GUIDELINES FOR MAINTAINING

HAWAII'S TRADITIONAL HOUSES

HISTORIC HAWAI'I FOUNDATION

These practical suggestions have been prepared to help owners of vintage homes protect the long-term value of their buildings.

>>> The recommendations are not complicated or costly. Rather, these are maintenance-oriented guidelines and financially feasible considerations to help owners solve normal wear and tear problems.

>>> These guidelines are based on the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preservation*, which are the foundation for many rehabilitation and home improvement projects in Hawaii.

>>> The purpose of this brochure is to address typical repairs necessitated by island environmental conditions – rain, humidity, strong sun, salt-air, mildew, algae and many pests that contribute to house upkeep problems.

REMEMBER THESE USEFUL GENERAL GUIDELINES:

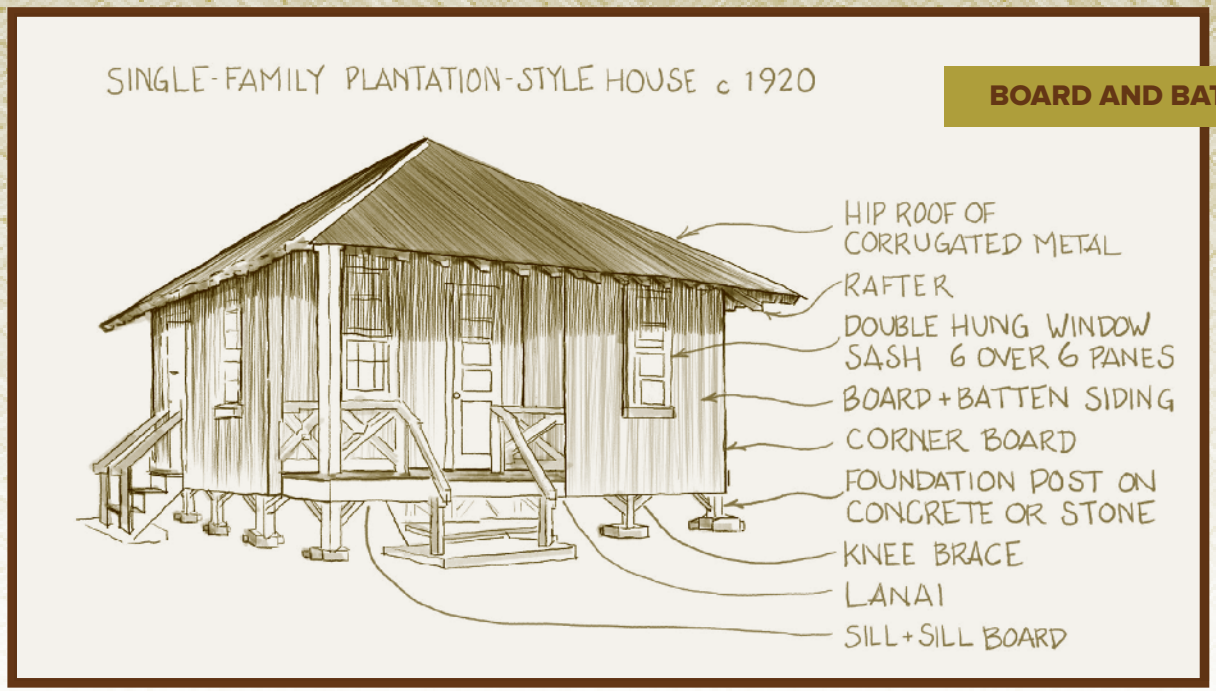
1. Good building maintenance is good housekeeping.
2. Keep as much as possible of original materials, features, finishes, construction techniques and examples of craftsmanship that characterize the home.
3. Keep the original style and character.
4. If you have to replace deteriorated features, replace them with components that match the original in design, color, texture and, where possible, materials.

