes as required. NO FASTENERS ARE TO BE USED ON ANY WALL OR FLOOR SURFACES.

PART 3 - EXECUTION

3.1 GENERAL

A. Historic Elements to remain in-situ:
1. Install protection in its entirety before commencement of abatement, painting or other work that may harm historic elements.
2. Protect all historic elements to remain in place during construction that may be damaged by construction activities. In the event of new damage, contractor is to notify the Owner immediately as to the nature and extent of damage and the proposed method for repair. Contractor shall be responsible for repairs and replacement of newly damaged items by qualified specialists to the satisfaction of the Owner, at no additional cost to the Owner. Be aware that the inherent value of an historic original element is higher than the value of a modern replication of that element.
3. Secure protection adequately so as to maintain a safe environment for workers and other individuals using the building throughout the duration of the project. DO NOT ATTACH PROTECTION MATERIALS DIRECTLY TO HISTORIC ELEMENTS.

3.2 PREPARATION

A. Remove all debris and impediments to allow for full access as required to perform protection of historic elements, and for demolition and construction.

3.3 INSTALLATION OF PROTECTION

A. General:
1. Alternative methods to specified protection may be acceptable if equal or greater protection is provided. Submit alternate methods to the Architectural Conservator for review. Do not proceed with alternate methods until approvals are secured.
2. Protection will be required to remain in place for the duration of the project. Protection may have to be removed during the project for access to protected elements, etc. If protection is temporarily removed, reinstall after work is complete and maintain protection throughout the duration of the project.
3. Extent of protection covers all historic elements that will remain during construction, whether specifically called out on the drawings or not. Temporary protection may be required in areas to perform specific work activities.
4. All protection assemblies shall be self-supporting and self-bracing. DO NOT ATTACH PROTECTION DIRECTLY TO HISTORIC ELEMENTS.

B. Floors, all materials in primary path of construction travel. Defined as those areas that will experience a high level of traffic with finish materials that require a high level of protection care.
1. Vacuum floor surface of all loose dust and debris. Cover entire pathway surface with Kraft paper, then with ½” fiberboard covered by 1 sheet of polyethylene and ½” plywood. Fasten edges to prevent slippage. Tape all polyethylene edges to create a watertight seal. Stagger edges of materials with joints below to provide a uniform flush surface.

C. Wall Murals
1. Mural protection is to be constructed primarily of zip wall poles no less than 6” from the wall surfaces. Wood boards minimum of 1” x 6” x 6” must be installed between poles and ceiling and floor “padding”. Rigid foam is to be attached to the poles with wire or zip ties. Plastic sheeting is to be applied on the hallway side of the protection.
2. Do not damage adjacent surfaces.

D. Railings
   1. Railing protection is to be constructed of Ethafoam™ or other pure polyethylene foam wrapped around all metal components and taped. Foam must not react chemically with metals. Tape must not touch metal.

E. Light Fixtures
   1. Wrap light fixtures in situ with polyethylene sheet. Tape sheet in place. Tape must not touch light fixture.

3.4 CATALOGING OF SALVAGE ELEMENTS

A. General. Label elements in a manner to permit reinstallation in its original location and configuration, or in a new location. Contractor to submit proposed method for labeling and cataloging salvage elements.

B. Numbering and cataloging. Each item removed for salvage shall be given a unique catalog number that is to be permanently marked on the element and listed on the artifact log. Label the elements on the backside or in another obscure location. Contractor to submit proposed artifact log.

3.5 REMOVAL OF SALVAGE ELEMENTS

A. General
   1. Exercise extreme care in removing elements for salvage and materials attached to historic elements that are to remain.
   2. Unbolt bolted connections; leave embedded connector undisturbed and in place for later element reinstallation.
   3. Unscrew screwed connections; leave embedded connector undisturbed and in place for later element reinstallation.
   4. Do not pry apart members whose finishes chipping, crazing or cracking will damage, or whose structural integrity will be compromised.
   5. Remove all nails from wood elements from the backside. Drive nails through or pull from the back so that the head does not splinter the finish face. Do not remove nail heads from painted mural surfaces.
   6. Remove items whole whenever possible. Where cuts are required, make cuts cleanly and with the proper tool at logical break points.

B. Light Fixtures. Remove light fixtures in whole units. Remove and salvage all fastening and/or mounting hardware. Protect existing wiring if wiring will be reused.

3.6 STORAGE

A. Transport items to the off-site storage facility. Store elements in their natural configuration, i.e. store doors in an upright position.

B. Store metals, inlaid wood, textiles, and all climate sensitive materials in clean, secure location with temperature between 65°F and 75°F and relative humidity between 50% and 60%.

C. Do not cover wood elements entirely, allow air to circulate around wood elements to prevent the growth of mold or mildew.
D. Record the moisture percentage of the wood elements just prior to removal and immediately upon delivery to the storage facility. Maintain the same moisture level throughout the duration of storage.

E. Install kraft paper between wood elements if necessary to prevent paint or other coatings from damaging adjacent elements. Use glassine paper over painted murals and ceiling elements. Store painted panels vertically with ½” ethafoam between panels. Store panels with flaking or unstable paint horizontally without stacking.

F. Organize elements so that they are readily retrievable. Store like elements together.

3.7 REINSTALLATION

A. Reinstall salvage elements in their original location.

B. Contractor is responsible for proper inventorizing and distribution to appropriate subcontractors of salvaged material for reinstallation.

C. Re-use original fastener locations and nail or screw holes. Strengthen or consolidate original holes as needed.

3.8 PROTECTION DURING APPLICATION OF CHEMICALS

A. Comply with the chemical cleaner manufacturer's recommendations for protecting building surfaces against damage from exposure to their products.

B. Cover adjacent surfaces with materials that are proven to resist chemical cleaners selected for Project. Use covering materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent staining from adhesive.

C. Dispose of runoff from chemical operations in accordance with all ordinances and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

END OF SECTION 01351