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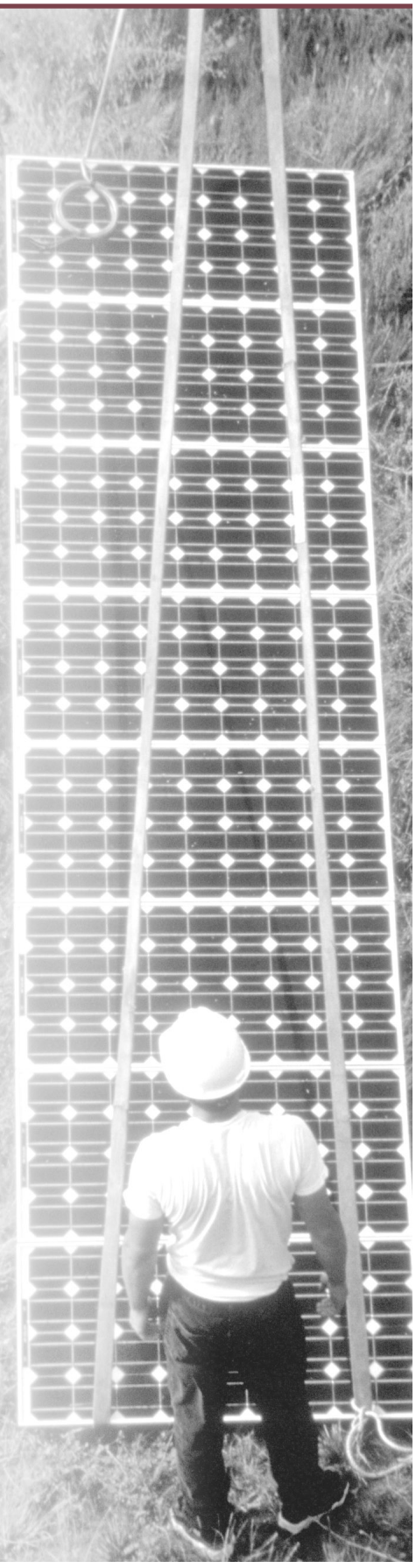


ORGANIZATION OF THIS BOOK

While we recognize that this Guidebook is intended for home remodeling and rehabilitation, it is nevertheless organized to follow the progression of new home construction. So, it begins with considerations of the building site, then moves on to the framing of the house, and concludes with the paints and other finishes that are applied at the end of the construction process. We have also included a final section on the ongoing operation and maintenance of a home since even the best designed and built home can suffer from environmental problems if harmful chemicals, such as those contained in cleansers and pesticides, are brought indoors. The Checklist which appears on pages 4 and 5 follows this same order.

Finally, since this Guidebook is not meant to be a comprehensive compendium of healthy and efficient building strategies, but rather an introduction to this issue, we have also included a Resources section that provides information on where you can obtain additional information on healthy and efficient building practices. We urge you to explore the websites and publications that we have included here to learn more about improving your home and our environment.

WHY BUILD SUSTAINABLY?

ENERGY EFFICIENCY

Energy efficiency is probably one of the most environmentally and economically effective choices a consumer can make. Not only does the generation and use of energy contribute to Los Angeles' air pollution and to global climate change, but energy costs are one of the most significant expenditures that low-income households make. Using energy wisely, therefore, not only improves the environment, but can increase the amount of income available to homeowners and tenants for other needs.

Energy efficiency and the use of renewable energy are also the best ways to reduce our dependence on foreign oil and to reduce the impact on air quality. Adding insulation wherever possible is the first step. Upgrading appliances like refrigerators and hot water heaters can reduce monthly utility costs significantly. Reducing energy use is in everyone's best interest. The community exports fewer dollars, the local air quality improves, and residents continue to save money for years after the improvements have paid for themselves.

RESOURCE CONSERVATION

Our buildings are rapidly consuming our natural resources. Trees and water are two natural resources that are under great strain due to conventional construction practices. For example, twenty years ago, the average old growth tree harvested from National Forests was 24" in diameter. Today the average is 13". Because of our high use of solid sawn lumber materials, we have depleted 95% of these old growth forests. Sustainable building approaches seek to reduce this impact by using resources more efficiently.

One way that the timber industry has sought to improve lumber use efficiency has been to develop innovative, engineered products that utilize fast-growing farm trees as an alternative and supplementation to the over-harvested old forests. These products are stronger, straighter and lighter—some only using 50% of the wood fiber to perform the same structural function as solid sawn lumber. Fast growing tree farms are an example of a resource that can renew itself in our lifetime.

Another innovative response to depleted resources is the advent of recycled-content building materials, which has grown out of the increasing stockpiles of recycled material. Today, Americans recycle seven times more than they did a decade ago. Building materials are the perfect application for tons of recycled refuse. Not only does recycling divert waste from the landfill, but many of the remanufactured materials are of higher quality and durability than conventional materials. For example, recycled-content decking material, made out of plastic bottles which are melted down and mixed with wood chips, last ten times longer than wood decks and never have to be treated or painted.

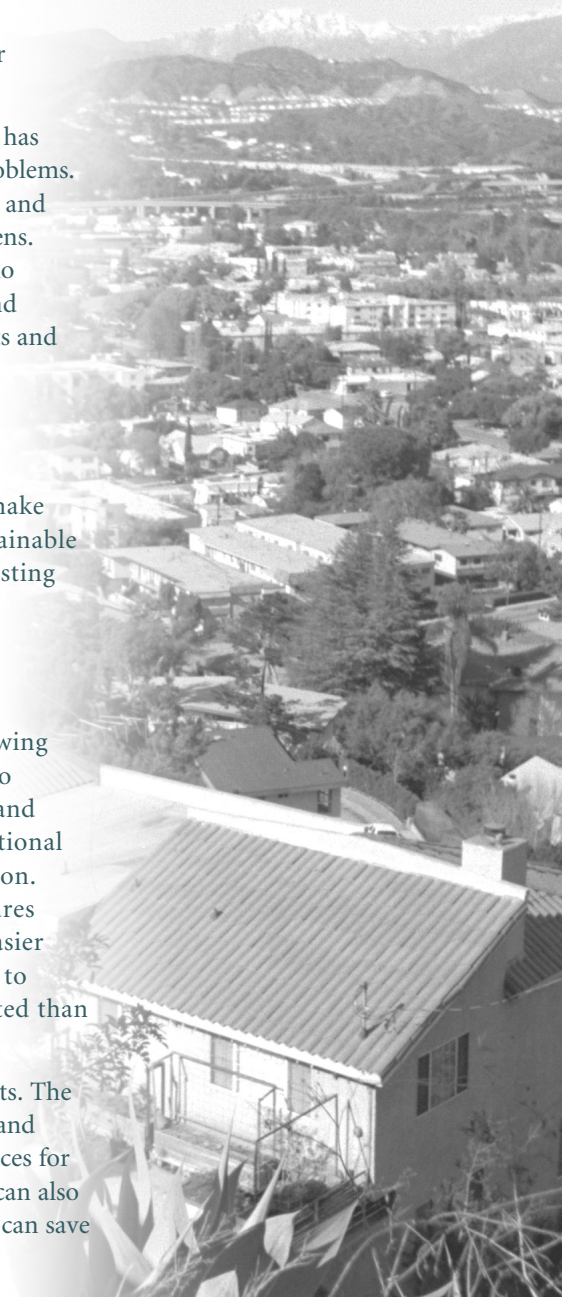
Water in Los Angeles has long been a source of environmental controversy while simultaneously supporting the region's economic growth. The City's water sources are very limited, and this important resource is becoming increasingly costly. Like energy efficiency, using water efficiently can both improve the environment and reduce household expenses.

INDOOR AIR QUALITY

The US Environmental Protection Agency reports that air in new homes can be ten times more polluted than outdoor air. As a result, as many as 15% of Americans may be allergic to their own homes. According to the New England Journal of Medicine, 40% of children born today will develop respiratory disease in part due to the chemicals in their homes. It is a quiet crisis that is only now reaching the public.

Many products typically used in home construction may have negative health impacts on occupants. For example, products such as cabinets, counter tops, shelving and furniture are made from particleboard that is glued together with formaldehyde based adhesives. Formaldehyde, a suspected human carcinogen, is released into the home for years after the product containing it has been installed. Paints and floor finishes also contain chemicals that are not healthy to breathe. That "new house smell" is actually the odor of volatile organic compounds (VOCs), and is a telltale sign that there are harmful chemicals in the indoor environment. VOCs also contribute to urban smog.

The construction industry has responded to these indoor air problems and has developed alternate products that alleviate conventional indoor toxicity problems. For example, solvent-free adhesives, used throughout the house in flooring and countertops, eliminate many of the suspected and known human carcinogens. They also adhere better. Paints and cleaners that have reduced or contain no volatile organic compounds are now commonly available, as are finishes and cleaners. These products are comparable in cost with conventional products and help create a healthier home environment.



Safety

This Guidebook also contains a few recommendations to make homes safer places to live because, for any home to be sustainable in the truest sense of that word, it must provide safe and lasting shelter for its occupants.

Cost Considerations

The checklist of sustainable building features on the following two pages identifies products by range of cost compared to conventional building practices: no cost, low cost (<5%) and moderate cost (>5%). These ranges are relative to conventional products typically used for a given rehabilitation application. The cost ranges also reflect the cost of incorporating features during the remodeling process. For example, it is much easier to design a new solar building than it is to retrofit an existing building to take advantage of solar energy. Some buildings are more easily retrofitted than others. Therefore, the cost guidelines are broad and general.

A second issue also impacts the relative cost of sustainable building products. The building industry pricing structure is typically based on volume purchases and type of customer. For example, a large tract builder can get much lower prices for materials than a small remodeling contractor. Prices for the same product can also vary from dealer to dealer by as much as 50%. Therefore, careful shopping can save money for small projects.

CHECKLIST

The following checklist identifies which recommended features have tie-ins to City of Los Angeles or Department of Water and Power (DWP) programs.

Most of the features identified are applicable to both single and multi-family buildings.

The checklist identifies cost considerations for products: No Cost, Low Cost and Moderate Cost. These are discussed in more detail on page 3.

Most of the features have an overall environmental benefit addressing one or more of the four key areas of environmental concern described on pages 2-3: Energy Efficiency, Resources Conservation, Indoor Air Quality and Safety. However, there are many other, more immediate and personal benefits of using sustainable features for the homeowner. These include: lower initial cost of products, lower monthly operating costs, more comfort, healthier, quieter, higher quality materials, more durable, require less maintenance.

