



There's Always **Room for** Improvement

RecycleWorks San Mateo County, A Taste & A Talk Series, 28 May 2009



There's Always Room for Improvement

Know your energy habits



There's Always Room for Improvement

Know your energy habits

Know the facts about your house

There's Always Room for Improvement

Know your energy habits

Know the facts about your house

Go on green home tours & ask around

There's Always Room for Improvement

Know your energy habits

Know the facts about your house

Go on green home tours & ask around

Work with retrained professionals

There's Always Room for Improvement

Know your energy habits

Know the facts about your house

Go on green home tours & ask around

Work with retrained professionals

Have a master plan for transition

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Niles , California



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Niles , California

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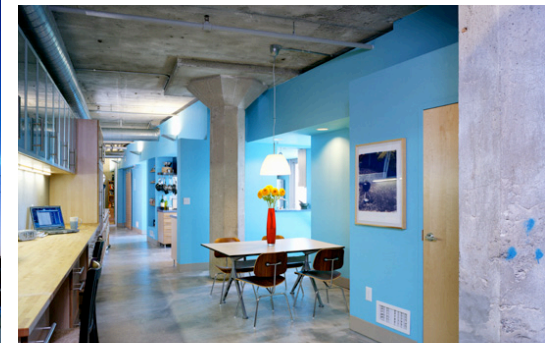


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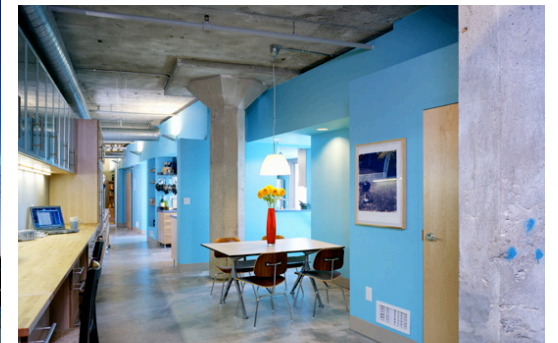
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= National Organization

for Commercial Buildings &
Large Scale Production Home Developers



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= LEED rating system

Leadership in Energy & Environmental Design



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Green? Prove it!



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Green? Prove it!

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= California Organization

for residential construction,
new & existing, small & large

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= Green Point Rated system

for residential construction,
new & existing, small & large

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Livable
Communities

=

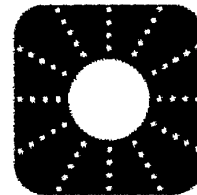
Green Point Rated system

for residential construction,
new & existing, small & large

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Livable
Communities



Energy
Conservation

=

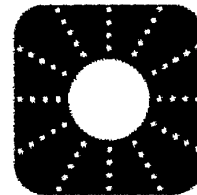
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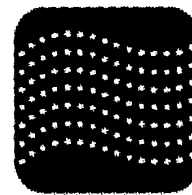
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Livable
Communities



Energy
Conservation



Indoor Air
Quality

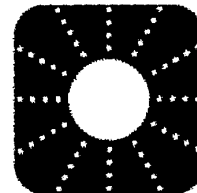
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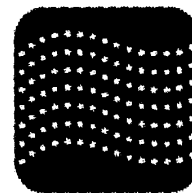
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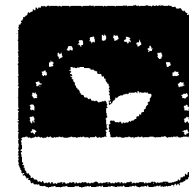
Livable
Communities



Energy
Conservation



Indoor Air
Quality



Resource
Conservation

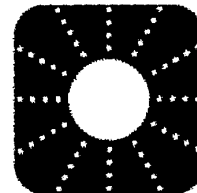
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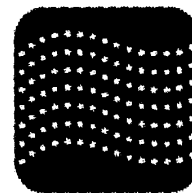
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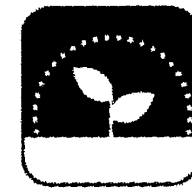
Livable
Communities



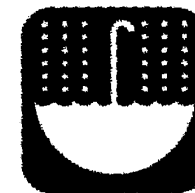
Energy
Conservation



Indoor Air
Quality



Resource
Conservation



Water
Conservation

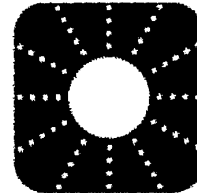
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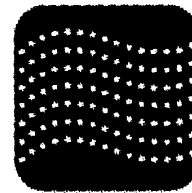
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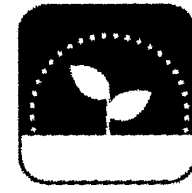
Livable
Communities



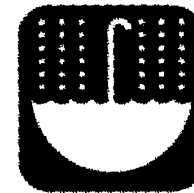
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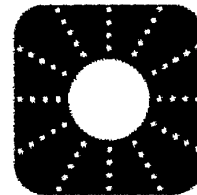
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new & existing, small & large

Green? Prove it!

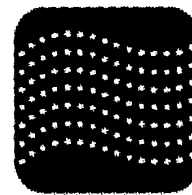
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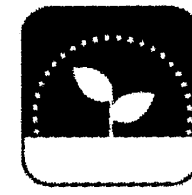
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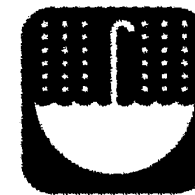
Energy
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Indoor Air
Quality



Resource
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Water
Conservation

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for residential construction,
new & existing, small & large



Green? Prove it!

All House Types Have Room For Improvement



All House Types Have Room For Improvement



Welschmeyer Residence

1989 - 2008



Welschmeyer Residence

1989 - 2008



Welschmeyer Residence

1989 - 2008



Then
Now

Welschmeyer Residence

1989 - 2008



Welschmeyer Residence

1989 - 2008

- As purchased in 1989, a drafty old fixer-upper.



Welschmeyer Residence

1989 - 2008

- As purchased in 1989, a drafty old fixer-upper.
- Build it Green Home Tour, Spring 2008



Welschmeyer Residence

1989 - 2008

- As purchased in 1989, a drafty old fixer-upper.
- Build it Green Home Tour, Spring 2008
- Build it Green Pilot Program for Existing Homes



Welschmeyer Residence

1989 - 2008

- As purchased in 1989, a drafty old fixer-upper.
- Build it Green Home Tour, Spring 2008
- Build it Green Pilot Program for Existing Homes
- Green Point Rated



Welschmeyer Residence

1989 - 2008



Welschmeyer Residence

1989 - 2008

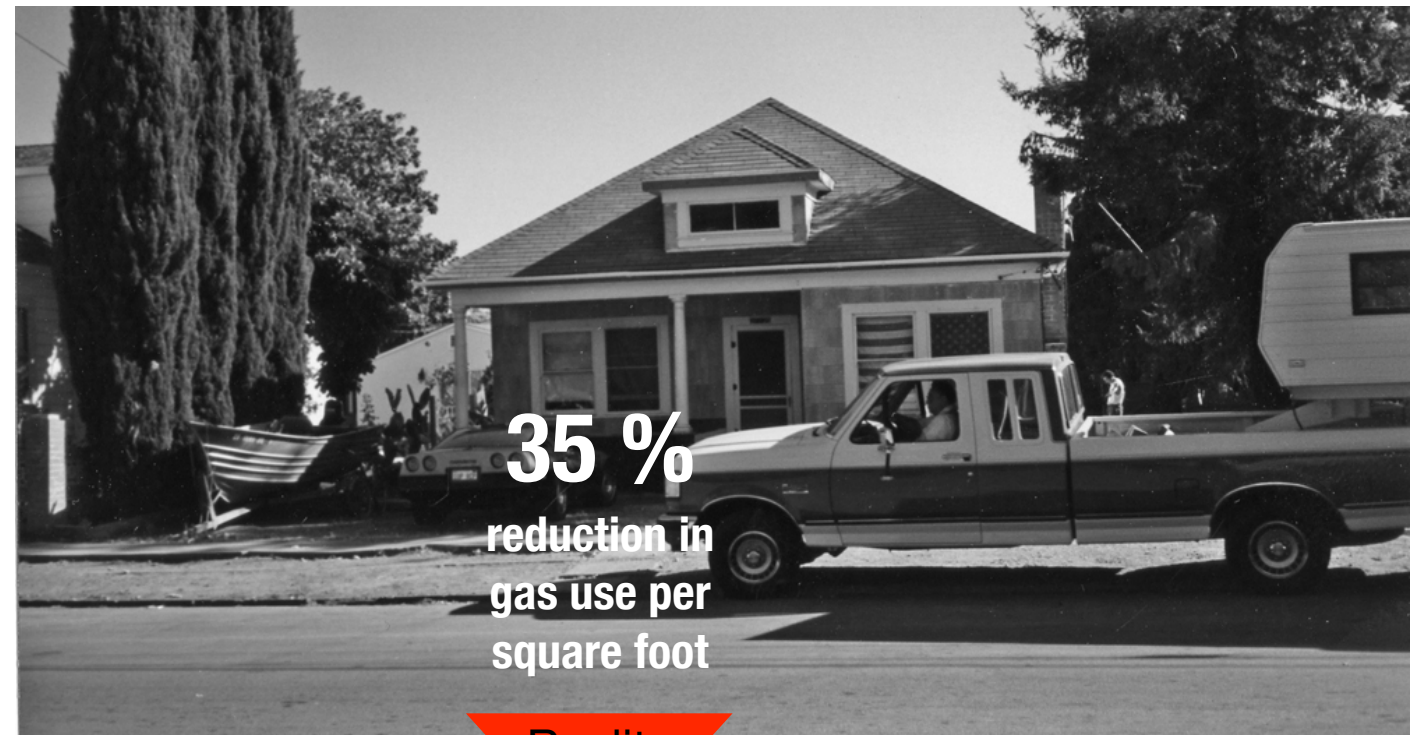
We doubled the
size of the house
and our PG&E
bill never
changed!



Welschmeyer Residence

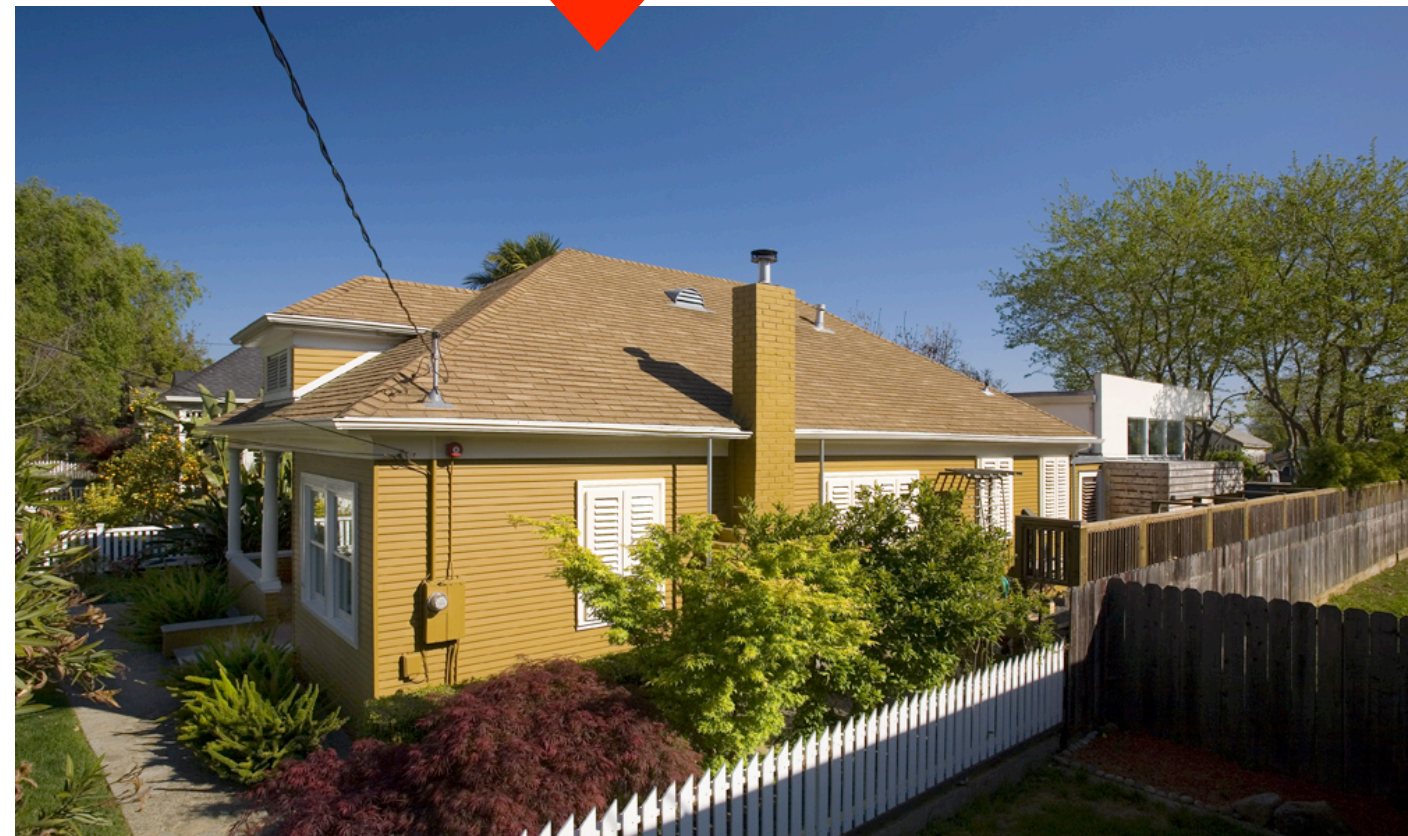
1989 - 2008

We doubled the size of the house and our PG&E bill never changed!



35 %
reduction in
gas use per
square foot

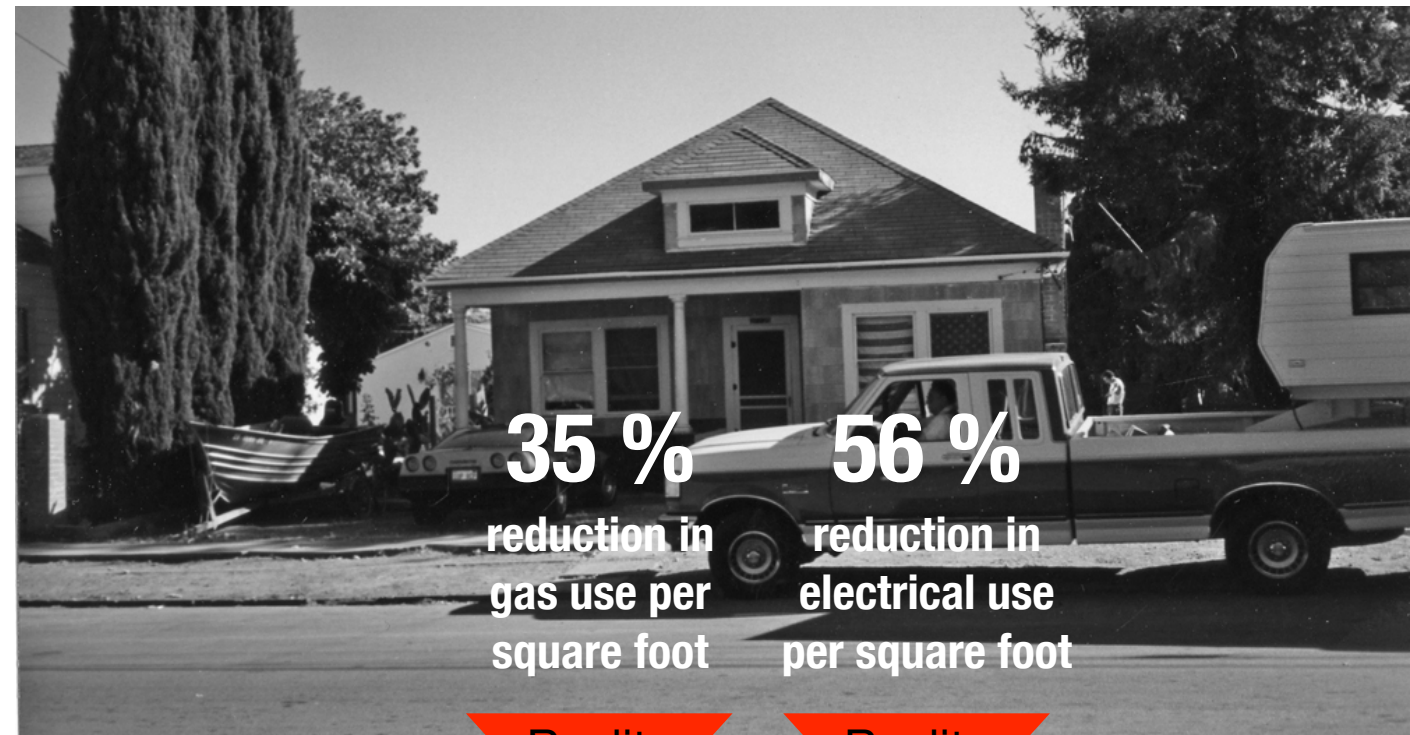
Reality



Welschmeyer Residence

1989 - 2008

We doubled the size of the house and our PG&E bill never changed!



Reality

Reality



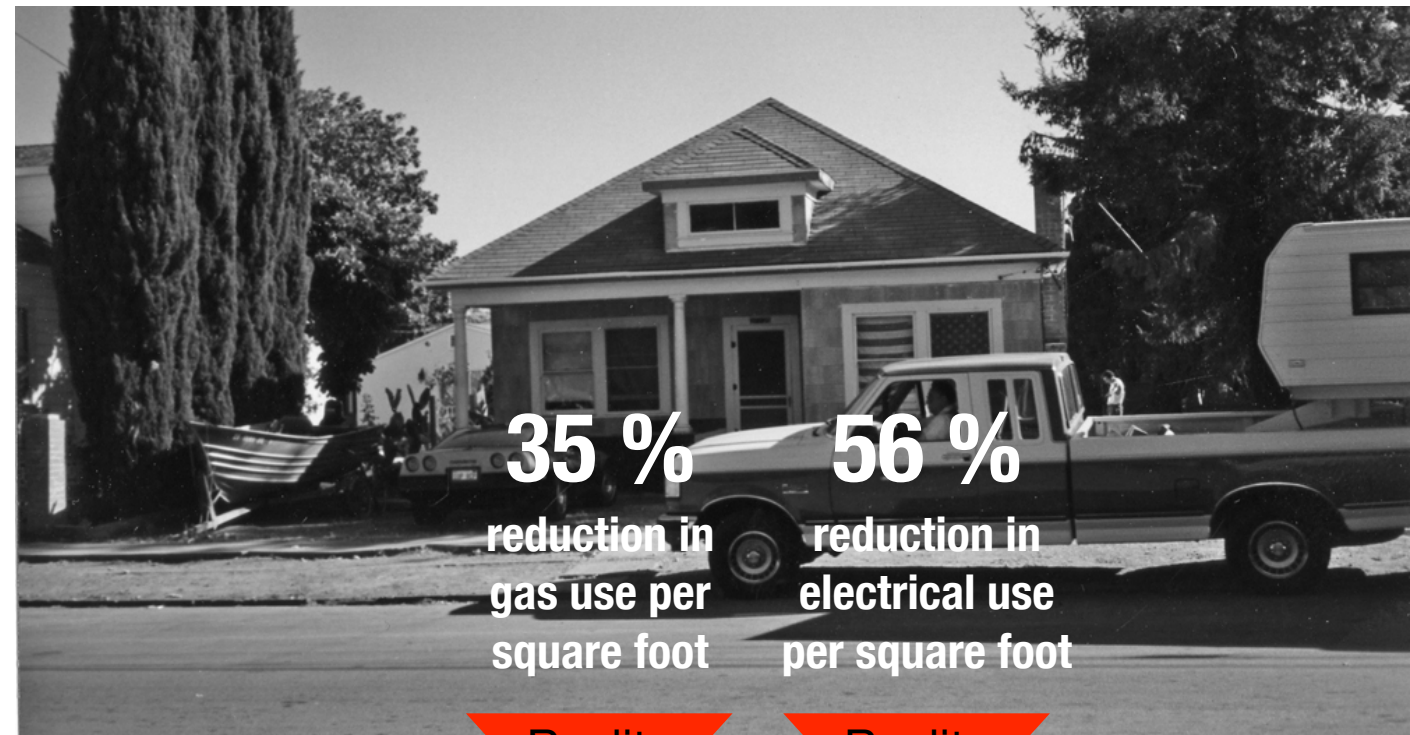
Welschmeyer Residence

1989 - 2008

We doubled the size of the house and our PG&E bill never changed!

26 %
better than California Energy
Conservation Requirements

Paper



35 %

reduction in
gas use per
square foot

56 %

reduction in
electrical use
per square foot

Reality

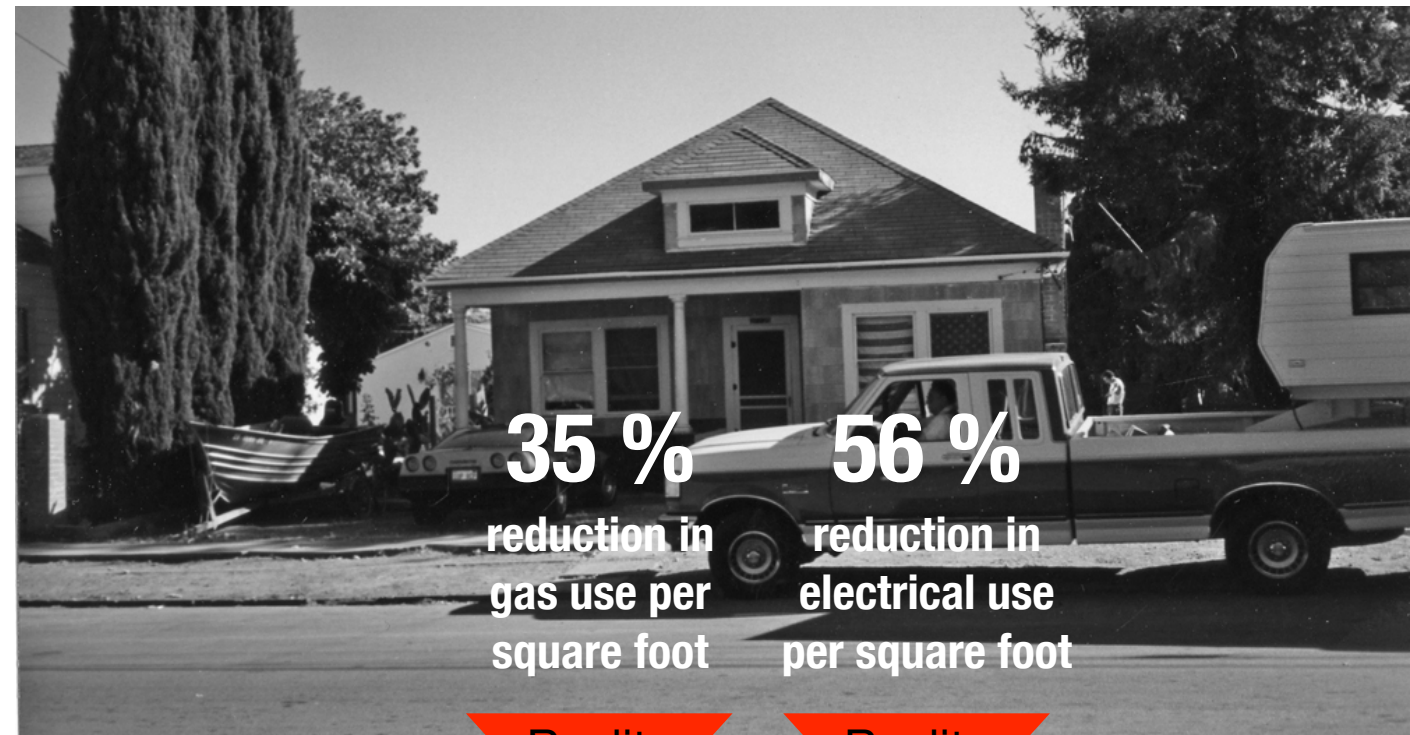
Reality



Welschmeyer Residence

1989 - 2008

We doubled the size of the house and our PG&E bill never changed!



Reality

Reality

26 %
better than California Energy
Conservation Requirements

Paper

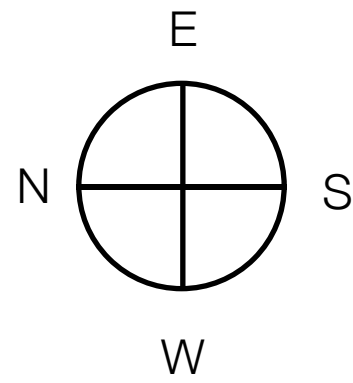
34 %
better than California Energy
Conservation Requirements,
**FUTURE removal of forced air unit &
replacement with solar hydronic
fan coil unit**

Paper



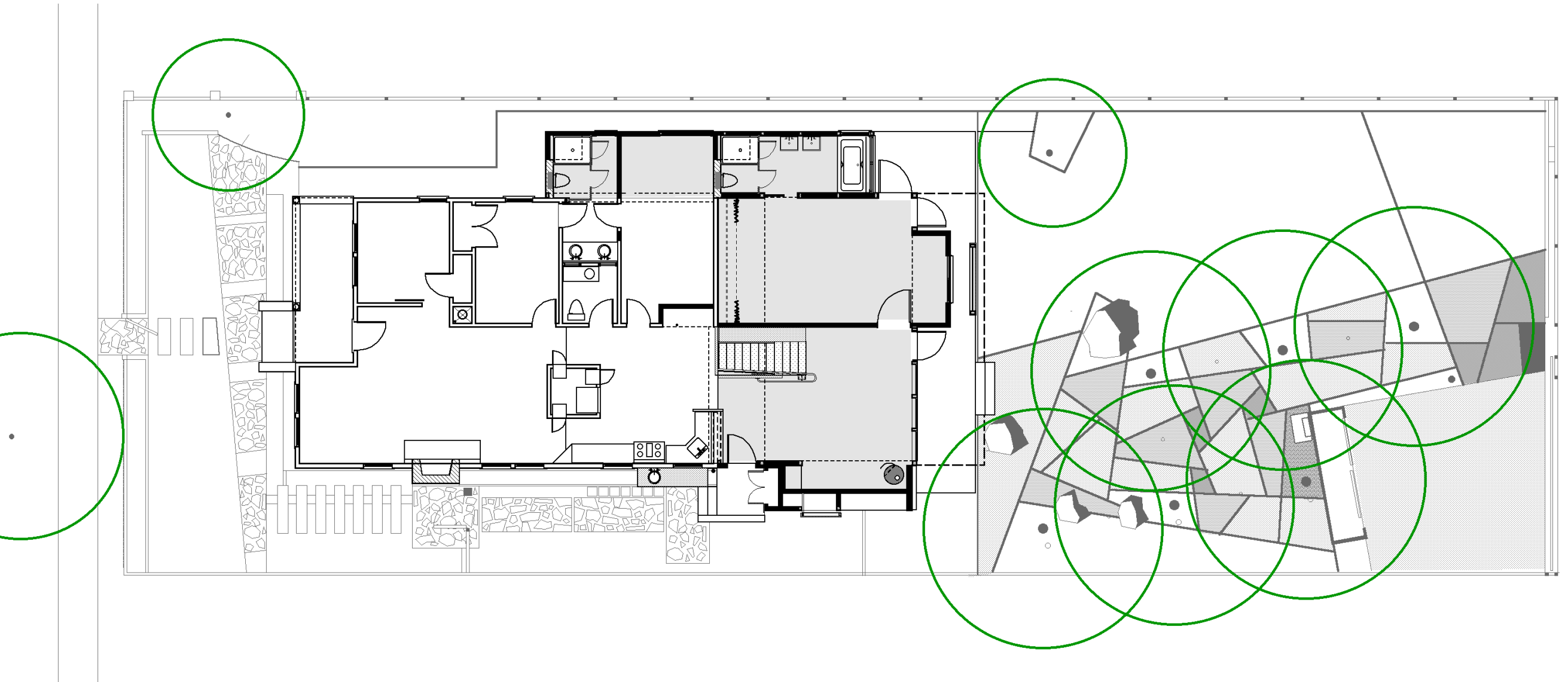
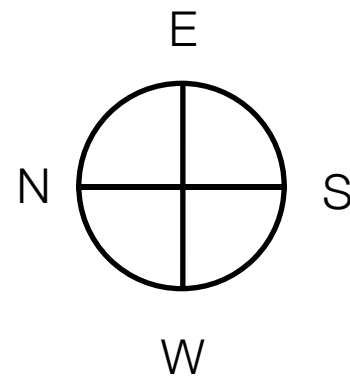
Design

1990



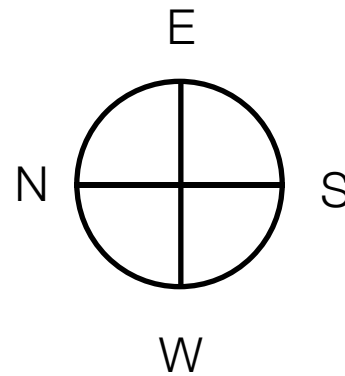
Design

1990

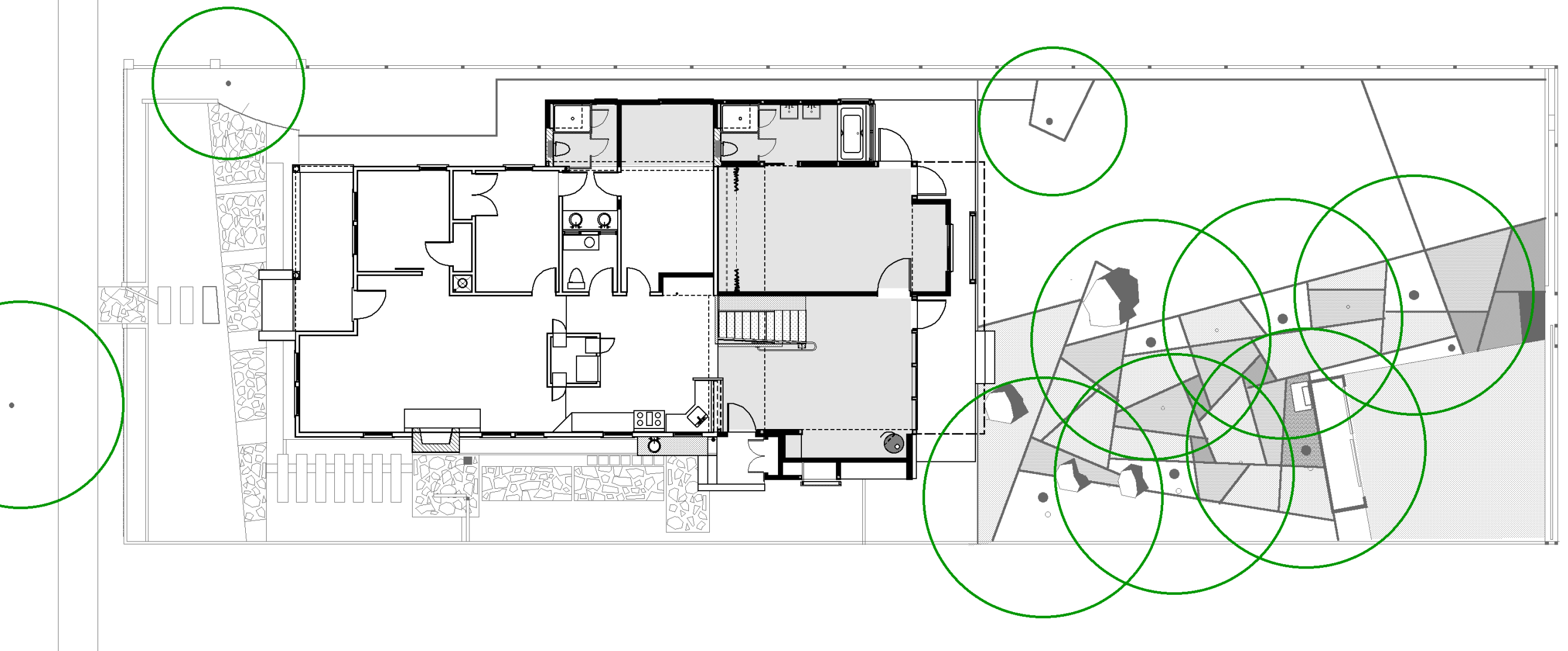


Design

1990

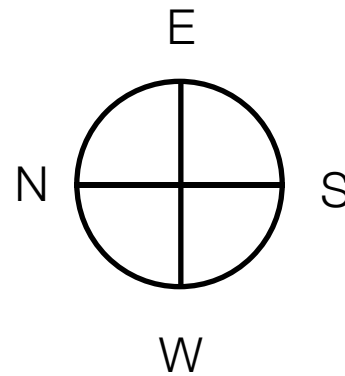


- The Micro-climate in NILES makes it possible to eliminate air-conditioning, which reduces electrical consumption.

