COUNTY OF MENDOCINO
DEPARTMENT OF PLANNING AND BUILDING SERVICES
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OPERATION AND MAINTENANCE MANUAL

In compliance with the California Green Building Standards Code, this Operation and Maintenance Manual shall be available at Final Inspection and remain with the building throughout the life-cycle of the structure.
This manual has been prepared for the dwelling located at:
Address
City/State/Zip
Builder
Address
City/State/ Zip
Phone/Internet

Electricity for this property is provided by: ☐ Check if solar or alternate source of electricity is used.
Service Provider
Address
City/State/Zip
Phone/Internet
Alternate Source
*Information to reduce use of electricity is included.

Water for this property is provided by: ☐ Check if well or alternate source of water is used.
Service Provider
Address
City/State/Zip
Phone/Internet
*Information to reduce consumption of water is included.
Sewer for this property is provided by: ☐ Check if private sewage disposal/septic is used.
Service Provider
Address
City/State/Zip
Phone/Internet
*Information to reduce demand on sewage system is included.
Fuel Gas for this property is provided by: ☐ Check if Liquid Propane tank is used.
Service Provider
Address
City/State/Zip
Phone/Internet
*Information to reduce consumption of fuel gas is included.

Garbage/Trash removal for this property is provided by:
Service Provider
Address
City/State/Zip
Phone/Internet
*Information on waste reduction is included.

Recycling for this property is provided by:
Service Provider
Address
City/State/Zip
Phone/Internet
*Information about local recycling programs and their locations is included.

Public Transportation	
Regional and local public transportation options, including address, phone and web addresses are provided below.	
Bus line	Phone/Internet
Light Rail / Train	Phone/Internet
Car Pool/Van Pool	Phone/Internet
Ride Share or Other	

Building Department

Occupancy of this dwellings occupancy was authorized by authority of the Local Enforcing Agency.

Local Enforcing Agency

Address

City/State/Zip

Phone

Special Inspection Verification/Certification

Special inspection required by the CALGreen code or by the local enforcing agency shall be verified. Upon completion a copy of inspection verification and/or certificates of completion shall be included in this manual.

- HVAC system commissioning
- HERS Verification
- Cool roof verification
- Material conservation
- Other third party requirements
- Blower door testing
- Attic Insulation
- Thermal insulation
- Cement reduction

Note: The above listed items are not an all inclusive of measures that may need "Special Inspection." Check with the local enforcing agency to verify mandated special inspections and verification requirements.

Fill in any other verifications or certifications below:

Solar Incentive Programs

California Programs

Information about state renewable energy incentive programs, such as the California Solar Initiative, is available through the California Energy Commission or through Go Solar California at the websites below.

- http://www.energy.ca.gov/
- http://gosolarcalifornia.ca.gov

Other Programs

Contact your local government or public utility from the information provided previously in this manual for more information regarding energy conservation tips, strategies and public/private partnerships that promote enhanced sustainability and/or save money.

Tax breaks, including rebates, credits or discounts may also be available through the local government, public utilities or the Federal Government, US Department of Energy.

The U.S. Department of Energy website: http://www.energy.gov/yourhome.htm

Water Conserving Landscape

To comply with the California Green Building Standards Code, automatic irrigation system controllers for landscaping installed at the time of final inspection must be weather- or soil moisture-based.

Irrigation Controllers

There are several types of irrigation controllers that base the irrigation schedule on evapotranspiration data. Other irrigation controllers may use a combination of historical data and real-time data feeds from on-site temperature sensors, soil moisture sensors, sunlight intensity indicators or they may use data from weather stations. Weather and/or soil moisture-based controllers represent technological advances in irrigation that enable the proper amount of water required by the landscape plants or postpone irrigation during periods of rain. Utilizing these "smart" controllers is an improvement over irrigating by an arbitrary "run time" where the amount of water needed and the amount of water applied may not be effectively matched.