	Single Family	Multi-Family	City / DWP	No Cost	Low Cost <5%	Moderate Cost >5%	Energy Efficiency	Resource Conservation	Indoor Air Quality	Safety
A • SITE										
1. Xeriscaping	✔	✔	✔	✔				✔		
2. Permeable Paving	✔	✔				✔		✔		
3. Water Catchment	✔	✔			✔			✔		
4. Job Site Construction & Demolition Waste Recycling	✔	✔	✔		✔			✔		
5. Recycled-Content Deck Material	✔	✔			✔			✔		
6. Recycled-Content Siding	✔	✔			✔			✔		
7. Certified Sustainable Wood Siding & Decking	✔	✔			✔			✔		
B • STRUCTURAL FRAME										
1. Engineered Lumber	✔	✔				✔		✔		
2. OSB Subfloor and Sheathing	✔	✔		✔				✔	✔	
3. Certified Sustainable Wood	✔	✔			✔			✔		
4. Finger-Jointed Studs	✔	✔		✔				✔		
5. Interior Recycled-Content Steel Studs	✔	✔			✔			✔		
C • PLUMBING										
1. Convert Gas to Tankless Hot Water Heater	✔	✔				✔	✔			
2. Install Hot Water Jacket Insulation	✔	✔			✔		✔			
3. Retrofit All Faucets with Flow Reducers	✔	✔	✔	✔				✔		
4. Replace Old Toilets with Low Flush Models	✔	✔	✔		✔			✔		
5. Install Horizontal Axis Washing Machine	✔	✔	✔			✔	✔	✔		
D • ELECTRICAL										
1. Compact Fluorescent Bulbs	✔	✔	✔		✔		✔			
2. Refrigerator Replacement	✔	✔	✔			✔	✔			
3. 100-Amp Service Upgrade	✔	✔				✔				✔
E • ROOFING										
1. Light Colored Roofing	✔	✔	✔	✔			✔			
2. Minimum 25-Year Composition Roofing	✔	✔			✔			✔		

CHECKLIST

	Single Family	Multi-Family	City / DWP	No Cost	Low Cost <5%	Moderate Cost >5%	Energy Efficiency	Resource Conservation	Indoor Air Quality	Safety
F • INSULATION										
1. Upgrade Wall Insulation to Meet Energy Code	✔	✔	✔			✔	✔			
2. Upgrade Ceiling Insulation to Meet Energy Code	✔	✔	✔			✔	✔			
3. Cellulose Insulation in Walls	✔	✔	✔			✔	✔	✔		
4. Cellulose Insulation in Ceilings	✔	✔	✔			✔	✔	✔		
G • WINDOWS										
1. Replace Single with Double-Glazed Windows	✔	✔	✔			✔	✔			
2. Reflective Film on West Windows	✔	✔	✔		✔		✔			
3. Replace Metal Windows with Wood Windows	✔	✔	✔			✔	✔			
4. Replace Metal Windows with Low-E Windows	✔	✔	✔		✔		✔			
H • HVAC										
1. Whole House Fan	✔		✔			✔	✔		✔	
2. Separate Garage Exhaust Fan for Attached Garage	✔	✔				✔			✔	
3. Eliminate Electric Heaters and Wall-Mounted Gas Heaters	✔	✔				✔	✔		✔	✔
4. Range Hood Vented to Outside	✔	✔			✔				✔	
I • RENEWABLES / SOLAR ENERGY										
1. Natural Cooling	✔	✔	✔			✔	✔			
2. Passive Solar Heating	✔				✔		✔			
3. Solar Hot Water Heating	✔	✔				✔	✔			
4. Pre-Plumbing for Solar Water Heating	✔	✔			✔		✔	✔		
5. Photovoltaics	✔	✔	✔			✔		✔		
6. Green Power	✔	✔	✔		✔			✔		
J • FINISHES / INDOOR AIR QUALITY										
1. Elimination of All Particleboard	✔	✔				✔			✔	
2. Seal All Exposed Particleboard	✔	✔		✔					✔	
3. Low/No-VOC and Formaldehyde-Free Interior Paint	✔	✔		✔					✔	
4. Low-VOC Wood Finishes	✔	✔		✔					✔	
5. Solvent-Free Adhesives Used Inside	✔	✔		✔					✔	
6. Carbon Monoxide Detector Installed	✔	✔			✔				✔	✔
7. Recycled-Content Carpet	✔	✔			✔			✔		
8. Replace Vinyl Flooring with Linoleum	✔	✔			✔			✔		
9. Finger-Jointed Trim	✔	✔		✔				✔		
10. Recycled-Content Ceramic Tile	✔	✔			✔			✔		
K • OPERATIONS & MAINTENANCE										
1. Low-Toxic or Citrus-Based Cleaning Supplies	✔	✔		✔					✔	
2. HEPA Filters on Vacuum Cleaners	✔	✔		✔					✔	
3. Doormats on All Exterior Doors	✔	✔			✔				✔	
4. Cleaning Supplies and Paints Stored in Ventilated Area	✔	✔		✔					✔	
5. Non or Low-Toxic Pesticides and Fertilizers	✔	✔		✔					✔	
6. Provide Recycle Storage Bins	✔	✔			✔			✔		
7. Gas Sut-Off Valve for Earthquake Safety	✔	✔			✔					✔
8. Bolt Home to Foundation for Earthquake Safety	✔					✔				✔

A • SITE

1. Xeriscaping

DESCRIPTION: Xeriscape is a simple, low water and low maintenance landscaping approach that involves:

- The addition of organic material such as manure, compost and peat moss to properly aerate the soil.
- Reduce lawn areas to a minimum. No more than 25% of landscaped area should be covered with turf, such as Blue Gramma, Buffalo Grass, Tall-type Fescue which require less water to maintain.
- All planting beds mulched with wood chips at least 2" deep.
- Appropriate use of low water, drought-resistant plants. A recommended list of drought tolerant species is available from LA Department of Water and Power (DWP). Call 1-800 U ASK DWP.

CONDITIONS: Xeriscaping can replace hard surfaces or lawn area when landscaping is installed.

BENEFIT: Xeriscaping can reduce exterior water use by 75% compared with lawn, thus saving time, resources and money.

2. Permeable Paving

DESCRIPTION: Permeable paving allows water to penetrate to sub-surface in order to replenish soil moisture and aquifers. Permeable paving absorbs water rather than letting it flow down storm drains.

CONDITIONS: The most typical applications of permeable paving are walkways, patios, and driveways.

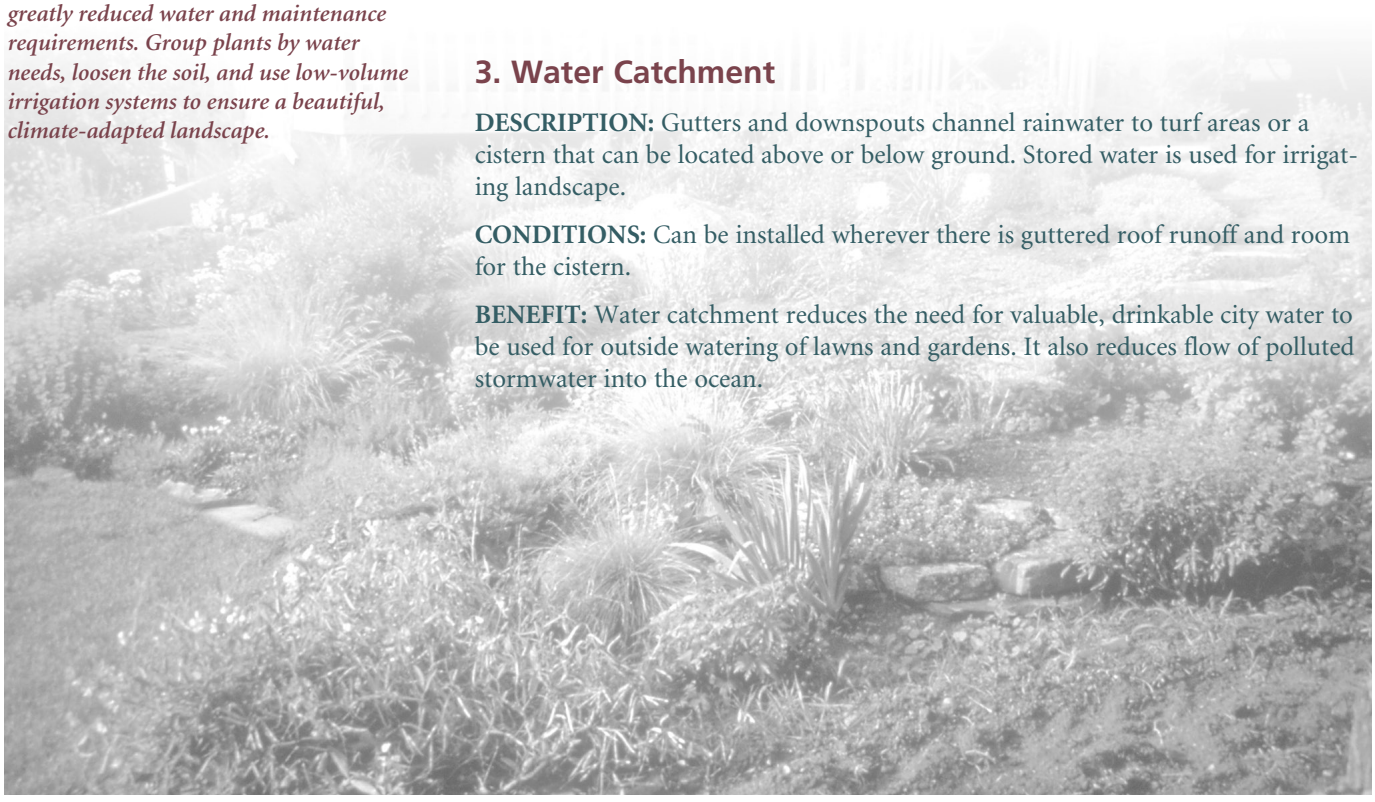
BENEFIT: Permeable paving reduces flooding and the volume of polluted storm water that reaches the river or ocean. It also reduces the need to irrigate

3. Water Catchment

DESCRIPTION: Gutters and downspouts channel rainwater to turf areas or a cistern that can be located above or below ground. Stored water is used for irrigating landscape.

CONDITIONS: Can be installed wherever there is guttered roof runoff and room for the cistern.

BENEFIT: Water catchment reduces the need for valuable, drinkable city water to be used for outside watering of lawns and gardens. It also reduces flow of polluted stormwater into the ocean.