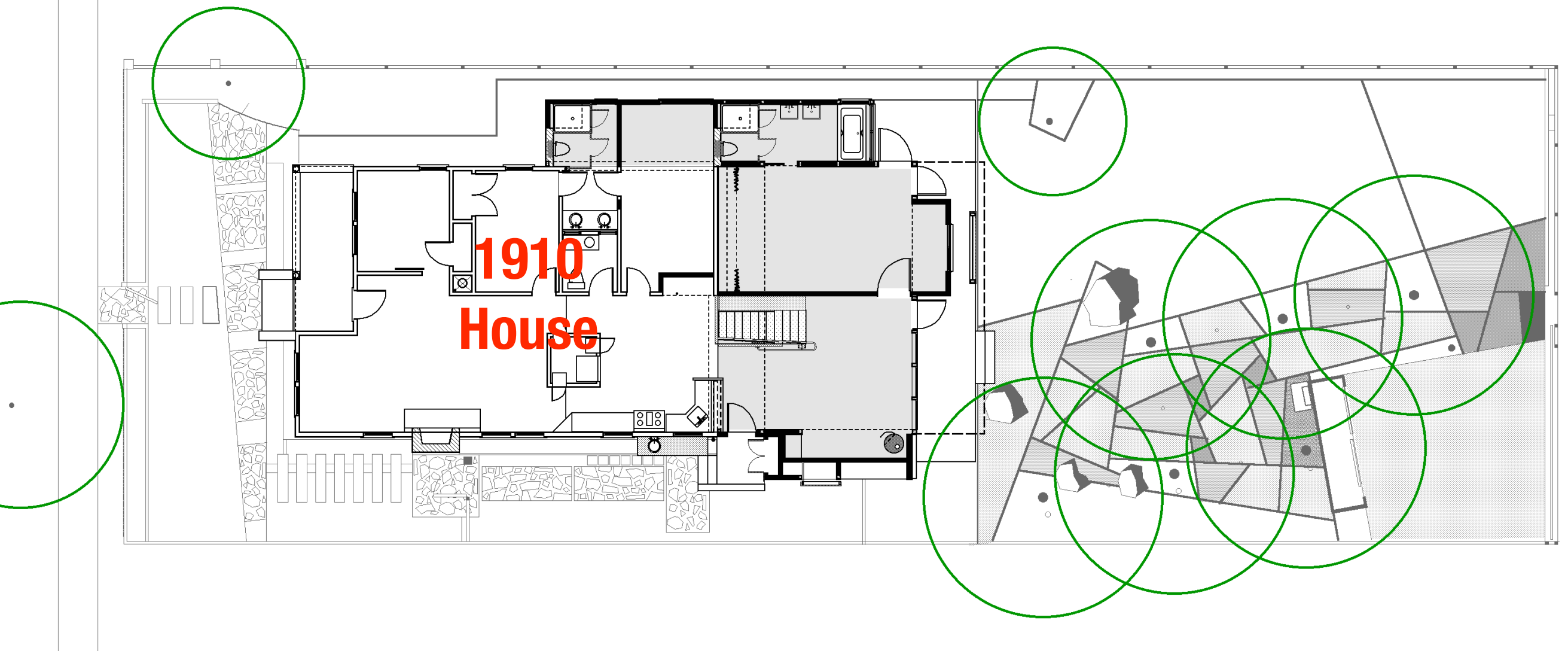


Design

1990

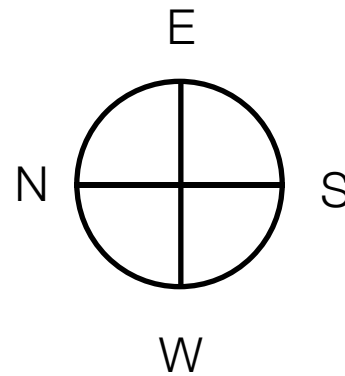


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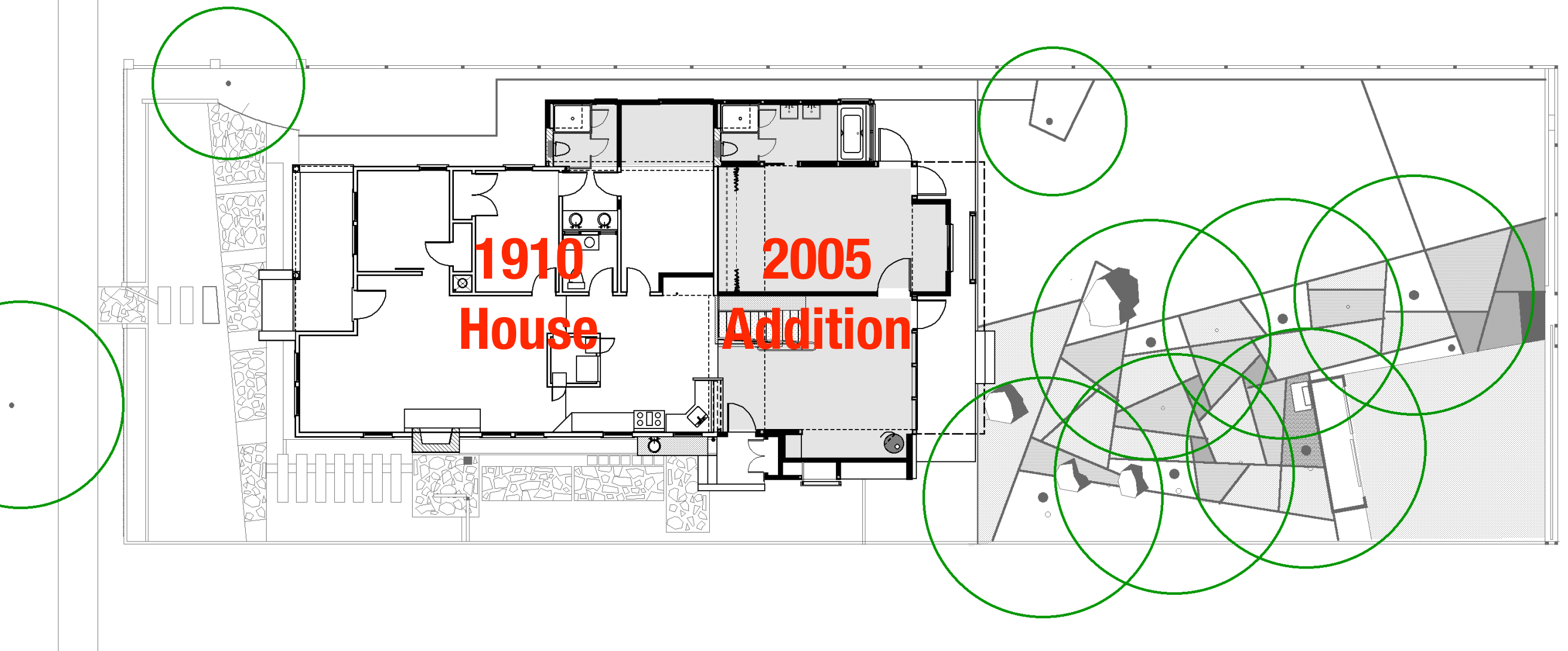


Design

1990

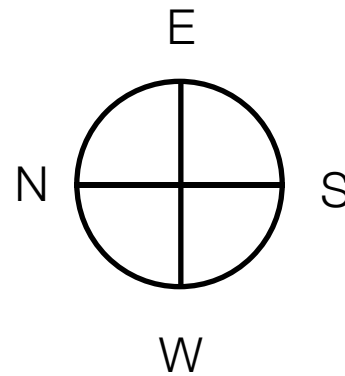


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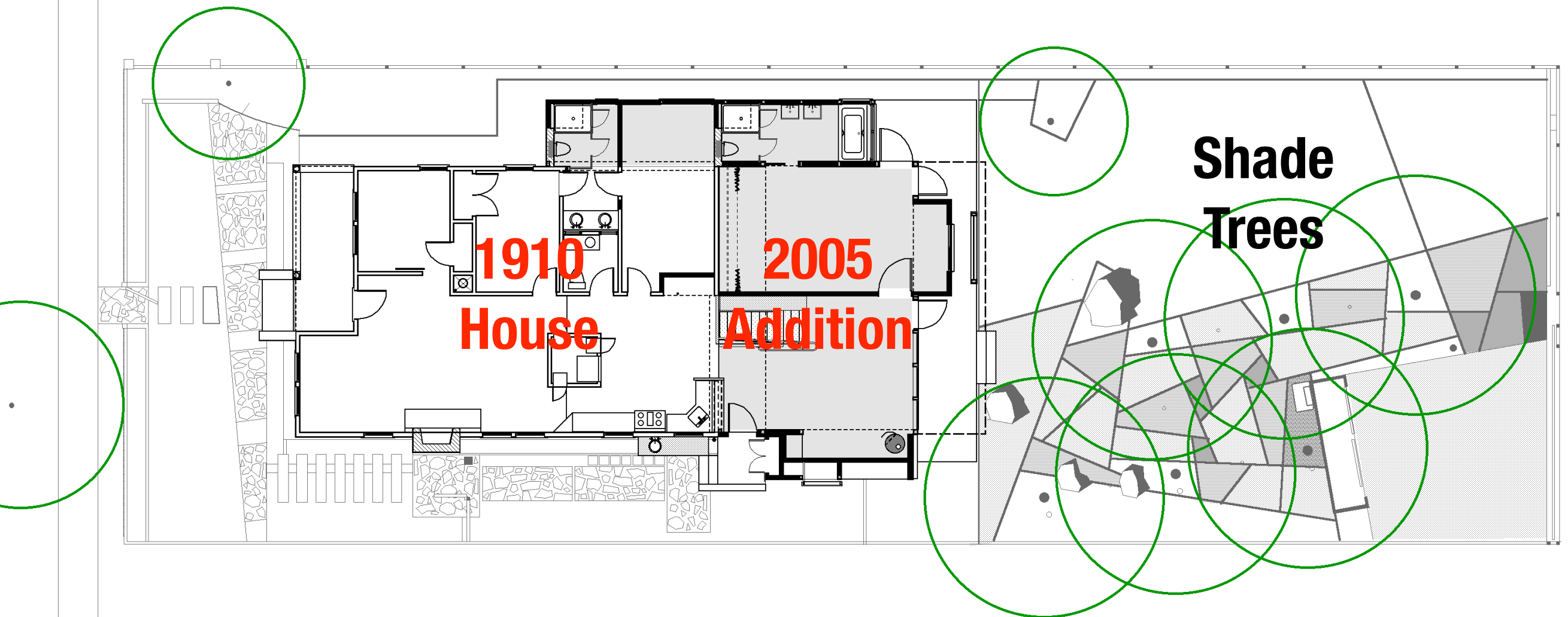


Design

1990

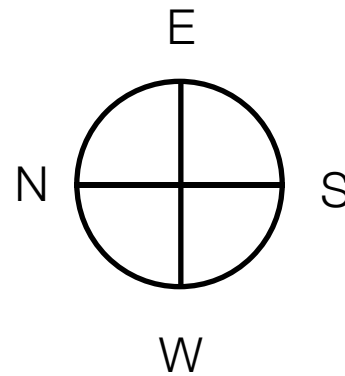


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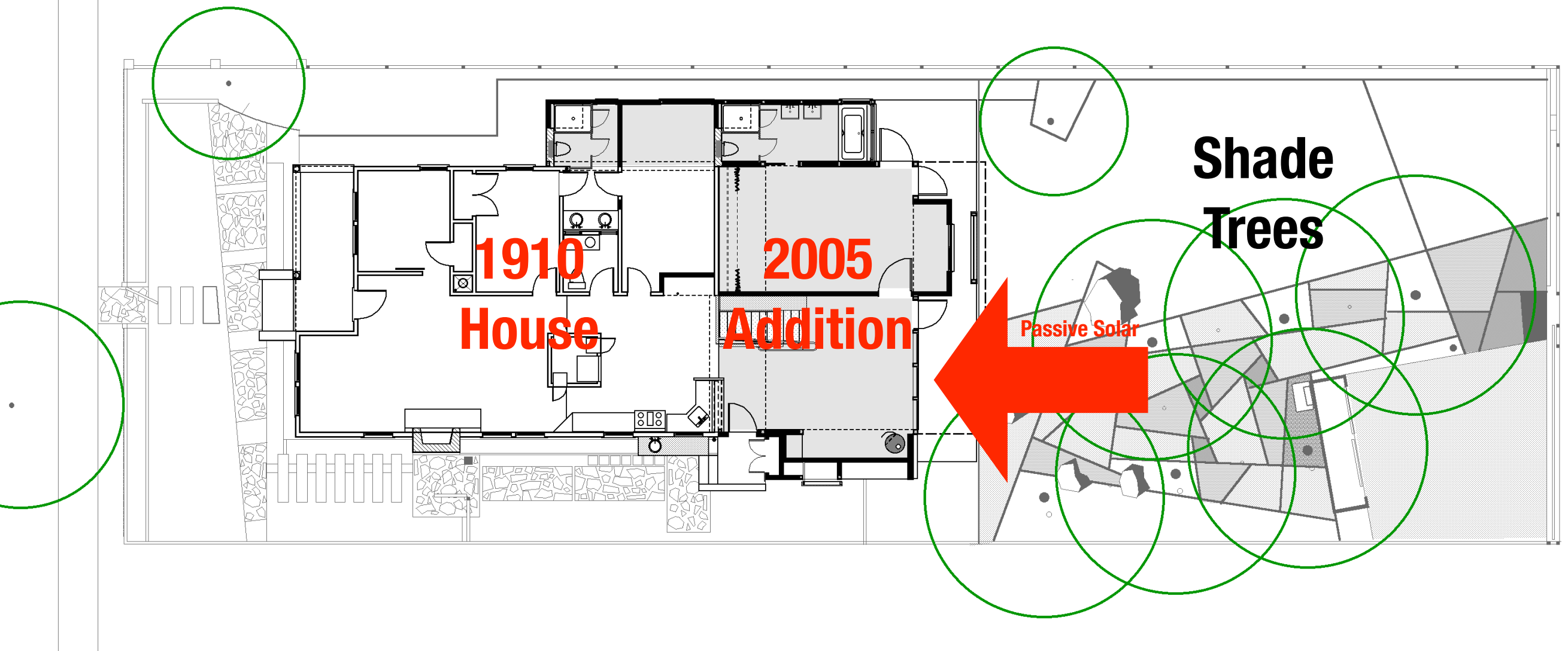


Design

1990

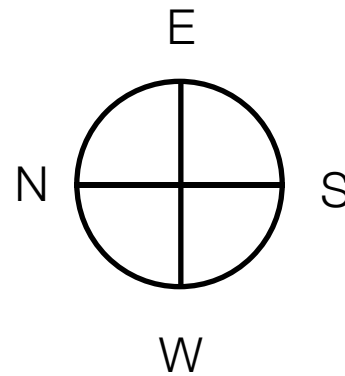


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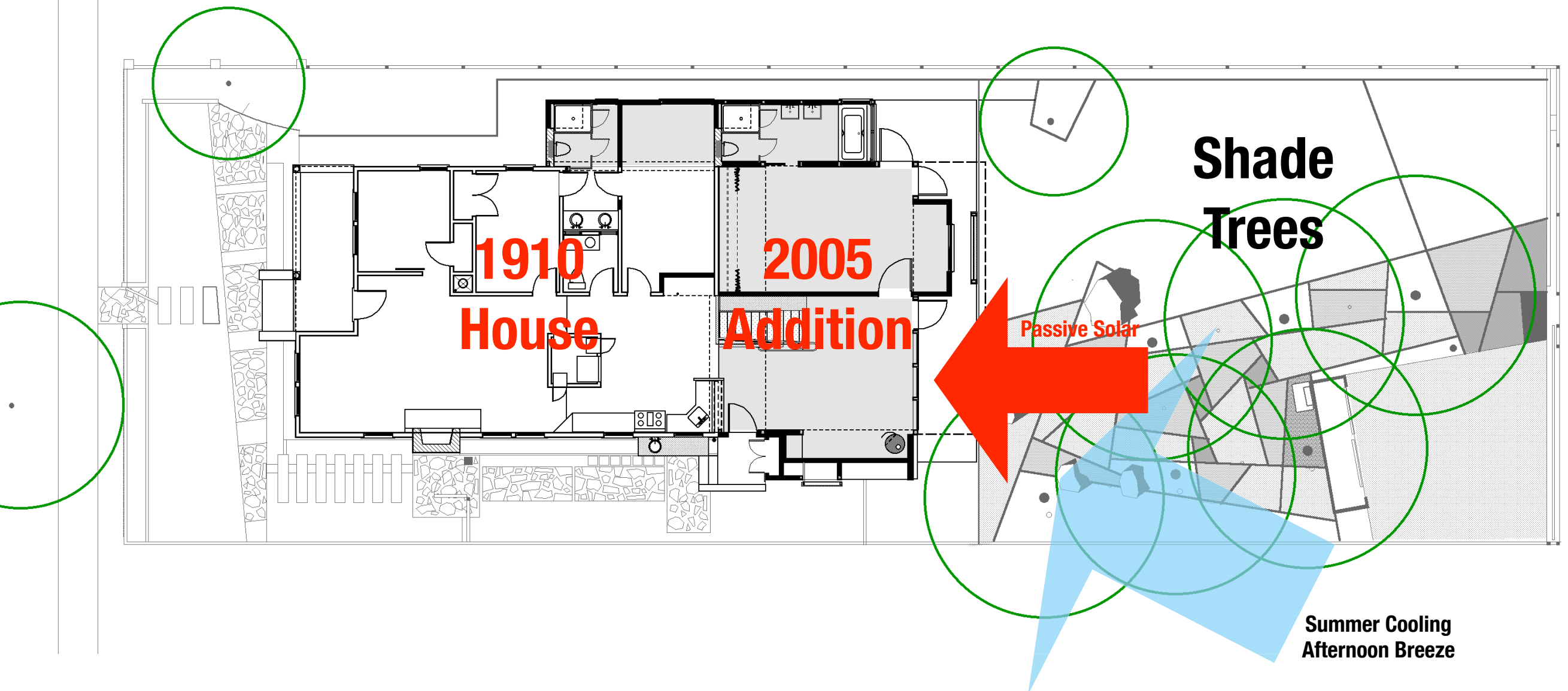


Design

1990

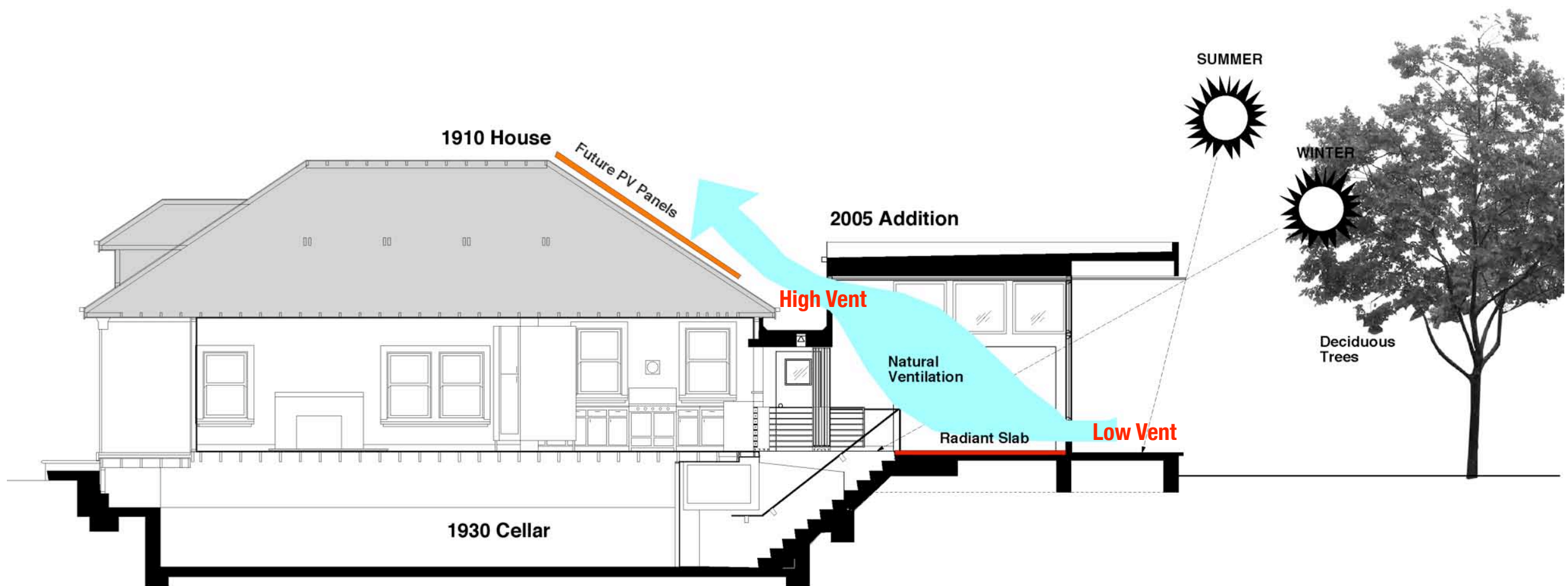


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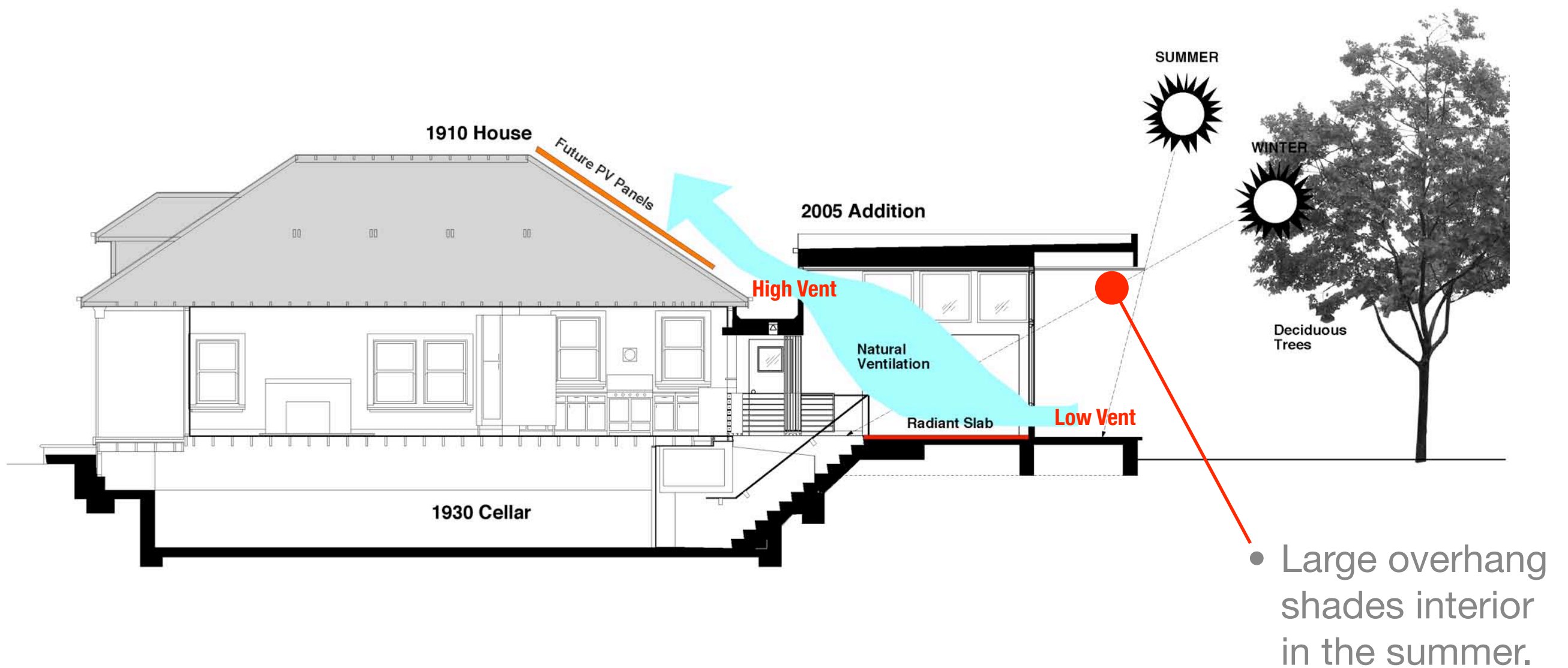


Design 2000

Design 2000

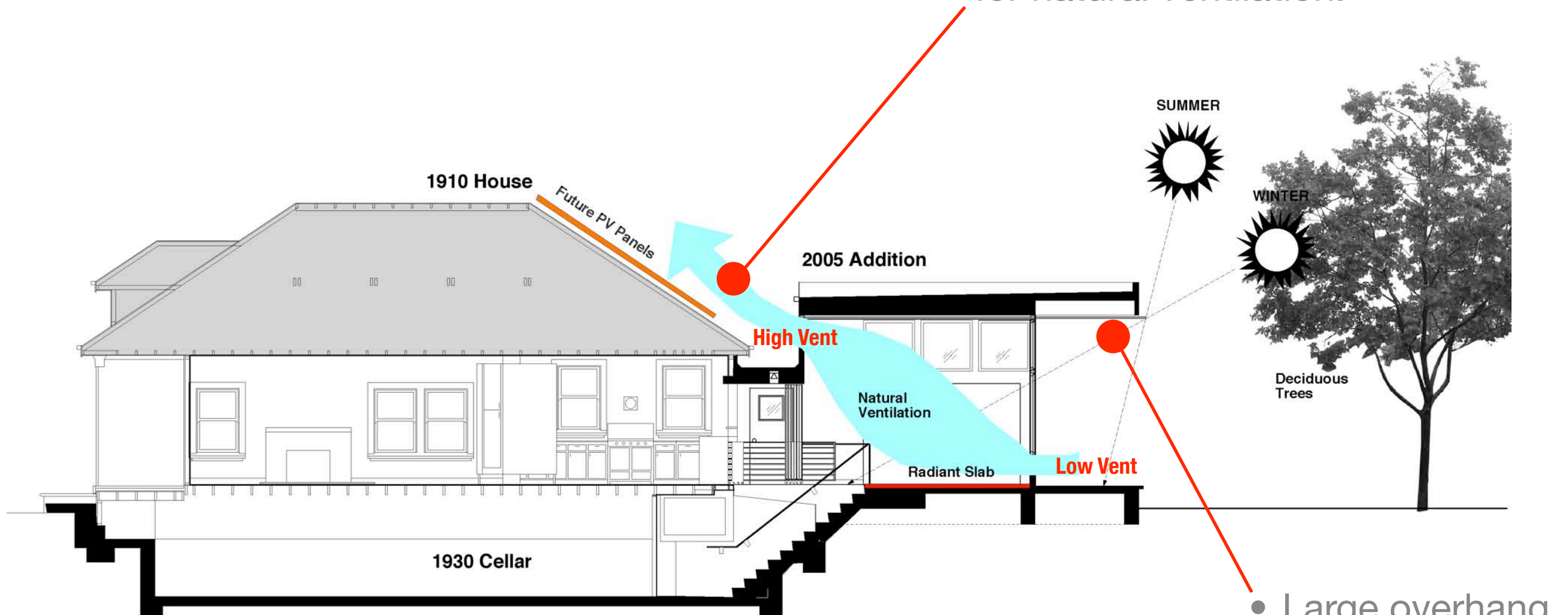


Design 2000



Design 2000

- Heat build-up on south slope of roof assists in stack effect for natural ventilation.



- Large overhang shades interior in the summer.

Specifications

2003

01.00.00 General Requirements

SCOPE: The Work defined in the Contract Documents and summarized herein consists of Green Build Improvements to include: re-certification of House with Green Point Rating for Existing Homes, New Solar Water Heating system, New hydronic fancoil forced air system in attic if 1910 House, and reinstallation of existing attic insulation for compliance with Quality Insulation Installation (QII) requirements.

- Not in Contract:** Items marked (NIC) on the drawings or noted in the specifications are not to be furnished or installed as part of this Contract. Provide for (NIC) items or Owner-furnished items as shown or specified. Provide all necessary or rough-in stub-outs, caps, pull wires, cables, backing, protection and other work which may be required for installation of (NIC) items or Owner-furnished items.
- Drawings:** The drawings are necessarily diagrammatic and indicate only general arrangements, and the specifications are necessarily descriptive and indicate only general aspects, insofar as related to requirements for the various items of material, equipment and apparatus required. Extreme accuracy in regard to said requirements cannot be guaranteed. Drawings indicate general arrangement and location of such items as piping, conduit, ductwork, apparatus, and equipment. The drawings and specifications are for the guidance of the Contractor and the exact locations, distances, and levels will be governed by the building site and actual building conditions. The Contractor shall make minor changes from arrangements or locations shown in order to meet structural or architectural conditions or because of interference with other work without expense to Owner. Keep one copy of all contract documents, including all approved drawings, shop and setting drawings, specifications, addenda, and Change Orders, complete and in good order, at the job site and available to representatives of the Owner, the Architect, and public agencies having jurisdiction.
- Complete Work:** Items listed under each section of the specifications are not necessarily all inclusive. The Contractor shall be responsible for the complete work.
- Design Build Systems Scope:** The Contract Documents require the design and construction of various systems which could include Fireprotection, Plumbing, Mechanical (HVAC) and Electrical. The scope of Design Build work shall be as identified in the Project Team list.
- Design Build Systems:** Contractor acknowledges that it shall be responsible for the design-build work, including the design, method of construction, and coordination and integration with other trades, required to achieve the architectural design intent of the Contract Documents, including siting, sequencing, placement, and details of construction. Contractor guarantees the design-build work shall be constructed in compliance with building codes and ordinances in effect and shall be fit and proper for its intended use. Contractor guarantees the design and method of construction of the design-build work shall not incorporate or employ the use of any product, process or technique which may be protected by common law or statutory patent, copyright or trade secret rights unless Contractor or subcontractor shall be the lawful owner or licensee of same. Contractor agrees to and does hereby indemnify and hold harmless Owner and their consultants from any and all claims, damages and expenses resulting from breach or failure by Contractor to perform fully any of the foregoing obligations, and specifically agrees to indemnify and hold Owner harmless from any and all claims of its own employees, agents, subcontractors, suppliers or third parties and to make good any damages to the Work, and attorneys' fees and investigation costs resulting from the inadequacies of the design techniques or methods of construction of the design-build work. The design and the drawings & specifications for the techniques & method of construction of the design-build work shall be prepared and shall result in work which is fit to perform its intended purpose. Contractor shall cause such plans & specifications to be prepared, stamped and signed by qualified, registered, licensed engineers authorized to practice their professions under the laws of the State of California.
- Contract Administration by Contractor:** Contractor shall perform general administration, supervision, coordination, and other duties as required; and establish and control procedures for processing submittals, change orders, etc., including job conference and other routines; all as necessary to expedite the work and to achieve the quality required within the established time Schedules.
- Review of the Work:** No work prepared by and/or installed by one trade shall be covered over by another trade by applying subsequent materials or finishes until the Architect/Engineer or his authorized representatives have had the opportunity to review the work installed. The Contractor is advised that amongst (but not limited to) those items subject to this requirement are the following: Concrete formwork and rebar before pours. All plumbing, mechanical and electrical rough-in work before concrete pours, placement of gypsum board, or soffits. Verify that as-builts are updated prior to concealment of work. Wall, floor, and ceiling surfaces before finish surfaces such as ceramic tile, paint, and resilient tile are applied.
- Existing Conditions:** The Contractor shall be held to have examined the building site and to have compared it with the Drawings and Specifications; to have carefully examined all the Contract Documents; and to have satisfied himself as to the conditions under which the Work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the Contractor on account of an error on his part or his negligence or failure to acquaint himself with the conditions of the Work.

- Verifying Conditions:** Verify measurements in field, as required for Work fabricated to fit job conditions. Before starting Work, examine adjoining work on which installation is to be made and dependent for perfect workmanship and fit. Give written notification of any existing deficiencies detrimental to proper and timely installation of work.
- Limit of Work:** The entire space as indicated on the Drawings is defined as the "LIMIT OF WORK". Confine operations to areas within the "LIMIT OF WORK" except for utility work and any other off-site work shown or specified. Barricades or fences, as approved, may be used during the course of construction and removed upon completion of the project. Store materials and equipment only within the "LIMIT OF WORK" or in areas approved by the Owner. Move equipment, as necessary, to accomplish work in areas outside the "LIMIT OF WORK" and replace and clean up affected areas after each increment of work.
- Site Layout:** Site data and building dimensions indicated on the Drawings are as exact as could be obtained, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, and similar data shall be governed finally by field conditions and the Architect's instructions. Contractor shall verify on site the location and depth (elevation) of all existing utilities and services before performing any excavation work.
- General Contractor Coordination:** Coordinate all portions of the Work of the Subcontractors for the Project.
- Utility Coordination:** The Contractor's attention is directed to the existence of pipelines, conduits and other utilities which may be buried within the limits of the work or adjacent thereto, and which may or may not be shown on the Drawings and which may or may not be "live". Every precaution shall be taken to preserve and protect "live" improvements from injury or damage during construction operations. It shall be the sole responsibility of the Contractor to repair or replace, to the satisfaction of the utility company involved, any damage to the utilities caused by the Contractor's work, whether or not those utilities are indicated on the Drawings.
- Subcontractor Coordination:** Coordinate HVAC, Plumbing, Electrical, and Structural Work to resolve potential conflicts in location of piping, conduit and equipment and sound control issues. Prepare layout drawings and review the layout drawings, Shop Drawings and Product Data of other Subcontractors as required. Conduct and review the coordination process and notify the Architect in writing of any conflicts before proceeding with fabrication and installation of mechanical and electrical systems.
- Mechanical and Electrical Subcontractors:** Coordinate HVAC, Plumbing, Electrical, and Structural Work to resolve potential conflicts in location of piping, conduit and equipment and sound control issues. Prepare layout drawings and review the layout drawings, Shop Drawings and Product Data of other Subcontractors as required. Conduct and review the coordination process and notify the Architect in writing of any conflicts before proceeding with fabrication and installation of mechanical and electrical systems.
- Pre-Construction Conference:** Conduct a meeting between the Owner, Contractor and Architect prior to the start of the various phases of the construction to discuss and familiarize all concerned with the Contract Documents, on-site lines of authority and communication, procedures, correspondence, schedules, safety, and specified General Requirements. Major Subcontractors invited to attend shall have their responsible Foremen or Superintendents present.
- Progress Meetings:** Conduct regular progress meeting at the Project site, attended by the Owner, Architect, and Subcontractors and suppliers as appropriate to the agenda, to discuss and review the Project. Suggested agenda items are: work progress and construction schedule, field observations, work quality, detection and resolution of problems and conflicts, coordination, pending changes or substitutions, submittals and safety.
- Cutting and Patching:** Examine existing conditions of the Project, including elements subject to damage or to movement during cutting and patching. After uncovering work, examine the conditions affecting the installation of products or performance of the Work. Report unsatisfactory or questionable conditions to the Architect in writing. Do not proceed with the work until the Architect has provided further instruction. Perform all cutting, associated structural reinforcing, and patching in a manner to prevent damage to other work and to provide proper surfaces for the installation of materials, equipment and repairs. Patching shall achieve security, strength, and weather protection, as applicable and required, and shall preserve the integrity and continuity of existing fire ratings. Patching shall successfully duplicate undisturbed adjacent finishes, colors, textures and profiles. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the Architect's judgment shall be final.
- Regulatory Requirements:** Comply with the applicable requirements of all Federal, State and local agencies having jurisdiction over the Project. References to "code" or "building code" not otherwise identified, shall mean the Uniform Building Code (UBC), 1991 Edition, with the 1992 California Amendments together with additions, changes, amendments and interpretations adopted by the City of Sunnyvale in effect on the date of receipt of bids. Nothing in Drawings or these Specifications is to be construed as requiring or permitting work that is contrary to these rules, regulations and codes.