Landscape Water Use Conservation Methods

There are many methods to reduce the amount of water used in a landscape and still maintain the health, appearance and function of the landscape. Following are a few examples:

- Conform to local or the California Department of Water Resources' model Water Efficient Landscape Ordinance
- Use water-efficient landscape designs utilizing native and drought tolerant plants and by minimized turf areas
- Use mulch, soil amendments or other soil improvement methods to reduce water loss through evaporation or runoff and to improve water availability for plant use.
- Install efficient irrigation systems and follow a regulator maintenance schedule. Adjust irrigation controllers as necessary to accommodate changes in seasons and plants needs.
- Schedule landscape irrigation during early or late hours
- Continue learning or education to stay current on new technologies, strategies or products that promote efficient water use.

Irrigation System Design
Homeowners or a design professional can develop an efficient system design meeting homeowner expectations while also reducing waste and conserving natural resources.

When planning landscaping and irrigation the follow ideas can help:

- Use drought tolerant or native species plants.
- Minimize the usage of spray heads.
- Install a low consumption irrigation system such as drip or subsurface.
- Use graywater or recycled water when possible.
- Consider rainwater catchment and storage systems.
- Follow the manufacturer's installation instructions to ensure optimum system efficiency.

Operation and Maintenance Information

This property and structure requires periodic maintenance of the grounds, equipment and appliances.

Manufacturer installation, operation and maintenance instructions must be followed for all equipment and appliances.

Examples of these manuals include but are not limited to;

- HVAC system
- Water heater
- Water saving devices and water reuse systems
- Water pump and/or well
- Water treatment system
- Kitchen appliances
- Garage door and opener
- Whole house fan
- Security alarm system
- Smoke, fire and carbon monoxide alarms
- Landscape irrigation system
- Photovoltaic electrical system
- Septic system

Included or attached to this manual are the manufacturer's installation and maintenance instructions for each specific appliance and/or equipment installed.

Checklist
Proper maintenance will extend the life of a building and the systems installed there in. In addition to specific manufacturer instructions for maintenance and service, the following checklist will assist setting a typical maintenance schedule required on a building.
Weekly
Survey the property, check overall condition
Check landscape irrigation system for leaks and broken heads
Check exterior lighting for burned out bulbs
Monthly
Change return air filters
Check caulking- exterior, interior at plumbing fixtures and at floors (tub, toilet etc.)
Check exterior drainage and swales
Check exhaust fan and damper door for correct operation
Dust off and test smoke and carbon monoxide detectors for operation
Check plumbing for leaks (bathtubs, dishwasher, sinks, lavatories, showers, laundry hook ups, water heater, toilets and any other plumbing)
Check plants and shrubs – trim to avoid contact with house
Check irrigation sprinklers and adjust as necessary – avoid water spray on building and ensure uniform coverage
Test ground fault circuit interrupter (GFCI) outlets
Semi-Annually
Check clothes dryer vent pipe and remove any lint
Clean out roof gutters and downspouts
Inspect roof system for broken or missing roofing material
Check and clean window weep holes
Check weather stripping
Check outdoor AC condenser unit for obstructions and/or debris, clean fins with water hose (while unit is off) for optimal performance
Check house for evidence of termites and other pests
Check all painted surfaces
Drain water heater to remove sediment
Annually
Change batteries in smoke and carbon monoxide detectors
Check condensate drain lines for blockage
Trim trees back to avoid contact with house
Check chimney flue and vents for obstructions and debris

NOTE: Portions of this property will require routine maintenance and may not have a specific manual.

Grading
The grading around the building is sloped away from the structure is not only functional, but a building code requirement enforced during the final inspection. The yard drainage must not drain onto neighboring property or near the building foundation. It is important the owner or tenant maintain this grade or swale to protect the building from moisture. An inspection after any landscaping, construction or a storm is necessary, so the swale or grade always directs the flow of water away from the foundation of the building and to storm sewer systems or other appropriate locations approved for the structure.