A 1: Water-wise landscapes exhibit color and variety throughout the year, with greatly reduced water and maintenance requirements. Group plants by water needs, loosen the soil, and use low-volume irrigation systems to ensure a beautiful, climate-adapted landscape.

4. Job Site Construction and Demolition Waste Recycling

DESCRIPTION: Cardboard and wood make up over 50% of construction waste and can be easily recycled. All metals are also easily recycled. Job site demolition and construction debris is separated on site into bins for cardboard, wood, metals and plastics. Bins of sorted materials are hauled to recycling centers.

CONDITIONS: The only limitation is room on site for separation of debris. Note: Appropriate care should be taken for materials considered hazardous or toxic.

BENEFIT: Recycling reduces pressure on landfills and can represent a saving over dumping fees.

A 4: Cardboard and wood make up over 50% of construction waste, and are generally easily separated and recycled. All metals are easily recycled. Construction debris recycling represents a significant reduction in landfill disposal of these recyclable materials.

5. Recycled-Content Deck Material

DESCRIPTION: Recycled wood fiber and plastic are formed into deck boards replacing redwood, cedar and pressure treated pine. Most products accept screws and nails, and cut like wood.

CONDITIONS: These products can be used whenever wood decks are resurfaced or rebuilt.

BENEFIT: The durability of these materials is greater than wood, providing cost-savings to the homeowner over the life of the products. They will not warp, do not require staining and are not treated with potentially toxic chemicals. Additionally, using these alternative products can reduce pressure on the logging of old-growth forests.

6. Recycled-Content Siding

DESCRIPTION: Recycled-content siding is often called hardboard. Manufacturers use varying amounts of both pre- and post-consumer recycled content material. It looks and performs like wood siding with fewer material defects.

CONDITIONS: To be used whenever wood siding is replaced.

BENEFIT: Siding that has been engineered from wood fiber will not crack, split or warp and holds paint longer than solid wood siding. Recycled-content siding reduces maintenance costs and saves resources.

7. Certified Sustainable Wood Siding and Decking

DESCRIPTION: Certified wood comes from forests that are managed in accordance with sustainable forest practices developed by the Forest Stewardship Council. Certified redwood and cedar siding and decking are now available.

CONDITIONS: To be used whenever siding or decking is replaced.

BENEFIT: Sustainable forest certification assures that the forest from which the redwood or cedar is produced is managed in a way that will assure the long-term availability of these precious woods and do not damage ancient, old-growth forests. Sustainable forest management practices are environmentally sound, socially beneficial and economically viable.

B STRUCTURAL FRAME

B 1: Engineered lumber is made from fast growing farm trees and uses a higher percentage of the potential wood fiber. Wood "I" joists use 50% less wood as solid-sawn joists and result in a floor or roof that is stronger, straighter and won't warp.

1. Engineered Lumber

DESCRIPTION: Engineered lumber products, include, but are not limited to, gluelam, microlam, laminated veneer lumber, wood "I" joists, oriented strand board, parallel strand lumber, or other remanufactured wood fiber structural materials used for structural framing of floors, walls and roofs.

CONDITIONS: Engineered lumber should be used whenever structural members are replaced. They substitute for 2"x10"s and 2"x12"s in most interior applications.

BENEFIT: Engineered lumber uses wood fiber more efficiently than conventional lumber, resulting in stronger, straighter and defect-free construction. Engineered lumber replaces the use of solid sawn lumber from old-growth trees.

2. OSB Subfloor and Sheathing

DESCRIPTION: Oriented Strand Board (OSB) is manufactured from fast-growing farm trees. It comes in sheets and is used for sheathing and sub-floors.

CONDITIONS: OSB should be used whenever plywood sheathing or sub-floor is replaced.

BENEFIT: Some OSB uses lower formaldehyde content adhesives that contribute to a healthier indoor air quality. OSB is stronger than traditional sheet material and cost-competitive. OSB also reduces the need for large diameter old growth trees to be made into plywood.

3. Certified Sustainable Wood

DESCRIPTION: Certified wood comes from forests that are managed in accordance with sustainable forest practices developed by the Forest Stewardship Council. Certified solid sawn lumber and plywood are now available.

CONDITIONS: Certified wood can be used in any application that normally uses conventional lumber.

BENEFIT: Sustainable forest certification assures that the forest from which the redwood or cedar is produced is managed in a way that will assure the long-term availability of these precious woods and do not damage ancient, old-growth forests. Sustainable forest management practices are environmentally sound, socially beneficial and economically viable.

B 5: Steel studs provide flexibility for some interior applications. They should not be used for exterior wall framing.

4. Finger-Jointed Studs

DESCRIPTION: Finger-jointed studs use short pieces of 2"x4" or 2"x6" material glued together to form standard stud lengths.

CONDITIONS: They can be used wherever conventional studs would be typically used.

BENEFIT: Finger-jointed studs are straighter, stronger, and more durable than solid sawn studs which warp and twist, causing unusable material or crooked walls. They reduce the use of solid sawn wood studs thereby decreasing the pressure on virgin forests.

5. Interior Recycled-Content Steel Studs

DESCRIPTION: Light gauge steel studs can be used instead of wood and can contain up to 60% recycled steel.

CONDITIONS: Steel studs should only be used for interior applications, since they conduct heat readily through the building skin.

BENEFIT: Recycled steel reduces the demand on forests for wood studs. They also create straight interior walls since they do not warp like lumber.

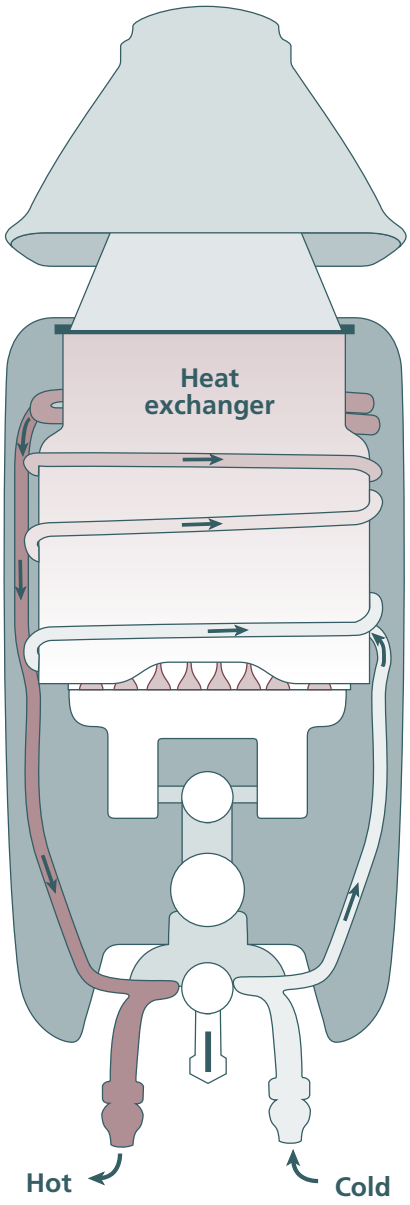
C ✦ PLUMBING

1. Convert Gas to Tankless Hot Water Heater (Flash Heater)

DESCRIPTION: Tankless water heaters heat water as needed rather than having a tank in which hot water is stored and their capacity to provide hot water is virtually unlimited.

CONDITIONS: Install tankless hot water heater as close to demand as possible. Device must have a variable-set thermostat and be appropriately sized.

BENEFIT: Typical hot water heaters lose 15% of their energy through standing tank losses, whereas tankless heaters use energy only for immediate hot water needs. Tankless water heaters are more reliable, providing hot water for every need.



C 1: Tankless water heaters heat water as it goes through a heat exchanger to the demand source. No hot water is stored in tanks. Heating is done on demand and is limited only by the supply of water and energy.

2. Install Hot Water Jacket Insulation

DESCRIPTION: Water heater jacket insulation is an insulated wrapper that goes around the hot water tank and is secured in place.

CONDITIONS: Can be installed on almost all existing hot water heaters. For new water heater installation, assure that installation does not void the warranty.

BENEFIT: Reduces heat loss by about 10%; more on older hot water heaters.

3. Retrofit All Faucets with Flow Reducers

DESCRIPTION: Flow reducers fit into the aerator at the tip of the faucet and reduce the rate of water flow through the faucet.

CONDITIONS: All faucets should accept reducers except old fixtures that do not have screw-on aerators.

BENEFIT: Flow reducers save water and money by slowing the flow from 2-3 gallons per minute to 1 gallon per minute or less with little noticeable effect.

4. Replace Old Toilets with Low Flush Models

DESCRIPTION: New toilets use 1.5 gallons per flush compared with old toilets that require 5 gallons per flush.

CONDITIONS: Whenever possible, replace existing toilets with new 1.5 gallon models. The LA Department of Water and Power (DWP) has a rebate program of $75-100 for ultra-low flush toilets. Call 1-800 610-9682 for information.

BENEFIT: Each toilet replacement can save up to 4,000 gallons of water per year.

5. Install Horizontal Axis Washing Machine

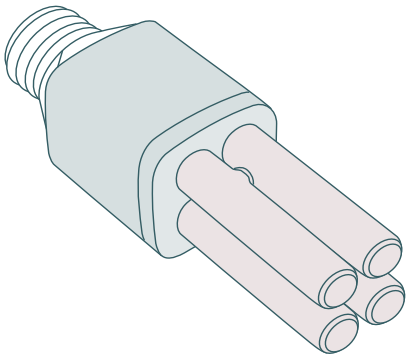
DESCRIPTION: Horizontal, front loading washing machines simply load from the front rather than the top.

CONDITIONS: Recommended whenever washing machines are replaced. LADWP has a rebate program worth $150 toward the purchase of a horizontal axis washing machine. Call 1-800 544-4498 for information.

BENEFIT: Horizontal access machines save resources by using less water and less energy. They use 50% less water than conventional top loading machines, translating into lower energy and water bills for the resident. Additionally, because access is from the front, machines can be stacked, saving space. Manufacturers claim that there is less wear and tear on clothes than with the traditional agitator (top loading) machines.

D ✦ ELECTRICAL

D 1: Compact fluorescent bulbs consume approximately one-third of the electricity used by incandescent bulbs. Bulbs may last up to ten years and save up to $120 over the life of the bulb.



1. Compact Fluorescent Bulbs

DESCRIPTION: Compact fluorescent bulbs screw in like conventional bulbs but consume approximately one-third of the electricity used by incandescent bulbs to produce an equivalent amount of light.

CONDITIONS: They should replace conventional bulbs in areas where the light is on three or more hours a day such as security and common area lighting. Closet lights, however, do not save much energy over time and so are not the best application for this technology.