- Quality Control:** The work of the Contract shall be subject to the inspection and observation of the City's Building Inspection Representative. Contractor shall provide access to the work and shall furnish the City's Building Inspection Representative reasonable facilities for obtaining such information as may be necessary to keep fully informed respecting the work.
- Existing Conditions:** The Contractor shall be held to have examined the building site and to have compared it with the Drawings and Specifications; to have carefully examined all the Contract Documents; and to have satisfied himself as to the conditions under which the Work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the Contractor on account of an error on his part or his negligence or failure to acquaint himself with the conditions of the Work. Inspection of the work shall not relieve the Contractor from any obligation to fulfill any portion of this Contract. Shop and field work shall be performed by mechanics, craftsmen, and workers skilled and experienced in the fabrication and installation of the work involved. All work on the project shall be performed in accordance with the best accepted practices of the various trades involved and in accordance with the Drawings, reviewed shop drawings, and these Specifications. All work shall be erected and installed plumb, level, square and/or true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. Finished work shall be free from defects and damage. The Architect reserves the right to reject any materials and/or work quality which is not considered to be up to the highest standards of the various trades involved. Such inferior material or work-quality shall be repaired or replaced, as directed, at no additional cost to the Owner.
- Quality Control:** The work of the Contract shall be subject to the inspection and observation of the City's Building Inspection Representative. Contractor shall provide access to the work and shall furnish the City's Building Inspection Representative reasonable facilities for obtaining such information as may be necessary to keep fully informed respecting the work.
- Testing Laboratory Services:** The Contractor shall coordinate the services of the Testing Laboratory Agency, Soils Engineer or Inspectors, selected and paid for by the Owner, as necessary to fulfill the requirements of the Contract Documents. Such testing laboratory or agency shall supervise the preparation and selection of samples required for testing. Owner shall pay for initial inspections and tests required by the various technical sections of the specifications unless specifically noted to be paid for by the Contractor. Contractors shall pay for any additional tests and inspections by Contractor's or Owner's testing laboratory or agency when initial tests and inspections reveal failure to meet contract requirements. Contractor shall be responsible for notification to the Testing Agency(s) and the City Inspector(s) for all required inspections. Adequate notice shall be provided to allow the inspector(s) to become familiar with the Project.
- Reference Standards:** For Work specified by reference to standard specifications of agencies or societies (ASTM, AISC, Federal Specifications, etc.) or the standard specifications of trade associations (IGA, TCA, etc.), comply with the applicable requirements of the latest revision and supplements in effect on the date of receipt of bids, unless otherwise specified. Reference standard specifications have the same force as if they were printed in full text within the Specification, except as modified in the Section. For Work specified by reference to the written specifications or other literature of a manufacturer, comply with the applicable requirements of the latest revision and supplements in effect on the date the material is furnished and/or installed. Referenced manufacturer's specifications and literature have the same force as if they were printed in full text within the Specification, except as modified in the Section. For Work specified by reference to the written Specifications of special reports (Sound Report, Title 24 Compliance Report, Soils Report) comply with the applicable requirements of the latest revision and supplements in effect on the date the Work is performed. Referenced reports have the same force as if they were printed in full text within the specification except as modified by the Section.
- Safety:** Exercise precaution at all times for the protection of persons and property. Observe the safety provisions of all applicable laws, building and construction codes. Eliminate attractive nuisances from the Work and from the Site. In no case shall the Owner or Architect be responsible for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, nor shall the Owner or Architect be responsible for Contractor's failure to employ proper safety procedures.
- Traffic and Access:** Maintain traffic on roads and streets adjacent to or leading to the site. Where construction operations interfere with the free movement of traffic, provide traffic controls, flaggers or similar devices to efficiently control traffic movement. Hours shall comply with the CITY regulations.
- Storage and Construction Space:** Confine storage and construction operations to areas within the Limit of Work or as directed or approved by the Owner. Restore all such areas at the completion of construction.
- Parking:** Confine all parking for construction vehicles and employees' cars to areas designated by the Owner or City.
- Non-Construction Noise and Activity:** Comply with the Owner's policies to eliminate or limit the playing of radios, tape decks or other noise sources caused by construction personnel and occurring in areas where such noise would constitute a nuisance in the Owner's opinion. The consumption of alcoholic beverages on the Project is strictly prohibited.

- Dust Control:** Abate any dust nuisance on or about the Project which is a result of construction activities.
- Temporary Facilities:** Provide and pay for necessary temporary power, light, and water required during the course of construction of the Project. Furnish, install, and pay for meters, equipment, wiring, and piping necessary to provide such utilities.
- Security:** Provide and maintain barriers, security measures, and other facilities as required to protect the Work from unauthorized entry, vandalism, and theft. Also provide and maintain barriers to protect adjacent spaces from damage from construction operations.
- Protection of Work:** Protect the various materials, work, equipment and finishes provided by the several trades from other operations or work such that all items are in satisfactory condition at the Date of Substantial Completion. The final responsibility for this protection rests with the Contractor even though various Sections may contain specific comments or precautions about protection.
- Prior to Final Inspection:** Temporary facilities and utilities shall be properly disconnected, removed and disposed of off-site. Leave all systems, equipment and devices in full and proper adjustment and operation and properly labeled and identified. All materials and finishes shall be neat, clean and unmarked with parts securely attached. Replace or properly repair all broken work including glass, equipment, etc. Deliver and store on the premises as directed all extra materials as specified. Assemble all guarantees, manuals and other Submittals for delivery as directed by the Architect.
- Final Inspection:** Upon receipt of written notice that the work is ready for final inspection and acceptance, the Architect and the Contractor shall promptly make a joint inspection of the work and note all deficiencies, if any. If there are no deficiencies, or when noted deficiencies have been removed and they find the work under Contract fully performed and acceptable, the Architect will promptly notify the Owner accordingly. Notice shall be deemed that the Contractor has carefully inspected all portions of the work, that he has reviewed in detail the drawings and the specifications and that all conditions of the Contract Documents have been fulfilled. All subcontractors shall review, inspect and otherwise check their work for compliance with all conditions of the Contract Documents.
- Owner Occupancy:** The Contractor shall allow the Owner to take possession of and use any completed or partially completed portion of the Work as soon as it is possible without interference to the Work. Possession, use of space or Work, and placing and installation of equipment by Owner shall not in any way evidence the completion of the Work or any part of it.

01.80.00 Special Environmental Requirements

SUMMARY: This work includes special environmental, sustainable, and "green" building practices related to community housing enhancement, energy conservation and efficiency, indoor air quality, resource conservation, and water conservation. The Construction Team is required to comply with sustainable building practices during construction and when considering materials for substitutions. The Contract Documents are not intended to limit alternative means of achieving these environmental goals. Suggestions from the Construction Team for implementing these goals are encouraged.

Existing condition energy conservation / indoor air quality analysis

- Building Performance Testing:** The Building Performance Tester shall be a specialist within the field with a minimum of 5 years testing/building science experience. Prior to the demolition or selective demolition of any portion of the existing structure, a building performance test shall be done, to include: Site inspection of the exterior shell, crawl space inspection, attic inspection, carbon monoxide testing, visual inspection of combustion appliances, air infiltration test with Blower Door test and IR camera, evaluate all ventilation devices, visual inspection of all exhaust fans, Insulation performance inspection, Heating equipment combustion analysis, Visual inspection of heating equipment, cooling equipment analysis. Duct testing including Duct Blaster test, appliance evaluation, waterheater fuel gas analysis and visual inspection of the water heater.
- Renewable Energy**
Solar Photovoltaic Grid-Tied Design Build Performance: The Solar PV Design Build Contractor shall be a specialist within the field with a minimum of 5 years design and installation experience and approved by the California Energy Commission. The electrical load estimates for the residence shall be based on one years utility bills, for existing structures, or load estimates based on the architectural design and electrical load and lighting load estimates. The solar insulation resource estimates shall be based on: average peak-sun hours, panel tilt, panel orientation, and potential shading of the panels. Panel shading for existing conditions shall be determined by the Solar Access at the 4 corners of the array installation with a Solar Pathfinder or digital Solmetric Sun Eye instrument or equal. Panel shading for new construction shall be estimated based field observations of adjacent structures and new planning plans. The PV Panel manufacturer shall be selected by the Design-Build Contractor but requires architects review and approval for frame color and panel appearance. The PV Design-Build contractor shall evaluate the system options utilizing the California Solar Initiative's Expected Performance Based Bydown Calculator. The PV panel array size shall be limited to the areas as described in the Architectural Drawings and, or by the Expected Performance Based Bydown analysis. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, System schematic drawings, panel, panel mounts, inverter and other

system equipment information. After review and approval, the PV Design Build Contractor shall submit all required state (California Solar Initiative) and local Utility and City applications for: financial incentives, interconnection, and building permits. The PV installation shall be coordinated with the General Contractor.

Renewable Energy

- Solar Hot Water Heating Systems Design Build Performance:** The Solar Hot Water Heating systems (SHWH) Design Build Contractor shall be a specialist within the field with a minimum of 5 years design and installation experience. The hot water load estimates for the residence shall be based on one years utility bills, for existing structures, or load estimates based on the architectural design and hot water load estimates. When the heating system for the residence also includes hydronic fancoil units the space heating and SHWH system shall be designed by a registered Mechanical Engineer in accordance with Manual J, D & S requirements. The solar insulation resource estimates shall be based on: average peak-sun hours, panel tilt, panel orientation, and potential shading of the panels. Panel shading for existing conditions shall be determined by the Solar Access at the 4 corners of the array installation with a Solar Pathfinder or digital Solmetric Sun Eye instrument or equal. Panel shading for new construction shall be estimated based field observations of adjacent structures and new planning plans. The SHWH Panel manufacturer shall be selected by the Design-Build Contractor but requires architects review and approval for frame color and panel appearance. The PV panel array size shall be limited to the areas as described in the Architectural Drawings. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, System schematic drawings, panel, panel mounts, storage tank and other system equipment information. After review and approval, the SHWH Design Build Contractor shall submit all required state (California Solar Initiative) and local Utility and City applications for: financial incentives, interconnection, and building permits. The SHWH installation shall be coordinated with the General Contractor.

Environmental Stewardship

- Green Point Rating:** This project has been designed based on recommendations from the Build it Green organization of California and is to be constructed under the review of a certified Green Point Rater to ensure the anticipated green point rating at the completion of the project. Refer to the drawing index for the Green Point Rating Check List.

Environmental Stewardship

- Energy Conservation:** Maximize energy conservation strategies in order to reduce life-cycle energy requirements. Reduce undesirable heat gain and heat loss through the exterior envelope. Use daylight as the primary lighting source and supplement with integrated and energy efficient electrical lighting systems. Choose equipment with high-end energy performance characteristics, including lighting, HVAC systems, appliances and office equipment. Where appropriate, use thermal storage strategies such as thermal mass of the building or ground to minimize total energy consumption. Design Mechanical systems for efficient operation throughout the typical operating range, from minimum peak load.

Environmental Stewardship

- Sustainable Site Planning and Landscaping:** Maximize erosion and sedimentation control. Minimize site disturbance. Maximize planted areas. Reduce heat island effect. Where possible, reduce or eliminate light pollution from night lighting. Reduce or eliminate use of pesticides. Rely on indigenous, dry or xeriscape planting. Maintain existing planting on site to reduce costs. Implement seasonal plant and soil maintenance schedule to maintain healthy soil and landscaping. Minimize storm water runoff. Reduce water use with efficient irrigation systems and local vegetation.

Environmental Stewardship

- Durable & Resource Efficient Materials:** Select materials with long and useful service life, with surfaces that minimal or no refinishing or resurfacing, with protective coating requirements that do not involve frequent application of toxic or odorous renewal and protection, that can be reused or recycled after their service life in this building. Where possible and allowable by the Agency and Code with jurisdiction over the project, re-use existing building materials to the extent feasible within the design concept expressed in the Construction Documents. Use construction practices such as material reduction and dimensional planning that maximize efficient use of resources and materials. Where possible, select materials harvested and manufactured regionally, within a 500-mile radius of the project site.

Environmental Stewardship

- Pollution:** Select materials that generate the least amount of pollution during mining, manufacturing, transportation, installation, use and disposal. Avoid materials that emit greenhouse gases, that contain ozone-depleting chemicals, that emit potentially harmful volatile organic compounds (VOCs). Avoid materials that can leach harmful chemicals into the ground water. Protect and restore natural habitats where feasible within scope of project.

Environmental Stewardship

- Wood Products:** Use woods from Forest Stewardship Council (FSC) accredited certified sustainable harvested resources. Composite wood products with high-recycled content, which meet the indoor air quality data requirements, are acceptable.

Environmental Stewardship

- Water Efficiency:** Reduce the use of municipally supplied water. Reduce dependence on municipal storm water systems for plumbing fixtures and irrigation.

Paul welschmeyer architects

STUDIO: 37735 Second Street
Niles District
Fremont, California
94536

Phone: 510.825.5783
Email: studio@pwwarchitects.biz
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Owner: Mr. & Mrs. Welschmeyer
37735 Second Street
NILES District
Fremont, California
94536



The Green Build Specification is to provide the Owner & Architect alternate pricing for specific items which have substantial cost impacts for this project.



A0.4

Specifications

2003

MAKE THEM GREEN

01.00.00 General Requirements

SCOPE: The Work defined in the Contract Documents and summarized herein consists of Green Build Improvements to include: re-certification of House with Green Point Rating for Existing Homes, New Solar Water Heating system, New hydronic fancoil forced air system in attic if 1910 House, and reinstallation of existing attic insulation for compliance with Quality Insulation Installation (QII) requirements.

- Not in Contract:** Items marked (NIC) on the drawings or noted in the specifications are not to be furnished or installed as part of this Contract. Provide for (NIC) items or Owner-furnished items as shown or specified. Provide all necessary or rough-in stub-outs, caps, pull wires, cables, backing, protection and other work as may be required for installation of (NIC) items or Owner-furnished items.
- Drawings:** The drawings are necessarily diagrammatic and indicate only general arrangements, and the specifications are necessarily descriptive and indicate only general aspects, insofar as related to requirements for the various items of material, equipment and apparatus required. Extreme accuracy in regard to said requirements cannot be guaranteed. Drawings indicate general arrangement and location of such items as piping, conduit, ductwork, apparatus, and equipment. The drawings and specifications are for the guidance of the Contractor and the exact locations, distances, and levels will be governed by the building site and actual building conditions. The Contractor shall make minor changes from arrangements or locations shown in order to meet structural or architectural conditions or because of interference with other work without expense to Owner. Keep one copy of all contract documents, including all approved drawings, shop and setting drawings, specifications, addenda, and Change Orders, complete and in good order, at the job site and available to representatives of the Owner, the Architect, and public agencies having jurisdiction.
- Complete Work:** Items listed under each section of the specifications are not necessarily all inclusive. The Contractor shall be responsible for the complete work.
- Design Build Systems Scope:** The Contract Documents require the design and construction of various systems which could include Fireprotection, Plumbing, Mechanical (HVAC) and Electrical. The scope of Design Build work shall be as identified in the Project Team list.
- Design Build Systems:** Contractor acknowledges that it shall be responsible for the design-build work, including the design, method of construction, and coordination and integration with other trades, required to achieve the architectural design intent of the Contract Documents, including siting, sequencing, placement, and details of construction. Contractor guarantees the design-build work shall be constructed in compliance with building codes and ordinances in effect and shall be fit and proper for its intended use. Contractor guarantees the design and method of construction of the design-build work shall not incorporate or employ the use of any product, process or technique which may be protected by common law or statutory patent, copyright or trade secret rights unless Contractor or subcontractor shall be the lawful owner or licensee of same. Contractor agrees to and does hereby indemnify and hold harmless Owner and their consultants from any and all claims, damages and expenses resulting from breach or failure by Contractor to perform fully any of the foregoing obligations, and specifically agrees to indemnify and hold Owner harmless from any and all claims of its own employees, agents, subcontractors, suppliers or third parties and to make good any damages to the Work, and attorneys' fees and investigation costs resulting from the inadequacies of the design techniques or methods of construction of the design-build work. The design and the drawings & specifications for the techniques & method of construction of the design-build work shall be prepared and shall result in work which is fit to perform its intended purpose. Contractor shall cause such plans & specifications to be prepared, stamped and signed by qualified, registered, licensed engineers authorized to practice their professions under the laws of the State of California.
- Contract Administration by Contractor:** Contractor shall perform general administration, supervision, coordination, and other duties as required; and establish and control procedures for processing submittals, change orders, etc., including job conference and other routines; all as necessary to expedite the work and to achieve the quality required within the established time Schedules.
- Review of the Work:** No work prepared by and/or installed by one trade shall be covered over by another trade by applying subsequent materials or finishes until the Architect/Engineer or his authorized representatives have had the opportunity to review the work installed. The Contractor is advised that amongst (but not limited to) those items subject to this requirement are the following: Concrete formwork and rebar before pours. All plumbing, mechanical and electrical rough-in work before concrete pours, placement of gypsum board, or soffits. Verify that as-builts are updated prior to concealment of work. Wall, floor, and ceiling surfaces before finish surfaces such as ceramic tile, paint, and resilient tile are applied.
- Existing Conditions:** The Contractor shall be held to have examined the building site and to have compared it with the Drawings and Specifications; to have carefully examined all the Contract Documents; and to have satisfied himself as to the conditions under which the Work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the Contractor on account of an error on his part or his negligence or failure to acquaint himself with the conditions of the Work.

- Verifying Conditions:** Verify measurements in field, as required for Work fabricated to fit job conditions. Before starting Work, examine adjoining work on which installation is in any way dependent for perfect workmanship and fit. Give written notification of any existing deficiencies detrimental to proper and timely installation of work.
- Limit of Work:** The entire space as indicated on the Drawings is defined as the "LIMIT OF WORK". Confine operations to areas within the "LIMIT OF WORK" except for utility work and any other off-site work shown or specified. Barricades or fences, as approved, may be used during the course of construction and removed upon completion of the project. Store materials and equipment only within the "LIMIT OF WORK" or in areas approved by the Owner. Move equipment, as necessary, to accomplish work in areas outside the "LIMIT OF WORK" and replace and clean up affected areas after each increment of work.
- Site Layout:** Site data and building dimensions indicated on the Drawings are as exact as could be obtained, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, and similar data shall be governed finally by field conditions and the Architect's instructions. Contractor shall verify on site the location and depth (elevation) of all existing utilities and services before performing any excavation work.
- General Contractor Coordination:** Coordinate all portions of the Work of the Subcontractors for the Project.
- Utility Coordination:** The Contractor's attention is directed to the existence of pipelines, conduits and other utilities which may be buried within the limits of the work or adjacent thereto, and which may or may not be shown on the Drawings and which may or may not be "live". Every precaution shall be taken to preserve and protect "live" improvements from injury or damage during construction operations. It shall be the sole responsibility of the Contractor to repair or replace, to the satisfaction of the utility company involved, any damage to the utilities caused by the Contractor's work, whether or not those utilities are indicated on the Drawings.
- Subcontractor Coordination:** Coordinate HVAC, Plumbing, Electrical, and Structural Work to resolve potential conflicts in location of piping, conduit and equipment and sound control issues. Prepare layout drawings and review the layout drawings, Shop Drawings and Product Data of other Subcontractors as required. Conduct and review the coordination process and notify the Architect in writing of any conflicts before proceeding with fabrication and installation of mechanical and electrical systems.
- Mechanical and Electrical Subcontractors:** Coordinate HVAC, Plumbing, Electrical, and Structural Work to resolve potential conflicts in location of piping, conduit and equipment and sound control issues. Prepare layout drawings and review the layout drawings, Shop Drawings and Product Data of other Subcontractors as required. Conduct and review the coordination process and notify the Architect in writing of any conflicts before proceeding with fabrication and installation of mechanical and electrical systems.
- Pre-Construction Conference:** Conduct a meeting between the Owner, Contractor and Architect prior to the start of the various phases of the construction to discuss and familiarize all concerned with the Contract Documents, on-site lines of authority and communication, procedures, correspondence, schedules, safety, and specified General Requirements. Major Subcontractors invited to attend shall have their responsible Foremen or Superintendents present.
- Progress Meetings:** Conduct regular progress meeting at the Project site, attended by the Owner, Architect, and Subcontractors and suppliers as appropriate to the agenda, to discuss and review the Project. Suggested agenda items are: work progress and construction schedule, field observations, work quality, detection and resolution of problems and conflicts, coordination, pending changes or substitutions, submittals and safety.
- Cutting and Patching:** Examine existing conditions of the Project, including elements subject to damage or to movement during cutting and patching. After uncovering work, examine the conditions affecting the installation of products or performance of the Work. Report unsatisfactory or questionable conditions to the Architect in writing. Do not proceed with the work until the Architect has provided further instruction. Perform all cutting, associated structural reinforcing, and patching in a manner to prevent damage to other work and to provide proper surfaces for the installation of materials, equipment and repairs. Patching shall achieve security, strength, and weather protection, as applicable and required, and shall preserve the integrity and continuity of existing fire ratings. Patching shall successfully duplicate undisturbed adjacent finishes, colors, textures and profiles. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the Architect's judgment shall be final.
- Regulatory Requirements:** Comply with the applicable requirements of all Federal, State and local agencies having jurisdiction over the Project. References to "code" or "building code" not otherwise identified, shall mean the Uniform Building Code (UBC), 1991 Edition, with the 1992 California Amendments together with additions, changes, amendments and interpretations adopted by the City of Sunnyvale in effect on the date of receipt of bids. Nothing in Drawings or these Specifications is to be construed as requiring or permitting work that is contrary to these rules, regulations and codes.

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Existing condition energy conservation / indoor air quality analysis

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system equipment information. After review and approval, the PV Design Build Contractor shall submit all required state (California Solar Initiative) and local Utility and City applications for: financial incentives, interconnection, and building permits. The PV installation shall be coordinated with the General Contractor.

Renewable Energy

- Solar Hot Water Heating Systems Design Build Performance:** The Solar Hot Water Heating systems (SWH) Design Build Contractor shall be a specialist within the field with a minimum of 5 years design and installation experience. The hot water load estimates for the residence shall be based on one years utility bills, for existing structures, or load estimates based on the architectural design and hot water load estimates. When the heating system for the residence also includes hydronic fancoil units the space heating and SWH system shall be designed by a registered Mechanical Engineer in accordance with Manual J, D & S requirements. The solar insulation resource estimates shall be based on: average peak-sun hours, panel tilt, panel orientation, and potential shading of the panels. Panel shading for existing conditions shall be determined by the Solar Access at the 4 corners of the array installation with a Solar Pathfinder or digital Solmetric Sun Eye instrument or equal. Panel shading for new construction shall be estimated based field observations of adjacent structures and new planning plans. The SWH Panel manufacturer shall be selected by the Design-Build Contractor but requires architects review and approval for frame color and panel appearance. The PV panel array size shall be limited to the areas as described in the Architectural Drawings. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, System schematic drawings, panel, panel mounts, storage tank and other system equipment information. After review and approval, the SWH Design Build Contractor shall submit all required state (California Solar Initiative) and local Utility and City applications for: financial incentives, interconnection, and building permits. The SWH installation shall be coordinated with the General Contractor.

Environmental Stewardship

- Green Point Rating:** This project has been designed based on recommendations from the Build it Green organization of California and is to be constructed under the review of a certified Green Point Rater to ensure the anticipated green point rating at the completion of the project. Refer to the drawing index for the Green Point Rating Check List.

Environmental Stewardship

- Energy Conservation:** Maximize energy conservation strategies in order to reduce life-cycle energy requirements. Reduce undesirable heat gain and heat loss through the exterior envelope. Use daylight as the primary lighting source and supplement with integrated and energy efficient electrical lighting systems. Choose equipment with high-end energy performance characteristics, including lighting, HVAC systems, appliances and office equipment. Where appropriate, use thermal storage strategies such as thermal mass of the building or ground to minimize total energy consumption. Design Mechanical systems for efficient operation throughout the typical operating range, from minimum peak load.

Environmental Stewardship

- Sustainable Site Planning and Landscaping:** Maximize erosion and sedimentation control. Minimize site disturbance. Maximize planted areas. Reduce heat island effect. Where possible, reduce or eliminate light pollution from light lighting. Reduce or eliminate use of pesticides. Rely on indigenous, dry or xeriscape planting. Maintain existing planting on site to reduce costs. Implement seasonal plant and soil maintenance schedule to maintain healthy soil and landscaping. Minimize storm water runoff. Reduce water use with efficient irrigation systems and local vegetation.

Environmental Stewardship

- Durable & Resource Efficient Materials:** Select materials with long and useful service life, with surfaces that minimal or no refinishing or resurfacing, with protective coating requirements that do not involve frequent application of toxic or odorous renewal and protection, that can be reused or recycled after their service life in this building. Where possible and allowable by the Agency and Code with jurisdiction over the project, re-use existing building materials to the extent feasible within the design concept expressed in the Construction Documents. Use construction practices such as material reduction and dimensional planning that maximize efficient use of resources and materials. Where possible, select materials harvested and manufactured regionally, within a 500-mile radius of the project site.

Environmental Stewardship

- Pollution:** Select materials that generate the least amount of pollution during mining, manufacturing, transportation, installation, use and disposal. Avoid materials that emit greenhouse gases, that contain ozone-depleting chemicals, that emit potentially harmful volatile organic compounds (VOCs). Avoid materials that can leach harmful chemicals into the ground water. Protect and restore natural habitats where feasible within scope of project.

Environmental Stewardship

- Wood Products:** Use woods from Forest Stewardship Council (FSC) accredited certified sustainable harvested resources. Composite wood products with high-recycled content, which meet the indoor air quality data requirements, are acceptable.

Environmental Stewardship

- Water Efficiency:** Reduce the use of municipally supplied water. Reduce dependence on municipal storm water systems for plumbing fixtures and irrigation.

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The seal symbol denotes a Green Build Specification item as to be scoped as Base Contract Bid.
The General Contractor is to provide the Owner & Architect alternate pricing for specific items which have substantial cost impacts for this project.

Scale Project

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MAKE THEM GREEN

01.00.00 General Requirements

SCOPE: The Work defined in the Contract Documents and summarized herein consists of Green Build Improvements to include: re-certification of House with Green Point Rating for Existing Homes, New Solar Water Heating system, New hydronic fancoil forced air system in attic if 1910 House, and reinstallation of existing attic insulation for compliance with Quality Insulation Installation (QII) requirements.

- Not in Contract:** Items marked (NIC) on the drawings or noted in the specifications are not to be furnished or installed as part of this Contract. Provide for (NIC) items or Owner-furnished items as shown or specified. Provide all necessary or rough-in sub-outs, caps, pull wires, cables, backing, protection and other work as may be required for installation of (NIC) items or Owner-furnished items.
- Drawings:** The drawings are necessarily diagrammatic and indicate only general arrangements, and the specifications are necessarily descriptive and indicate only general aspects, insofar as related to requirements for the various items of material, equipment and apparatus required. Extreme accuracy in regard to said requirements cannot be guaranteed. Drawings indicate general arrangement and location of such items as piping, conduit, ductwork, apparatus, and equipment. The drawings and specifications are for the guidance of the Contractor and the exact locations, distances, and levels will be governed by the building site and actual building conditions. The Contractor shall make minor changes from arrangements or locations shown in order to meet structural or architectural conditions or because of interference with other work without expense to Owner. Keep one copy of all contract documents, including all approved drawings, shop and setting drawings, specifications, addenda, and Change Orders, complete and in good order, at the job site and available to representatives of the Owner, the Architect, and public agencies having jurisdiction.
- Complete Work:** Items listed under each section of the specifications are not necessarily all inclusive. The Contractor shall be responsible for the complete work.
- Design Build Systems Scope:** The Contract Documents require the design and construction of various systems which could include Fireprotection, Plumbing, Mechanical (HVAC) and Electrical. The scope of Design Build work shall be as identified in the Project Team list.
- Design Build Systems:** Contractor acknowledges that it shall be responsible for the design-build work, including the design, method of construction, and coordination and integration with other trades, required to achieve the architectural design intent of the Contract Documents, including siting, sequencing, placement, and details of construction. Contractor guarantees the design-build work shall be constructed in compliance with building codes and ordinances in effect and shall be fit and proper for its intended use. Contractor guarantees the design and method of construction of the design-build work shall not incorporate or employ the use of any product, process or technique which may be protected by common law or statutory patent, copyright or trade secret rights unless Contractor or subcontractor shall be the lawful owner or licensee of same. Contractor agrees to and does hereby indemnify and hold harmless Owner and their consultants from any and all claims, damages and expenses resulting from breach or failure by Contractor to perform fully any of the foregoing obligations, and specifically agrees to indemnify and hold Owner harmless from any and all claims of its own employees, agents, subcontractors, suppliers or third parties and to make good any damages to the Work, and attorneys' fees and investigation costs resulting from the inadequacies of the design techniques or methods of construction of the design-build Work. The design and the drawings & specifications for the techniques & method of construction of the design-build work shall be prepared and shall result in work which is fit to perform its intended purpose. Contractor shall cause such plans & specifications to be prepared, stamped and signed by qualified, registered, licensed engineers authorized to practice their professions under the laws of the State of California.

- Contract Administration by Contractor:** Contractor shall perform general administration, supervision, coordination, and other duties as required; and establish and control record, processing submittals, change orders, and holding job conference and other work as may be required for the Work and in accordance with the Contract Documents.

- Verifying Conditions:** Verify measurements in field, as required for Work fabricated to fit job conditions. Before starting Work, examine adjoining work on which installation is in any way dependent for perfect workmanship and fit. Give written notification of any existing deficiencies detrimental to proper and timely installation of work.
- Limit of Work:** The entire space as indicated on the Drawings is defined as the "LIMIT OF WORK". Confine operations to areas within the "LIMIT OF WORK" except for utility work and any other off-site work shown or specified. Baricades or fences, as approved, may be used during the course of construction and removed upon completion of the project. Store materials and equipment only within the "LIMIT OF WORK" or in areas approved by the Owner. Move equipment, as necessary, to accomplish work in areas outside the "LIMIT OF WORK" and replace and clean up affected areas after each increment of work.
- Site Layout:** Site data and building dimensions indicated on the Drawings are as exact as could be obtained, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, and similar data shall be governed finally by field conditions and the Architect's instructions. Contractor shall verify on site the location and depth (elevation) of all existing utilities and services before performing any excavation work.
- General Contractor Coordination:** Coordinate all portions of the Work of the Subcontractors for the Project.
- Utility Coordination:** The Contractor's attention is directed to the existence of pipelines, conduits and other utilities which may be buried within the limits of the work or adjacent thereto, and which may or may not be shown on the Drawings and which may or may not be "live". Every precaution shall be taken to preserve and protect "live" improvements from injury or damage during construction operations. It shall be the sole responsibility of the Contractor to repair or replace, to the satisfaction of the utility company involved, any damage to the utilities caused by the Contractor's work, whether or not those utilities are indicated on the Drawings.
- Subcontractor Coordination:** Coordinate HVAC, Plumbing, Electrical, and Structural Work to resolve potential conflicts in location of piping, conduit and equipment and sound control issues. Prepare layout drawings and review the layout drawings, Shop Drawings and Product Data of other Subcontractors as required. Conduct and review the coordination process and notify the Architect in writing of any conflicts before proceeding with fabrication and installation of mechanical and electrical systems.
- Mechanical and Electrical Subcontractors:** Coordinate HVAC, Plumbing, Electrical, and Structural Work to resolve potential conflicts in location of piping, conduit and equipment and sound control issues. Prepare layout drawings and review the layout drawings, Shop Drawings and Product Data of other Subcontractors as required. Conduct and review the coordination process and notify the Architect in writing of any conflicts before proceeding with fabrication and installation of mechanical and electrical systems.
- Pre-Construction Conference:** Conduct a meeting between the Owner, Contractor and Architect prior to the start of the various phases of the construction to discuss and familiarize all concerned with the Contract Documents, on-site lines of authority and communication, procedures, correspondence, schedules, safety, and attend all General Requirements. Major Subcontractors invited to attend shall have their responsible Foremen or Superintendents present.
- Progress Meetings:** Conduct regular progress meeting at the Project site, attended by the Owner, Architect, and Subcontractors and suppliers as appropriate to the agenda, to discuss and review the Project. Suggested agenda items are: work progress and construction schedule, field observations, work quality, detection and resolution of problems and conflicts, coordination, pending changes or substitutions, submittals and safety.
- Cutting and Patching:** Examine existing conditions of the Project, cutting and patching. After uncovering work, examine the conditions affecting the installation of products or performance of the Work. Report unsatisfactory or questionable conditions to the Architect in writing. (The cost associated with this work shall be the Contractor's responsibility.)

- Quality Control:** The work of the Contract shall be subject to the inspection and observation of the City's Building Inspection Representative. Contractor shall provide access to the work and shall furnish the City's Building Inspection Representative reasonable facilities for obtaining such information as may be necessary to keep fully informed respecting the work.
- Existing Conditions:** The Contractor shall be held to have examined the building site and to have compared it with the Drawings and Specifications; to have carefully examined all the Contract Documents; and to have satisfied himself as to the conditions under which the Work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the Contractor on account of an error on his part or his negligence or failure to acquaint himself with the conditions of the Work. Inspection of the work shall not relieve the Contractor from any obligation to fulfill any portion of this Contract. Shop and field work shall be performed by mechanics, craftsmen, and workers skilled and experienced in the fabrication and installation of the work involved. All work on the project shall be performed in accordance with the best accepted practices of the various trades involved and in accordance with the Drawings, reviewed shop drawings, and these Specifications. All work shall be erected and installed plumb, level, square and/or true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. Finished work shall be free from defects and damage. The Architect reserves the right to reject any materials and/or work quality which is not considered to be up to the highest standards of the various trades involved. Such inferior material or work-quality shall be repaired or replaced, as directed, at no additional cost to the Owner.
- Quality Control:** The work of the Contract shall be subject to the inspection and observation of the City's Building Inspection Representative. Contractor shall provide access to the work and shall furnish the City's Building Inspection Representative reasonable facilities for obtaining such information as may be necessary to keep fully informed respecting the work.
- Testing Laboratory Services:** The Contractor shall coordinate the services of the Testing Laboratory Agency, Soils Engineer or Inspectors, selected and paid for by the Owner, as necessary to fulfill the requirements of the Contract Documents. Such testing laboratory or agency shall supervise the preparation and selection of samples required for testing. Owner shall pay for initial inspections and tests required by the various technical sections of the specifications unless specifically noted to be paid for by the Contractor. Contractors shall pay for any additional tests and inspections by Contractor's or Owner's testing laboratory or agency when initial tests and inspections reveal failure to meet contract requirements. Contractor shall be responsible for notification to the Testing Agency(ies) and the City Inspector(s) for all required inspections. Adequate notice shall be provided to allow the inspector(s) to become familiar with the Project.
- Reference Standards:** For Work specified by reference to standard specifications of agencies or societies (ASTM, AISC, Federal Specifications, etc.) or the standard specifications of trade associations (IGA, TCA, etc.), comply with the applicable requirements of the latest revision and supplements in effect on the date of receipt of bids, unless otherwise specified. Reference standard specifications have the same force as if they were printed in full context within the Specification, except as modified in the Section. For Work specified by reference to the written specifications or other literature of a manufacturer, comply with the applicable requirements of the latest revision and supplements in effect on the date the material is furnished and/or installed. Referenced manufacturer's specifications and literature have the same force as if they were printed in full context within the Specification, except as modified in the Section. For Work specified by reference to the written Specifications of specific equipment, Report, Title 24 Compliance Report, or report (comply with the applicable requirements of the latest revision and supplements in effect on the date Work is performed. Referenced reports have the same force as if they were printed in full context within the specification except as modified by the Section.
- Safety:** Exercise precaution at all times for the protection of persons and property. Observe the safety provisions of all applicable laws, building and construction codes. Eliminate attractive nuisances from the Work and from the Site. In no case shall the Owner or Architect be responsible for construction means.