>>> We hope you will find these home maintenance guidelines useful because, as time goes by, Hawaii's traditional homes, well-built by local carpenters, are growing in value. If maintained properly, these buildings can have a useful life of many more years.

>>> The process of keeping your property in a state of utility through maintenance and repairs is important. Rehabilitation makes possible efficient, continuing use while saving those features of your property that are significant to its original appearance and design.

HISTORICAL NOTES

TWO RESIDENTIAL BUILDING TYPES



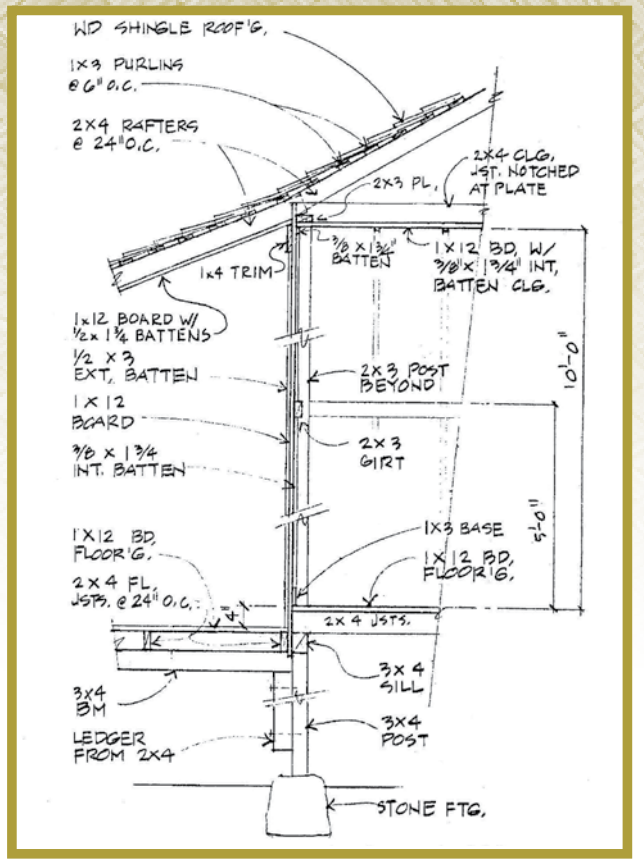
PLANTATION-STYLE SINGLE-FAMILY COTTAGE, C. 1920

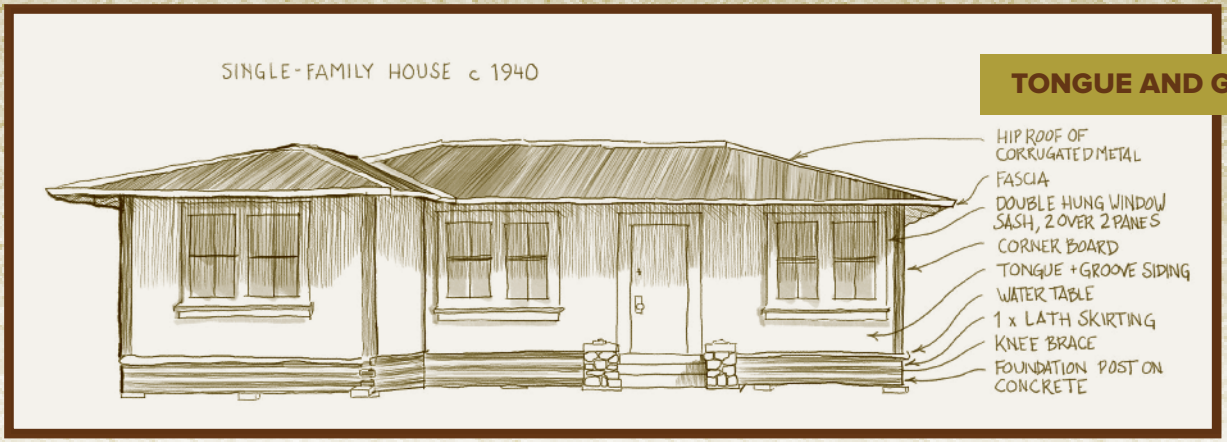
As the sugar and pineapple plantations began to build single family dwellings, this type of hipped roof, board and batten, single-wall cottage became one of the most popular house forms throughout the Islands.

