



The San Diego Real Estate  
Inspection Company

## Inspection Report

### Home Buyer

**Property Address:**  
777 Mac Court  
San Marcos CA 92069

**Sample Report**



**The San Diego Real Estate Inspection Co.**

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PLEASE NOTE THAT THIS IS A SAMPLE REPORT ONLY, AND MAY NOT BE REPRESENTATIVE OF A REPORT PREPARED FOR ANOTHER PROPERTY. EACH PROPERTY IS UNIQUE, AND DIFFERENT COMPONENTS MAY OR MAY NOT EXIST IN THIS OR OTHER PROPERTIES. YOUR REPORT MAY CONTAIN DIFFERENT ITEMS THAN THOSE CONTAINED IN THIS REPORT. OUR REPORT FORMAT IS CHANGED ON AN ON-GOING BASIS, AND EVOLVES OVER TIME. THIS REPORT IS AN EXAMPLE ONLY AND SHOULD NOT BE RELIED UPON AS A SAMPLE OF WHAT YOU WILL RECEIVE.

HOME INSPECTORS ARE ONLY REQUIRED TO REPORT ON DEFECTS IN THE EXISTING COMPONENTS OF A HOUSE. HOME INSPECTORS DO NOT REPORT ON THE ABSENCE OF LUXURY ITEMS THAT ARE NOT REQUIRED BY THE BUILDING CODE, SUCH AS AIR CONDITIONING, TRASH COMPACTORS, GARAGE DOOR OPENERS, SPAS, ETC.

THE BUYER SHOULD TAKE RESPONSIBILITY TO CONFIRM WHICH COMPONENTS ARE IN THE HOUSE, AND CONFIRM THAT THE INFORMATION PROVIDED IN THE MLS LISTING OR OTHER MARKETING MATERIAL IS ACCURATE.

PLEASE CALL US WITH ANY QUESTIONS ABOUT OUR REPORT, AND THE ITEMS WHICH WILL BE INCLUDED.

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# 1. BUILT-IN KITCHEN APPLIANCES

The home inspector shall observe and operate the basic functions of the following kitchen appliances: Permanently installed dishwasher, through its normal cycle; Range, cook top, and permanently installed oven; Trash compactor; Garbage disposal; Ventilation equipment or range hood; and Permanently installed microwave oven. The home inspector is not required to observe: Clocks, timers, self-cleaning oven function, or thermostats for calibration or automatic operation; Non built-in appliances; or Refrigeration units. The home inspector is not required to operate: Appliances in use; or Any appliance that is shut down or otherwise inoperable.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

**IN NI NP RR Inspection Items**

## 1.0 DISHWASHER

**DISHWASHER: AGED, GENERAL ELECTRIC**

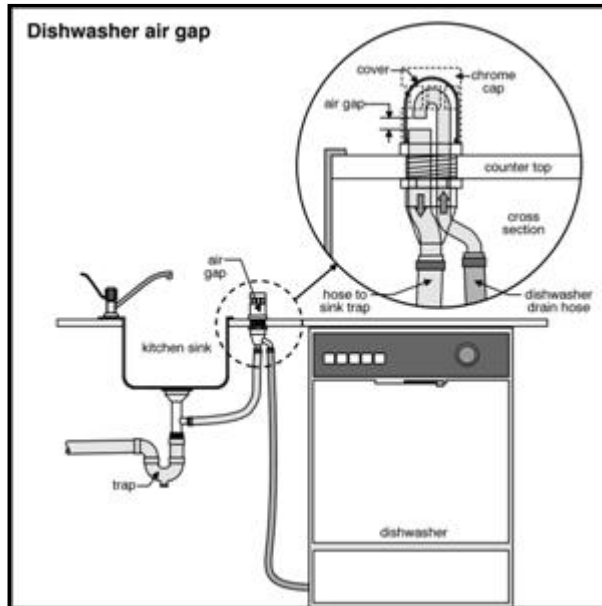
**Findings:**

(1) The dishwasher is in poor condition. The door hinges are broken and the door springs are not functioning properly. The interior has a heavy layer of calcium. The dishwasher was not run due to the poor condition. Recommend replacement.



1.0 Picture 1

(2) No air gap was installed for the dishwasher. An air gap is required to prevent dirty water from being sucked back into the water supply. Recommend installation of an air gap by a qualified plumber.



Diagrams inserted to illustrate proper configuration.

Check boxes make it easy to scan report for repair items.

**IN NI NP RR Inspection Items**

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**IN NI NP RR Inspection Items**


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1.0 Picture 2

    **1.1 RANGES/COOKTOP**
**RANGE:** ELECTRIC, UNKNOWN**Findings:**

The electric range is in poor condition. The front right coil was missing, and the griddle was missing. Recommend replacement.

Arrows indicate exact location of defects.



1.1 Picture 1

    **1.2 FOOD WASTE DISPOSER**  
**DISPOSER:** IN SINK ERATOR  
**Findings:**
    **1.3 RANGE HOOD**  
**EXHAUST/RANGE HOOD:** UNKNOWN BRAND, VENTED  
**Findings:**
    **1.4 MICROWAVE COOKING EQUIPMENT (Built-in)**  
**BUILT-IN MICROWAVE:** AGED, GENERAL ELECTRIC  
**Findings:**


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**IN NI NP RR Inspection Items**


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**IN NI NP RR Inspection Items**

The microwave was tested and was functional at time of inspection. However the microwave appears to be original, and is an older unit. recommend budgeting for a new microwave as the life remaining is limited. Microwave and wall oven are one unit, so both will require replacement simultaneously.



1.4 Picture 1

    **1.5 WALL OVEN**

**WALL OVEN:** ELECTRIC, GENERAL ELECTRIC

**Findings:**

Wall oven was tested and functional at time of inspection. The timer and timer knob are damaged.