- Dust Control:** Abate any dust nuisance on or about the Project which are a result of construction activities.
- Temporary Facilities:** Provide and pay for necessary temporary power, light, and water required during the course of construction of the Project. Furnish, install, and pay for meters, equipment, wiring, and piping necessary to provide such utilities.
- Security:** Provide and maintain barriers, security measures, and other facilities as required to protect the Work from unauthorized entry, vandalism, and theft. Also provide and maintain barriers to protect adjacent spaces from damage from construction operations.
- Protection of Work:** Protect the various materials, work, equipment and finishes provided by the several trades from other operations or work such that all items are in satisfactory condition at the Date of Substantial Completion. The final responsibility for this protection rests with the Contractor even though various Sections may contain specific comments or precautions about protection.
- Prior to Final Inspection:** Temporary facilities and utilities shall be properly disconnected, removed and disposed of off-site. Leave all systems, equipment and devices in full and proper adjustment and operation and properly labeled and identified. All materials and finishes shall be neat, clean and unmarked with parts securely attached. Replace or properly repair all broken work including glass, equipment, etc. Deliver and store on the premises as directed all extra materials as specified. Assemble all guarantees, manuals and other Submittals for delivery as directed by the Architect.
- Final Inspection:** Upon receipt of written notice that the work is ready for final inspection and acceptance, the Architect and the Contractor shall promptly make a joint inspection of the work and note all deficiencies, if any. If there are no deficiencies, or when noted deficiencies have been removed and they find the work under Contract fully performed and acceptable, the Architect will promptly notify the Owner accordingly. Notice shall be deemed that the Contractor has carefully inspected all portions of the work, that he has reviewed in detail the drawings and the specifications and that all conditions of the Contract Documents have been fulfilled. All subcontractors shall review, inspect and otherwise check their work for compliance with all conditions of the Contract Documents.
- Owner Occupancy:** The Contractor shall allow the Owner to take possession of and use any completed or partially completed portion of the Work as soon as is possible without interference to the Work. Possession, use of space or Work, and placing and installation of equipment by Owner shall not in any way evidence the completion of the Work or any part of it.

01.80.00 Special Environmental Requirements

SUMMARY: This work includes special environmental, sustainable, and "green" building practices related to community/housing enhancement, energy conservation and efficiency, indoor air quality, resource conservation, and water conservation. The Construction Team is required to comply with sustainable building practices during construction and when considering materials for substitutions. The Contract Documents are not intended to limit alternative means of achieving these environmental goals. Suggestions from the

- Existing condition energy conservation / indoor air quality analysis Building Performance Testing:** The Building Performance Tester shall be a specialist within the field with a minimum of 5 years selective demolition of any portion of the existing structure, a building performance test shall be done, to include: Site inspection of the exterior shell, crawl space inspection, attic inspection, carbon monoxide testing, visual inspection of combustion appliances, air infiltration test with Blower Door test and IR camera, evaluate air ventilation devices, visual inspection of all exhaust fans, insulation performance inspection, Heating equipment combustion analysis. Visual inspection of heating equipment, cooling equipment, evaluation, waterheater fuel gas analysis and visual inspection of the water heater.

system equipment information. After review and approval, the PV Design Build Contractor shall submit all required state (California Solar Initiative) and local Utility and City applications for: financial incentives, interconnection, and building permits. The PV installation shall be coordinated with the General Contractor.

Renewable Energy

- Solar Hot Water Heating Systems Design Build Performance:** The Solar Hot Water Heating systems (SHWH) Design Build Contractor shall be a specialist within the field with a minimum of 5 years design and installation experience. The hot water load estimates for the residence shall be based on one years utility bills, for existing structures, or load estimates based on the architectural design and hot water load estimates. When the heating system for the residence also includes hydronic fancoil units the space heating and SHWH system shall be designed by a registered Mechanical Engineer in accordance with Manual J, D & S requirements. The solar insulation resource estimates shall be based on: average peak-sun hours, panel tilt, panel orientation, and potential shading of the panels. Panel shading for existing conditions shall be determined by the Solar Access at the 4 corners of the array installation with a Solar Pathfinder or digital Solmetric Sun Eye instrument or equal. Panel shading for new construction shall be estimated based field observations of adjacent structures and new planning plans. The SHWH Panel manufacturer shall be selected by the Design Build Contractor or as shown on drawings, but requires architects review and approval for frame color and panel appearance. The PV panel array size shall be limited to the areas as described in the Architectural Drawings. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, System schematic drawings, panel, panel mounts, storage tank and other system equipment information. After review and approval, the SHWH Design Build Contractor shall submit all required state (California Solar Initiative) and local Utility and City applications for: financial incentives, interconnection, and building permits. The SHWH installation shall be coordinated with the General Contractor.

Environmental Stewardship

- Green Point Rating:** This project has been designed based on recommendations from the Build it Green organization of California and is to be constructed under the review of a certified Green Point Rater to ensure the anticipated green point rating at the completion of the project. Refer to the drawing index for the Green Point Rating Check List.

Environmental Stewardship

- Energy Conservation:** Maximize energy conservation strategies in order to reduce life-cycle energy requirements. Reduce undesirable heat gain and heat loss through the exterior envelope. Use daylight as the primary lighting source and supplement with integrated and energy efficient electrical lighting systems. Choose equipment with high-end energy performance characteristics, including lighting, HVAC systems, appliances and office equipment. Where appropriate, use thermal storage strategies such as thermal mass of the building or ground to minimize total energy consumption. Design Mechanical systems for efficient operation throughout the typical operating range, from minimum peak load.

Environmental Stewardship

- Sustainable Site Planning and Landscaping:** Maximize erosion and sedimentation control. Minimize site disturbance. Maximize planted areas. Reduce heat island effect. Where possible, reduce or eliminate light pollution from light lighting. Reduce or eliminate use of pesticides. Rely on indigenous, dry or xeriscape planting. Maintain existing planting on site to reduce costs. Implement seasonal plant and soil maintenance schedule to maintain healthy soil and landscaping. Minimize storm water runoff. Reduce water use with efficient irrigation systems and local vegetation.

Environmental Stewardship

- Durable & Resource Efficient Materials:** Select materials with long and useful service life, with surfaces that minimal or no refinishing or resurfacing, with protective coating requirements that do not involve frequent application of toxic or odorous materials and protection, that can be reused or recycled after their service life in this building. Where possible and allowable by the Agency and Code with jurisdiction over the project, re-use existing building materials to the extent feasible within the design concept expressed in the Construction Documents. Use construction practices such as material reduction and dimensional planning that maximize efficient use of resources and materials. Where possible, select materials harvested and manufactured regionally, within a 500-mile radius of the project site.

Environmental Stewardship

- Pollution:** Select materials that generate the least amount of pollution during mining, manufacturing, transportation, installation, use and disposal. Avoid materials that emit greenhouse gases, that contain ozone-depleting chemicals, that emit potentially harmful volatile organic compounds (VOCs). Avoid materials that can leach harmful chemicals into the ground water. Protect and restore natural habitats where feasible within scope of project.

Environmental Stewardship

- Wood Products:** Use woods from Forest Stewardship Council (FSC) accredited certified sustainable harvested resources. Composite wood products with high-recycled content, which meet the indoor air quality data requirements, are acceptable.

Environmental Stewardship

- Water Efficiency:** Reduce the use of municipally supplied water. Reduce dependence on municipal storm water systems for plumbing fixtures and irrigation.



-Existing condition energy conservation / indoor air quality analysis

1. Building Performance Testing: The Building Performance Tester shall be a specialist within the field with a minimum of 5 years

Drawings and Specifications; to have carefully examined all the conditions under which the Work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the Contractor on account of an error on his part or his negligence or failure to acquaint himself with the conditions of the Work.

adopted by the City of Sunnyvale in effect on the date of receipt of bids. Nothing in Drawings or these Specifications is to be construed as requiring or permitting work that is contrary to these rules, regulations and codes.

employees' cars to areas designated by the Owner or City.

- Non-Construction Noise and Activity:** Comply with the Owner's policies to eliminate or limit the playing of radios, tape decks or other noise sources caused by construction personnel and occurring in areas where such noise would constitute a nuisance in the Owner's opinion. The consumption of alcoholic beverages on the Project is strictly prohibited.

approval for frame color and panel appearance. The PV Design-Build contractor shall evaluate the system options utilizing the California Solar Initiative's Expected Performance Based Byrdcon Calculator. The PV panel array size shall be limited to the areas as described in the Architectural Drawings, and, or by the Expected Performance Based Byrdcon analysis. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, System schematic drawings, panel, panel mounts, inverter and other

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The best system deserves a Green Point Rating and a LEED certification. Green Build Specifications: Green Build specifications items are to be scoped as Base Contract Bid. The General Contractor is to provide the Owner & Architect alternate pricing for specific items which have substantial cost impacts for this project.

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Environmental Stewardship

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2003

MAKE THEM GREEN

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The leaf symbol denotes a Green Build specification item and its contribution to sustainability aspects of this project.

The General Contractor is to provide the Owner & Architect alternate pricing for specific items which have substantial cost impacts for this project.

system equipment information. After review and approval, the PV Design Build Contractor shall submit all required state (California Solar Initiative) and local utility and City applications for financial incentives, interconnection, and building permits. The PV installation shall be coordinated with the General Contractor.

3. Solar Hot Water Heating Systems Design Build Performance: The Solar Hot Water Heating systems (SWH) Design Build Contractor shall be a specialist within the field with a minimum of 5 years design and installation experience. The hot water load estimates for the residence shall be based on one year's utility bills, for existing structures, or load estimates based on the architectural design and hot water load estimates. When the heating system for the residence also includes hydronic fancoil units the space heating and SWH system shall be designed by a registered Mechanical Engineer in accordance with Manual J, D & S requirements. The solar insulation resource estimates shall be based on: average peak-sun hours, panel tilt, panel orientation, potential shading of the panels. Panel shading for existing construction shall be determined by the Solar Pathfinder or digital Solmetric Sun Eye instrument or equal. Panel shading for new construction shall be estimated based field observations of adjacent structures and new planning plans. The SWH Panel manufacturer shall be selected by the Design Build Contractor or as shown on drawings, but requires architects review and approval for frame color and panel appearance. The PV panel array size shall be limited to the areas as described in the Architectural Drawings. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, system schematic drawings, panel, panel mounts, storage tank and other system equipment information. After review and approval, the SWH Design Build Contractor shall submit all required state (California Solar Initiative) and local utility and City applications for financial incentives, interconnection, and building permits. The SWH installation shall be coordinated with the General Contractor.

4. Green Point Rating: This project has been designed based on recommendations from the Build it Green organization of California and is to be constructed under the review of a certified Green Point Rating. Ensure the anticipated green point rating at the completion of the project. Refer to the drawing index for the Green Point Rating Check List.

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7. Durable & Resource Efficient Materials: Select materials with long and useful service life, with surfaces that minimal or no refinishing or resurfacing, with protective coating requirements that do not involve frequent application of toxic or odorous renewal and protection, that can be reused or recycled after their service life in this building. Where possible and allowable by the Agency and Code with jurisdiction over the project, re-use existing building materials to the extent feasible within the design concept expressed in the Construction Documents. Use construction practices such as material reduction and dimensional planning that maximize efficient use of resources and materials. Where possible, select materials harvested and manufactured regionally, within a 500-mile radius of the project site.

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10. Water Efficiency: Reduce the use of municipally supplied water. Reduce dependence on municipal storm water systems for plumbing fixtures and irrigation.



Scale Project

Specifications

A0.4



The leaf symbol denotes a Greenbuild Item and its contribution to sustainability aspects of this project.

Green Build Specifications:
Green Build specification items are the Base Contract Bid.

The General Contractor is to provide the Owner & Architect alternate pricing for specific items which have substantial cost impacts for this project.

he Contractor shall be subject to the if the City's Building Inspection all provide access to the Building Inspection Representative ing such information as may be l respecting the work.

ontractor shall be held to have id to have compared it with the o have carefully examined all the have satisfied himself as to the is to be performed before entering e shall subsequently be made on out of an error on his part or his t himself with the conditions of the all not relieve the Contractor from on of this Contract. Shop and field echanics, craftsmen, and workers fabrication and installation of the he project shall be performed in fed practices of the various trades with the Drawings, reviewed shop ons. All work shall be erected and ditor true, or true to indicated angle, relationship to the work of other free from defects and damage. The reject any materials and/or work is to be up to the highest standards of ch interior material or work-quality is directed, at no additional cost to

he Contract shall be subject to the if the City's Building Inspection all provide access to the work and liding Inspection Representative ing such information as may be l respecting the work.

The Contractor shall coordinate the story Agency, Solls Engineer or r by the Owner, as necessary to Contract Documents. Such testing nwise the preparation and selection ing. Owner shall pay for initial ty the various technical sections of locally noted to be paid for by the pay for any additional tests and wern's testing laboratory or agency ns reveal failure to meet contract e responsible for notification to the City Inspector(s) for all required shall be provided to allow the with the Project.

Work specified by reference to ncies or societies (ASTM, ACP, the standard specifications (ACI, J), comply with the applicable on and suppliers in effect on the s otherwise specified. Reference same force as if they were printed fication, except as modified in the l by reference to the written of a manufacturer, comply with the applicable requirements of the latest revision and supplements in effect on the date the material is furnished and/or installed. Referenced manufacturer's specifications and literature have the same force as if they were printed in full context within the Specification, except as modified in the Section. For Work specified by reference to the written Specifications of specific equipment, Report, Title 24 Compliance Based on report) comply with the applicable requirements of the latest revision and supplements in effect on the date Work is performed. Referenced reports have the same force as if they were printed in full context within the specification except as modified by the Section.

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employees' cars to areas designated by the Owner or City.

28. Non-Construction Noise and Activity: Comply with the Owner's policies to eliminate or limit the playing of radios, tape decks or other noise sources caused by construction personnel and occurring in areas where such noise would constitute a nuisance in the Owner's opinion. The consumption of alcoholic beverages on the Project is strictly prohibited.

29. Dust Control: Abate any dust nuisance on or about the Project which are a result of construction activities.

30. Temporary Facilities: Provide and pay for necessary temporary power, light, and water required during the course of construction of the Project. Furnish, install, and pay for meters, equipment, wiring, and piping necessary to provide such utilities.

31. Security: Provide and maintain barriers, security measures, and other facilities as required to protect the Work from unauthorized entry, vandalism, and theft. Also provide and maintain barriers to protect adjacent spaces from damage from construction operations.

32. Protection of Work: Protect the various materials, work, equipment and finishes provided by the several trades from other operations or work such that all items are in satisfactory condition at the Date of Substantial Completion. The final responsibility for this protection rests with the Contractor even though various Sections may contain specific comments or precautions about protection.

34. Prior to Final Inspection: Temporary facilities and utilities shall be properly disconnected, removed and disposed of off-site. Leave all systems, equipment and devices in full and proper adjustment and operation and properly labeled and identified. All materials and finishes shall be neat, clean and unmarked with parts securely attached. Replace or properly repair all broken work including glass, equipment, etc. Deliver and store on the premises as directed all extra materials as specified. Assemble all guarantees, manuals and other Submittals for delivery as directed by the Architect.

35. Final Inspection: Upon receipt of written notice that the work is ready for final inspection and acceptance, the Architect and the Contractor shall promptly make a joint inspection of the work and note all deficiencies, if any. If there are no deficiencies, or when noted deficiencies have been removed and they find the work under Contract fully performed and acceptable, the Architect will promptly notify the Owner accordingly. Notice shall be deemed that the Contractor has carefully inspected all portions of the work, that he has reviewed in detail the drawings and the specifications and that all conditions of the Contract Documents have been fulfilled. All subcontractors shall review, inspect and otherwise check their work for compliance with all conditions of the Contract Documents.

36. Owner Occupancy: The Contractor shall allow the Owner to take possession of and use any completed or partially completed portion of the Work as soon as is possible without interference to the Work. Possession, use of space or Work or placing and installation of equipment by Owner shall in any way evidence the completion of the Work or any part thereof.

01.85.00 Special Environmental Requirements

SUMMARY: This work includes special environmental, sustainable, and "green" building practices related to community/housing enhancement, energy conservation and efficiency, indoor air quality, resource conservation, and water conservation. The Construction Team is required to comply with sustainable building practices during construction and when considering materials for substitutions. The Contract Documents are not intended to limit alternative means of achieving these environmental goals. Suggestions from the

1. Existing condition energy conservation / indoor air quality analysis Building Performance Testing: The Building Performance Tester shall be a specialist within the field with a minimum of 5 years

selective demolition of any portion of the existing structure, a building performance test shall be done, to include: Site inspection of the exterior shell, crawl space inspection, attic inspection, carbon monoxide testing, visual inspection of combustion appliances, air infiltration test with Blower Door test and IR camera, evaluate air ventilation devices, visual inspection of all exhaust fans, insulation performance inspection, Heating equipment combustion analysis. Visual inspection of heating equipment, cooling equipment analysis. Duct testing including Duct Blaster test, appliance evaluation, waterheater fuel gas analysis and visual inspection of the water heater.

approval for frame color and panel appearance. The PV Design-Build contractor shall evaluate the system options utilizing the California Solar Initiative's Expected Performance Based Byrdcon Calculator. The PV panel array size shall be limited to the areas as described in the Architectural Drawings, and, or by the Expected Performance Based Byrdcon analysis. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, system schematic drawings, panel, panel mounts, inverter and other

and to make good any damages to the Work, and attorneys' fees and investigation costs resulting from the inadequacies of the design techniques or methods of construction of the design-build work. The design and the drawings & specifications for the techniques & method of construction of the design-build work shall be prepared and shall result in work which is fit to perform its intended purpose. Contractor shall cause such plans & specifications to be prepared, stamped and signed by qualified, registered, licensed engineers authorized to practice their professions under the laws of the State of California.

6. Contract Administration by Contractor: Contractor shall perform general administration, supervision, coordination, and other duties as required; and establish and control record, processing submittals, changes orders, attending job conference and other

to attend shall have their responsible Foremen or Superintendents present.

16. Progress Meetings: Conduct regular progress meeting at the Project site, attended by the Owner, Architect, and Subcontractors and suppliers as appropriate to the agenda, to discuss and review the Project. Suggested agenda items are: work progress and construction schedule, field observations, work quality, detection and resolution of problems and conflicts, coordination, pending changes or substitutions, submittals and safety.

17. Cutting and Patching: Examine existing conditions of the Project, cutting and patching. After uncovering work, examine the conditions affecting the installation of products or performance of the Work. Report unsatisfactory or questionable conditions to the Architect in writing. (This work associated with this work could also be associated

applicable requirements of the latest revision and supplements in effect on the date the material is furnished and/or installed. Referenced manufacturer's specifications and literature have the same force as if they were printed in full context within the Specification, except as modified in the Section. For Work specified by reference to the written Specifications of specific equipment, Report, Title 24 Compliance Based on report) comply with the applicable requirements of the latest revision and supplements in effect on the date Work is performed. Referenced reports have the same force as if they were printed in full context within the specification except as modified by the Section.

24. Safety: Exercise precaution at all times for the protection of persons and property. Observe the safety provisions of all applicable laws, building and construction codes. Eliminate attractive nuisances from the Work and from the Site. In no case shall the Owner or Architect be responsible for construction means.



-Existing condition energy conservation / indoor air quality analysis

1. Building Performance Testing: The Building Performance Tester shall be a specialist within the field with a minimum of 5 years

Drawings and Specifications; to have carefully examined all the conditions under which the Work is to be performed before entering into this Contract. No allowance shall subsequently be made on behalf of the Contractor on account of an error on his part or his negligence or failure to acquaint himself with the conditions of the Work.

adopted by the City of Sunnyvale in effect on the date of receipt of bids. Nothing in Drawings or these Specifications is to be construed as requiring or permitting work that is contrary to these rules, regulations and codes.

employees' cars to areas designated by the Owner or City.

approval for frame color and panel appearance. The PV Design-Build contractor shall evaluate the system options utilizing the California Solar Initiative's Expected Performance Based Byrdcon Calculator. The PV panel array size shall be limited to the areas as described in the Architectural Drawings, and, or by the Expected Performance Based Byrdcon analysis. A full system design submittal shall be submitted to the Architect and Owner for review and approval to include: site analysis, system sizing, system schematic drawings, panel, panel mounts, inverter and other

Construction

2005

Construction

2005



Construction

2005



Construction

2005



Construction

2005



Construction

2005



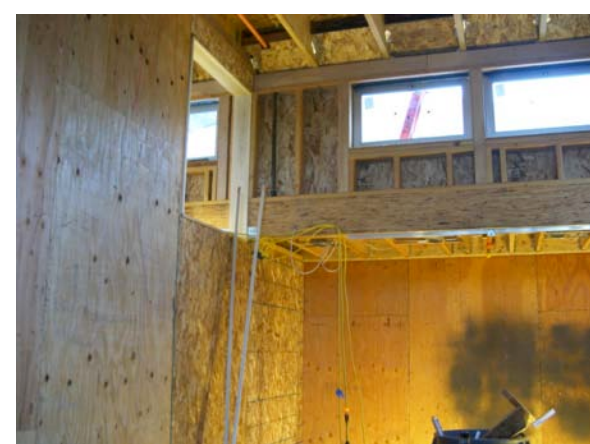
Construction

2005



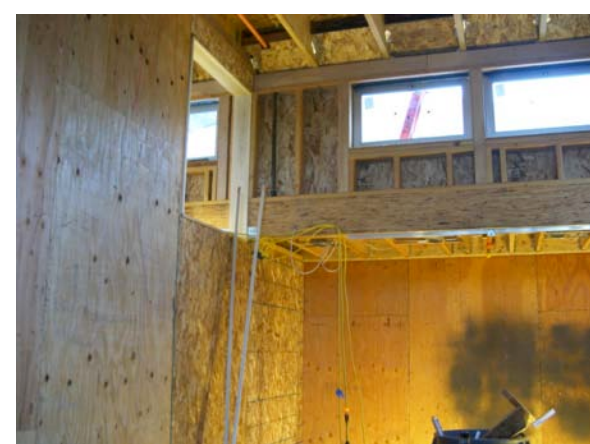
Construction

2005



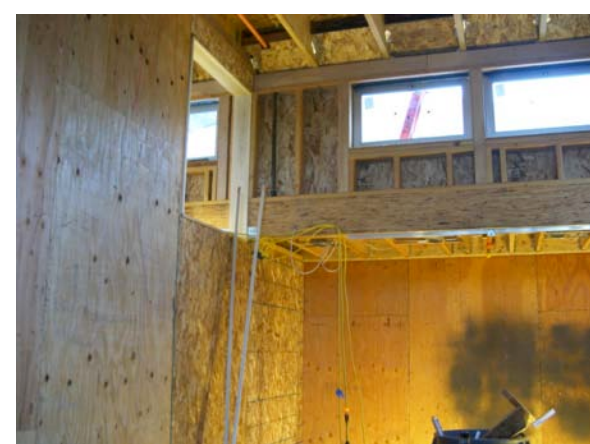
Construction

2005



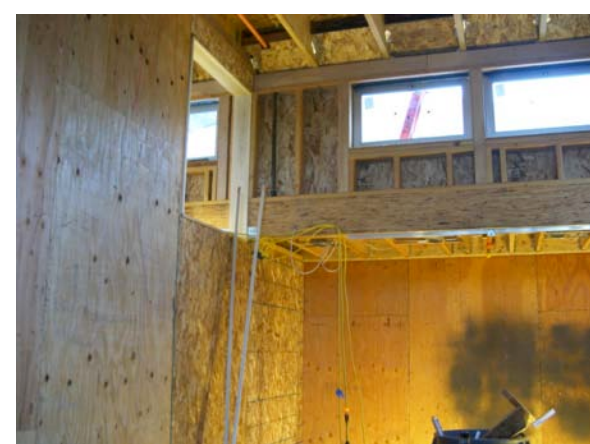
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2005



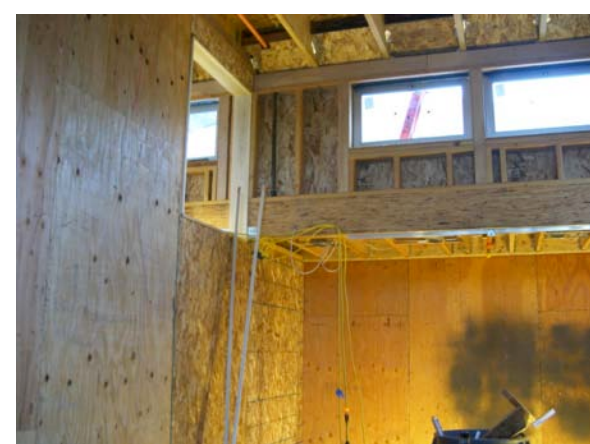
Construction

2005



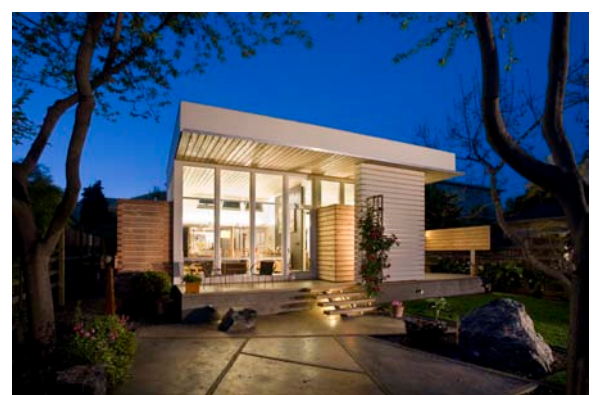
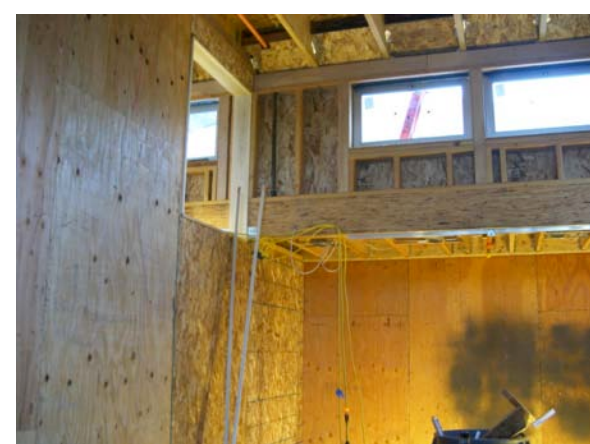
Construction

2005



Construction

2005



Plant Trees First

1990

- Planting trees was the first site improvement. 6 mature mulberry trees keep the property cool in the Summer and provide wildlife habitat.



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Water
Conservation



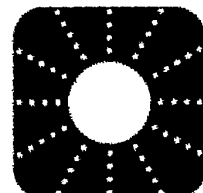
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Water
Conservation



Energy
Conservation



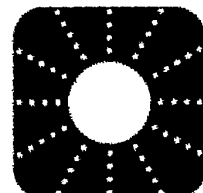
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Water
Conservation



Energy
Conservation



Livable
Communities



Reduce Dirt Entering House

1991



Reduce Dirt Entering House

1991

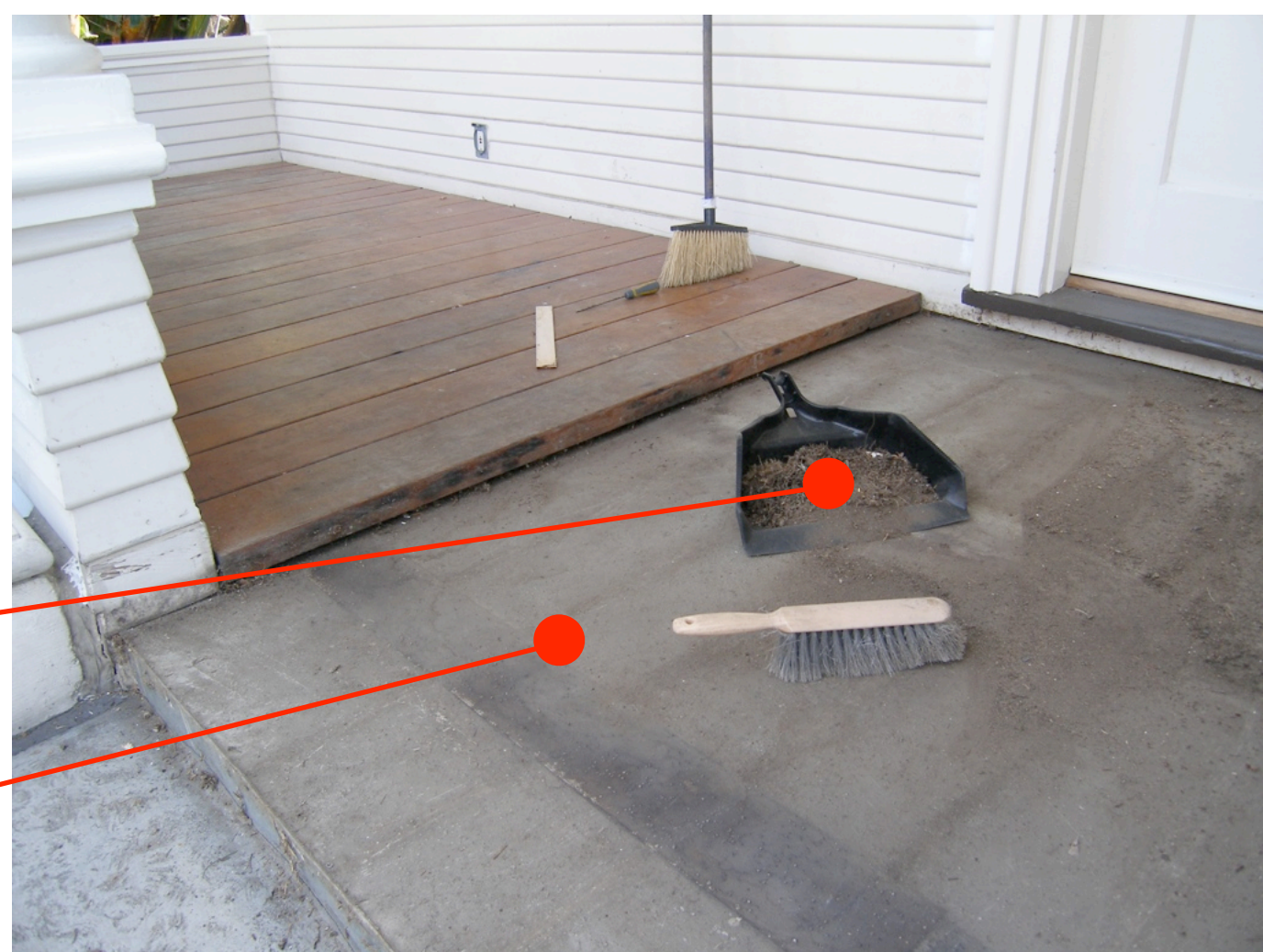
- Removable (salvaged wood) decking over waterproofing traps dirt from shoes before it enters the house



Reduce Dirt Entering House

1991

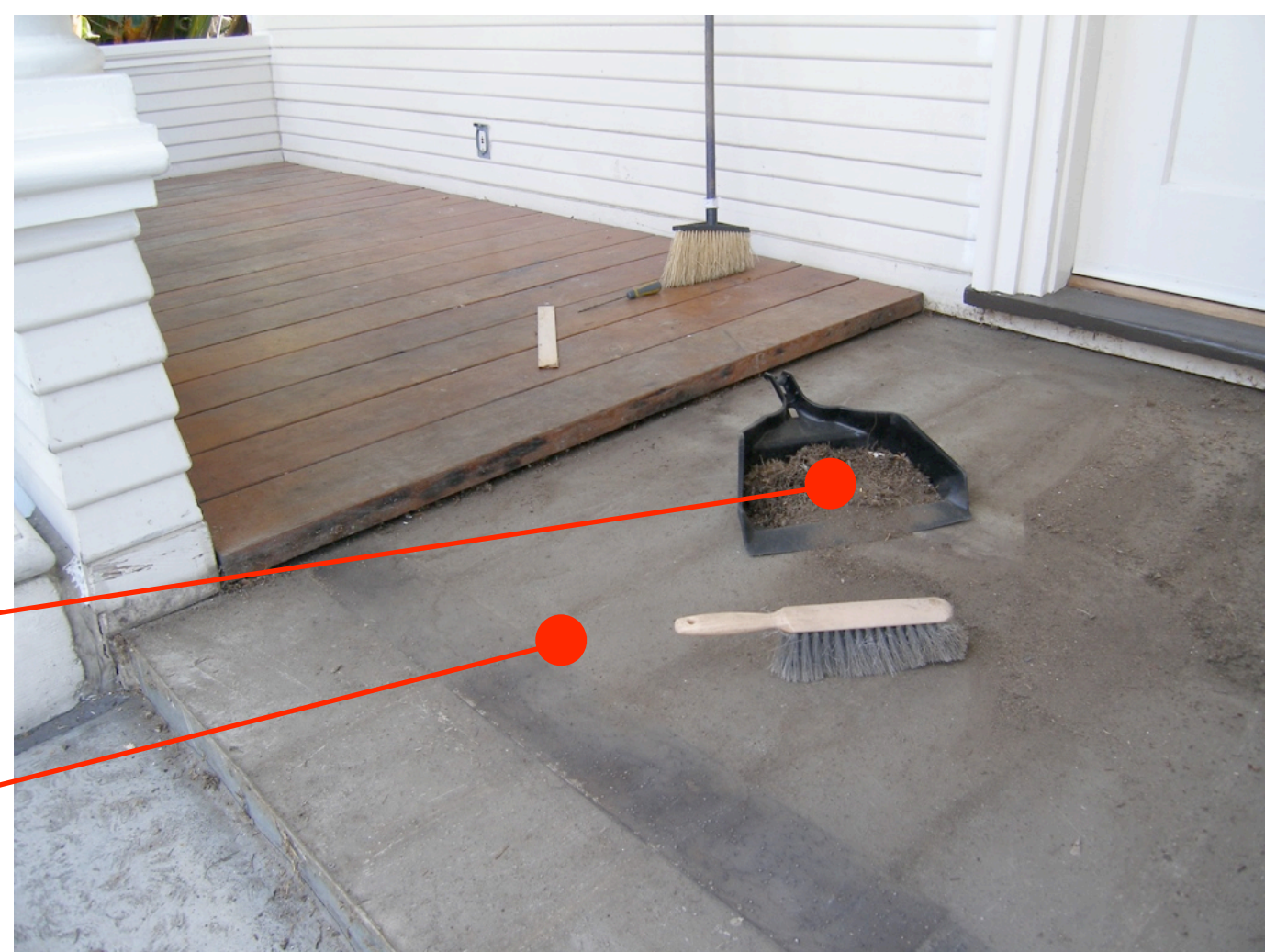
- Removable (salvaged wood) decking over waterproofing traps dirt from shoes before it enters the house
- Waterproofing