BENEFIT: The compact fluorescent bulbs may last up to ten years and save up to $120 over the life of the bulb.

2. Refrigerator Replacement

DESCRIPTION: Refrigerators and freezers are among the largest users of electricity in most homes. They can account for up to 25% of household energy use. New appliances are much more energy efficient.

CONDITIONS: DWP has a recycling program and will pay $35 for old, still-operating, second refrigerators. Call 1-800 234-9722 for more information and restrictions.

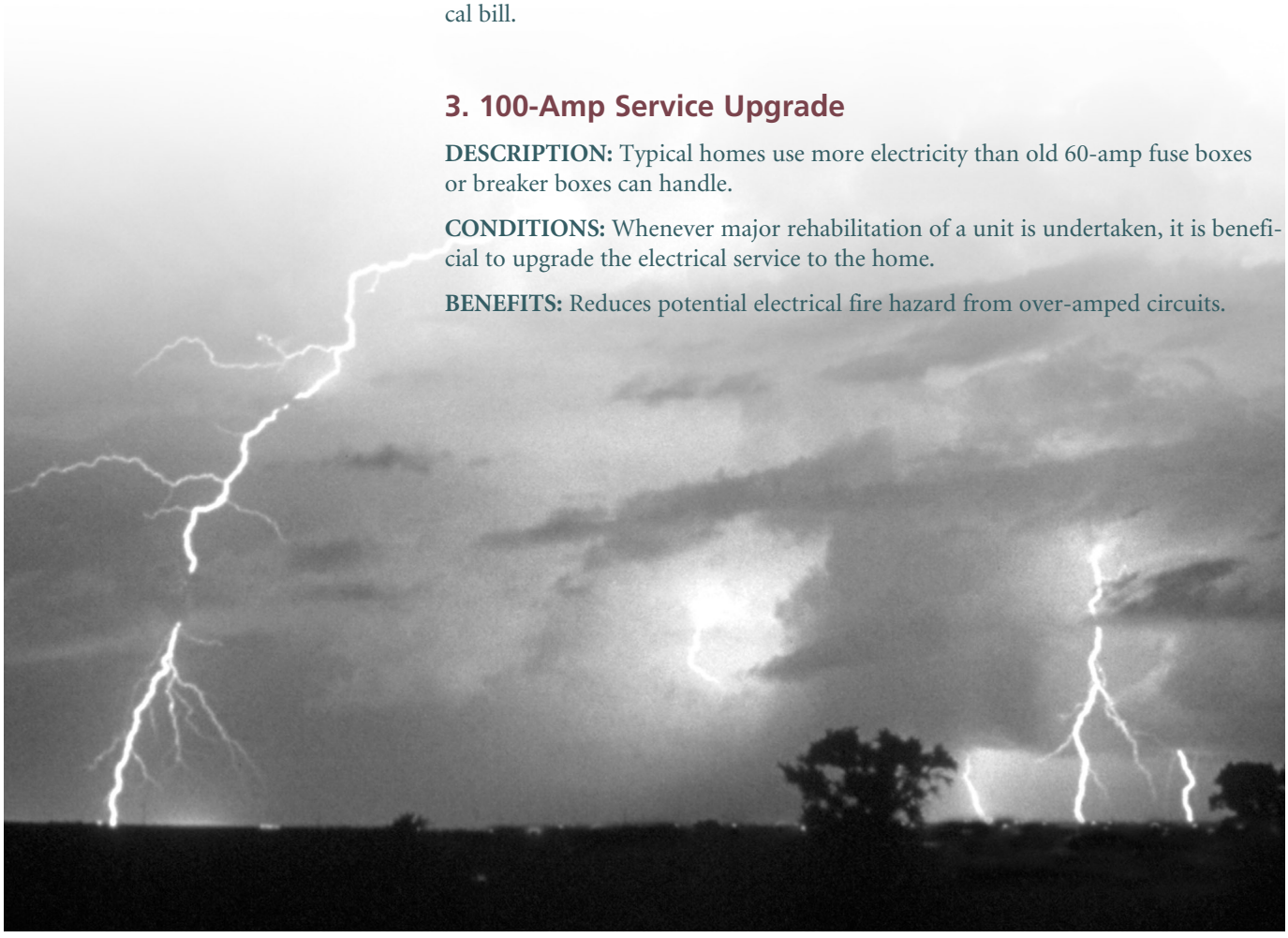
BENEFIT: New, efficient refrigerators can save over 10% of the total annual electrical bill.

3. 100-Amp Service Upgrade

DESCRIPTION: Typical homes use more electricity than old 60-amp fuse boxes or breaker boxes can handle.

CONDITIONS: Whenever major rehabilitation of a unit is undertaken, it is beneficial to upgrade the electrical service to the home.

BENEFITS: Reduces potential electrical fire hazard from over-amped circuits.



E ✦ ROOFING

1. Light Colored Roofing

DESCRIPTION: Dark roofing materials absorb heat making the house warmer, whereas light colored roofing reflects heat away from the building.

CONDITIONS: When roofing is replaced, light colored shingles should be used. If it is a flat roof, the black asphalt or roofing material should be coated with light colored gravel or painted with light colored or reflective paint.

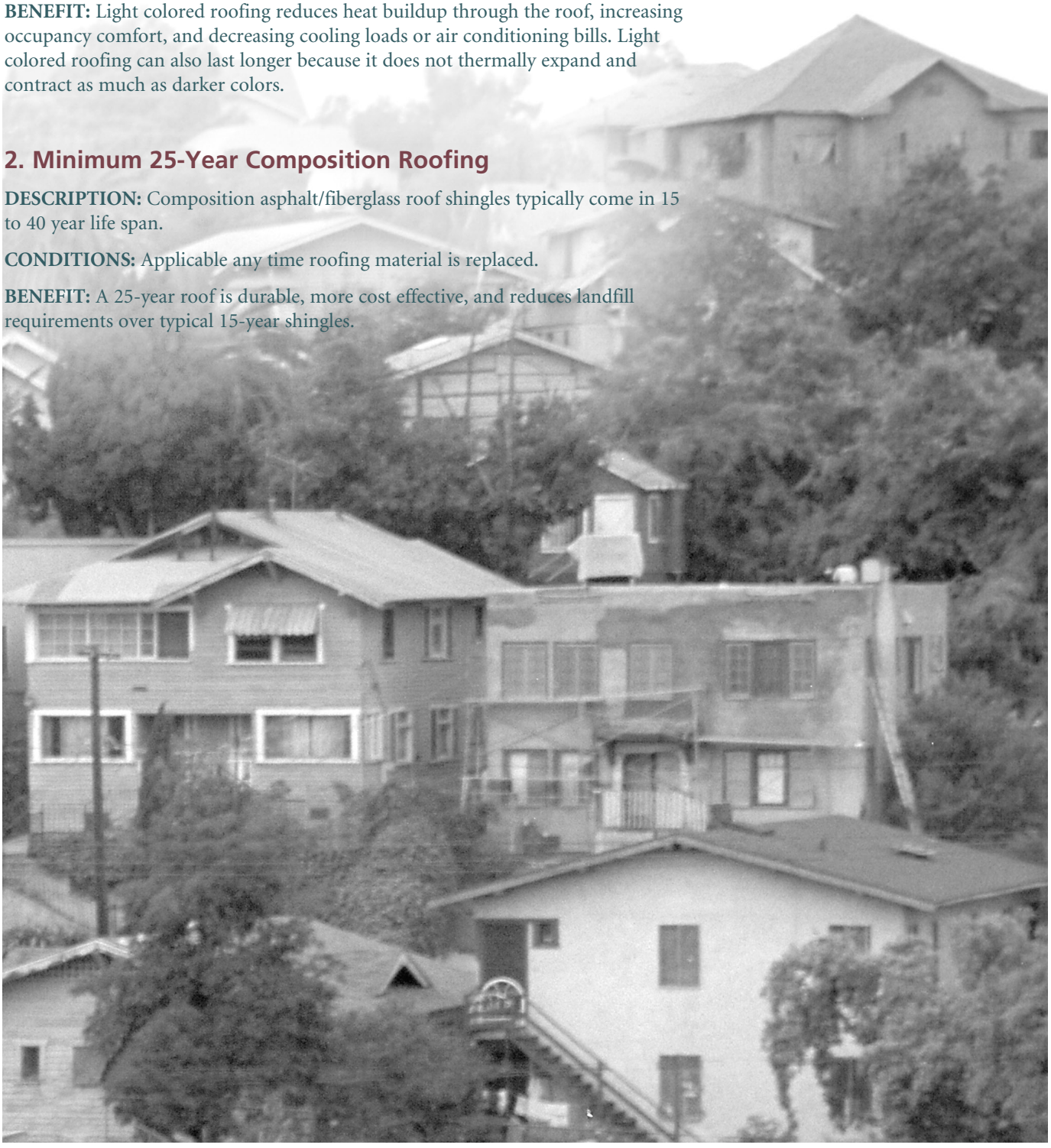
BENEFIT: Light colored roofing reduces heat buildup through the roof, increasing occupancy comfort, and decreasing cooling loads or air conditioning bills. Light colored roofing can also last longer because it does not thermally expand and contract as much as darker colors.

2. Minimum 25-Year Composition Roofing

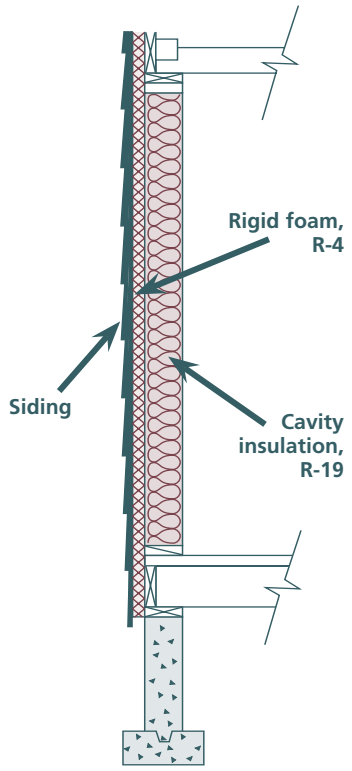
DESCRIPTION: Composition asphalt/fiberglass roof shingles typically come in 15 to 40 year life span.

CONDITIONS: Applicable any time roofing material is replaced.

BENEFIT: A 25-year roof is durable, more cost effective, and reduces landfill requirements over typical 15-year shingles.



F • INSULATION



F 1: Walls can be constructed to R-24 in new homes or additions by adding 1" foam to the exterior of the wall framing under the siding. This also reduces conductive heat loss through the framing material.