CHARACTER DEFINING FEATURES

- Hipped roof of corrugated metal with open eaves and exposed rafter tails
- Board and batten single walls of 1 x 12 boards and ½ x 3 battens reinforced with corner boards
- Open lanai with exposed 4 x 4 wood post, 2 x 3 wood framed railing and decking of 1 x 12 spaced boards
- Wood plank steps over exposed stringers with 2 x 3 wood open railing or metal pipe railing
- Multi-paneled doors, often five-panel or two-panel with operable half screen upper panel
- Boxed wood double-hung, sliding or casement windows
- Exposed wood post and knee braced-foundation resting on stone or concrete footings (known as tofu blocks)

BOARD AND BATTEN SINGLE-WALL CONSTRUCTION





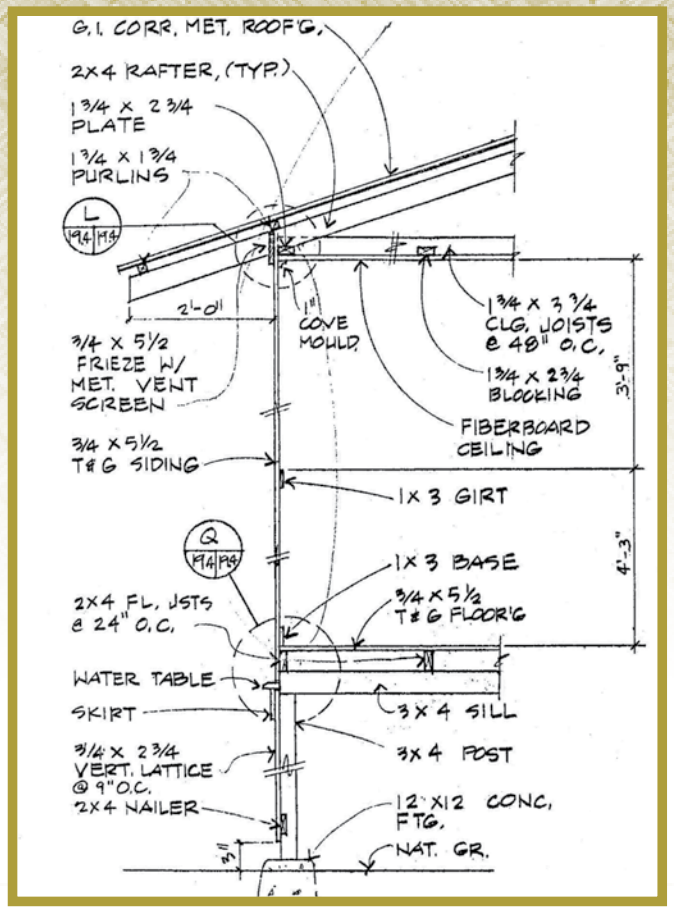
SINGLE-FAMILY DWELLING, C. 1940

In the pre-World War II years, vertical tongue and groove board, single-wall homes were built by both plantation and non-plantation owners. These new houses had hipped roofs, but they also had larger windows and a more streamlined exterior appearance than the older plantation-style cottage.