Reduce Dirt Entering House

1991

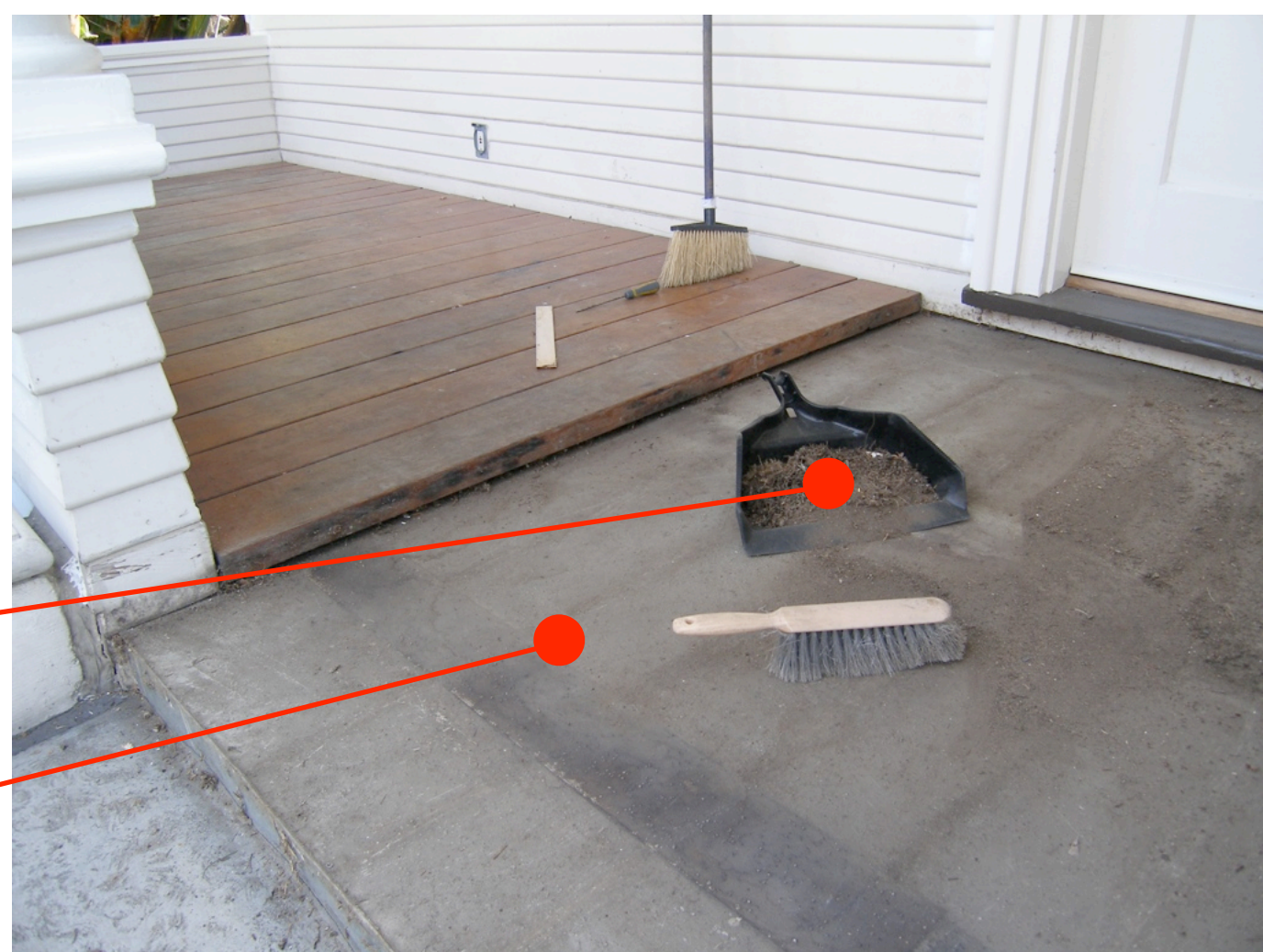
- Removable (salvaged wood) decking over waterproofing traps dirt from shoes before it enters the house
- Waterproofing
- The decking is removed in sections



Reduce Dirt Entering House

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- Removable (salvaged wood) decking over waterproofing traps dirt from shoes before it enters the house
- Waterproofing
- The decking is removed in sections
- Easy to refinish



Reduce Dirt Entering House

1991

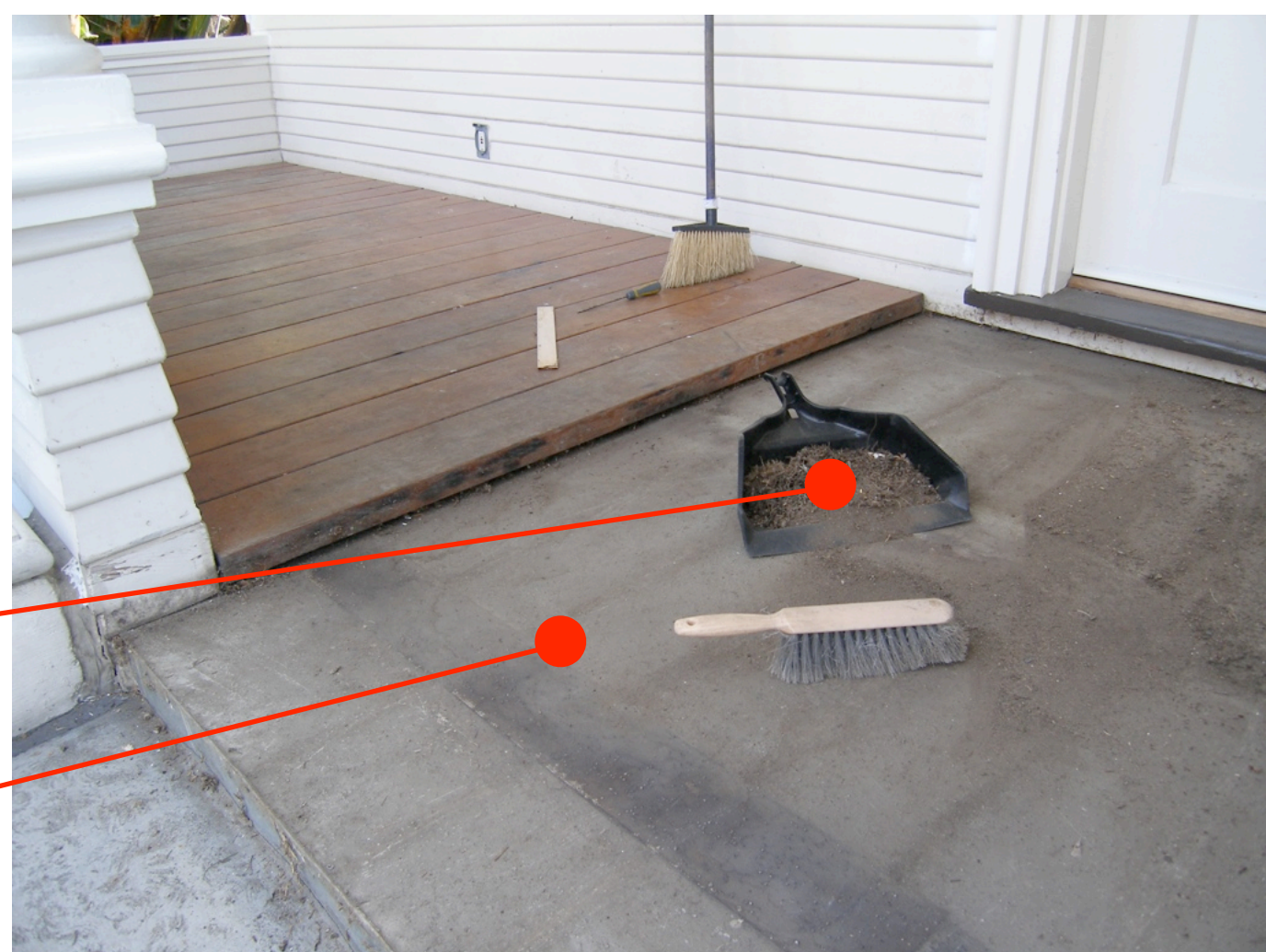
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Reclaimed & Salvaged Paving

1991



Reclaimed & Salvaged Paving

1991

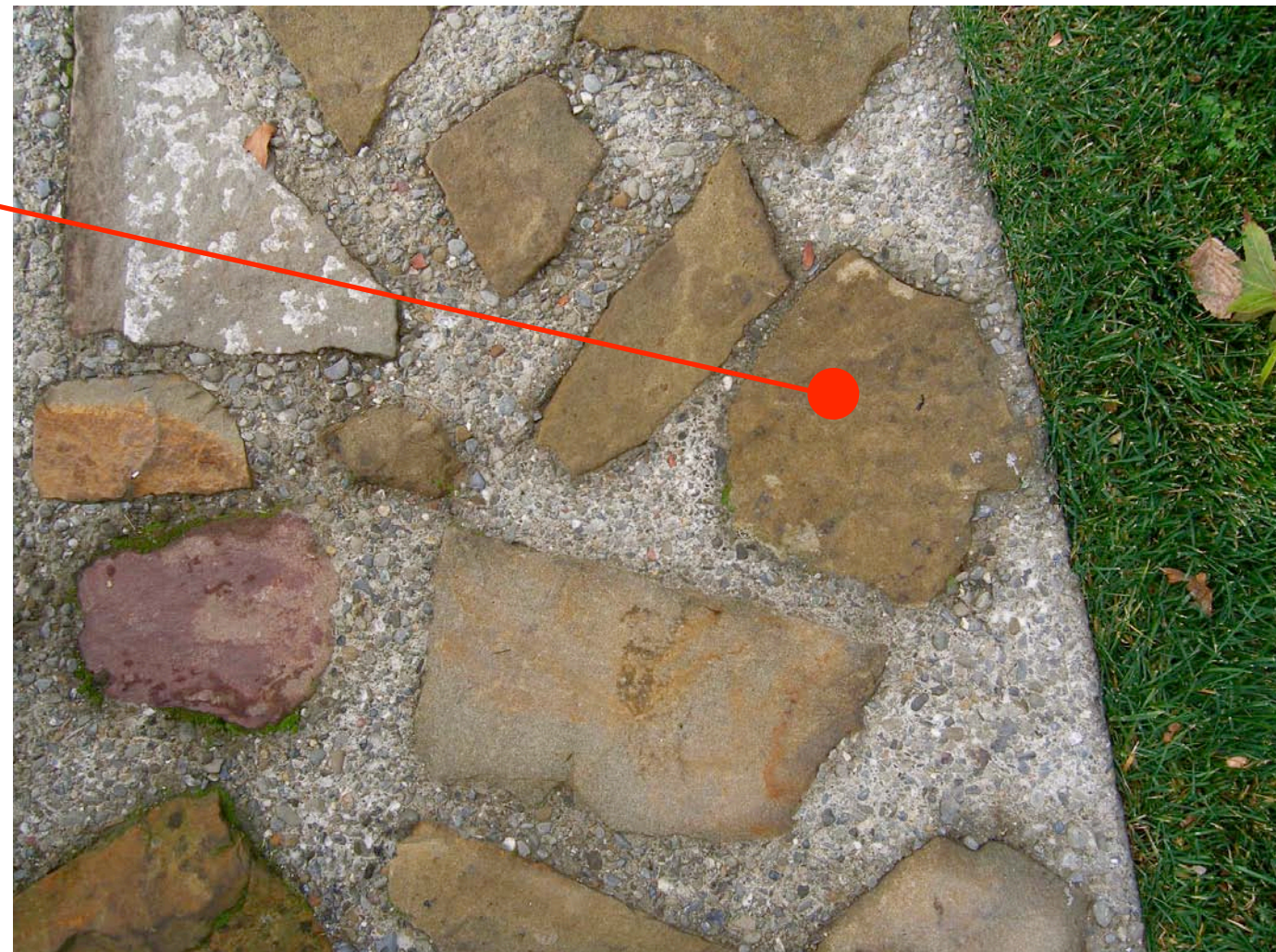
- Reclaimed Paving: Existing Concrete walkways were broken into small pieces, reshaped and in-filled with a colored concrete mix.



Reclaimed & Salvaged Paving

1991

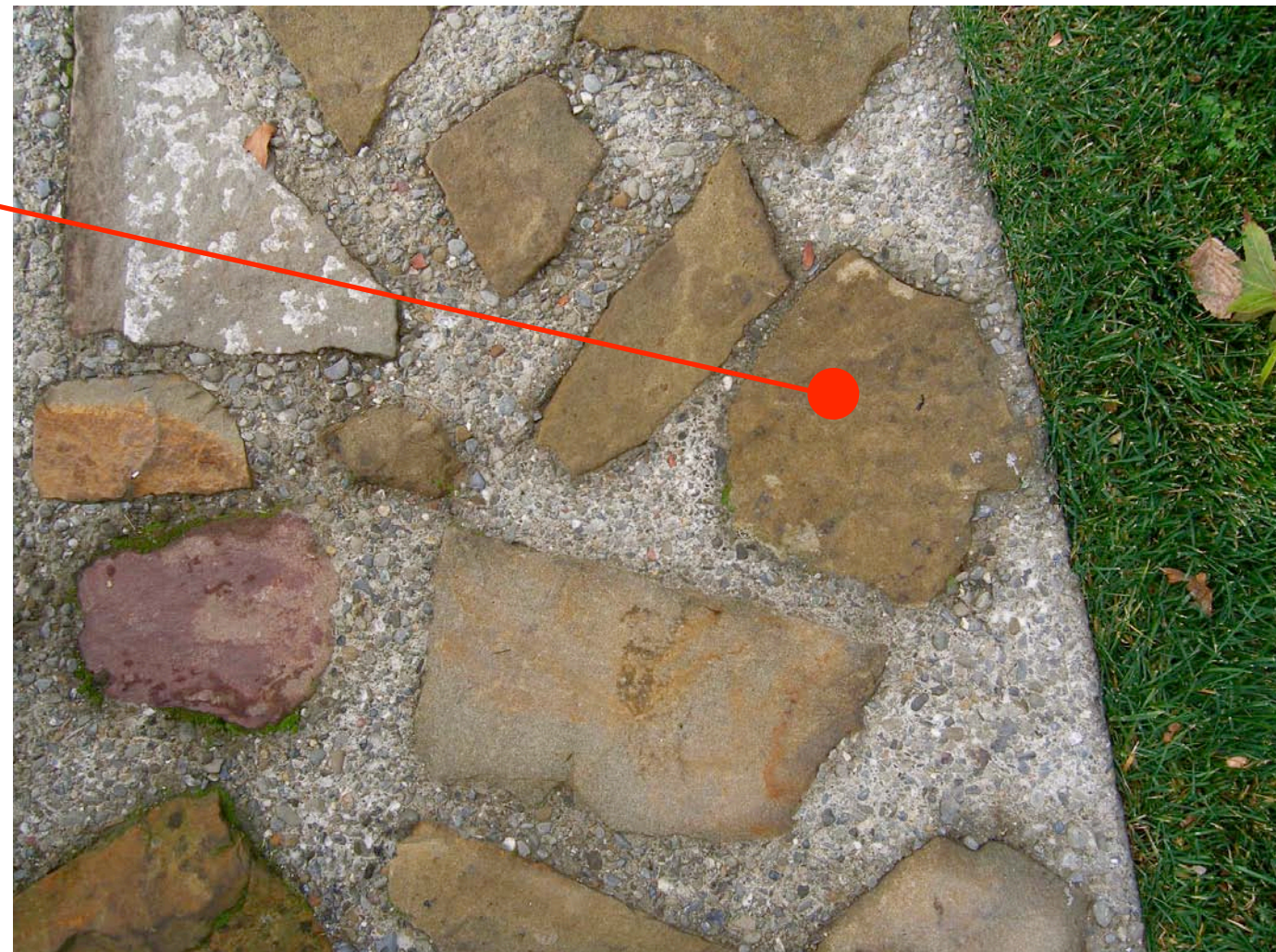
- Reclaimed Paving: Existing Concrete walkways were broken into small pieces, reshaped and in-filled with a colored concrete mix.
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Reclaimed & Salvaged Paving

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- Reclaimed Paving: Existing Concrete walkways were broken into small pieces, reshaped and in-filled with a colored concrete mix.
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Resource
Conservation

Gravel as Paving

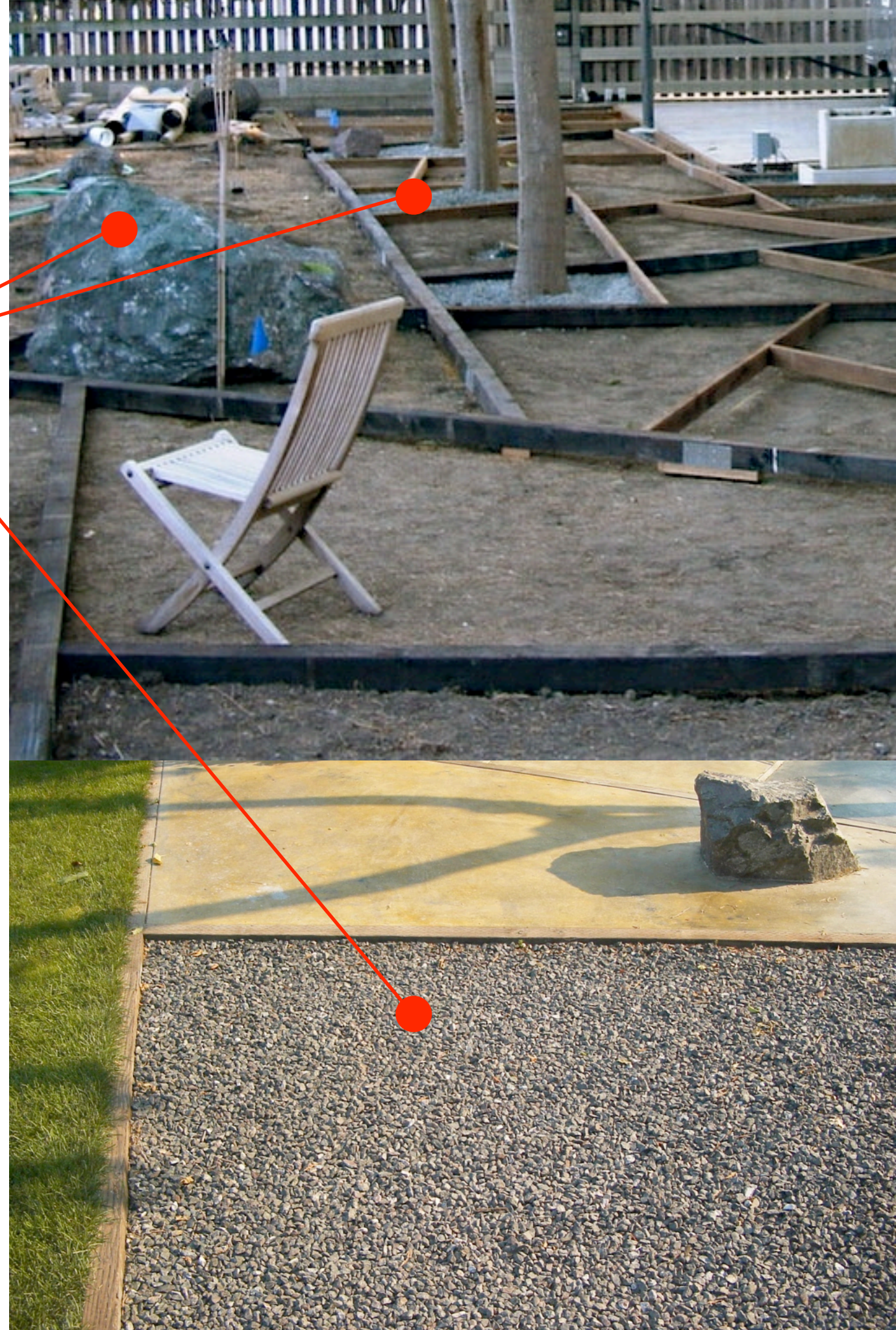
2002



Gravel as Paving

2002

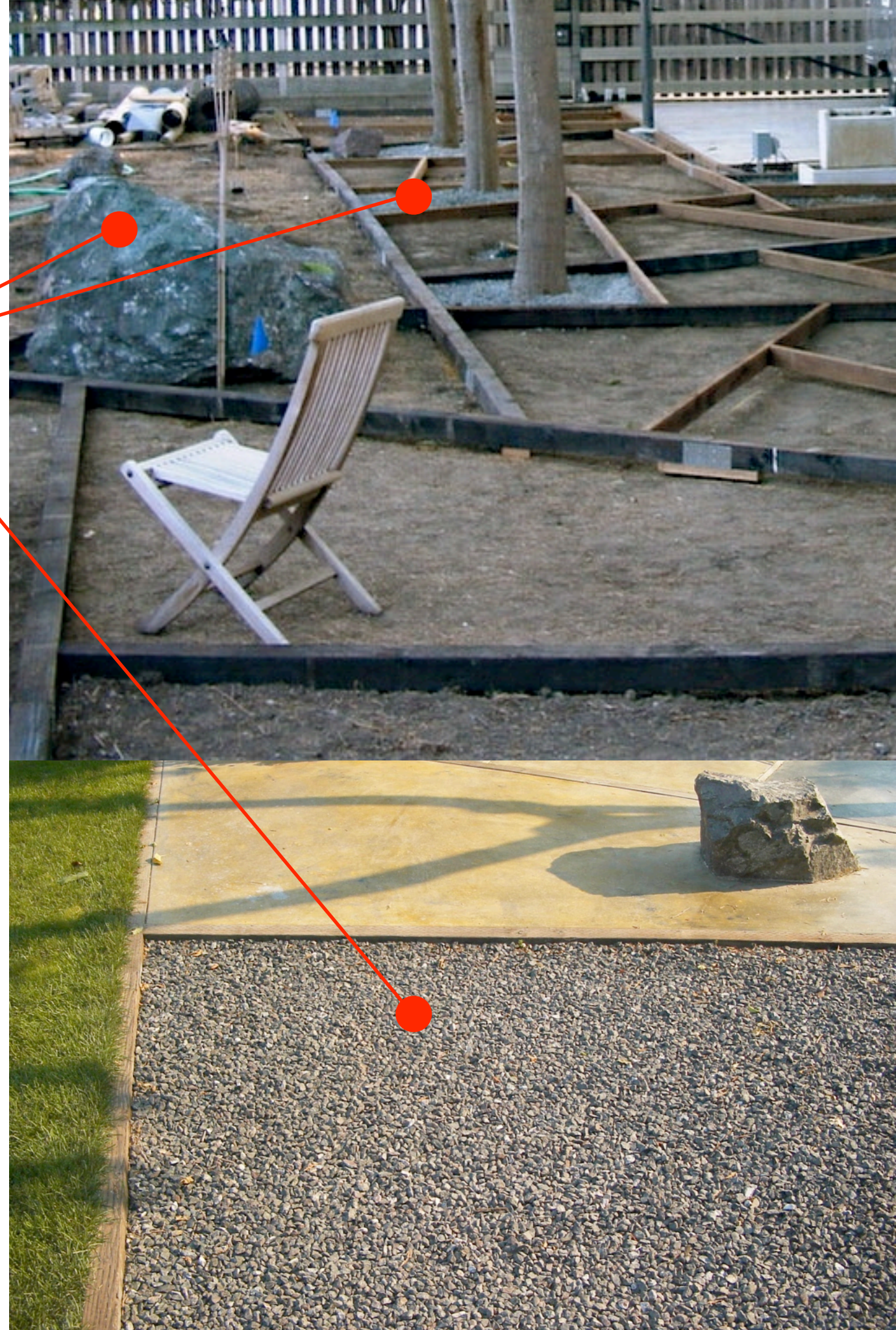
- Gravel paving reduces storm water run-off, good for the trees, is reusable, easy to relocate and reduces reflective glare .
- Gravel and boulders from local source - the Dumbarton Quarry.



Gravel as Paving

2002

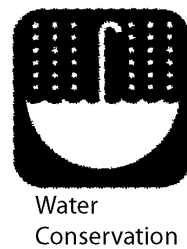
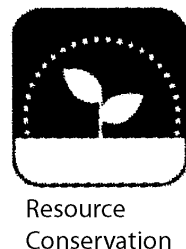
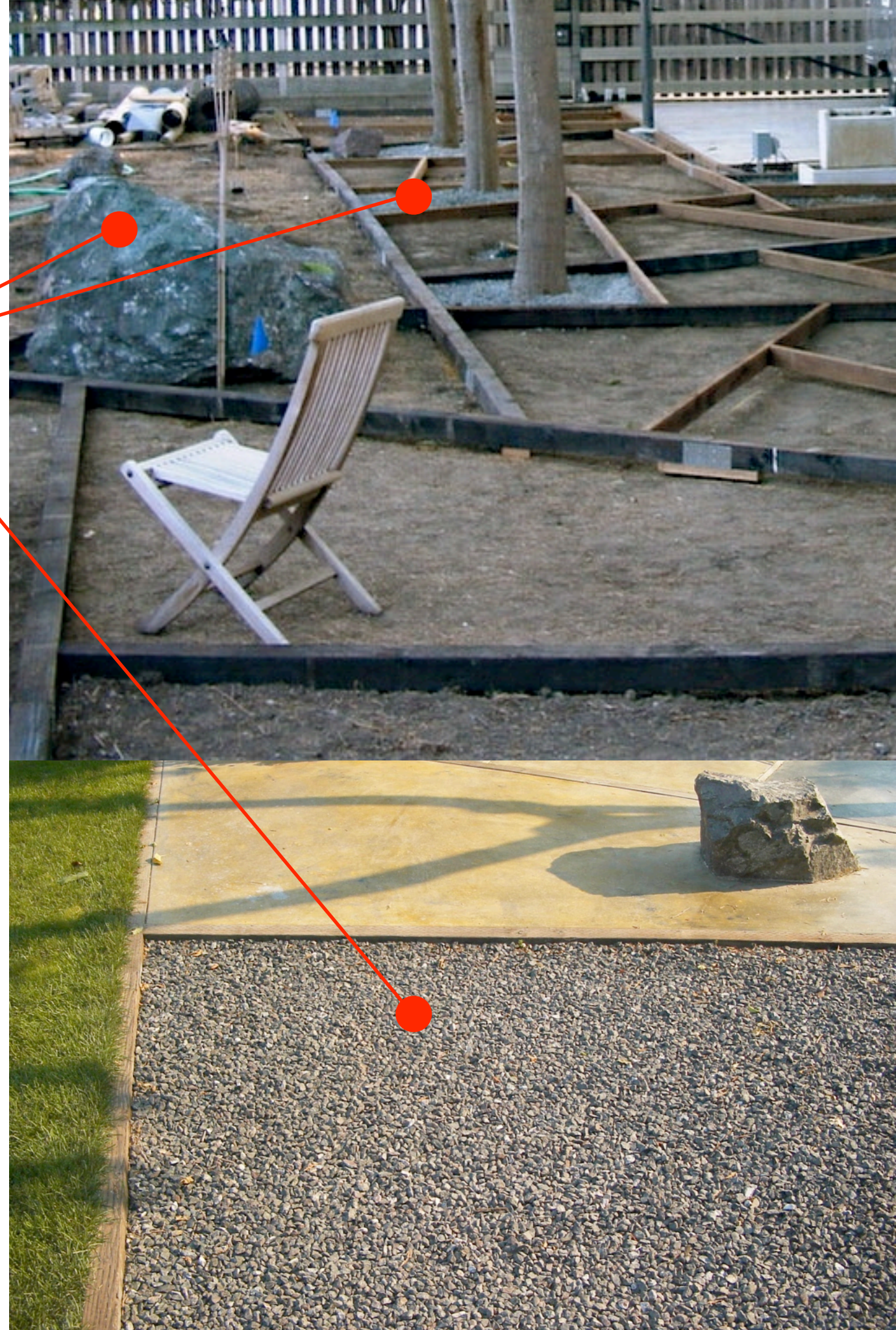
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Reclaimed Fencing

2006



Reclaimed Fencing

2006

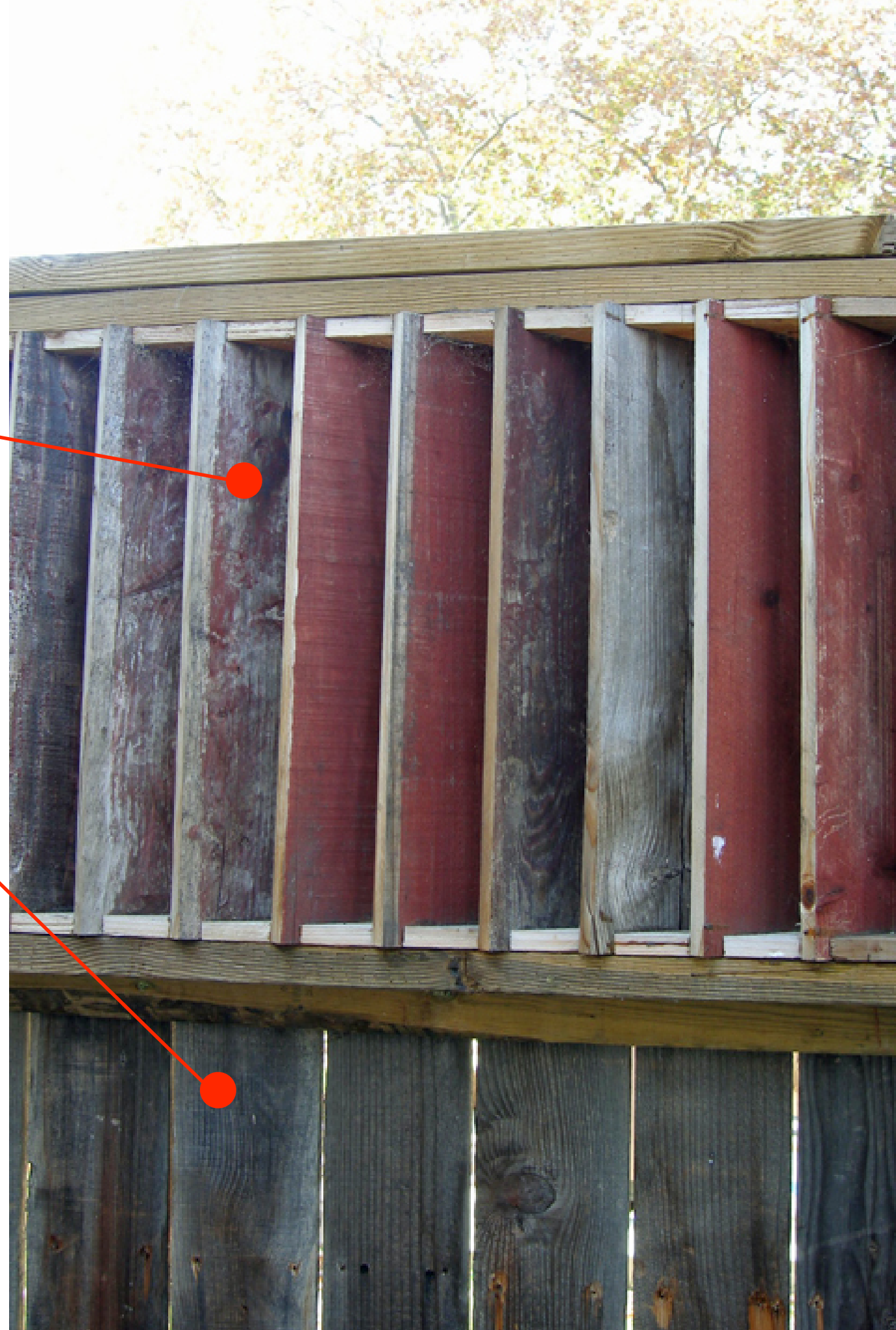
- Salvaged fencing boards repurposed as louvered privacy screen.