1. Upgrade Wall Insulation to Meet or Exceed Energy Code Requirements

Title 24 of the California Code of Regulations (R-12 wall insulation)

DESCRIPTION: Insulation in exterior walls can reduce the demand for air conditioning and make homes more comfortable. Walls of existing wood frame houses should be insulated to capacity of the wall cavity or, at a minimum, to the Title 24 Standard of R-12 .

CONDITIONS: The existing home qualifies only if the walls have no existing insulation or if the insulation is settled or degraded. Wall cavities with existing insulation can be blown full of new cellulose or high recycled content fiberglass (>25%) to increase the density, thereby increasing the R-value. Exterior walls can be wrapped with a minimum of 1" (R-4) rigid foam to increase R-value if total exterior refinish is being performed.

BENEFIT: Increased wall insulation improves comfort summer and winter, decreased heating and cooling requirements and cost, and makes the home quieter.

2. Upgrade Ceiling Insulation to Meet or Exceed Energy Code Requirements

Title 24 of the California Code of Regulations (R-19 ceiling insulation)

DESCRIPTION: Increase ceiling insulation in existing structure to R-19, where possible.

CONDITIONS: Installation is generally intended to be in ceilings below attic space, with appropriate gable or soffit ventilation. NOTE: If existing cathedral or flat ceilings are already insulated, it is not recommended to install more insulation in the cavity unless adequate insulation ventilation is provided. It is most cost-effective to add insulation during construction or when remodeling other areas.

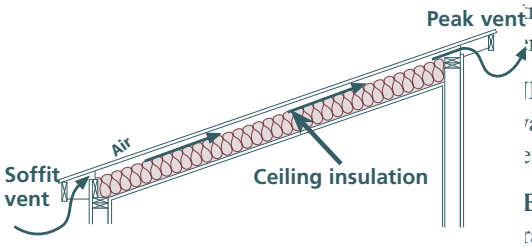
BENEFIT: Increased roof insulation increases comfort summer and winter, while decreasing heating and cooling requirements, energy consumption and cost.

3. Cellulose Insulation in Walls

DESCRIPTION: Spray cellulose is a highly effective insulation made out of recycled newspaper and a binder. Install spray cellulose wall insulation that has been mixed with low toxic binders to adhere to stud and joist cavity surfaces to at least an R-13 insulation level. Spray insulation has two advantages: the spray process fills cavities and ...rations reducing air infiltration. The binder in the insulation also reduces the air ...ment within wall cavities, reducing moisture intrusion and flame spread.

...DITIONS: This installation is intended for total "gut" renovation where existing ...all surfaces have been removed to the studs or during new construction. It is not ...effective in other applications.

...EFIT: Using cellulose insulation keeps house more comfortable by reducing air ...ration, resulting in less energy required and lower utility bills.



Cathedral ceiling insulation ventilation

F 2: Ceilings in existing homes can be insulated while other work is being done. Since heat rises, this is the most cost effective insulation retrofit. Precautions must be taken to preserve existing attic ventilation. It is not recommended to retrofit cathedral or sloped ceilings where insulation ventilation is difficult to maintain.

4. Cellulose Insulation in Ceilings

DESCRIPTION: Dry-blown or loose-fill cellulose is treated with borates for fire resistance and as an insecticide. It is typically used in ceilings. Cellulose does not contain formaldehyde common to fiberglass insulation.

CONDITIONS: Cellulose can be spread over ceiling joists or blown into tight cavities to increase ceiling R-value. It is important to maintain insulation ventilation and not pack the entire ceiling cavity, especially in cathedral ceiling applications.

BENEFIT: Cellulose insulation is formaldehyde free and therefore healthier. It is fire-resistant and saves energy.

G ✦ WINDOWS

1. Replace Single with Double-Glazed Windows

DESCRIPTION: Windows lose heat through the frame and glass, and let in cold or hot outside air between the window and the surrounding framing material.

CONDITIONS: Replace single-glazed windows with double-glazed windows whenever possible and cost effective.

BENEFIT: Good double-glazed windows make the whole house more comfortable during all seasons while saving energy and money.

2. Reflective Film on West Windows

DESCRIPTION: Installing high reflective film on west windows reduces heat gain from a low setting sun.

CONDITIONS: Any unshaded west windows are good candidates for film application.

BENEFIT: Reflective film reduces overheating. Reflective film is an inexpensive alternative that can create greater comfort and prevent or significantly lower the need for additional cooling.

3. Replace Metal Windows with Wood Windows

DESCRIPTION: Metal frame windows conduct heat out in cool weather and heat in on hot days. Wood is a much better insulator and, therefore, is more energy efficient.

CONDITIONS: Consider wood windows for any window that is being replaced.

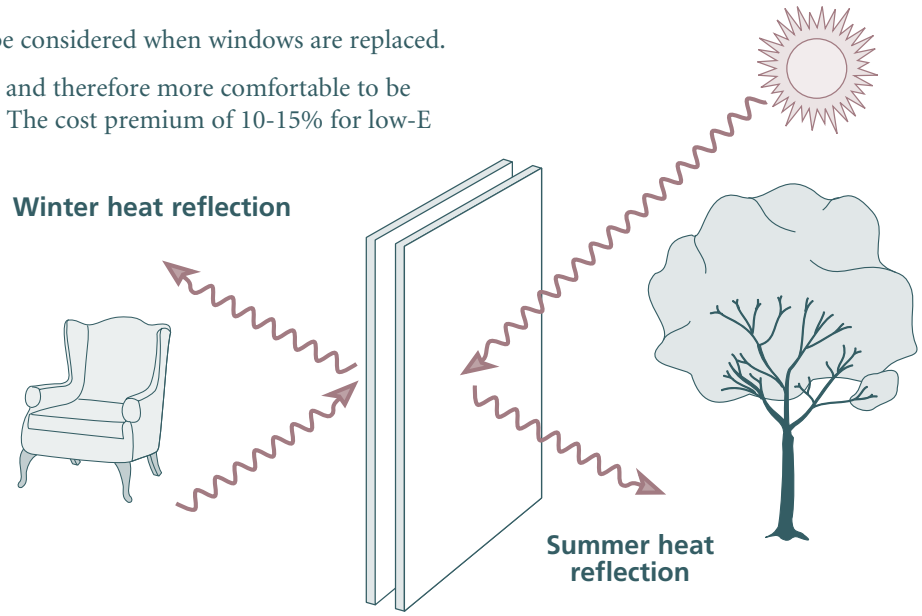
BENEFIT: Wood windows create greater comfort and better energy efficiency.

4. Replace Metal Windows with Low-E Vinyl Windows

DESCRIPTION: Low-E glass coating increases glass R-value to 3 compared to R-1 for single glazed windows.

CONDITIONS: Low-E windows should be considered when windows are replaced.

BENEFIT: Low–E windows are insulating and therefore more comfortable to be near in cold weather or hot summer days. The cost premium of 10-15% for low-E



G4: Low-E glass and Heat Mirror™ windows not only save money but increase comfort year-round. The coating reflects heat back into the house in winter and reflects heat out in summer.

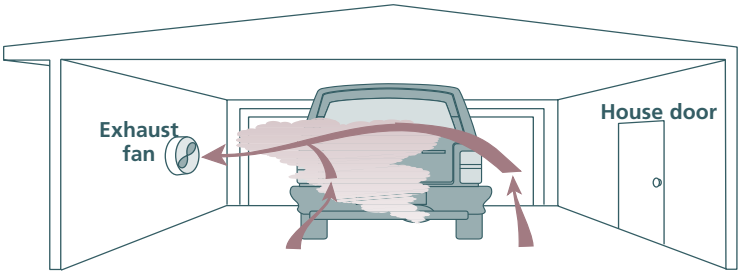
1. Whole House Fan

DESCRIPTION: Whole house fans are capable of quickly venting the air of an entire house. The fan should have two speeds: low speed for continuous ventilation and high speed. It should be of sufficient size to vent the entire house quickly.

CONDITIONS: The fan must be mounted in a hallway ceiling on the top floor of a house. An airtight seal is required to prevent air infiltration or exfiltration. Fans should be sized to produce between 4-5 air changes per hour within the home.

BENEFIT: Air movement can provide comfort at temperatures above normal comfort ranges. By moving large volumes of air, indoor comfort can be achieved at higher temperatures without air conditioning.

2. Separate Garage Exhaust Fan for Attached Garage



H 2: The USEPA has identified motor vehicle exhaust in attached garages as a significant source of indoor air pollution. Vehicle exhaust can migrate into the home each time the adjoining door is opened. Install an attic-type exhaust fan in the opposite wall from the house door, wired to the garage door opener on a timer.

DESCRIPTION: According to the US EPA, the single most significant source of indoor air quality health hazards in the house is from attached garages. Car exhaust contains many known carcinogens and can migrate into the living space when doors are opened to the garage.

CONDITIONS: The exhaust fan should be installed on the opposite wall from the door to the house. It can be wired to an electric garage door or put on a timer to run for 15 minutes after the door has been opened or closed.

BENEFIT: An exhaust fan creates a healthier indoor environment by reducing the potential of toxic car exhaust gasses from entering the house.

3. Eliminate Electric Heaters and Wall-Mounted Gas Heaters

DESCRIPTION: Wall-mounted electric and gas heating units are potential fire hazards. Gas units produce both unburned hydrocarbons and carbon monoxide, a deadly unnoticeable gas.

CONDITIONS: Replacement with a heat pump is potentially expensive. A less costly option is to use the hot water heater as the heat source using a fan coil to distribute heat in the home.

BENEFIT: Eliminating electric heaters and wall-mounted gas heaters results in greater safety and more energy efficiency.

4. Range Hood Vented to the Outside

DESCRIPTION: Stove top range hoods expel gases, smoke and other combustion by-products to the outside. Gases, smoke and other combustion by-products (such as unburned hydrocarbons) can result from cooking. More than smells, these particles are not healthy to breathe.

CONDITIONS: These are particularly important for gas stoves and can be installed where stoves are adjacent to exterior walls.

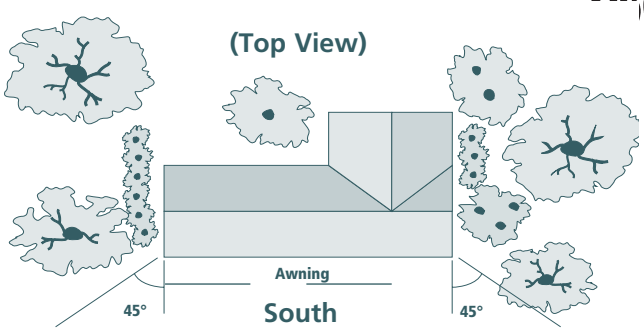
BENEFIT: Rangehoods vent directly outside to improve indoor air quality, over heating, and excess moisture build-up.