Gutters
The gutter and downspouts will need periodic maintenance to ensure proper function. The required interval for this maintenance will vary by season, however, gutters and downspouts should be inspected for debris before the rainy season. When trees and other deciduous vegetation shed leaves that drop into the gutters, this will inhibit the flow of water and possibly clog downspouts. The leaves and/or debris must be removed in order for the system to work as designed. The downspouts should direct the storm water away from the foundation at least 5 feet to avoid damage to the structure. Always keep the area clear where the storm water flows out of the downspout, if a clear area is not possible subsurface drains may need to be installed.

Irrigation
Inspect the landscape irrigation systems weekly for leaking or broken heads.

Frost Protected Foundation Systems
When the building utilizes a Frost-Protected Shallow Foundation, as allowed by local conditions, the monthly mean temperature of the building must be maintained at a minimum of 64°F (18°C).

Relative Humidity (RH)
RH is the percent of moisture in the air compared to the maximum amount of moisture this air can hold at the same condition. Warm air will hold more moisture than cold air. The design of the HVAC system should include controlling the moisture levels appropriate to the climate. The addition of moisture (humidification) may be required in colder climates during the winter season and removed (dehumidification) during the summer months.
Automatic, computer controlled humidifiers can control the humidity levels, providing enough moisture for a healthy comfortable dwelling and within the limits to prevent window and cold surface condensation. These levels are usually between 30 to 60 percent RH although certain health conditions may dictate benefits at either the higher or lower ranges.

Hygrometer
The hygrometer will show RH. Although the RH will not be exactly the same throughout the structure, one hygrometer is usually sufficient. It should be placed where the humidity symptoms are most obvious, in the room that you are most concerned about.

Low Relative Humidity
Below 30 percent RH, people can be uncomfortable and can suffer from dry mucus membranes which can lead to nosebleeds and infections. In general, low RH is only a problem during the winter months, when the outside air contains very little moisture. It is this dry outside air entering through cracks and openings in the building shell that causes the inside air to become dry. The greater the amount of outside air which leaks into the building, the dryer the indoor air becomes. By air-sealing and using energy-efficient construction, uncontrolled air leakage is greatly reduced, a more controlled indoor environment is created, and RH can be maintained at acceptable levels without the use of a humidifier.

Humidifiers require maintenance to avoid becoming breeding grounds for biological contaminants. The effects of bacteria, viruses, fungi, respiratory infections, allergic rhinitis and asthma, and ozone production can be minimized by higher humidity levels. Studies have shown that wintertime operation at 68° F at 60% RH provides the same level of occupant comfort as does 72° F at 30% RH; so lower utility bills and healthier environment are both benefits of controlled RH.

High Relative Humidity

High RH can lead to occupant discomfort, annoyances, and possibly serious health issues as they relate to bacteria, viruses, fungi, mites (dust mites and mold), allergic rhinitis and asthma, and chemical interactions. with mold, dust mites, and other biological pollutants.

The air conditioning system and/or stand-alone dehumidifier are designed to remove moisture (latent load) and decrease the RH levels. Studies show that summertime operation at 78° F at 30% RH provides the same level of occupant comfort as does 74° F at 70% RH. This lower humidity level will provide increased comfort, lower utility bills and less risk of health issues associated with high humidity.

Using exhaust fans in the bathrooms and kitchen can remove much of the moisture that builds up from everyday activities and help keep RH below 50%. Having a humidistat connected to an exhaust fan is required in bathrooms. This is an effective way to control RH in moisture prone areas. When using an adjustable humidistat, the setting should be adjusted according to the season -- lower RH in the summer and higher RH in the winter. Another benefit to using kitchen and bathroom exhaust fans is removal of odors and pollutants. These fans can also be part of an active ventilation system for the entire house and help to reduce humidity levels.