CHARACTER DEFINING FEATURES

- Hipped roof of wood shingles or corrugated metal
- Open eaves with fascia or closed eaves with screened ventilation ports
- Single wall construction of 1 x 10 or 1 x 12 tongue and groove boards reinforced with one or two courses of 1 x 3 wood girts mid-height
- Open lanai with exposed 4 x 4 wood post, 2 x 3 wood framed railing and decking of 1 x 12 spaced boards
- Concrete steps with lava rock knee (aka pony) wall or concrete block with stone cap
- Flush or single-panel exterior doors with flat wood casing
- Boxed wood double-hung, sliding or casement windows with flat wood casing, often paired
- Wood post and knee braced foundation resting on stone or concrete footings (aka tofu blocks)
- Foundation screened by 1 x 1 lath skirting, horizontal or vertical

TONGUE AND GROOVE SINGLE-WALL CONSTRUCTION



BEGIN WITH A HOUSE CHECKUP

If your answer is YES to any of these questions, please read the following sections on suggested maintenance and repairs.

For Hawaii's vintage homes, use this checklist for an annual maintenance inspection. This checklist is an easy way to evaluate the condition of your building and to record signs of problems that must be treated. Take care of small things right away because little problems can become big and expensive.

CHECKLIST

1. SITE AND LANDSCAPING

- ❑ Are trees, bushes or other plants touching the walls or foundations?
- ❑ Is vegetation overpowering the foundation and siding?
- ❑ Does run-off water remain near the foundation?
- ❑ Is material stored underneath the house which prevents good air circulation under the flooring?

2. STRUCTURAL SYSTEMS

- ❑ Are any of the foundation posts and footings missing or disconnected?
- ❑ Are wooden posts, sills, joists or steps soft when probed with screwdriver to test for rot and termite damage?

3. ROOFING

- ❑ Does the roof leak?
- ❑ Has a new roof been applied directly over old shingles?
  If yes, check for rotted shingles.
- ❑ Is any flashing around the roof loose or missing?
- ❑ Does the ridge of the roof sag?
- ❑ Are any rafters rotted or damaged?
- ❑ Are gutters blocked, leaking or missing?

4. LANAI AND DECKING

- ❑ Are any floors uneven?
- ❑ Does flooring need any repair?
- ❑ Are there signs of dampness on floors or around pipes?
- ❑ Are lanai railings in need of repair?

5. WALLS

- ❑ Are there any loose, rotted or missing exterior wall boards or battens?
- ❑ Is there any evidence of rot, termites or other damage?

6. DOORS AND WINDOWS

- ❑ Are any doors difficult to open?
- ❑ Are there open, separated joints around door frames, window frames or trim?
- ❑ Is putty around window glass missing, cracked or unpainted?
- ❑ Is any glass broken or cracked?
- ❑ Have original window frames and doors been replaced?
- ❑ Are windows difficult to operate, open or close, or do they not stay in position?

7. PAINTING AND STAINING

- ❑ Has it been more than ten years since the house has been repainted or stained?
- ❑ Is paint cracking, peeling, flaking, chipping or blistering?

8. ELECTRICAL SYSTEM

- ❑ Are there rooms without electrical outlets?
- ❑ Are there multiple extension cords used to connect to limited outlets?

9. PLUMBING

- ❑ Is water pressure inadequate?
- ❑ Are there any leaking pipes, faucets or toilets?
- ❑ Are there any damp spots on walls and floors around plumbing fixtures?

10. SAFETY AND SECURITY

- ❑ Are bedrooms, kitchen and high traffic areas lacking fire or smoke detectors?
- ❑ Are doors and windows unable to be locked or secured?
- ❑ Are there areas that can be easily broken into to access the home?
- ❑ Are there hazardous materials present, such as lead paint, asbestos materials or mildew/mold?

PRIORITIZE WORK TO BE DONE

Set priorities for intervention and treatment based on the severity of the damage.

1. Life Safety issues, especially electrical, plumbing and security.
2. Weatherproofing, especially roofing and windows.
3. Structural issues, especially foundation and walls.
4. Quality of Life issues, including finishes.

ROOFING

>>> Repairs or alterations should not alter the roof pitch or reduce the extent of overhang of the roof eaves. From both a functional and visual point of view, sound, weathertight roofing is an important element of your house. Maintaining the roof as "cover" is a top priority for every maintenance project because a good roof is the first line of defense against the biggest enemy of every old house – water.