1. Natural Cooling

DESCRIPTION: Natural cooling systems incorporate these techniques:

- Shading from deciduous trees for east and west-facing glass.
- Reflective films on east and west-facing glass.
- Radiant heat-reflective barriers installed in the attic space.
- Window overhangs and awnings: The goal in optimally sizing window overhangs or awnings is to provide a balance between summer cooling and winter heating through solar gain.

CONDITIONS: Any combination of natural cooling techniques can be used to reduce overheating on homes. Awnings should be used primarily on south facing glass. Landscaping that shades east and west-facing windows is most effective.



I 1: Natural cooling can increase comfort for the majority of hot weather days without air conditioning. Reflective films on east and west glass reduce solar gain. Landscaping that shades east and west sides is better since it shades and cools through evapotranspiration.

BENEFIT: Natural cooling reduces the need for air conditioning, saving money on energy bills, and can make homes without air conditioning more comfortable.

2. Passive Solar Heating

DESCRIPTION: Passive solar systems provide heat to the structure through south facing windows.

CONDITIONS: The house must incorporate windows that face within 30 degrees of due south and the ability to store excess heat in massive elements such as a slab floor. South facing windows should be shaded with an overhang, deciduous trees or awnings to reduce solar exposure in the summer.

BENEFIT: Passive solar design can reduce heating requirements by 30-50%, saving energy and money.

3. Solar Hot Water Heating

DESCRIPTION: Active solar systems are designed to provide water heating and/or heat to the structure by collecting heat from the sun using solar collectors. The hot water is stored for use at a later time. Active solar water heating can also supplement existing hot water heating methods by pre-warming the water. (See illustration on page 16.)

CONDITIONS: A sufficient south-facing roof area for collectors and space in a hot water closet for the additional hot water storage tank is required.

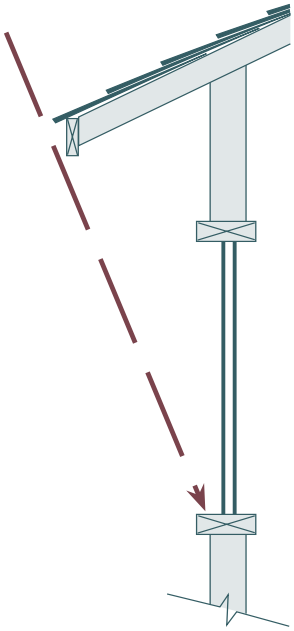
BENEFIT: Solar hot water systems can pay back in as little as seven years and reduce the cost of hot water dramatically thereafter.

4. Pre-Plumbing for Solar Water Heating

DESCRIPTION: Insulated copper pipes are installed from the attic to a hot water closet or mechanical room for future solar installation. This option allows the homeowner to install an active solar system at a later date if they desire.

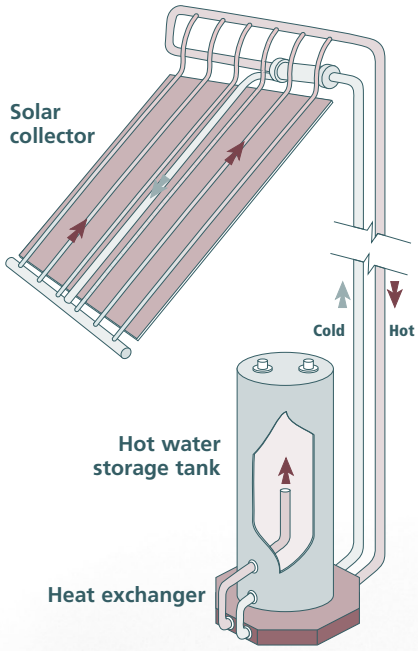
CONDITIONS: South-facing roof area for collectors and access for piping to mechanical room. This will be primarily applicable to units that are being extensively rehabilitated on the interior. The most cost-effective time to install this pre-plumbing is during construction, when the total cost should be less than $200 for materials and labor.

BENEFIT: Solar hot water pre-plumbing saves money compared to installing plumbing through finished living space.



I 2: South-facing windows should be shaded in summer. Overhangs can be designed to shade windows completely by using the sun-angle for June 21 to calculate depth of overhang.

I 3: (Page 15) Solar hot water and space heating systems are perfectly suited to Los Angeles' climate. The initial investment can be recouped in as little as seven years.



5. Photovoltaics (Solar Electric Panels)

DESCRIPTION: Photovoltaic panels, or PV panels, contain hundreds of small cells that collect the sun's energy and change it into electricity which can be used in the home. Excess electricity can be sent back into the utility grid for a credit on electric bills. The collected energy can also be stored in large batteries to meet the needs of nighttime energy requirements.

CONDITIONS: Photovoltaic panels should be mounted on the roof or on the ground at an appropriate angle (usually 40—60 degrees). The components for a residential, utility-tied system typically includes panels, a power relay center, an inverter, and storage batteries. Typical installation would be outside lighting, security lighting, or walkway illumination with self contained systems (battery included).

BENEFITS: PV panels can be used as a means to decrease reliance on conventional power plants that contribute to air pollution. PV can be cost effective in areas that require night lighting such as outdoor lights. The use of PV introduces solar energy in a way that many people have never seen.

6. Green Power

DESCRIPTION: Green Power is a program offered by LADWP to generate electricity from new, renewable, non-polluting energy sources like wind and solar.

CONDITIONS: Customers can choose to purchase green power instead of conventionally generated electricity. LADWP will provide energy efficiency services to customers who choose green power to offset its higher cost so that the net energy bill may not change. For information call 1-800-U ASK DWP.

BENEFIT: Green Power is environmentally beneficial and can help reduce the

I 5: Photovoltaic (solar-generated electric) solar systems reduce air pollution, increase energy independence and take advantage of an abundant and renewable resource. They can be cost effective today for exterior lighting applications as well.

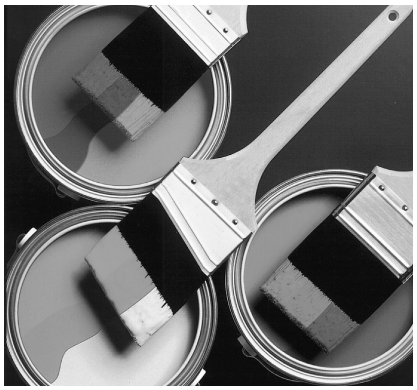
J • FINISHES / INDOOR AIR QUALITY

1. Elimination of All Particleboard

DESCRIPTION: Particleboard is made from wood fibers and an adhesive that contains formaldehyde, a suspected human carcinogen. The formaldehyde is continuously released, or off-gasses, for years after installation. Formaldehyde off-gassing contributes to poor indoor air quality. Particleboard is typically used for cabinets, counter tops, stair treads, and shelving.

CONDITIONS: Whenever possible, eliminate new particleboard inside houses by using solid wood for stair treads, certified plywood for shelving, and formaldehyde-free medium density fiberboard (MDF) for cabinets and countertops.

BENEFIT: Reduction of formaldehyde in homes is important to the health of residents, particularly young children who are most susceptible to its impacts.



J 3: Low/no-VOC paints are now manufactured by most major paint manufacturers - with similar coverage and durability characteristics as conventional paints.

2. Seal All Exposed Particleboard

DESCRIPTION: Sealing exposed edges of cabinets, the underside of counter tops, stairs, shelving or other applications of particleboard with a non-toxic paint is the next best solution to elimination of particleboard to reduce the release of harmful gasses.

CONDITIONS: Whenever kitchens are upgraded or cabinets and counter tops are installed, seal all edges and undersides before installation.

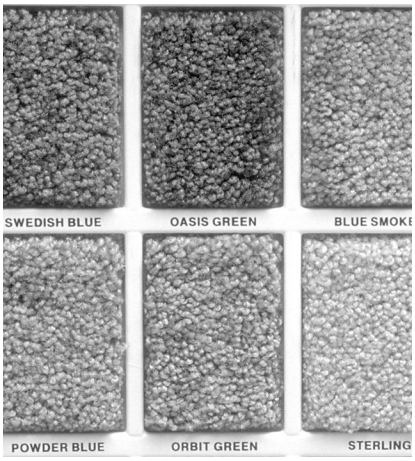
BENEFIT: Reduction of formaldehyde in homes is important to the health of residents, particularly young children who are most susceptible to its impacts.

3. Low/No-VOC and Formaldehyde-Free Interior Paint

DESCRIPTION: Most paint sold over the past thirty years releases volatile organic compounds (VOC) into the home. VOCs are a major indoor air pollutant when a house is tightly sealed. Once outside, VOCs react with other pollutants, producing ground-level ozone that also affects human health. Low/no-VOC products are manufactured without mercury or mercury compounds, or pigments of lead, cadmium, chromium, or their oxides.

CONDITIONS: Paint with low/no-VOCs is available at minimal increased cost from most major manufacturers. They are applied like traditional paint for most applications. High washability should be specified for bathrooms, kitchens and children's bedrooms.

BENEFIT: Low/no-VOC paint reduces the emissions of VOC's into the home, improving indoor air quality and reducing the formation of urban smog.



J 7: Carpet can be made from recycled "pop" bottles or recycled carpet at a competitive price to new nylon carpet.

4. Low-VOC Wood Finishes

DESCRIPTION: Conventional solvent-based wood finishes can off-gas for months, and can be harmful to children. Low-VOC finishes such as waterborne urethane and acrylic finishes are lower in toxic compounds in comparison to conventional solvent-based finishes while providing similar durability.

CONDITIONS: Conventional solvent-based wood finishes should not be used while houses are occupied. They should be left to off-gas for three to four weeks. Low-VOC wood finishes can be used with few harmful health impacts.

BENEFIT: Using low-VOC wood finishes reduces off-gassing into the home, improving indoor air quality.

J • FINISHES / INDOOR AIR QUALITY

5. Solvent-Free Adhesives Used Inside

DESCRIPTION: Adhesives are used throughout the home to bond materials together. For example, wood sub-floor is glued and screwed to floor joists. Solvent-based adhesives can off-gas toxic compounds for months. Solvent-free adhesives are free of toxic gasses such as aromatic hydrocarbons or solvents that contribute to air pollution.

CONDITIONS: These products should be used exclusively for all interior applications.

BENEFIT: These products may be stronger than conventional adhesives, allowing application to be smaller. Fewer pollutants are emitted into the air, reducing the potential harmful impacts on the health of the occupants and installers.