Reclaimed Fencing

2006

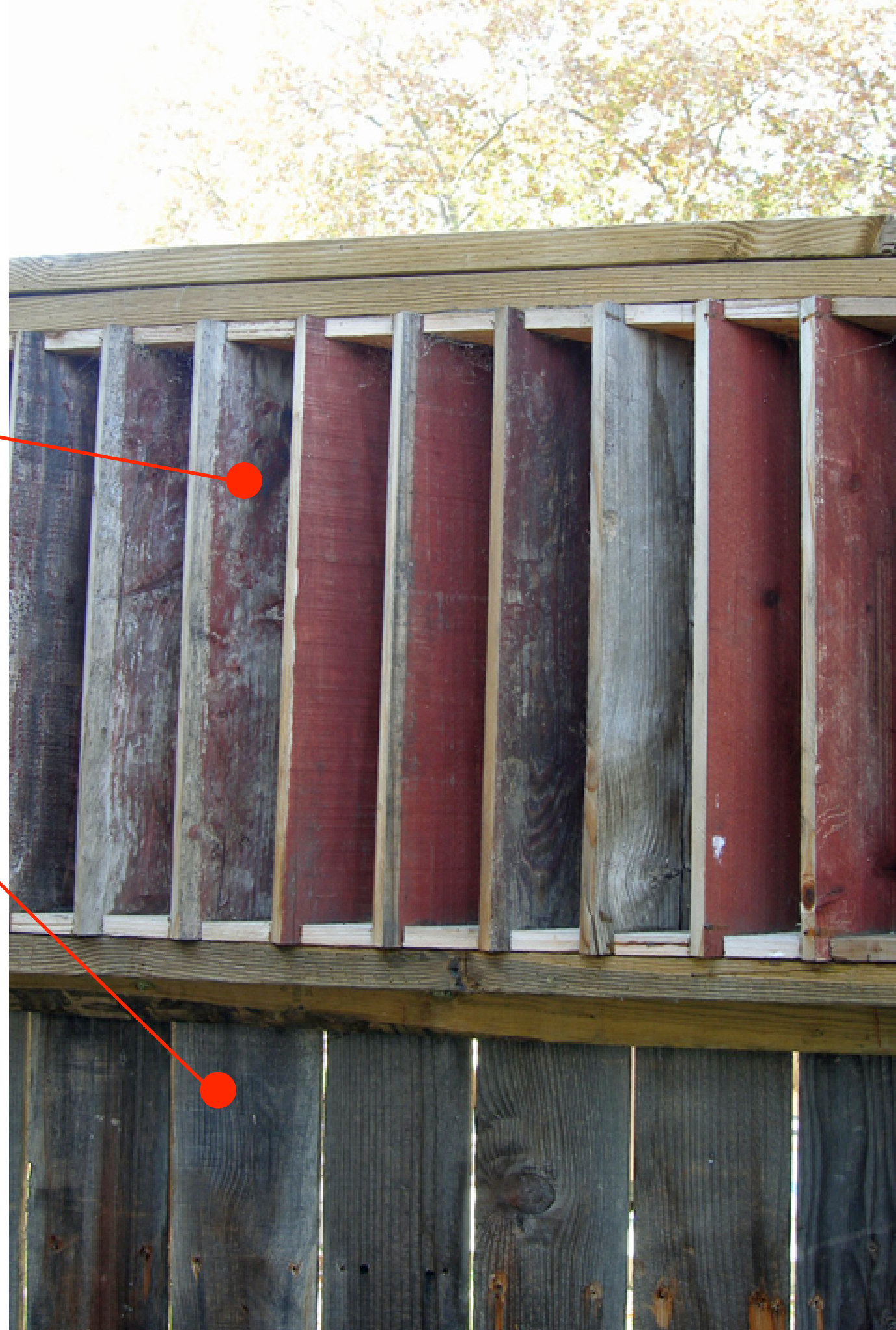
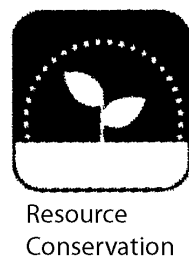
- Salvaged fencing boards repurposed as louvered privacy screen.
- Original fencing boards were salvaged, trimmed at the bottom & reinstalled.



Reclaimed Fencing

2006

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Natural Ventilation

2002 - 2005



Natural Ventilation

2002 - 2005

- High vent for airflow.



High Vent



Natural Ventilation

2002 - 2005

- High vent for airflow.
- Large overhang shades interior in the summer.



Natural Ventilation

2002 - 2005

- High vent for airflow.
- Large overhang shades interior in the summer.
- Low vent for airflow.



Natural Ventilation

2002 - 2005

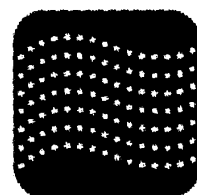
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High Vent



Low Vent

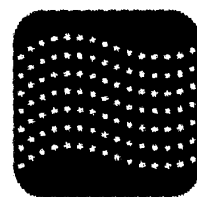


Indoor Air
Quality

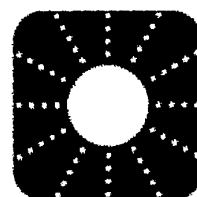
Natural Ventilation

2002 - 2005

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Indoor Air
Quality



Energy
Conservation

Radiant Floor Heating in Addition

2004



Radiant Floor Heating in Addition

2004

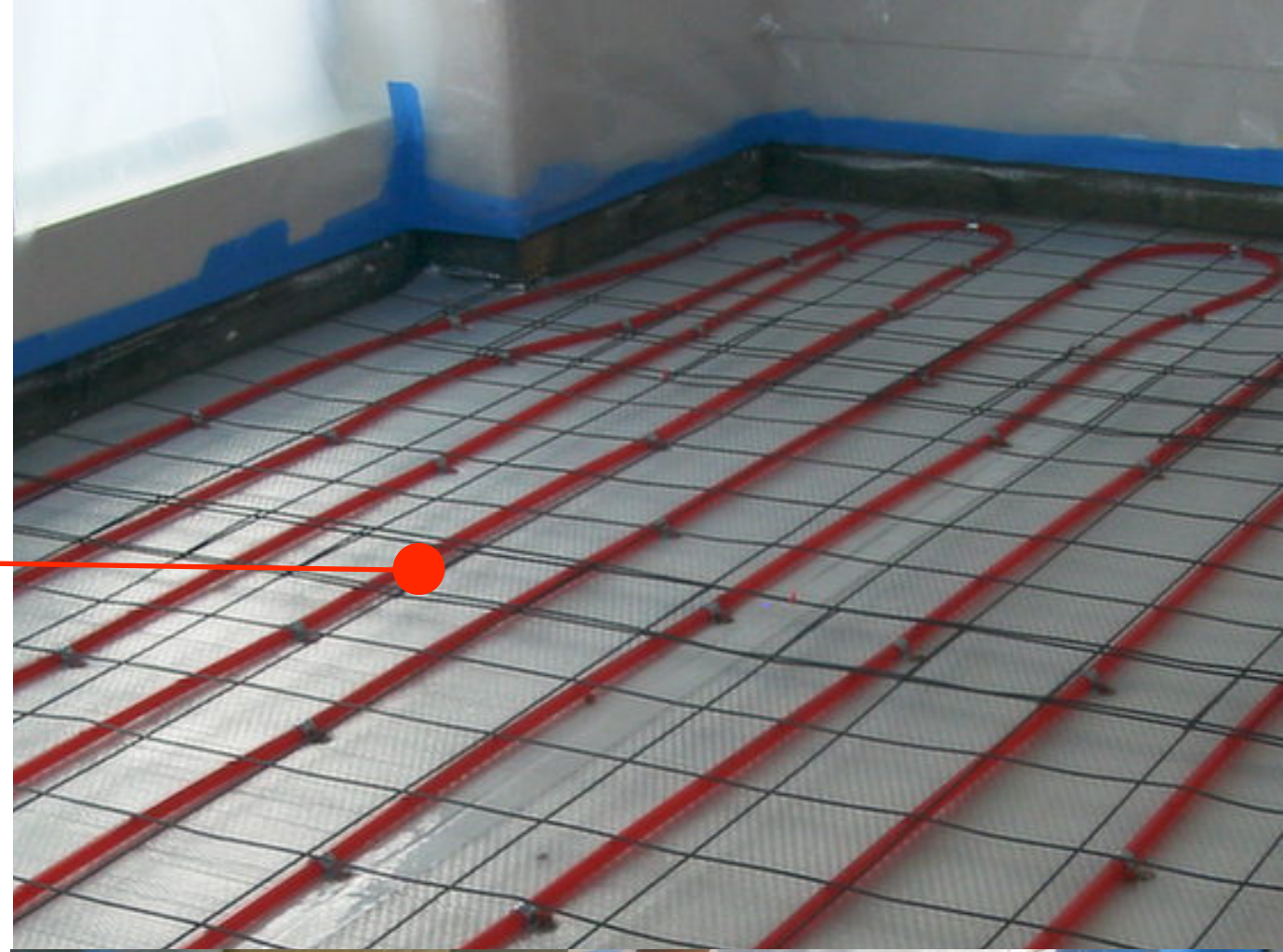
- Continuous hot water radiant tubing over insulation and attached to the structural slab.



Radiant Floor Heating in Addition

2004

- Continuous hot water radiant tubing over insulation and attached to the structural slab.
- Integral color concrete slab (3 1/2" thick) poured over tubing. This is the finished floor!



Radiant Floor Heating in Addition

2004

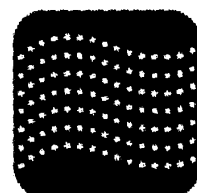
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- Hot water from water heater.



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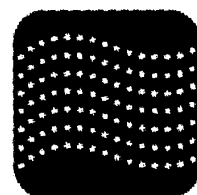
Indoor Air
Quality



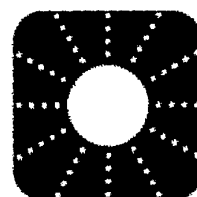
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Indoor Air
Quality



Energy
Conservation



Interior Ventilation & Light 2005



Interior Ventilation & Light 2005

- Operable transom windows allow for cross ventilation and eliminated air pressure differences in the house.



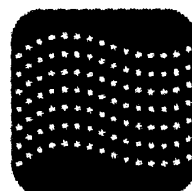
Interior Ventilation & Light 2005

- Operable transom windows allow for cross ventilation and eliminated air pressure differences in the house.
- Diffused white glass shares natural light to the Bedrooms and retains privacy.



Interior Ventilation & Light 2005

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Indoor Air
Quality



Kitchen Recycling Drawer

2006



Kitchen Recycling Drawer

2006

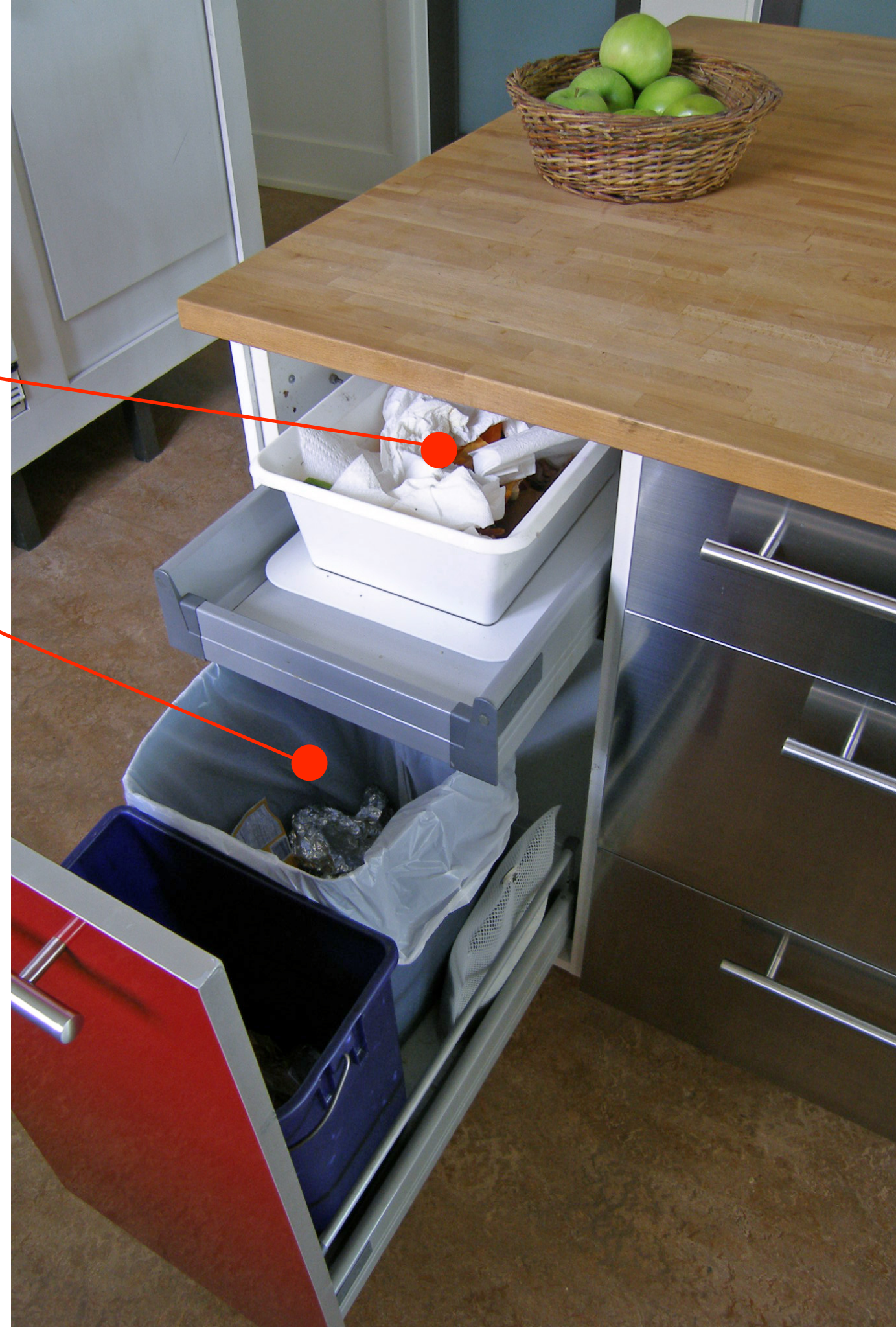
- Green waste: Food & soiled paper



Kitchen Recycling Drawer

2006

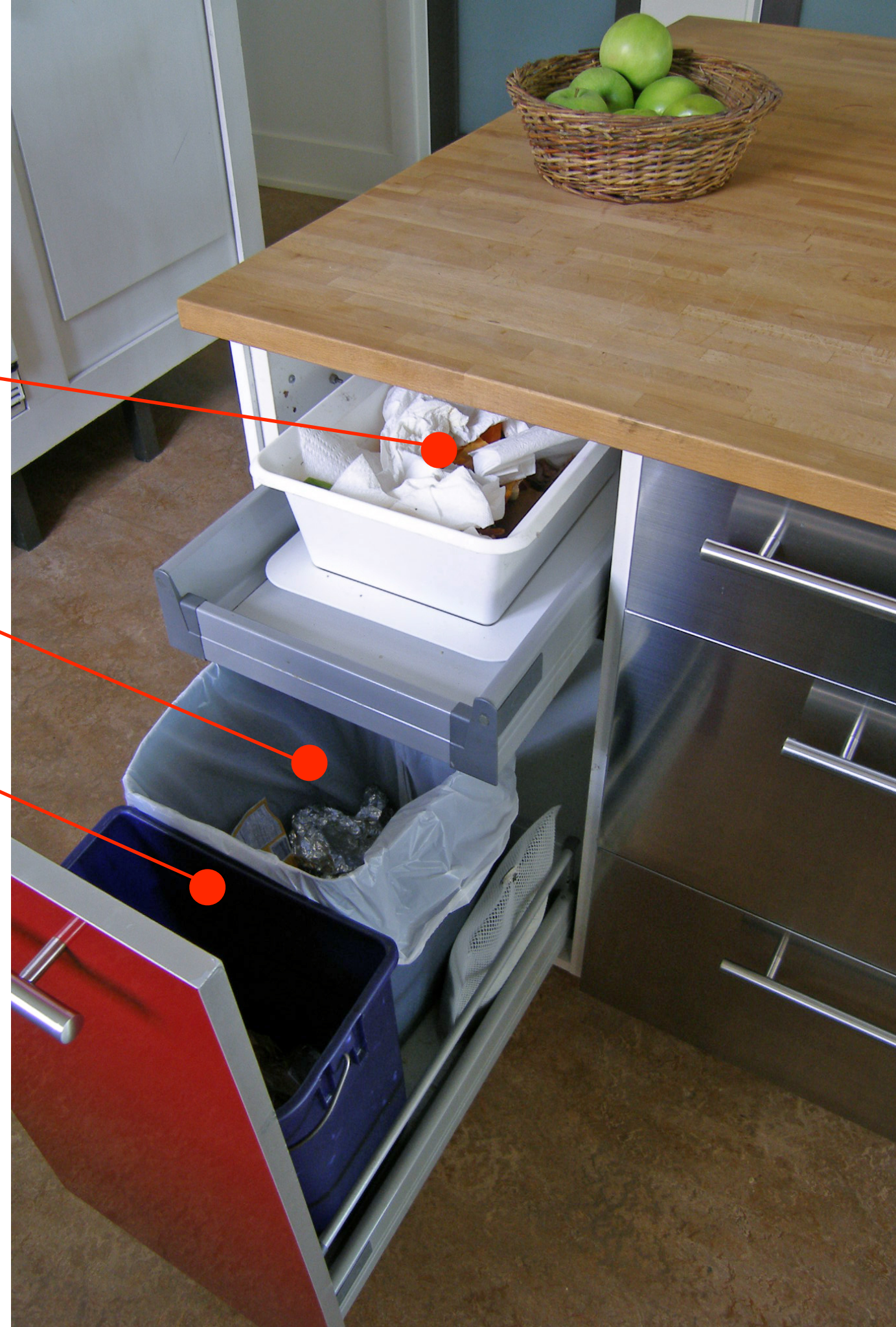
- Green waste: Food & soiled paper
- Trash: Not much anymore!



Kitchen Recycling Drawer

2006

- Green waste: Food & soiled paper
- Trash: Not much anymore!
- Recycle: Most everything



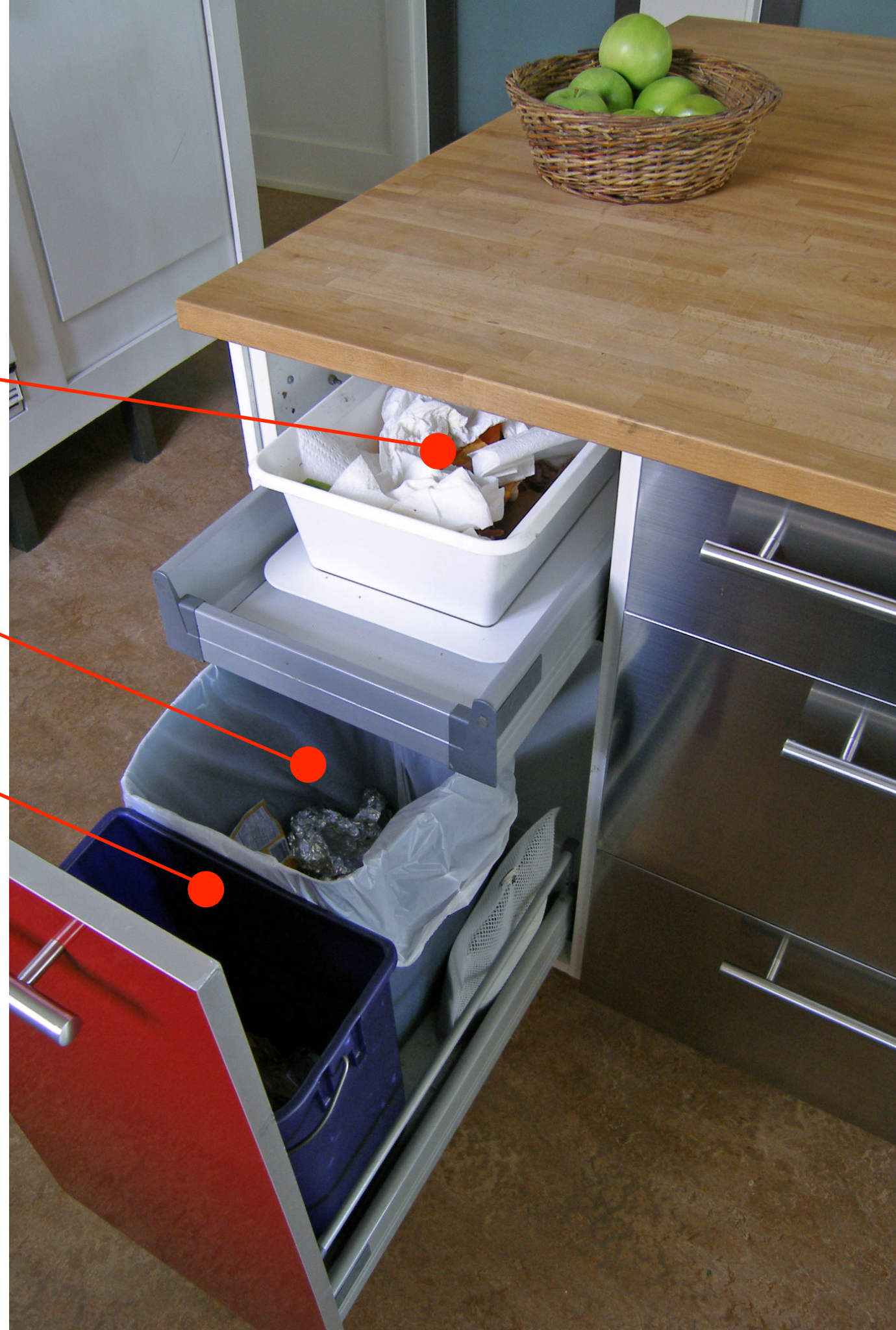
Kitchen Recycling Drawer

2006

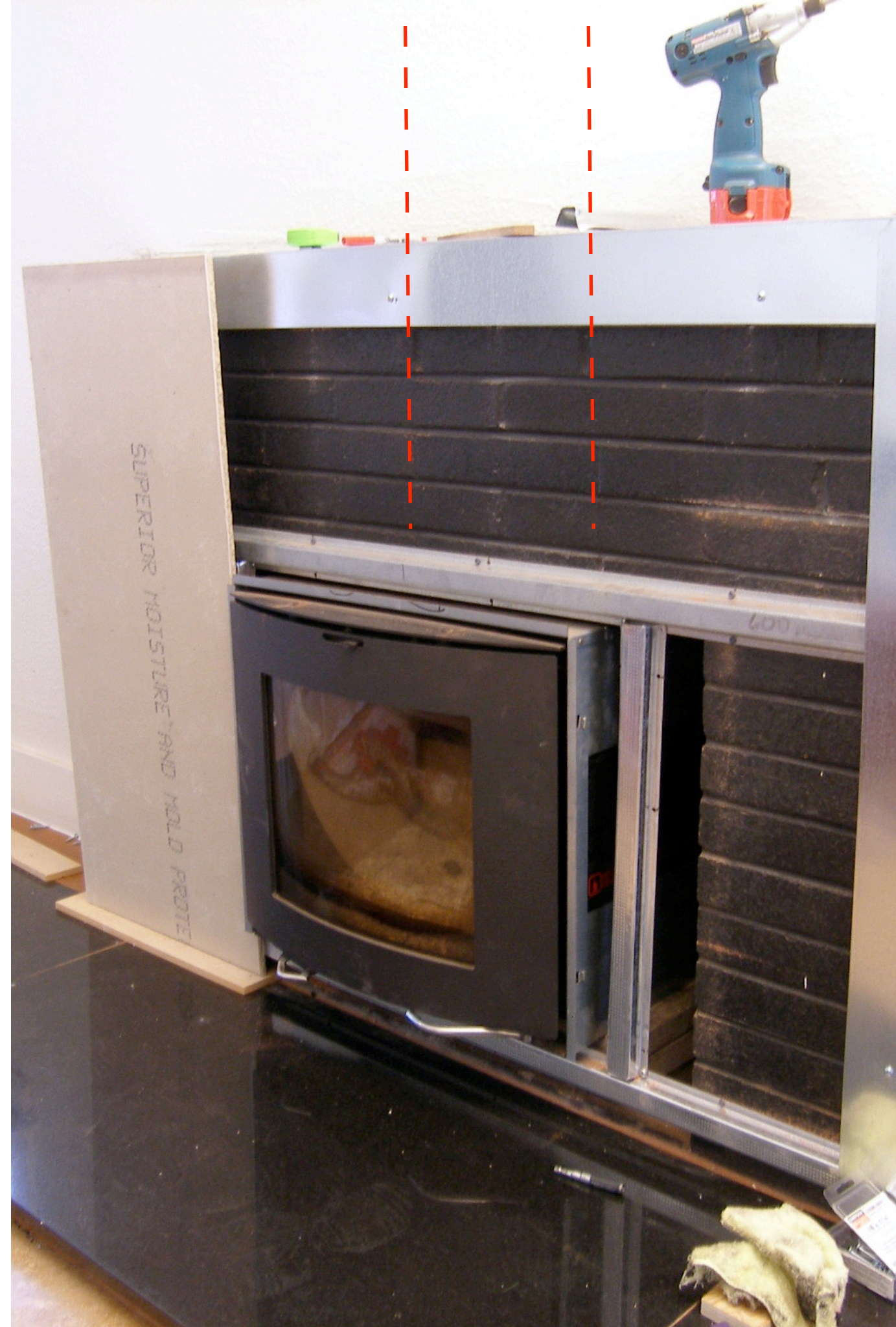
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Resource
Conservation

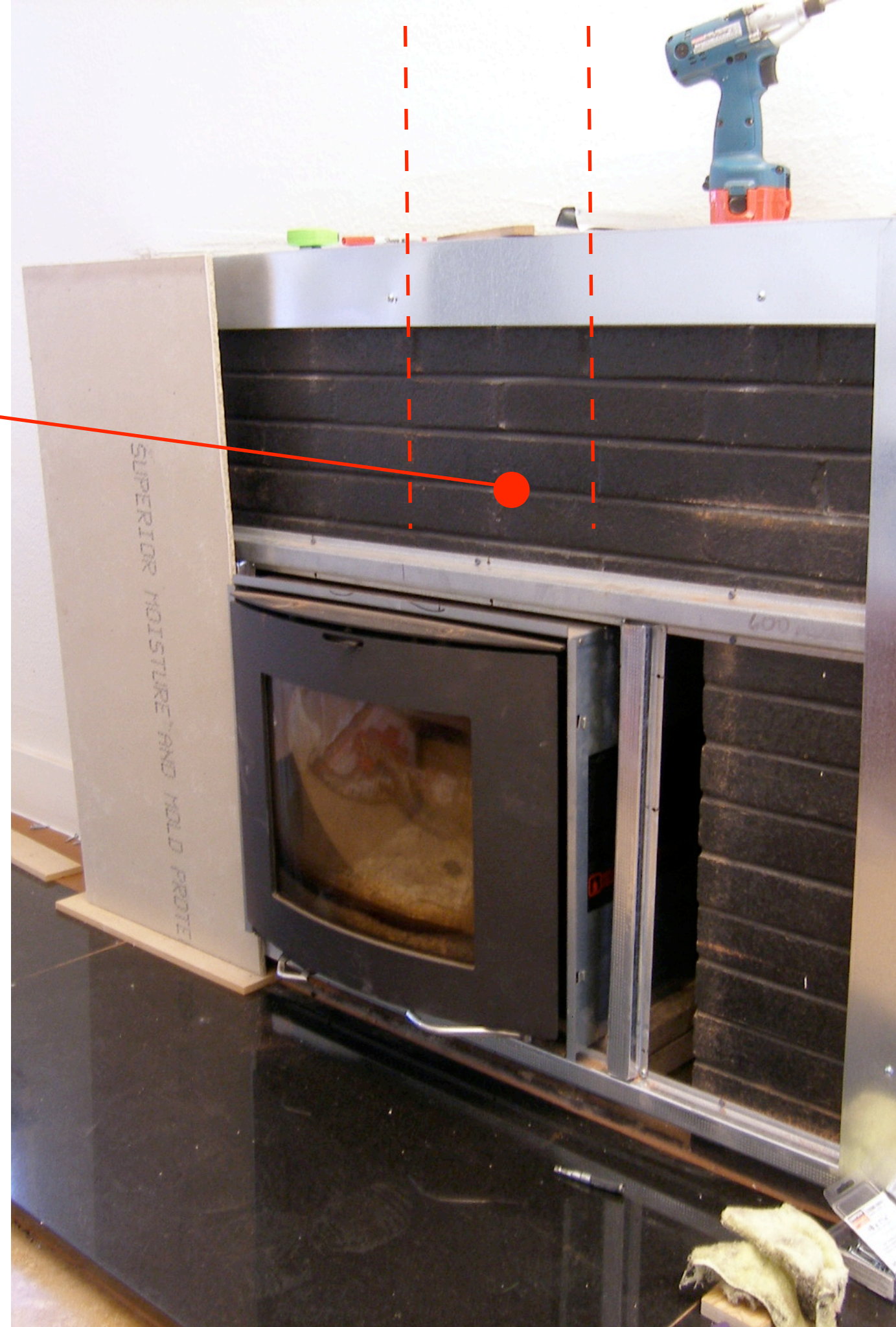


Decommission the Fire Place 2006



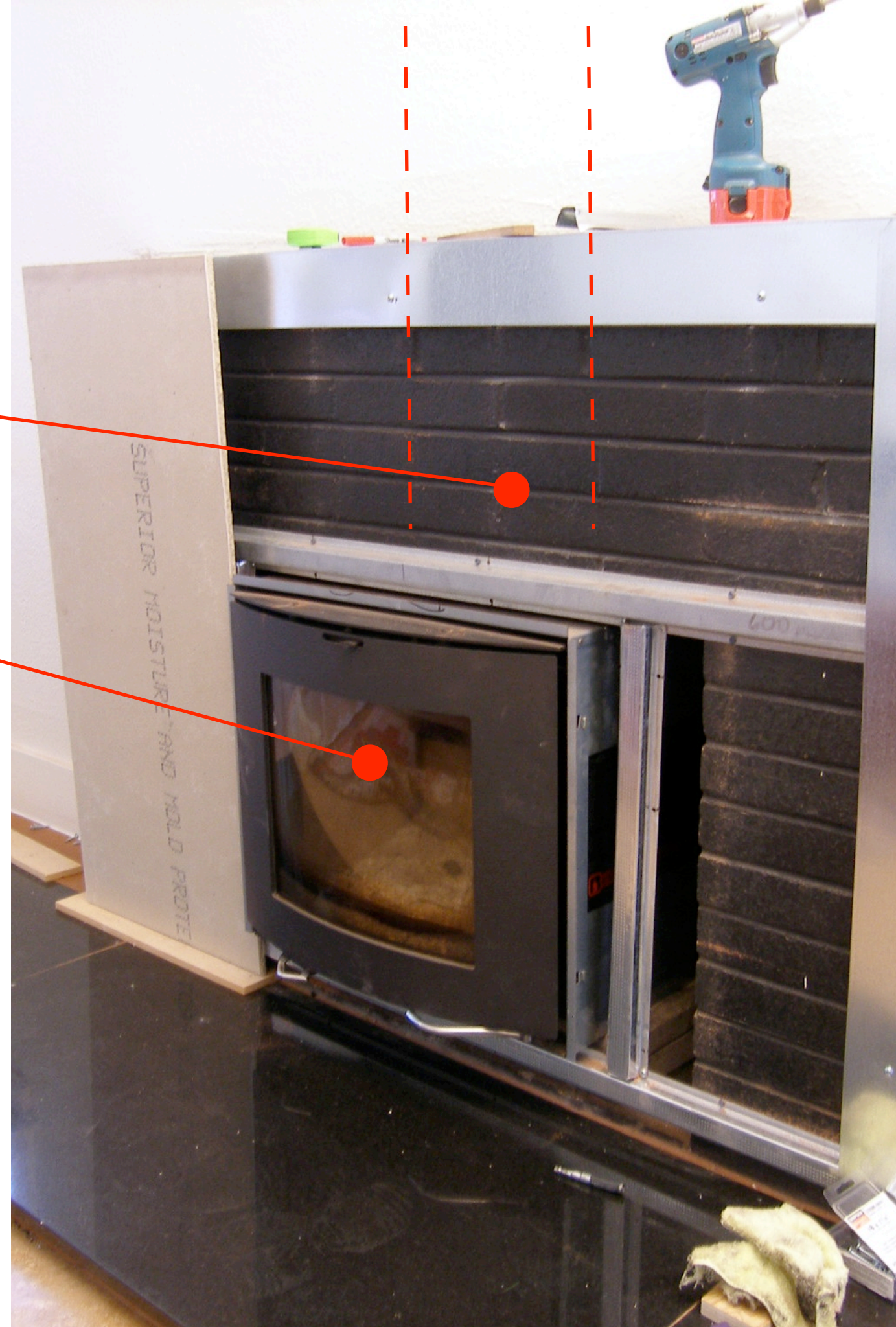
Decommission the Fire Place **2006**

- The original damper in the chimney flue was rusted open causing unwanted air leakage.