>>> Painted corrugated metal panels, sawn wooden shingles or asphalt shingles are the typical roofing materials found on these residential dwellings, and roofing materials help define the overall look of the house.

>>> The original roofing should be maintained or replaced in kind. Repairs generally will include replacement of extensively deteriorated metal panels or shingles and repairs to flashing and rain gutters. Painted new corrugated metal, sawn wooden shingles and asphalt shingles all have a maintenance life-cycle of at least 20 years.

>>> It is possible to make temporary repairs to "tin roofs," especially to rusted-out lapping areas, by getting another piece of the same corrugated stock. Pull the nails, stick the piece of stock in above the deck and then drive nails back in. Asphalt wet patch works pretty well on rusted metal and nail holes, but if your roof regularly leaks, you will need to replace it. Wooden sawn shingles can be renewed to inhibit the growth of mold and algae by painting the shingles with commercial shingle oil.

>>> Caulk all loose roof flashing and clean out roof gutters annually or more often. Remember that gutters protect the siding, doors and windows.

>>> If you have to completely re-roof the house, match the pitch, slope and detailing of the historic roof type. If possible, match the original material.

STRUCTURAL REPAIRS

>>> A sound foundation is essential to the maintenance of your house.

>>> Moisture and untreated foundation problems can cause irreversible structural damage. Wet wood leads to dry rot and termites.

>>> When repairs are needed to foundations, floor joists and the plate and frame, consult an experienced carpenter. For example, if wooden floor joists have deteriorated because of moisture or termites, you need to determine how much load the support walls should bear before reinforcing old joists with new wood or foundation posts.

>>> In case of foundation posts, allow a minimum of at least 18 inches between the ground and the bottom of floor joists for ventilation and access. Keep the area underneath the house dry.

>>> The wood siding on your house is its "skin." Most plantation-style houses were of single-wall construction, and the most common types of siding were 1" x 12" vertical board-and-batten or 1" x 6" vertical tongue-and-groove boards.

>>> Damaged siding and sills should be repaired rather than replaced, and homeowners can repair surface-damaged wallboards with putty formulated for use on wood. Do not use polyester putty or fillers designed for fiberglass or metal because they are too strong and inflexible for wood, causing cracking as the wood dries or expands.

>>> Be sure to have the house fumigated every five years. If the exterior siding has deteriorated beyond repair in parts of the house, selective replacement of exterior siding is required. Duplicate the original as closely as possible. With board-and-batten siding, maintain the original spacing of boards and battens to avoid covering any of the original trim such as corner boards and window and doorframes. Use of synthetic materials such as aluminum, vinyl or plastic over wooden siding may lead to moisture problems and should be avoided.