6. Carbon Monoxide Detector Installed

DESCRIPTION: Car exhaust, gas appliances and fire can produce carbon monoxide inside the home that can be dangerous to human health. A carbon monoxide detector is an advanced early warning system for inhabitants against carbon monoxide or unburned waste products.

CONDITIONS: Carbon monoxide detectors should be installed whenever smoke detectors are installed.

BENEFIT: Carbon monoxide detector can warn inhabitants against carbon monoxide and save lives.

J • FINISHES / INDOOR AIR QUALITY

7. Recycled-Content Carpet

DESCRIPTION: Carpeting made from recycled plastic bottles, recycled wool and recycled cotton is currently available. The carpet does not differ in appearance or performance from that made from virgin material. Costs of the recycled carpet and pad are competitive with similar weight products.

CONDITIONS: There are no limitations on installation when carpet is being replaced.

BENEFIT: Recycled plastic bottle carpet is more stain resistant than similarly priced, conventional nylon carpet. It saves resources and diverts waste from landfills.

8. Replace Vinyl Flooring with Linoleum

DESCRIPTION: Natural linoleum was the predecessor of vinyl flooring. It is made from natural materials: flax, chalk and linseed oil.

CONDITIONS: Can be used anywhere sheet vinyl is used.

BENEFIT: Linoleum is produced from natural materials. It is very durable and stain resistant. Linoleum can last 20-30 years as opposed to vinyl that lasts for five to seven years.

9. Finger-Jointed Trim

DESCRIPTION: Finger-jointed trim is resource efficient by using short pieces of clear wood glued together to create painted finished trim for doors and windows.

CONDITIONS: Finger-jointed trim can be used in any application where trim is to be painted.

BENEFIT: Finger-jointed trim is straighter and more stable than conventional clear wood. Clear wood trim gets more expensive as we deplete our ancient forests. Finger-jointing uses material more effectively saving both money and resources.

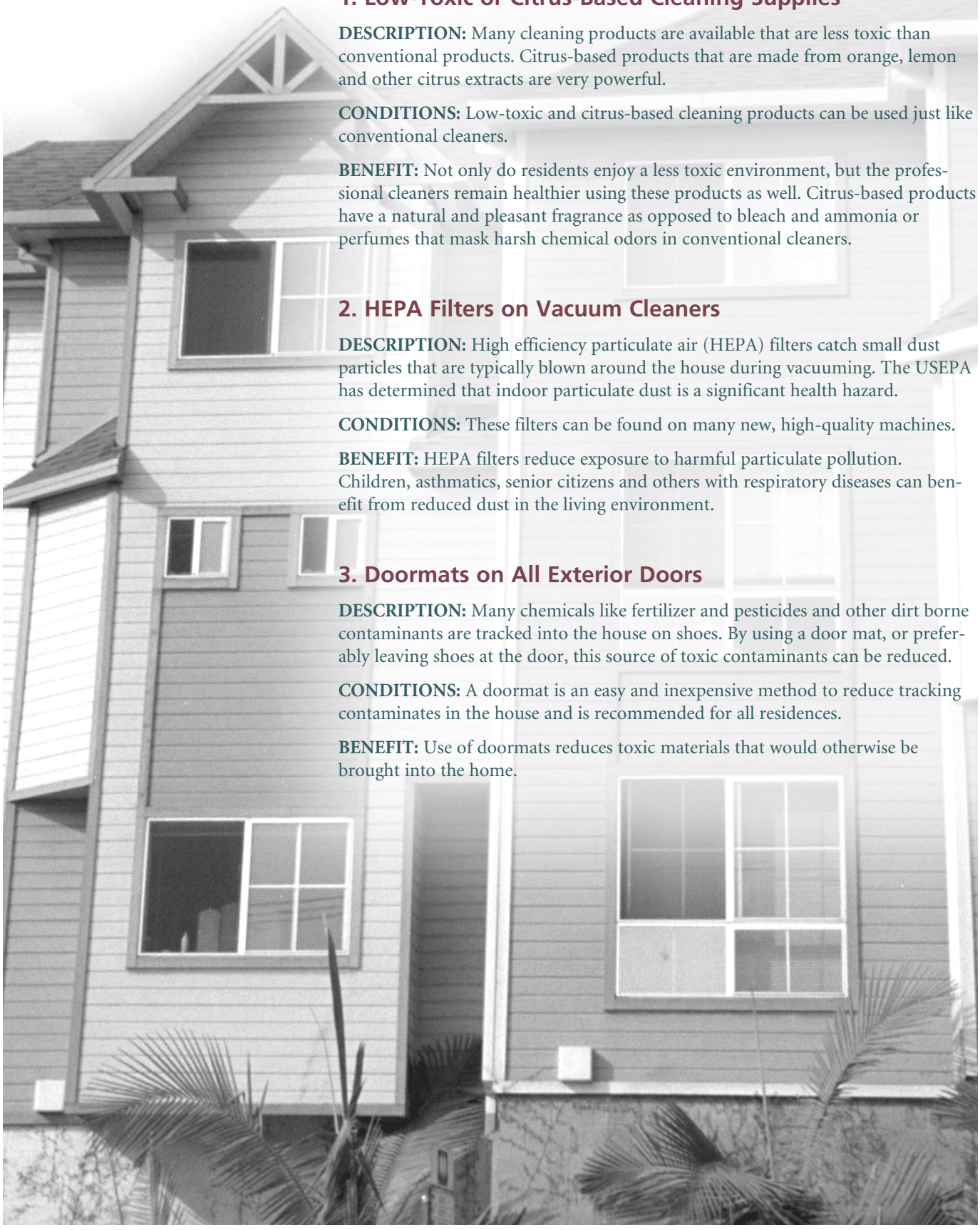
10. Recycled-Content Ceramic Tile

DESCRIPTION: Recycled-content ceramic tile contains recycled glass and other recycled materials.

CONDITIONS: These tiles were originally developed for high traffic commercial conditions and will wear well in residential applications.

BENEFIT: Recycled-content ceramic tile offers greater durability than conventional ceramic tile and is also a good application for recycled glass.

K • OPERATIONS & MAINTENANCE



1. Low-Toxic or Citrus-Based Cleaning Supplies

DESCRIPTION: Many cleaning products are available that are less toxic than conventional products. Citrus-based products that are made from orange, lemon and other citrus extracts are very powerful.

CONDITIONS: Low-toxic and citrus-based cleaning products can be used just like conventional cleaners.

BENEFIT: Not only do residents enjoy a less toxic environment, but the professional cleaners remain healthier using these products as well. Citrus-based products have a natural and pleasant fragrance as opposed to bleach and ammonia or perfumes that mask harsh chemical odors in conventional cleaners.

2. HEPA Filters on Vacuum Cleaners

DESCRIPTION: High efficiency particulate air (HEPA) filters catch small dust particles that are typically blown around the house during vacuuming. The USEPA has determined that indoor particulate dust is a significant health hazard.

CONDITIONS: These filters can be found on many new, high-quality machines.

BENEFIT: HEPA filters reduce exposure to harmful particulate pollution. Children, asthmatics, senior citizens and others with respiratory diseases can benefit from reduced dust in the living environment.

3. Doormats on All Exterior Doors

DESCRIPTION: Many chemicals like fertilizer and pesticides and other dirt borne contaminants are tracked into the house on shoes. By using a door mat, or preferably leaving shoes at the door, this source of toxic contaminants can be reduced.

CONDITIONS: A doormat is an easy and inexpensive method to reduce tracking contaminates in the house and is recommended for all residences.

BENEFIT: Use of doormats reduces toxic materials that would otherwise be brought into the home.

4. Cleaning Supplies and Paints Stored in an Enclosed Ventilated Area

DESCRIPTION: Many cleaning products and most fertilizers and pesticides are harmful to people. Provide an outside area or well ventilated inside area for cleaning supplies, paints, and other potentially toxic materials.

CONDITIONS: Storage areas should be designed into housing projects whenever possible.

BENEFIT: By storing these products outside, they do not contaminate indoor air. It also reduces the possibility of children getting into them.

5. Non or Low-Toxic Pesticides and Fertilizers

DESCRIPTION: These alternative products contain biological and/or inert chemical compounds that are not as toxic to people as many conventional products.

CONDITIONS: These products can be used for the same problems that conventional products treat.

BENEFIT: Non or low-toxic pesticides and fertilizers decrease the health hazard of conventional products, particularly in children, who spend more time in yards playing, and are more susceptible to toxic materials.

6. Provide Recycle Storage Bins in Each Living Unit and for Each Building

DESCRIPTION: Two or more recycling bins should be provided for each unit to make recycling convenient and efficient.

CONDITIONS: A safe, dry, and convenient storage area for bins is necessary.

BENEFIT: Handy recycling bins encourage residents to recycle. If the bins are provided, people are more likely to participate. Recycling reuses materials and diverts waste from crowded landfills.

K 6: Recycling bins are a convenient and inexpensive way to encourage recycling of cans, bottles and paper by occupants.

7. Gas Shut-Off Valve for Earthquake Safety

DESCRIPTION: Install shut-off valves on main supply pipe at gas meter.

CONDITIONS: Shut-off valves are easily installed at the meter.

BENEFIT: Reduces the potential fire danger during earthquakes.

8. Bolt Home to Foundation for Earthquake Safety

DESCRIPTION: Use 5/8" bolts drilled through the bottom plate to a depth of at least 4 inches into the concrete and affixed in place with an epoxy adhesive.

CONDITIONS: For homes that have not been bolted to the foundation, retrofit foundation bolting is recommended to prevent or reduce the likelihood of homes slipping off of the foundation during an earthquake.

BENEFITS: Homes that have been bolted to the foundation are less likely to suffer significant or irreparable damage from slipping off the foundation as the result of an earthquake.

RESOURCES

Below is a list of information on green building and sustainable communities. The resources identified below are just a sampling of the wealth of information available today to design, construct and maintain green affordable housing. For a comprehensive list of resources, please see Environmental Building News (EBN) 1997 Supplement to Volume 6, which is a detailed listing of over 150 of the best books and periodicals on green building and related topics and a listing of Internet resources. (Many of the resources listed below are excerpted from EBN's 1997 Supplement to Volume 6.)

Environmental Building News
Editor: Alex Wilson
Environmental Building News
28 Birge Street, Brattleboro, VT 05301
Tel: (802) 861-0954
Fax: (802) 257-7304
E-mail: info@ebuild.com
Web Site: http://www.ebuild.com
A monthly newsletter featuring news, reviews, and feature articles on all aspects of environmentally sustainable design and construction.