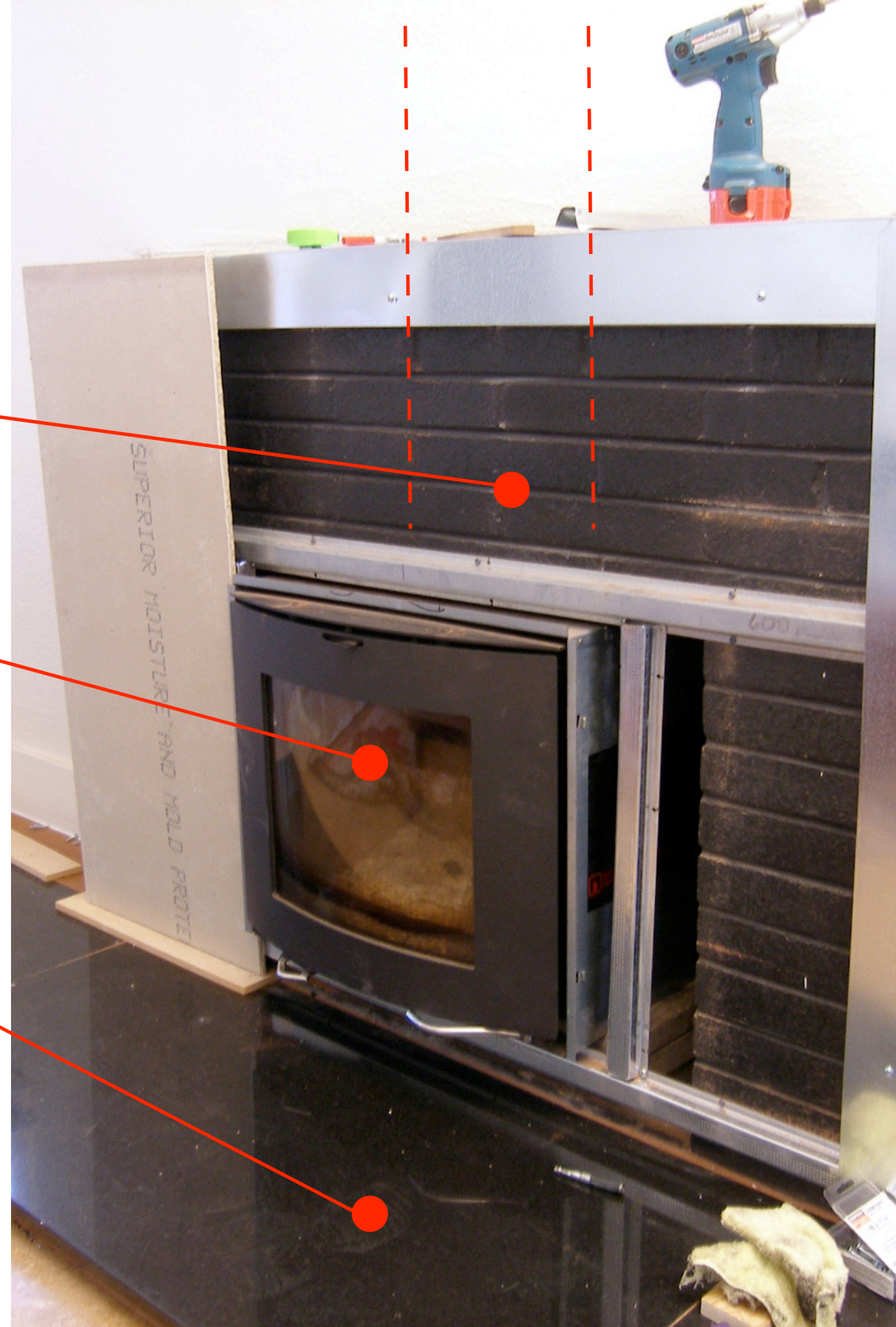
Decommission the Fire Place 2006

- The original damper in the chimney flue was rusted open causing unwanted air leakage.
- Install EPA rated Wood Burning insert to solve air leakage problem & provide heating, **98% less pollution then conventional fireplace.**



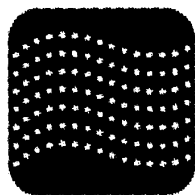
Decommission the Fire Place **2006**

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- Salvaged hearth material from commercial conference table top re-cut for new use.

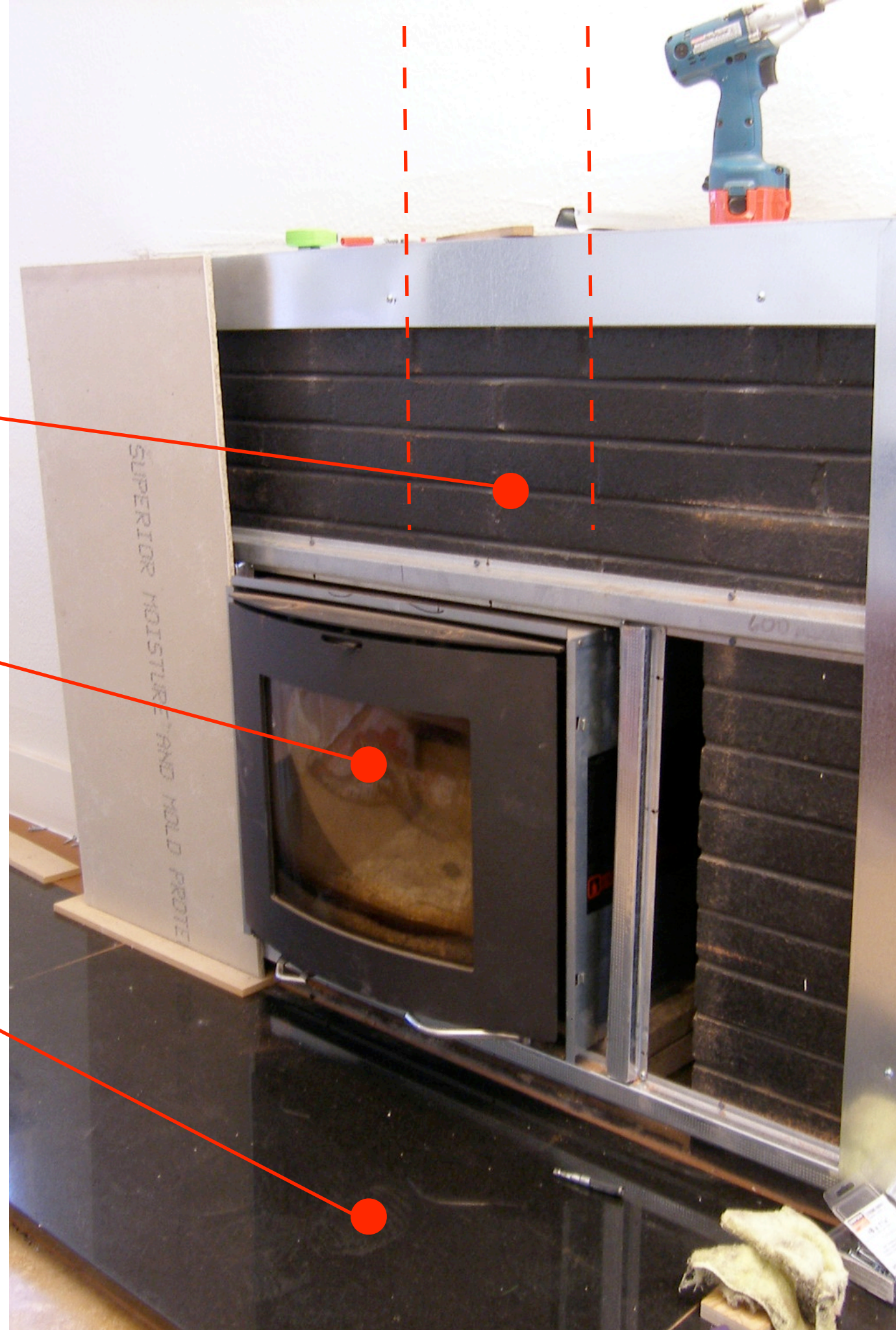


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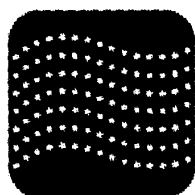


Indoor Air
Quality

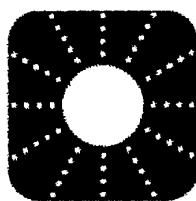


Decommission the Fire Place **2006**

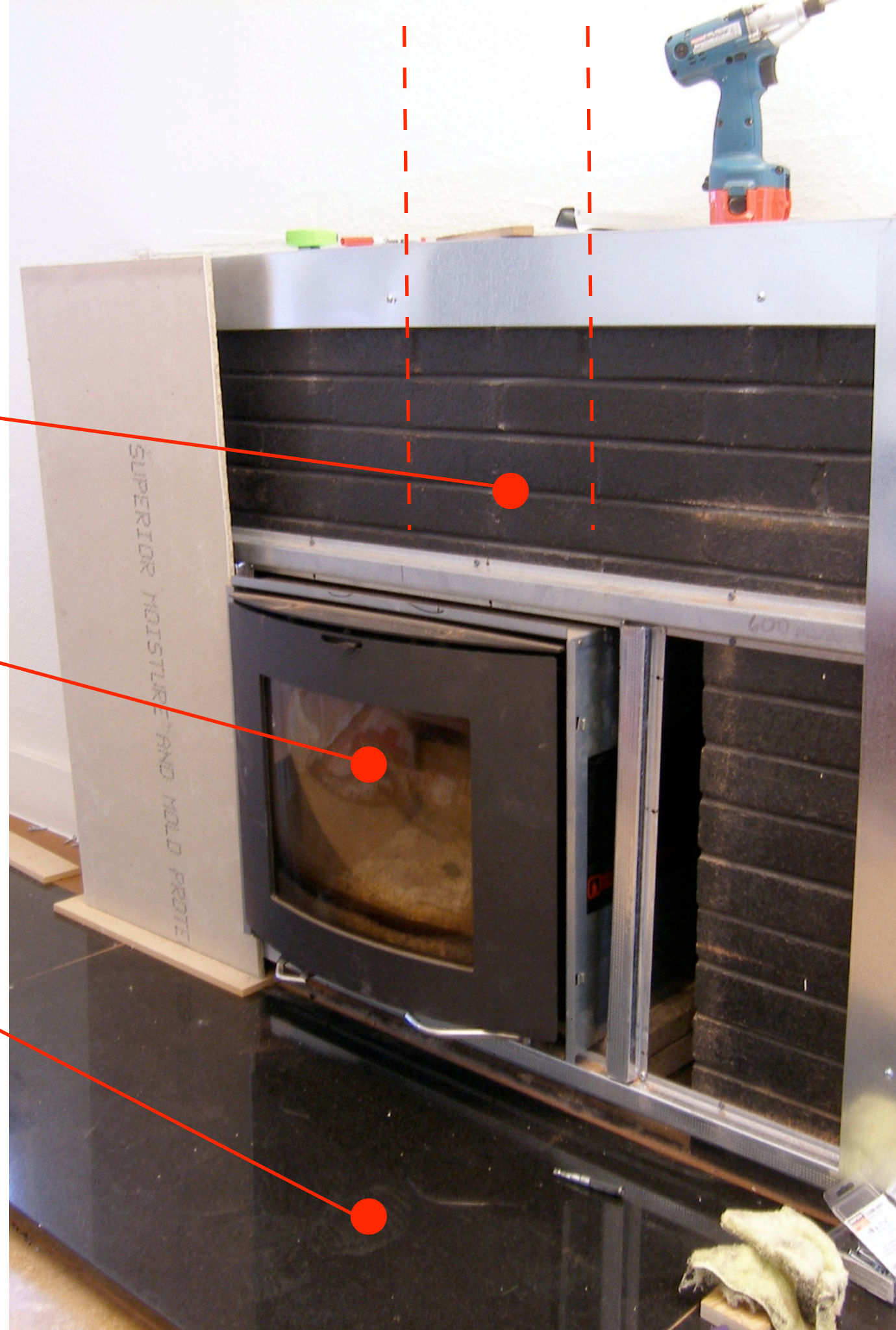
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Indoor Air
Quality

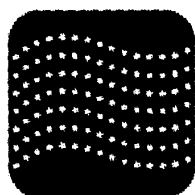


Energy
Conservation

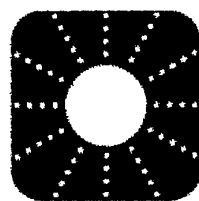


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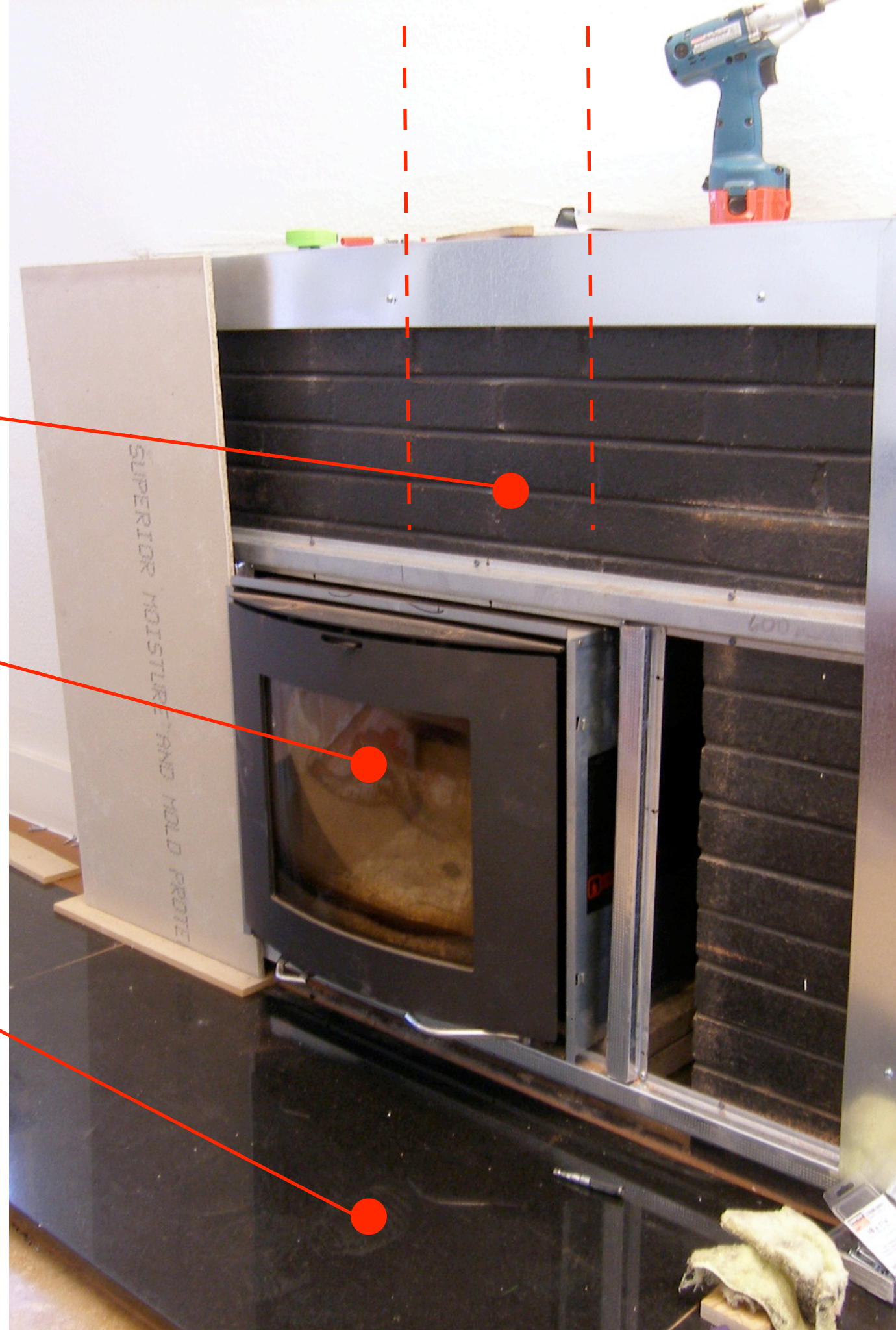
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Energy
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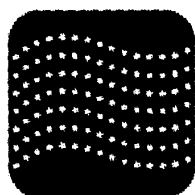


Resource
Conservation

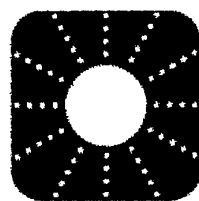


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Indoor Air
Quality



Energy
Conservation



Resource
Conservation



West Sun Protection

2007



West Sun Protection

2007



West Sun Protection

2007

- Shade glass from the hot western sun with custom made exterior mounted operable solar shutters.



West Sun Protection

2007

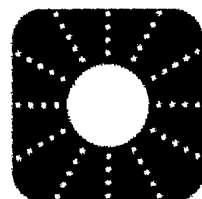
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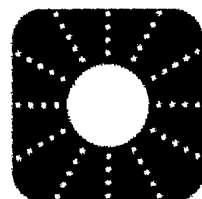
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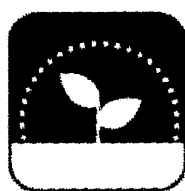
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Energy
Conservation



Resource
Conservation



Home Performance Testing:

The Equipment **2008**

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Home Performance Testing:

The Equipment **2008**

- The Home Performance Testers are practicing Building Scientists. 15 Years ago, no one ever tested their homes because the testing equipment did not exist. Now this equipment can determine the cause of bad health and bad energy consumption of a house.



Home Performance Testing:

The Equipment **2008**

- The Home Performance Testers are practicing Building Scientists. 15 Years ago, no one ever tested their homes because the testing equipment did not exist. Now this equipment can determine the cause of bad health and bad energy consumption of a house.
- Having Home Performance Testing done is the same as a doctor ordering an x-ray of your arm. It must be done before any treatments can be considered.



Home Performance Testing:

Blower Door Test **2008**



Home Performance Testing:

Blower Door Test **2008**

- This test depressurizes the house to determine how drafty the house is. Drafty is bad



Home Performance Testing:

Blower Door Test 2008

- This test depressurizes the house to determine how drafty the house is. Drafty is bad
- Because of all the caulking, weather-stripping, and replacement windows, **the house tested far better than expected - 0.22 air changes per hour.**



Home Performance Testing:

Air Flow Test **2008**



Home Performance Testing:

Air Flow Test **2008**

- The mechanical register is covered by the hood.



Home Performance Testing:

Air Flow Test **2008**

- The mechanical register is covered by the hood.
- Proper air flow ensures comfort and proper mixing of the heated air.



Home Performance Testing:

Air Flow Test **2008**

- The mechanical register is covered by the hood.
- Proper air flow ensures comfort and proper mixing of the heated air.
- **The existing system is BAD!** It needs to be replaced with a smaller furnace and properly installed ducts.



Home Performance Testing:

Duct Leakage Test **2008**



Home Performance Testing:

Duct Leakage Test **2008**

- Duct tape dries out and causes air leakage. It is not allowed by the building code anymore. Duct mastic must be used.



Home Performance Testing:

Duct Leakage Test **2008**

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Home Performance Testing:

Duct Leakage Test 2008

- Duct tape dries out and causes air leakage. It is not allowed by the building code anymore. Duct mastic must be used.
- The ducts are pressurized by a fan and the leakage is determined.
- Leaky ducts result in energy loss, and allows mold and dust to enter the house from the foundation or attic. **NOT A GOOD IDEA!**



Home Performance Testing:

Thermal Imaging **2008**



Home Performance Testing:

Thermal Imaging 2008

- With the thermal imaging camera, the insulation in the walls ceilings and floors can be inspected.



Home Performance Testing:

Thermal Imaging 2008

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- Just because the insulation was installed, it does not mean it was installed well. As an example, if you are cold and have a jacket on but don't zip it up, you are not going to get warm. Poorly installed insulation is like not zipping-up you jacket.



Home Performance Testing:

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- Just because the insulation was installed, it does not mean it was installed well. As an example, if you are cold and have a jacket on but don't zip it up, you are not going to get warm. Poorly installed insulation is like not zipping-up you jacket.
- Poor installation of attic insulation - REDO!



Next Improvements :

The Simple **Future**

Next Improvements :

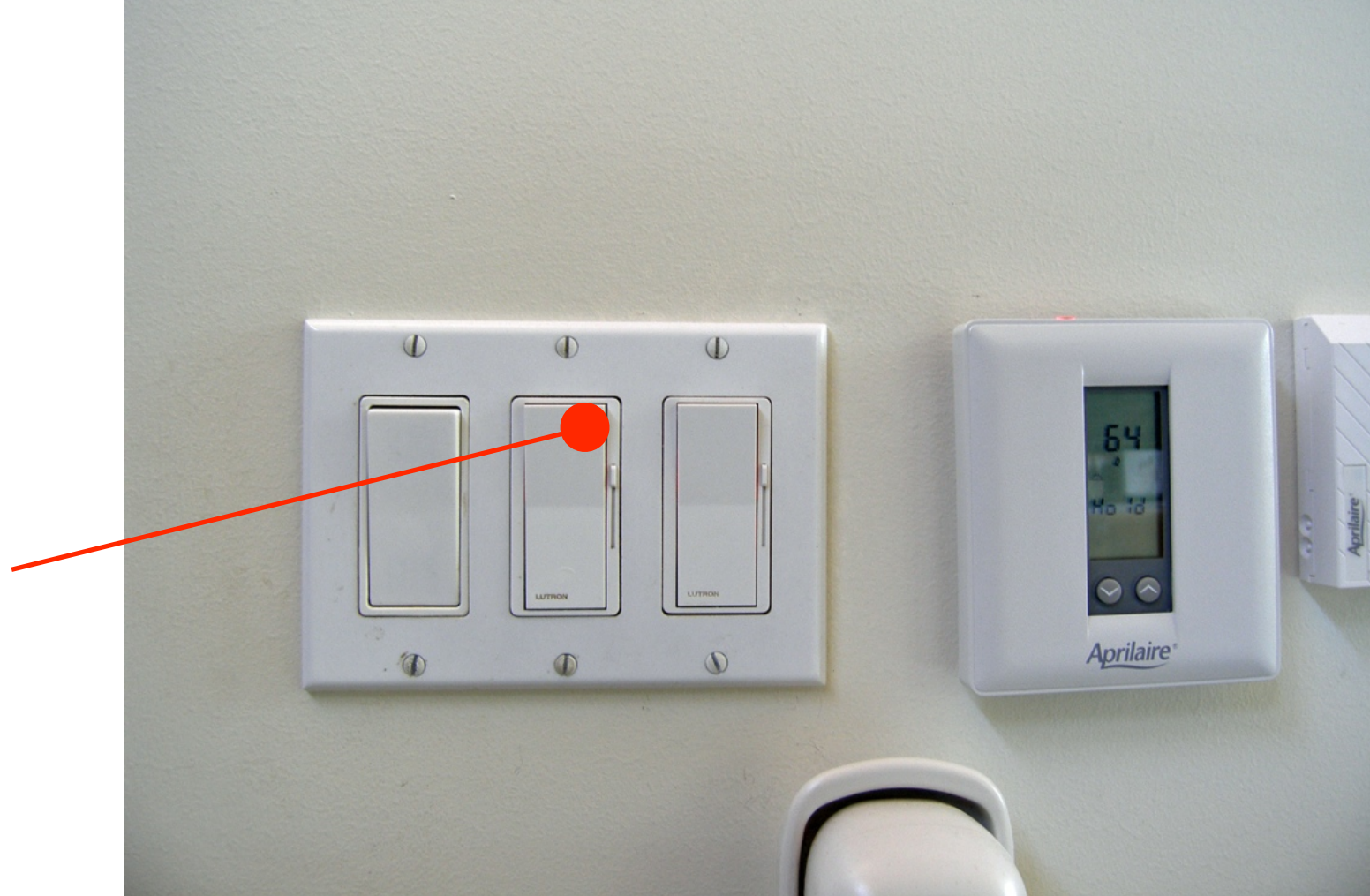
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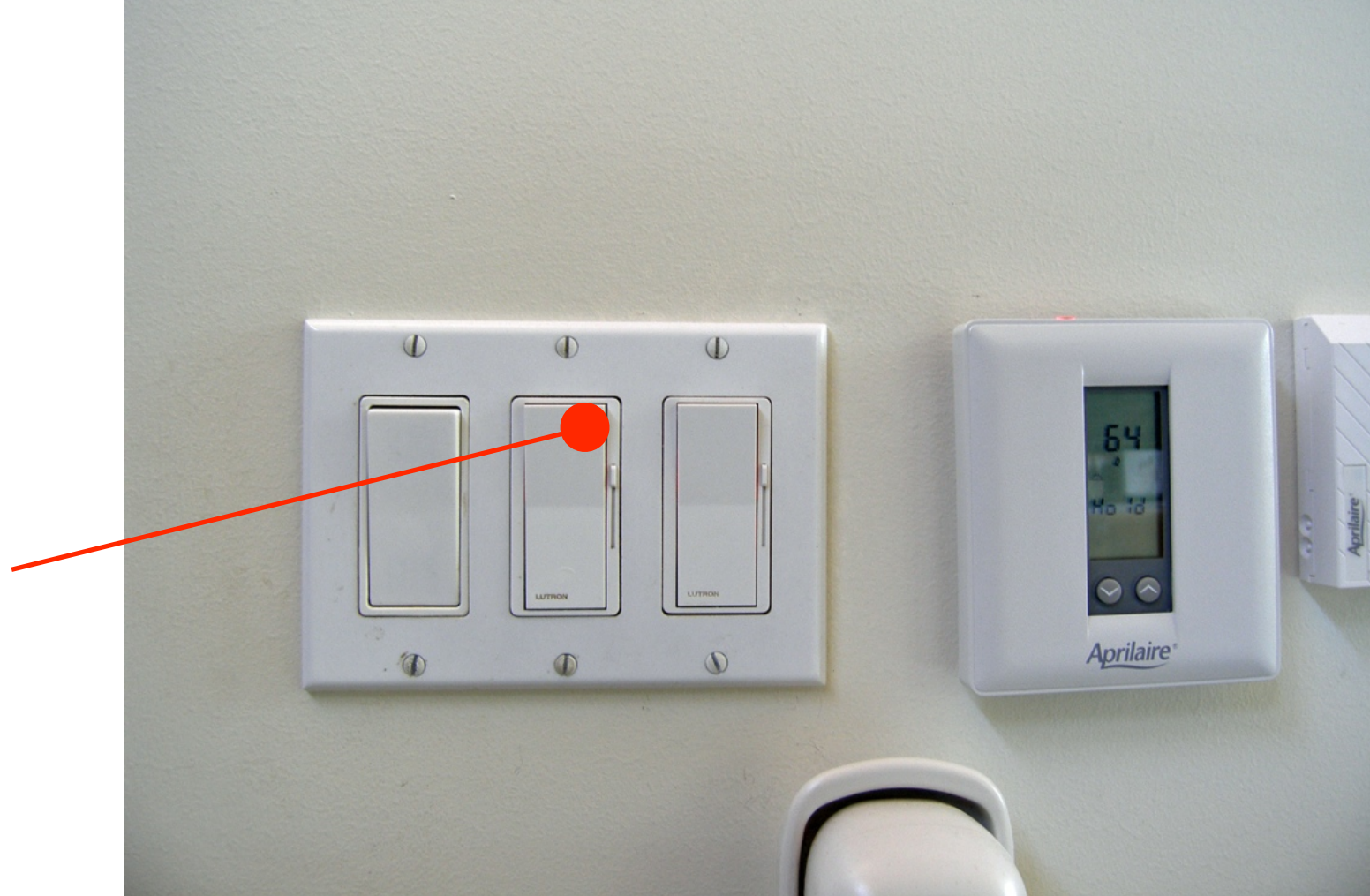
- Dimmer switches need to be replaced with standard switches, then we can put compact fluorescent light bulbs in the fixtures.



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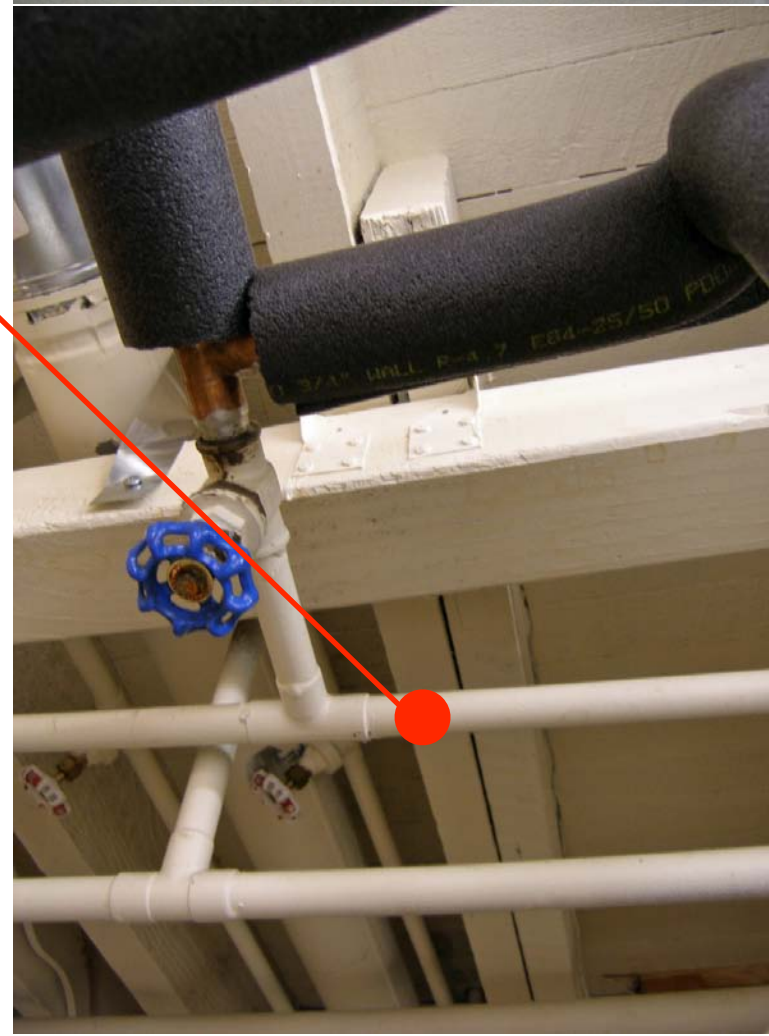
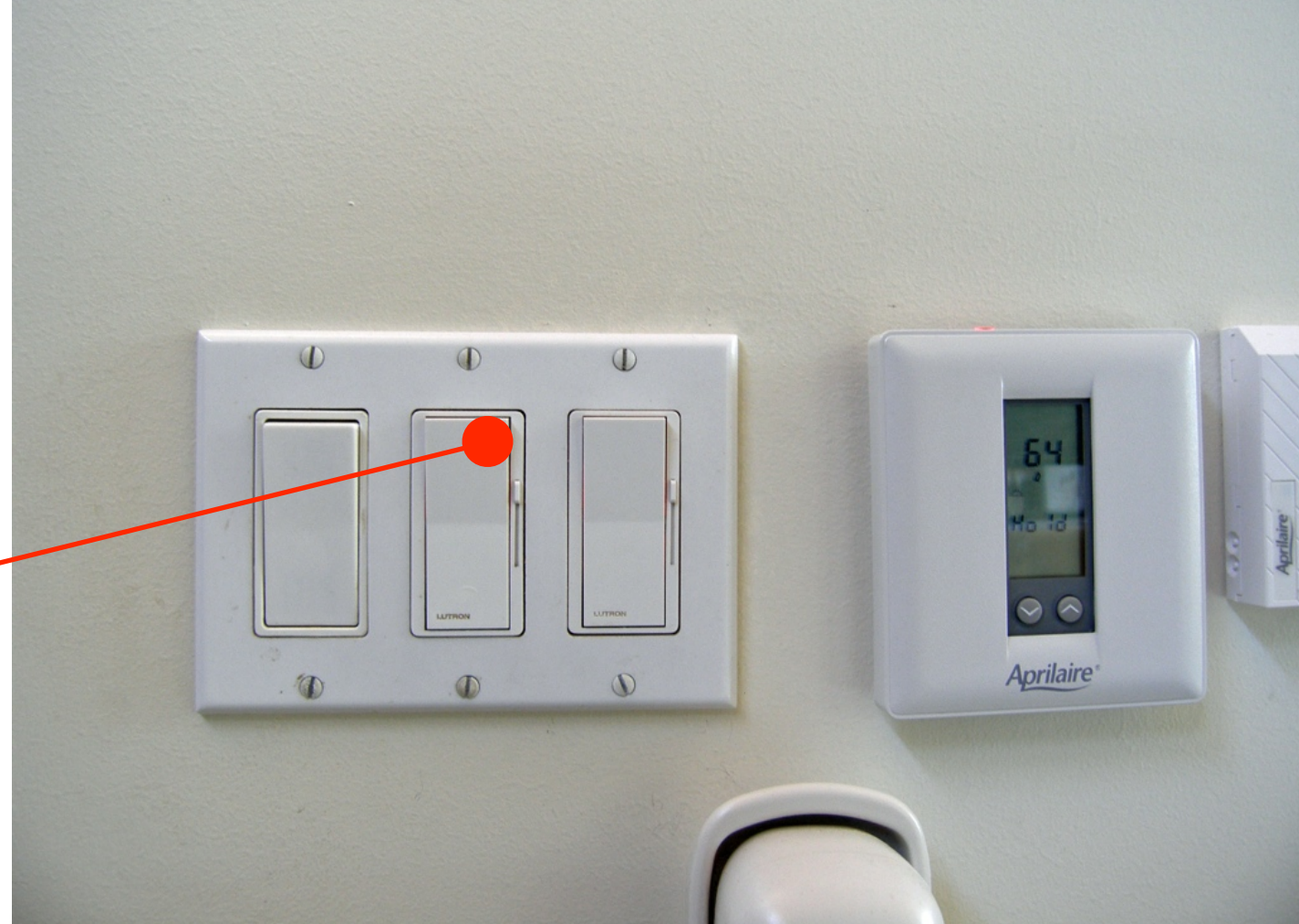
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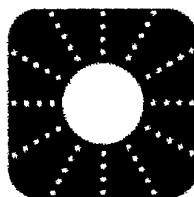
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- Finish insulating the hot water pipes.