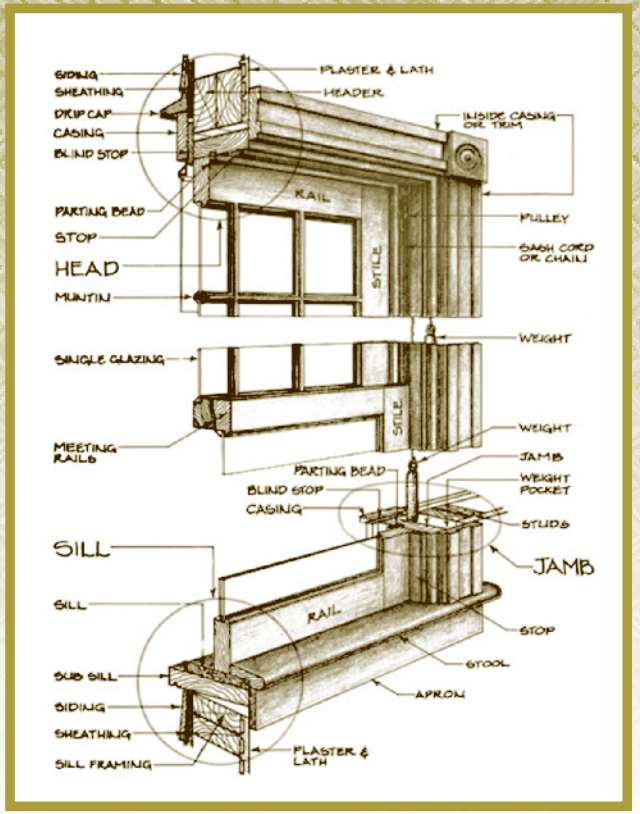
DOORS & WINDOWS

>>> Doors and windows are part of the weatherproofing and ventilation of your house. The design and location of doors and windows are key elements that help give your house its special distinctiveness. Retaining or restoring original doors and windows is an important way to preserve the character of the home.

>>> Doors and windows in most older houses become especially vulnerable to deterioration from sun and rain. Wind-driven rain penetrates the door frame and deterioration begins in the frame and in window sills and cracks in the window putty.

>>> Try to retain and repair the original doors and hardware because of the authenticity of the materials. Doorknobs, hinges and locksets can be repaired. Replacement porcelain knobs and other hardware can be sourced from online catalogues, salvage or material supply stores, or replica hardware providers.

>>> If a replacement door is required, choose one that most closely matches the design of the original door. Avoid reducing or enlarging the original door opening size to install "stock" size doors, and do not change the location of the door or cut new entrances in the wall. Doors should swing freely. If the doors and hinges become too tight, there may be a variety of problems and you should consult a carpenter. Avoid cutting the door.



>>> Retain all original windows, and wherever possible, repair the window frame, window sill, sash and glass. Do not install "stock" windows of another size, and avoid using jalousie windows to replace sash (unless that was the original style). All too often window sashes are replaced when little more than scraping and painting repairs are needed. For example, if you find some rot and deterioration at sash corner joints, all is not lost. New pieces can be made, and replacing a few bottom rails of the sash will be less expensive than buying all new windows for the house.

PAINTING & STAINING

>>> Keeping the exterior coated for protection is a key element of repair and maintenance. Your house should be painted at least once every 10 years. Siding, lanai, doors, window trim and "tin roofs" should be repainted or stained in a color as close to the original color as possible. Corrugated metal roofing should always be kept painted.

>>> When a change of color is necessary, it should be in character with other colors used on buildings of a similar vintage.

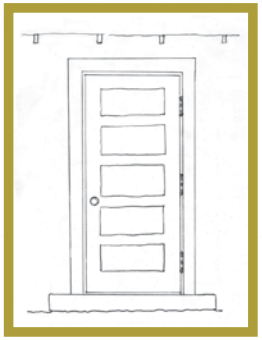
>>> When using stains, use oil-based penetrating stain and not solid body stain. If paint is flaking, have it tested for lead before taking any action. If lead is present, consult a professional. Make sure to take proper precautions when scraping any paint due to possible lead content.

>>> An inexpensive treatment of damaged but functional wall boards is to treat them with a mixture of boiled linseed oil and turpentine two or three times, a few days apart, so the oil will penetrate the wood. Repaint a month later.

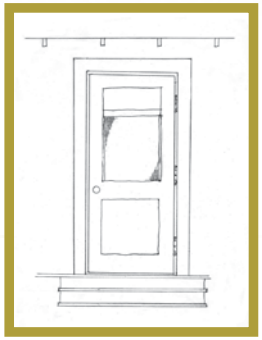
LANAI & DECKING

>>> Lanai and porches should neither be enclosed as additional interior space nor removed. Railings, posts, steps and other details should be retained and kept in good repair as an essential feature of the house. A fresh coat of paint on lanai floors and wooden steps is normally needed every three to five years.