EBN Product Catalog
Environmental Building News
28 Birge Street, Brattleboro, VT 05301
Tel: (802) 861-0954
Fax: (802) 257-7304
E-mail: catalog@ebuild.com
Web Site: http://www.ebuild.com
A comprehensive catalog of environmental product literature and references for 1200 building products.

Eco Home Network
4344 Russell Avenue, Los Angeles, CA 90027
Tel: (323) 662-5207
Fax: (323) 662-4744
E-mail: ecohome@pacbell.net
Web Site: http://www.ecohome.org
Eco-Home is a good local example of sustainable living that offers tours, a newsletter, a bookstore, and web-based information.

Blueprint for Greening Affordable Housing; Developer Guidelines for Resource Efficiency and Sustainable Communitites
published by Global Green USA
227 Broadway, Suite 302
Santa Monica, CA 90401
Tel: (310) 394-7700
Fax: (310) 394-7750
E-mail: ggusa@globalgreen.org
Web Site: www.globalgreen.org
These guidelines for affordable housing developers demonstrate green building principles by addressing a wide range of issues including: funding and financing opportunities, designing for security and safety, incorporating energy efficiency and renewable energy, ensuring healthy indoor air, and choosing construction materials. The Guidelines highlight the green themes, techniques, and benefits of thirteen greening affordable housing case studies from across the United States.

Green Development: Integrating Ecology and Real Estate
by Rocky Mountain Institute, Alex Wilson; published by John Wiley & Sons.
Rocky Mountain Institute
1739 Snowmass Creek Road
Snowmass, CO 81654-9199
Tel: (970) 927-3851 • Fax: (970) 927-3420
E-mail: general@rmi.org
Web Site: http://www.rmi.org
Covers all aspects of ecologically sensitive development, with real-world examples based on 80 case studies.

Healthy By Design: Building & Remodeling Solutions for Creating Healthy Homes
by David Rousseau, James Wasley; published by Hartely & Mark.
P.O. Box 147, Point Roberts, WA 98291
Tel: (800) 277-5887
Fax: (604) 738-1913
E-mail: hartmark@direct.ca
Features a discussion of indoor pollutants and their sources, case studies of healthy and energy efficient homes, and construction details conducive to healthier homes.

Los Angeles Eco Village
3551 White House Place
Los Angeles, CA 90004
Tel: (323) 738-1254 • Fax: (323) 386-5873
E-mail: crsp@igc.apc.org
Web Site: http://www.ic.org/laev
Demonstration site of an integrated environmental, economic, and social urban community for long-term health and sustainability. Offers tours, publications and other information.

Resource Guide to Recycled Content Construction Products
Solid Resources Citywide Recycling Division
City of Los Angeles, Department of Public Works
433 Spring Street, 5th Floor, MS 944
Los Angeles, CA 90013
Tel: (213) 847-1444
Fax: (213) 847-3054
E-mail: SRCRD@san.ci.la.ca.us
http:www.cityofla.org/san/sansrcrd.htm
A recycling tool kit for architects, construction specifiers and contractors, governmental agencies and others interested in recycling and buying recycled-content products.

Reducing Home Building Costs with OVE Design and Construction
NAHB Research Center, Inc.
400 Prince George's Blvd.,
Upper Marlboro, MD, 20772-8731
Tel: (301) 249-4000
Fax: (301) 547-2604
E-mail: lbowles@nahbrc.org
Web Site: http://www.nahbrc.org
A book on how to design and build housing using optimum value engineering, which reduces material quantities used while increasing ease of construction.

ReSourceful Specifications: Guideline Specifications for Environmentally Considered Building Materials & Construction Methods
Larry Strain, AIA, Siegel & Strain Architects; 1996.
Siegel & Strain Architects
1295 59th Street
Emeryville, CA 94608
Tel: (510) 547-8092
Fax: (510) 547-2604
E-mail: info@siegelstrain.com
Performance specification guidelines on environmental and healthy building materials. It is organized by Construction Specification Institute's (CSI) Divisions 1-16.

Sustainable Building Technical Manual
produced by the U.S. Green Building Council, Public Technology Inc. (PTI), and the U.S. Department of Energy, 1996.
U.S Green Building Council
110 Sutter Street, Suite 906
San Francisco, CA 94104
Tel: (415) 445-9500
Fax: (415) 445-9911
E-mail: info@usgbc.org
Web Site: http://www.usgbc.org
This practice-oriented manual will provide discussion on green buildings including: significance and environmental impacts of buildings, economics, programming and predesign, site and building design, construction process, building management and operations & maintenance, and future trends.

RESOURCES

WasteSpec: Model Specifications for Construction Waste Reduction, Reuse, and Recycling
by Triangle J Council of Governments.
P.O. Box 12276
Research Triangle Park, NC 27709
Tel: (919) 558-9343 • Fax: (919) 549-9390
E-mail: jkincaid@tjcog.org
Web Site: http://www.state.nc.us/TJCOG/cdwaste.htm
Provides model language to insert in specifications on waste reduction techniques during construction, reuse of construction materials on site, and salvage and recycling of construction and demolition waste material.

What's Working
57 Acorn Lane, Boulder, CO 80304
Tel: (303) 444-7044 • Fax: (303) 444-7013
E-mail: david@whatsworking.com
Web Site: www.greenbuilding.com
What's Working is an international design and consulting resource for builders, developers and architects in affordable green building. It develops certification programs, design consulting and green product specifications to create affordable, energy efficient and environmentally responsible housing, and is the co-publisher of the *Environmental Building News Product Catalog.*

PUBLICATIONS ON ENERGY EFFICIENCY

The following publications are useful tools for developers who are interested in energy efficiency. They are available from the **American Council for an Energy-Efficient Economy (ACEEE)**
1001 Connecticut Avenue, NW, Suite 801
Washington, DC 20036
Tel: (202) 429-0063 • Fax: (202) 429-0193
E-mail: ace3pubs@ix.netcom.com
Web Site: http://aceee.org

Consumer Guide to Home Energy Savings
by Alex Wilson and John Morrill
Updated periodically with model numbers of the most efficient appliances (heating, kitchen, laundry, air conditioning). Information on selecting energy-efficient equipment and improving the performance and efficiency of older equipment.

Exemplary Home Builder's Field Guide, 1994
by Joseph Lstiburek, Building Science Corp.
The definitive handbook for building safe, healthy, comfortable, durable, and energy-efficient houses. Organized for easy access and illustrated with 140 detailed construction drawings, it provides guidance and instruction on every phase of homebuilding from site planning to materials selection.

Improving Energy Efficiency in Apartment Buildings
by John DeCicco, Rick Diamond, Sandra Nolden, Janice DeBarros, and Tom Wilson, forward by Stephen Morgan
This book reviews building characteristics, energy use, and barriers to conservation in existing five-or-more unit multi-family housing, and presents an up-to-date overview of approaches for audit and retrofit, energy-saving technology, conservation programs, evaluation, and financing strategies.

Energy Conservation in Multifamily Housing: Review and Recommendations for Retrofit Programs
by John DeCicco, Loretta Smith, Rick Diamond, Steve Morgan, Janice DeBarros, Sandra Nolan, Theo Lubke and Tom Wilson
Reviews current energy conservation issues in multifamily buildings and covers sector characteristics, barriers to conservation, progress in technology, retrofit programs, financing, and evaluation. Drawing on this review and contacts with practitioners, the paper concludes with a set of recommendations for programs, policies, and research needed to advance energy conservation in this challenging sector.

INTERNET RESOURCES

The U.S. Department of Energy for Sustainability
Web Site: http://www.sustainable.doe.gov/
A networking hub for government and private-sector sustainability initiatives. The entire Sustainable Building Technical Manual is available here as a free download.

G.E.O Green Design Network
Web Site: http://www.greendesign.net
A large collection of sustainability and buildings Internet links, a book list with direct-ordering arrangement through the online bookstore Amazon-com, listings of green designers and other green building professionals, and many other resources. Includes a Southern California Greening Resource Directory.

CREST
Web Site: http://www.crest.org
CREST is a great starting point for any search on energy and sustainability related topics. Among the resources housed are content of the Greening of White House CD-ROM and archives from the green building and strawbale mailing lists.

WHO WE ARE

The City of Los Angeles Environmental Affairs Department

The Environmental Affairs Department (EAD) works to make Los Angeles the world leader in the protection and enhancement of the urban environment. EAD makes positive and measurable improvement in the quality of life in Los Angeles through an integrated and sustainable approach that recognizes the linkage between a clean and healthful environment, a strong economy, and equity for all people.

EAD is the chief advisor to the City on environmental matters. It proactively brings together people and resources to educate and develop ways to improve the Los Angeles environment. EAD strives to enable all individuals and organizations to have full and equal participation in environmental decision-making.

As a founding member of the City's Sustainable Design Task Force, the Environmental Affairs Department has been charged with developing the Los Angeles Sustainable Building Program to encourage sustainable building practices in the private sector. This Guidebook is the first step in that process, focusing first on the rehabilitation of residential buildings. With the assistance of grant funds from the U.S. Department of Energy, this program has been specifically developed for the affordable housing stock in Los Angeles. Subsequent efforts will target new residential design and construction and, ultimately, commercial rehabilitation and new commercial development.

Global Green USA

Acting as a catalyst, facilitator, and mediator, Global Green USA (GG USA), the American affiliate of Green Cross International, works in cooperation with individuals, industry, and government to create a global value shift toward a sustainable future. Through the Resource Efficiency and Sustainable Communities for the Urban Environment (RESCUE) Program, GG USA is working to stem climate change and fight suburban sprawl by forwarding renewable energy and creating healthier homes and neighborhoods.

Working in partnership with affordable housing developers through our Greening Affordable Housing Initiative (GAHI), GG USA is helping lower energy bills of families in need while protecting the environment. GG USA is also spearheading a Southern California Green Power Campaign to get business and residences to choose green power and is also working with one of the largest developers in Los Angeles to create a model process for increasing energy efficiency. GG USA's efforts include outreach to local and national legislatures to increase awareness about the importance of sustainable development and how to make it an integral part of public policy.

U.S. Department of Energy

The Environmental Affairs Department and Global Green USA express our gratitude to the Center of Excellence for Sustainable Development at the Denver Regional Support Office of the United States Department of Energy, for their support of this project. The U.S. DOE Office of Energy Efficiency and Renewable Energy's mission is to lead the Nation to a stronger economy, a cleaner environment and a more secure future through development and deployment of sustainable energy technologies. We would also like to express our gratitude to the Department of Energy's Rebuild America program and the assistance of the USDOE Seattle Regional Support Office.