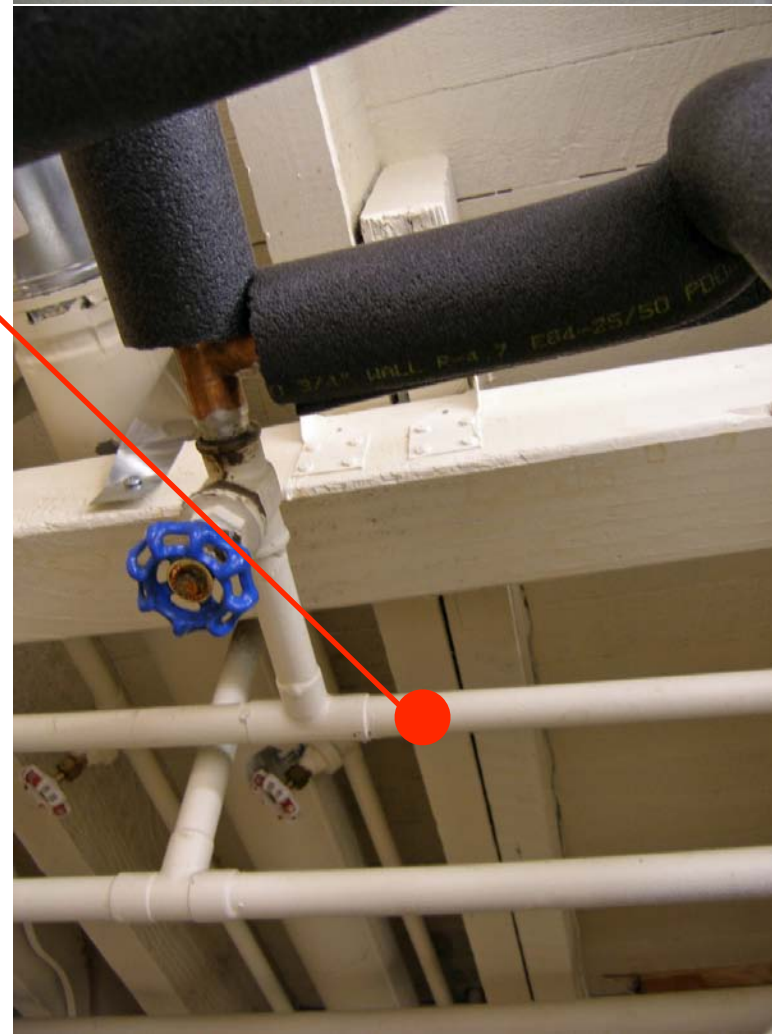
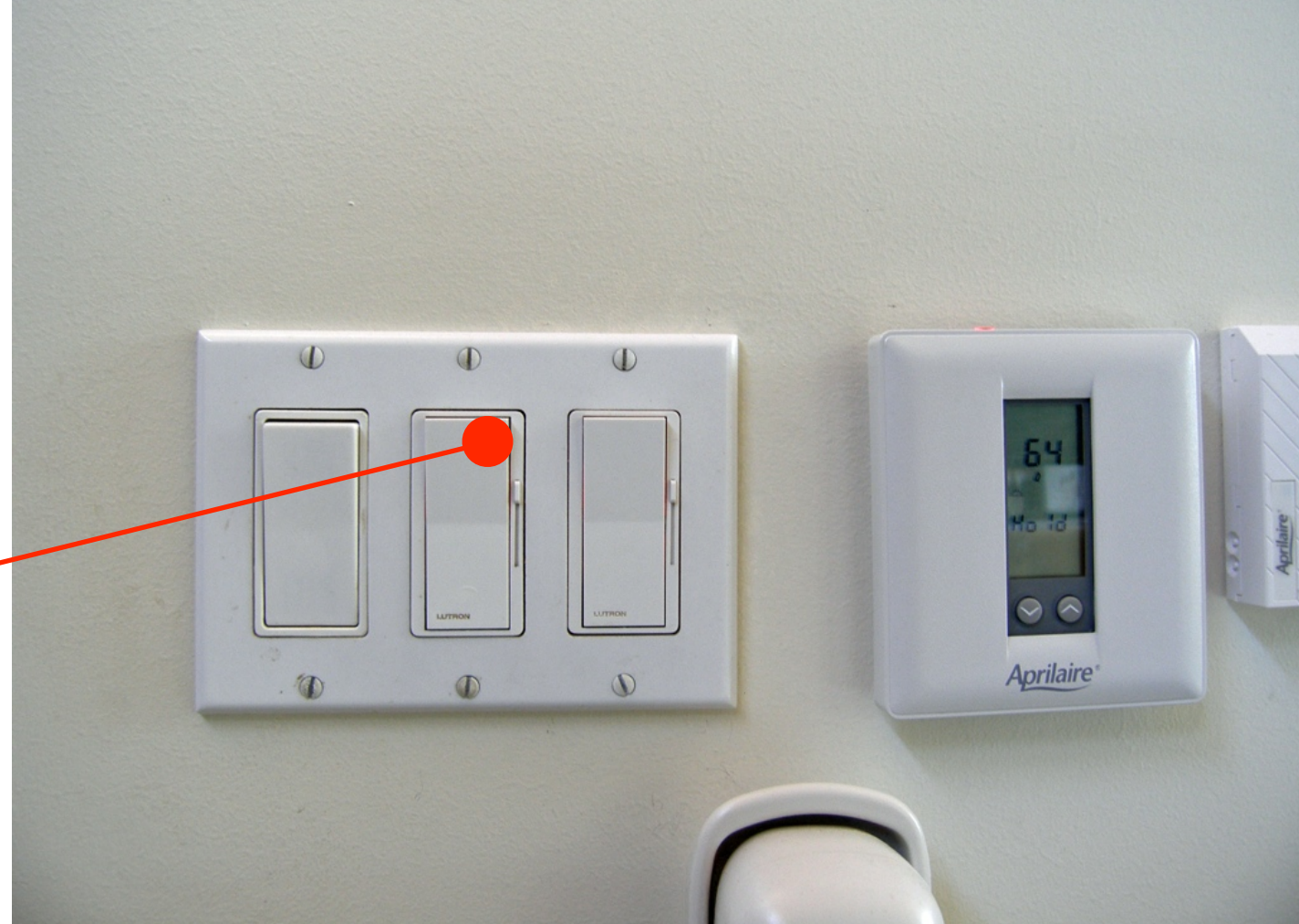
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Energy
Conservation



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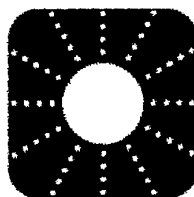
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The Simple **Future**

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Energy
Conservation

Next Improvements :

Harder **Future**



Next Improvements :

Harder **Future**

- Consider insulation or radiant barrier at rafters.



Next Improvements :

Harder **Future**

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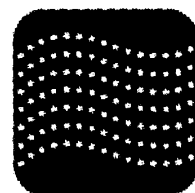
- Consider insulation or radiant barrier at rafters.
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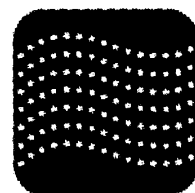
Indoor Air
Quality



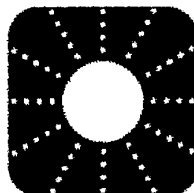
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Indoor Air
Quality



Energy
Conservation



Build it Green :

Home Tour Spring 2008

15

REMODEL

Welschmeyer Residence
37735 Second Street, Fremont



GROWING GREENER IN OLD NILES

An historic home nearing its centennial keeps getting better and greener

"Our greening process started 18 years ago," said Paul Welschmeyer, when he and his wife Jana bought their three-bedroom fixer-upper in Niles, an historic district in Fremont. When they moved in, their first project was planting a grove of mulberry trees to the south for shade. "As architects, energy conservation has always been part of our ethics, and we had the opportunity to put that into practice when we became homeowners" Paul said. Their goal was to maintain the historic integrity of the neighborhood, while expanding to meet the growing needs of their contemporary family.

They gradually remodeled the interior and improved energy efficiency by insulating the attic and replacing single-pane windows. The front porch was rebuilt with old Douglas fir joists, while salvaged shutters provide operable shade control. Well-integrated passive strategies and a combined radiant and forced air heating system keep the home comfortable year round. Besides remodeling and updating the existing home, the Welschmeyers added an addition in 2005 to reflect their contemporary lifestyle and better connect them to the backyard where a vintage air stream trailer (powered by PV) doubles as a guest house. The cellar, built during prohibition, was recently converted into office space.

What's more, the home is one of a handful selected to participate in the GreenPoint Rated Existing Home pilot program. Like many homeowners, the Welschmeyers have remodeled their home little by little, culminating in a complete and comprehensively green remodel. The GreenPoint Rated Existing Home program is uniquely designed to accommodate remodels and upgrades completed over time. "You can do incremental improvements as you maintain the property," Welschmeyer said, "and it will benefit you in the long run." For more about GreenPoint Rated, see page 15

"Our PG&E bill hasn't changed even after we doubled the square footage of the house."

—Jana Welschmeyer, homeowner/architect

DIRECTIONS TO HOME

From I-880 (Heading SOUTH)

Exit ALVARADO NILES RD.
Turn LEFT onto ALVARADO NILES RD.
Continue on NILES RD.
Turn RIGHT onto I ST.
Turn LEFT onto SECOND ST.

From I-680 (Heading SOUTH)

Exit CA-84, follow signs to
DUMBARTON BRIDGE
Continue on CA-84 through NILES CANYON
Cross MISSION BLVD into NILES
Continue RIGHT onto NILES BLVD
Turn LEFT onto I ST
Turn RIGHT onto SECOND ST

HOME STATISTICS

ORIGINALLY BUILT: 1910

ADDITION COMPLETED: 2005

SIZE BEFORE REMODEL: 2,080 SF.

SIZE AFTER REMODEL: 3,080 SF

OWNER/ARCHITECT/BUILDER:

Paul Welschmeyer Architect and
DES Architects

BUILDER: Creative Spaces
(for shell only)

GREENPOINT RATER: Building
Performance Services (BPS)

GREEN at a GLANCE

ENERGY EFFICIENCY & RENEWABLE ENERGY

- Passive solar design: 6 ft overhang, shade trees on south side, adjustable shutters on west side
- Designed for daylighting
- Designed for natural ventilation: stack effect and cross-room ventilation; no AC
- Solar hot water system planned
- Radiant barrier roof sheathing
- 26% more efficient than Title 24
- Hydronic radiant-floor heat
- Forced-air hydronic system planned
- Efficient water heater supplies domestic hot water and space heating
- 74% efficient wood fireplace
- Replaced single-pane windows with double-pane, low-e, metal-clad wood windows (Marvin)
- Energy Star® ceiling fans in bedrooms (Modern Fan Co.)
- High-efficiency lighting: mostly fluorescent, LED

RESOURCE CONSERVATION

- 55% recycling of construction waste
- Earthquake retrofit
- Advanced framing: load sized headers
- Engineered lumber: parallel beams and posts, I-joists, OSB
- Natural linoleum flooring (Forbo)
- Exposed concrete as finish floor
- No door/window trim used in addition
- Salvaged Douglas fir decking
- Salvaged wood fencing
- Salvaged stone and broken concrete pavers
- Exterior lights shielded to reduce light pollution
- Built-in recycling center

WATER CONSERVATION

- Water- and energy-efficient washing machine (Kenmore)
- Permeable landscaping paths: gravel, pavers

INDOOR AIR QUALITY

- Kitchen range hood vented to the outside (Vent-A-Hood)
- EPA-certified wood fireplace insert (Scan DSA 4)
- Low-VOC interior paint (Dunn Edwards Suprema)
- Sealed combustion water heater planned (AO Smith)

Build It GREEN HOME TOUR



SUNDAY, June 1, 2008
10AM - 5PM

Alameda and Contra Costa Counties

ADMIT TWO

\$50
This booklet
is good for 2
admissions.

HOME TOUR ORGANIZERS:



Green Point Rating:

Pilot Program for Existing **2008**



Green Point Rating:



Pilot Program for Existing **2008**

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- Comprehensive application and third party verification process.

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Build up of grade beam grid & slab Detail



Sand over Vapor barrier over crushed rock prior to concrete pour



Pest & Bug screen at 1910 House Cellar vents

PAUL WELSCHMEYER

architects



This photo illustrated the build-up of the grade beam grid and Slab.

The 1910 house is complicated with the cellar excavation/construction done in the 1930s. There is no proof that a vapor barrier was installed, but the lack of moisture in the cellar walls & floor are proof that the potential problems associated with ground moisture problems do not exist. **The dry state of the cellar needs to be field verified by the Rater.**

The combined solution to ground moisture mitigation for the 1910 house & 2005 Addition would result in full points. This must be confirmed by the Rater.

B Foundation (4): The rural nature of Niles does provide habitat for many type of animals, including: field mice, fruit rats, opossum, raccoons and skunks. Prior to the 2005 Addition the Cellar was accessed from outside and was a point of entry for some of these pests. By screening the existing cellar vents in the 1910 House and constructing the 2005 addition, all pest problems have been resolved.

In addition, the 2005 Addition has bug screens at all venting locations in the roof.

Below are a few details from the Construction Drawings regarding these bug screens.

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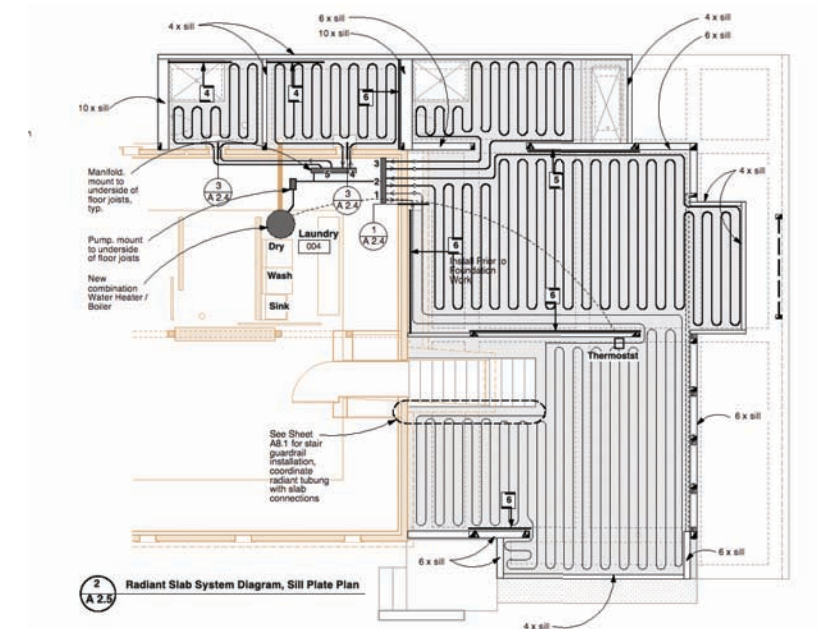
Radiant Installation

PAUL WELSCHMEYER

architects

water would come from a new Solar Hot Water Heating System and a new Water heater (Tankless or Vertex 50 gal.). This mechanical idea needs to be designed.

H HVAC (4): Install zoned hydronic radiant heating. This may have to be a weighted point as only the 2005 Addition is radiant heat. Below is the schematic layout from the Construction Documents. The system was a design-build project for the mechanical contractor. The Selected contractor was Aqua Heating Systems, Inc. from Los Gatos Ca. Very little design documentation was provided to the owner / City. All aspects of the installation passed the City inspections. Attached is a PDF document providing all the information on the design & installation.



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Future Greening Project

Future Greening Project

PAUL WELSCHMEYER

architects

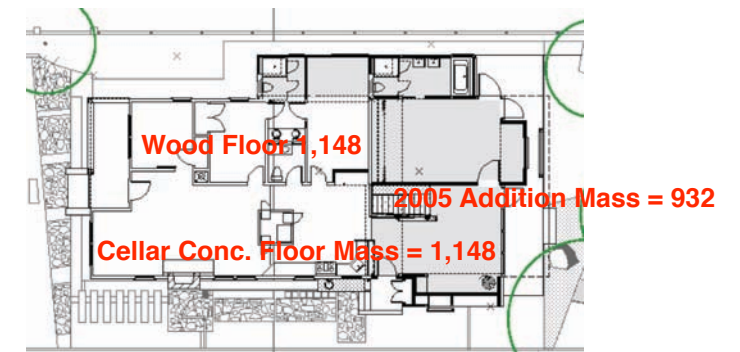
K Finishes (9): Test indoor air, formaldehyde levels less than 27ppb.

K Finishes (10): Total VOC test.

L Flooring (1a,b,c & d): 100% of the floors are Forbo Linoleum or exposed concrete. The Linoleum adhesive was Forbo L910 Adhesive and complies with VOC requirement. See purchase order below & MSDS Sheet attached. **Rater to Verify.**

PACKING LIST				FORBO LINOLEUM, INC.		ORDER NO. 601188-00
ORDER DATE 9/29/04	CUST. ORDER NO. PAUL WELSCHMEYER790	SALES REPRESENTATIVE HOUSE		DATE PRINTED 9/29/04	TIME PRINTED 13:41:45	
BILL TO FORBO IND SAMPLE FUND- WEST 17332 VON KARMAN AVE SUITE 130 IRVINE CA 92614				SHIP TO PAUL WELSCHMEYER ARCHITECTS 37735 SECOND STREET PH 510-825-0783 FREMONT CA 94536		
SHIPPED VIA BEST WAY	FRT. TERMS PPD	SHIPPED FROM RENO	MARKED FOR JOB MOCKUP-DES ARCHITECT			
WAREHOUSE NOTES						
QUANTITY	PRODUCT CODE	DESCRIPTION		PICK LOCATION	LOT NO.	
3	29.L910.04	FORBO LINO ADH L910-4 GAL		A10.2	SA4I044-01	
ORDER TOTALS				161		

L Flooring (2): Thermal Mass. The total Concrete (1" min.) floor area is a combination of the 2005 Addition & the Cellar which = 2,080 s.f., which is more than 50% of the total floor area.



Green Point Rating:

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Future Greening Project

Future Greening Project

What's the score?

PAUL WELSCHMEYER

architects

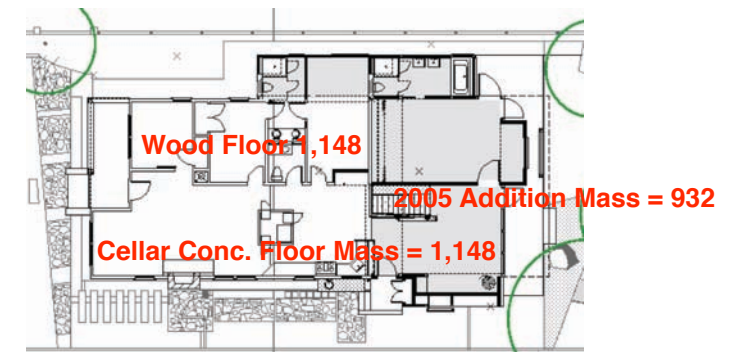
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What's the score?

**But it
is a
Whole
House
Rating**

Look at the T-24 Energy Report:

Certificate Of Compliance : Residential

(Part 1 of 4) **CF-1R**

Welschmeyer Residence: Present

Project Title

12/10/2007

Date

37737 Second Street Fremont

Project Address

Gabel Associates, LLC

Documentation Author

(510) 428.0803

Telephone

EnergyPro

Compliance Method

CA Climate Zone 03

Climate Zone

Building Permit #

Plan Check/Date

Field Check/Date

TDV (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	57.69	40.62	17.06
Space Cooling	1.29	1.17	0.11
Fans	2.86	1.76	1.10
Domestic Hot Water	10.57	10.06	0.51
Pumps	0.00	0.00	0.00
Totals	72.41	53.62	18.78

Percent better than Standard:

25.9%

BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

Look at the T-24 Energy Report:

**Energy Conservation is still
the biggest issue**

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BUILDING COMPLIES - NO HERS VERIFICATION REQUIRED

26 %

Look at the T-24 Energy Report:

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Certificate Of Compliance : Green Point Rated

(Part 1 of 4) **GPR-1R**

Welschmeyer Residence: Present

Project Title

37737 Second Street Fremont

Project Address

Build It Green

Documentation Author

EnergyPro

Compliance Method

(510) 845-0472

Telephone

CA Climate Zone 03

Climate Zone

9/9/2008

Date

Building Permit #

Plan Check/Date

Field Check/Date

TDV (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	31.26	33.49	-2.23
Space Cooling	4.76	1.17	3.59
Lighting	2.74	3.66	-0.91
Appliances	2.31	2.31	0.00
Fans	2.63	1.43	1.19
Domestic Hot Water	10.06	10.06	0.00
Pumps	0.00	0.00	0.00
Totals	53.77	52.13	1.64

Energy Usage	Standard	Proposed	Difference
Electricity (kWh)	2,242	1,767	475
Fuel (Therms)	1,270	1,338	-68



Meets GreenPoint Energy Threshold (J3a): 10 pts

GreenPoint Rated Energy Score (J3b): 17 pts

Improvement over GreenPoint Baseline: 3.0%

HERS Index: 101

Post Test shows 4.1% improvement compared to Pre-Test

BUILDING MEETS GREENPOINT ENERGY THRESHOLD

Look at the T-24 Energy Report:

Energy Conservation is still
the biggest issue

Certificate Of Compliance : Green Point Rated

(Part 1 of 4) **GPR-1R**

Welschmeyer Residence: Present

Project Title

37737 Second Street Fremont

Project Address

Build It Green

Documentation Author

EnergyPro

Compliance Method

(510) 845-0472

Telephone

CA Climate Zone 03

Climate Zone

9/9/2008

Date

Building Permit #

Plan Check/Date

Field Check/Date

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BUILDING MEETS GREENPOINT ENERGY THRESHOLD

2 %

Look at the T-24 Energy Report:

Energy Conservation is still
the biggest issue

The higher standards
expect

37%

above post - 1980

ce : Green Point Rated

(Part 1 of 4) GPR-1R

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Proposed Design	Compliance Margin
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33.49	-2.23
-------	-------

1.17	3.59
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BUILDING MEETS GREENPOINT ENERGY THRESHOLD

2%

Welschmeyer Residence

1989 - 2008

The higher standards
expect

37 %

above post - 1980

Welschmeyer Residence

1989 - 2008

The higher standards
expect

37 %

above post - 1980

26 %

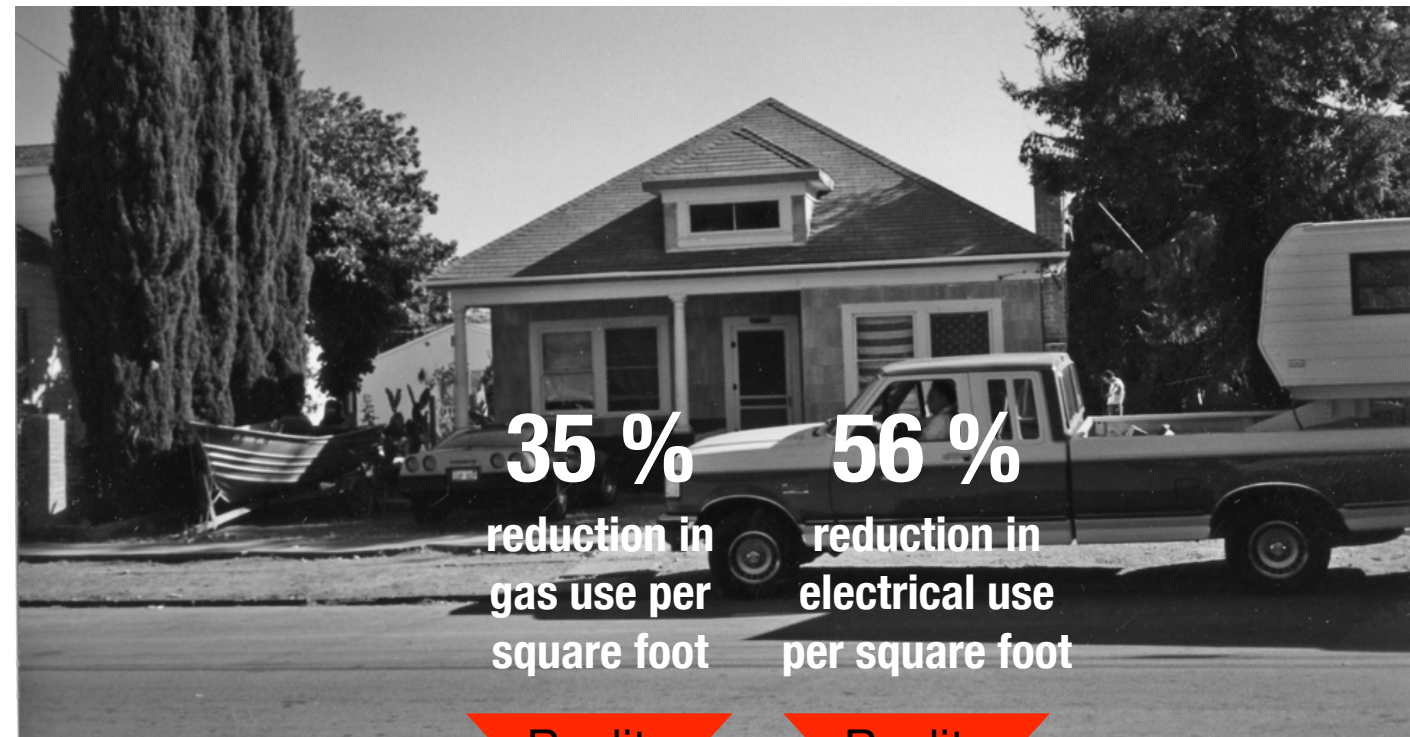
better than California Energy
Conservation Requirements

Paper

34 %

better than California Energy
Conservation Requirements,
FUTURE removal of forced air unit &
replacement with solar hydronic
fan coil unit

Paper



35 %

reduction in
gas use per
square foot

Reality

56 %

reduction in
electrical use
per square foot

Reality



Minimum Performance:



EXISTING HOME REQUIREMENT

- Attic/roof insulation meets current T-24
- 90% AFUE furnace
- Programmable thermostat
- Duct leakage < 15%
- Duct insulation above T-24
- Air Infiltration @ 0.5 ACH
- R-13 wall insulation for Post-1980 to 2000
- 10% above applicable T-24 for 2001 to now

Welschmeyer Residence - 1910



Minimum Performance:



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Welschmeyer Residence - 1910

Yes, poorly installed



Minimum Performance:



EXISTING HOME REQUIREMENT

- Attic/roof insulation meets current T-24
- 90% AFUE furnace
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Welschmeyer Residence - 1910

Yes, poorly installed
No, only 75%



Minimum Performance:



EXISTING HOME REQUIREMENT

- Attic/roof insulation meets current T-24
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Welschmeyer Residence - 1910

Yes, poorly installed

No, only 75%

Yes



Minimum Performance:



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- 10% above applicable T-24 for 2001 to now

Welschmeyer Residence - 1910

Yes, poorly installed

No, only 75%

Yes

Yes



Minimum Performance:



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Welschmeyer Residence - 1910

Yes, poorly installed

No, only 75%

Yes

Yes

None



Minimum Performance:



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Welschmeyer Residence - 1910

Yes, poorly installed

No, only 75%

Yes

Yes

None

0.22 Air Changes / HR - TIGHT!



Minimum Performance:



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Welschmeyer Residence - 1910

Yes, poorly installed

No, only 75%

Yes

Yes

None

0.22 Air Changes / HR - TIGHT!

None



Minimum Performance:



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Welschmeyer Residence - 1910

Yes, poorly installed

No, only 75%

Yes

Yes

None

0.22 Air Changes / HR - TIGHT!

None

Yes



Minimum Performance:



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- 10% above applicable T-24 for 2001 to now

Welschmeyer Residence - 2005



Minimum Performance:



EXISTING HOME REQUIREMENT

- Attic/roof insulation meets current T-24
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- Programmable thermostat
- Duct leakage < 15%
- Duct insulation above T-24
- Air Infiltration @ 0.5 ACH
- R-13 wall insulation for Post-1980 to 2000
- 10% above applicable T-24 for 2001 to now

Welschmeyer Residence - 2005

Yes, Radiant Barrier



Minimum Performance:



EXISTING HOME REQUIREMENT

- Attic/roof insulation meets current T-24
- 90% AFUE furnace
- Programmable thermostat
- Duct leakage < 15%
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- R-13 wall insulation for Post-1980 to 2000
- 10% above applicable T-24 for 2001 to now

Welschmeyer Residence - 2005

**Yes, Radiant Barrier
Hydronic Slab**



Minimum Performance:



EXISTING HOME REQUIREMENT

- Attic/roof insulation meets current T-24
- 90% AFUE furnace
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Welschmeyer Residence - 2005

Yes, Radiant Barrier
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Yes



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Welschmeyer Residence - 2005

Yes, Radiant Barrier
Hydronic Slab

Yes

NA, Radiant Slab



Minimum Performance:



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Welschmeyer Residence - 2005

Yes, Radiant Barrier
Hydronic Slab
Yes

NA, Radiant Slab

NA, Radiant Slab



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Welschmeyer Residence - 2005

Yes, Radiant Barrier
Hydronic Slab
Yes

NA, Radiant Slab

NA, Radiant Slab

0.22 Air Changes/HR - TIGHT!



Minimum Performance:



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Welschmeyer Residence - 2005

**Yes, Radiant Barrier
Hydronic Slab
Yes**

NA, Radiant Slab

NA, Radiant Slab

0.22 Air Changes/HR - TIGHT!

Yes



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Welschmeyer Residence - 2005

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Hydronic Slab**

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NA, Radiant Slab

NA, Radiant Slab

0.22 Air Changes/HR - TIGHT!

Yes

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Welschmeyer Residence - 2005

**Yes, Radiant Barrier
Hydronic Slab**

Yes

NA, Radiant Slab

NA, Radiant Slab

0.22 Air Changes/HR - TIGHT!

Yes

Yes



1930



Minimum Performance:



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Welschmeyer Residence - 2005

Yes, Radiant Barrier
Hydronic Slab

Yes

NA, Radiant Slab

NA, Radiant Slab

0.22 Air Changes/HR - TIGHT!

Yes

Yes



1930

High Thermal Mass



Minimum Performance:



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Welschmeyer Residence - 2005

**Yes, Radiant Barrier
Hydronic Slab**

Yes

NA, Radiant Slab

NA, Radiant Slab

0.22 Air Changes/HR - TIGHT!

Yes

Yes



1930

High Thermal Mass

**Not conditioned
but open to
conditioned space**



Green is Better!



Old

New

83

Community - 12
Energy - 37
IAQ/Health - 18
Resources - 8
Water - 14



Green is Better!



New

83



Green is Better!



Old

New



83

Green is Better!



New



Green is Better!



Old

New



83

Green is Better!



New



83

Green is Better!



New

83



Green is Better!



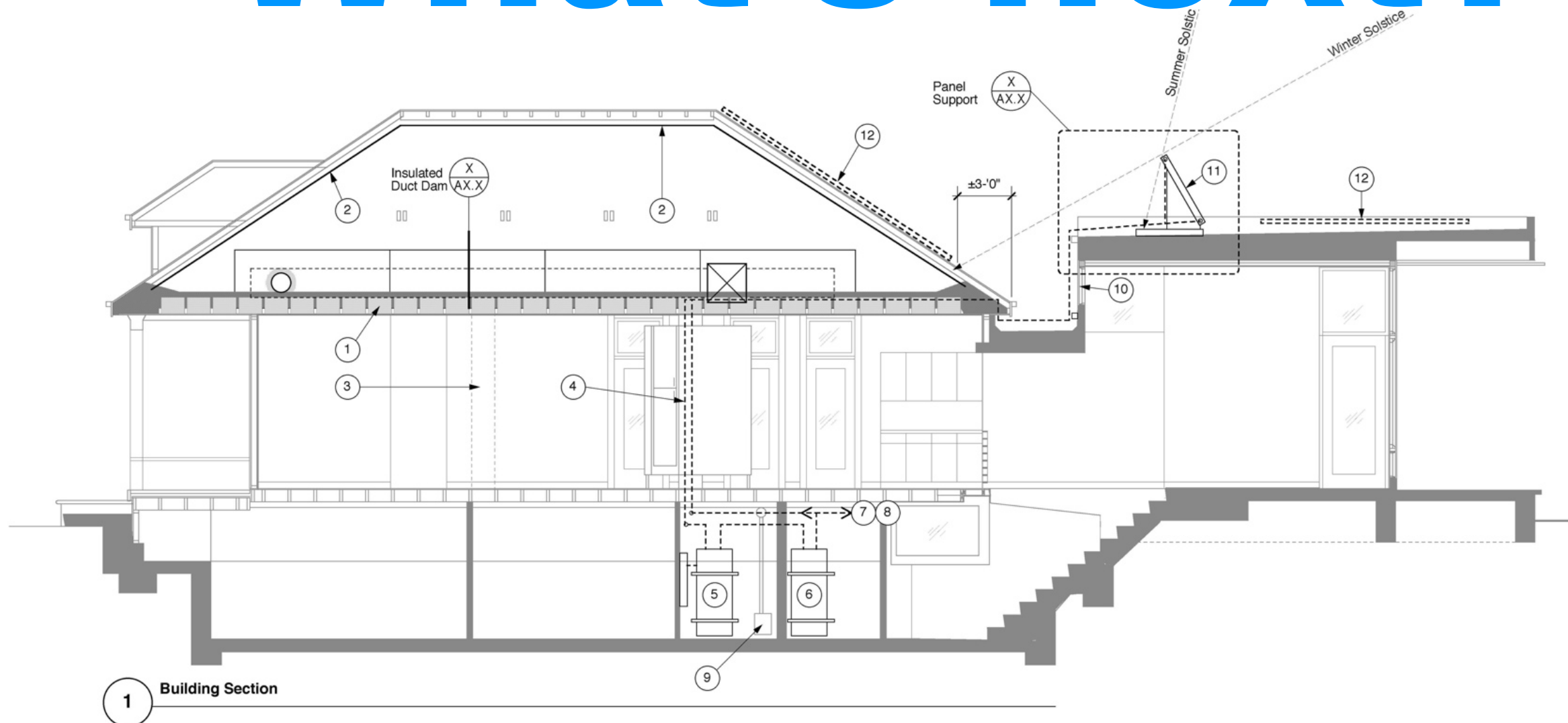
What's next?



Green is Better!



What's next?



Green is Better!



What's next?



Green is Better!



What's next?



Green is Better!



Green is Better!



Remember!

Know Your Energy Habits: Track your gas and electrical consumption and divide it by the thermally conditioned square footage of your house. As an example, the Welschmeyer residence consumes the current annual average of 0.27 Therms/s.f. and 3.67 KWH/s.f. Every house and family is different: work on improving your habits.

Green is Better!



Remember!

Know the Facts About Your House: There is a new subcontractor on the block who actually knows what they are doing and actually cares. Have your house evaluated by a High Performance Subcontractor such as BUILDING SOLUTIONS or SUSTAINABLE SPACES. It is inexpensive (\pm \$700) , then you will know how bad the house really is , and specifically what to fix.

Green is Better!



Remember!

Go on Green Home Tours & Ask Around: Many homeowners are embarrassed that their new green house does not work. Not all green projects are successful. If an Owner/Architect/ Contractor does not know how the house performs, they are usually hiding something.

Green is Better!



Remember!

Work with Retrained Professionals : Mechanical Subcontracting in the residential market has been working from rules of thumb which are not accurate and result in oversized/poorly designed HVAC systems. The State of California knows that the insulation industry rarely installs batt insulation correctly and to compensate for this, the insulation values for walls and ceilings are reduced by approximately 20% when determining compliance with T-24 energy regulations. In other words, the State considers your R-30 attic insulation to be R-24 unless otherwise verified by an independent home energy rater.

Green is Better!



Remember!

Have a Master Plan for Transition: Greening an existing house takes dedication and time. It is similar to trying to improve your grade at the end of the quarter, from a “C” to an “A”. It will never happen; but you may get a “B”. Be realistic, do one thing at a time, and do it all. Consider the next 10 years as your period of transition.

Member of the American
Institute of Architects,
East Bay Chapter



paul@pwarchitects.biz

Certified Build it Green
Professional & Member



Member of the Northern
Californian, U.S. Green
Building Council



www.pwarchitects.biz

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Niles , California