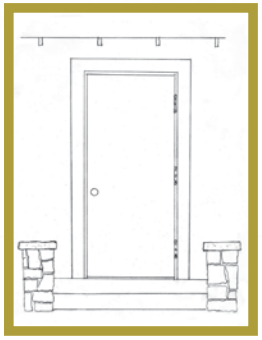
>>> Tongue-and-groove flooring usually deteriorate just on the end of a board. It is economically and structurally sound to cut the board off—usually at the second joist—keeping the rest of the board in place. To take out a tongue and groove board, split it up the middle with a circular saw, and lift the pieces up. To install a new tongue and groove, push the new board in from the end, leaving some extra stock on the end to be cut flush with the other board.



5 PANEL DOOR



HALF SCREEN



SOLID PANEL

ELECTRICAL & PLUMBING

>>> In setting priorities for repairs to the house, electrical and plumbing work are of high importance. Electrical repairs involve life safety and plumbing repairs will reduce moisture problems in the structure.

>>> When making electrical and plumbing repairs, install the systems in areas that will require the least possible alteration to the house. Avoid placing electric meters and other equipment where they can be seen from the street.

PLANTING & HEDGES

>>> Existing trees, plant materials and varieties should be maintained with regular pruning and other care. Ensure any irrigation systems do not spray water onto the building and are installed to drip or spray only on the vegetated areas.

>>> Vegetation growing too close to the structure traps moisture in foundations and siding. Keep at least a two-foot buffer space between plantings and the building. Trees should be

farther away to avoid roots affecting the foundation or branches affecting the roof or siding.

>>> Maintaining and using natural vegetation and materials is preferable to installing new fences or walls, unless they are part of the original design. When planting new vegetation, use indigenous species appropriate to the climate and local environment.

ADDITIONS & SECONDARY STRUCTURES

>>> The scale, proportions, materials and color of the existing house should guide the design, construction and finish of any expansion. Additions should be compatible to the existing building but do not need to match.

>>> New construction of add-ons for living space, and the addition of secondary buildings (such as carports, garages, garden or equipment sheds) should be located as inconspicuously as possible.

>>> An addition built to the side or rear of the dwelling will usually have the least impact.

>>> Avoid additions that are larger than the existing building and don't build additions that will damage original building features and details.

SUSTAINABILITY

>>> Good preservation practice is often synonymous with sustainability. Historic buildings embody the energy and carbon used to produce them. Reusing these structures avoids extraction, processing and transportation of new materials and construction processes. Traditional materials are durable and local craftspeople can provide maintenance.

>>> Retrofit measures to historic buildings should be limited to those that achieve reasonable energy savings, at reasonable costs, with the least impact on the historic character of the building.

>>> Sustainable strategies include implementing operational changes before altering the building, improving the efficiency of existing equipment, appliances, and systems with retrofits or replacements and employing sustainable materials when compliant with preservation priorities.

>>> Install high-efficiency ductless (split) equipment instead of ducted, central systems that may damage or obscure historic building materials. Supplement HVAC systems with ceiling fans and operable windows to improve cooling and reduce use of air conditioning.

>>> Install high-efficiency tankless water heaters that provide hot water on demand.

>>> Consider on-site solar technology after implementing all appropriate treatments to improve energy efficiency.

>>> Installing active solar devices on historic buildings must be undertaken with minimal impact on historic roofing materials and by placing them in locations with limited or no visibility, such as on flat roofs at a low angle or on a secondary roof slope. Consider installation on alternative locations, such as carports or adjacent structures.

>>> Retain and improve existing stormwater management features, such as gutters, downspouts, rain barrels, and bio-swales. Retain significant landscape features.

>>> Add natural sustainable features to the site, such as shade trees, to reduce cooling loads for the historic building.

REFERENCES & RESOURCES

Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68) with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (2017), Guidelines on Sustainability (2011) and Guidelines on Flood Adaptation (2021).

"Guidelines for Rehabbing Kauai's Old Houses" published by Community Housing Resource Board of Kauai, c. 1985. Original content by Barnes Riznik with design and illustrations by Griffin Noyes.

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