1.5 Picture 1

    **1.6 REFRIGERATOR**
**Findings:**

Refrigerators are not part of a general inspection.

    **1.7 WASHER/DRYER**
**Findings:****IN NI NP RR Inspection Items**

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The built-in appliances of the home were inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

## 2. PLUMBING SYSTEM

The home inspector shall observe: Interior water supply and distribution system, including: piping materials, supports, and insulation; fixtures and faucets; functional flow; leaks; and cross connections; Interior drain, waste, and vent system, including: traps; drain, waste, and vent piping; piping supports and pipe insulation; leaks; and functional drainage; Hot water systems including: water heating equipment; normal operating controls; automatic safety controls; and chimneys, flues, and vents; Fuel storage and distribution systems including: interior fuel storage equipment, supply piping, venting, and supports; leaks; and Sump pumps. The home inspector shall describe: Water supply and distribution piping materials; Drain, waste, and vent piping materials; Water heating equipment; and Location of main water supply shutoff device. The home inspector shall operate all plumbing fixtures, including their faucets and all exterior faucets attached to the house, except where the flow end of the faucet is connected to an appliance. The home inspector is not required to: State the effectiveness of anti-siphon devices; Determine whether water supply and waste disposal systems are public or private; Operate automatic safety controls; Operate any valve except water closet flush valves, fixture faucets, and hose faucets; Observe: Water conditioning systems; Fire and lawn sprinkler systems; On-site water supply quantity and quality; On-site waste disposal systems; Foundation irrigation systems; Spas, except as to functional flow and functional drainage; Swimming pools; Solar water heating equipment; or Observe the system for proper sizing, design, or use of proper materials.

**Please note that many factors can affect a plumbing system. The simple change of having a house vacant, having the water shut off, or performing any repairs can have an adverse affect on the plumbing system:**

**On the water supply side, debris, rust, scale and sediment can build up when the plumbing is not used, or water supply is shut off, such as in a vacant house. When the water is turned back on, debris can become dislodged and clog valves downstream. In particular, faucets can easily become clogged between the time a home inspection is performed and when the house is occupied. If you do not have any hot or cold water flowing from one of these valves, the valve will need to be flushed by a plumber.**

**On the waste side of the plumbing system, the amount of sludge that builds up on the inside of these pipes is surprising. That's why sometimes a home's plumbing system could work fine until it is vacant for a few weeks or months, and then the sludge inside pipes and P-traps begin to dry and clog pipes. This can also happen between the time a home inspection is performed, and the time the house is occupied. These clogs can cause waste water to back up and create leaks that could not be detected during the inspection. If no blockage was reported in the inspection report, but drains run slowly after you move in, the drains will require service by a plumber.**

***We attempt to evaluate drain pipes by flushing every drain that has an active fixture while observing its draw and watching for blockages or slow draining. This is not a conclusive test and only a video-scan of the main line would confirm its actual condition.***

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**IN NI NP RR Inspection Items**

IN	NI	NP	RR	Inspection Items
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>2.0 INTERIOR DRAIN, WASTE AND VENT SYSTEMS</b> <b>WASHER DRAIN SIZE: 2" DIAMETER</b> <b>PLUMBING WASTE: ABS</b> <b>Findings:</b> (1) Tub drains slowly in the upstairs hall bathroom. Recommend drain service by a licensed plumber.

**IN NI NP RR Inspection Items**

**IN NI NP RR Inspection Items**

2.0 Picture 1

(2) The drain tube below left side sink in hall bathroom is corroded. Recommend replacement by a licensed plumber.



2.0 Picture 2

**2.1 WATER SUPPLY AND DISTRIBUTION SYSTEM**

**PLUMBING DISTRIBUTION: POLYBUTYLENE\***

**Findings:**

Polybutylene plastic plumbing supply lines (PB or QUEST) are installed in the subject house. Polybutylene has been used in this area for many years, but has had a higher than normal failure rate, and is no longer being used. Many of these systems were the subject of a recall. Copper and Brass fittings used in later years have apparently reduced the failure rate. This subject house has copper fittings. We recommend that you consult with a licensed plumber about this system, the potential for it to fail, and the cost of re-plumbing your house prior to the end of your contingency period. For further details contact the Consumer Plumbing Recovery center at 1-800-392-7591 or the web at <http://www.pbpipe.com>

Useful web links included for more information.

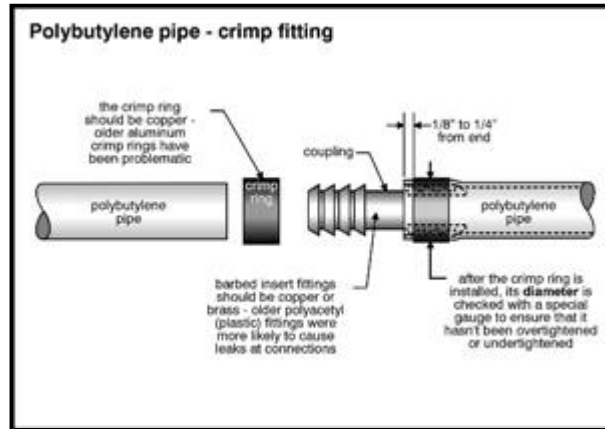
**IN NI NP RR Inspection Items**



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**IN NI NP RR Inspection Items**


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2.1 Picture 1

**□ □ □ ☒ 2.2 FIXTURES AND CONNECTED DEVICES**
**WATER SOURCE:** PUBLIC**WATER FILTERS:** NONE**PLUMBING SUPPLY:** COPPER**Findings:**

- (1) Toilet tank lid in master bathroom is broken. Recommend replacement.



2.2 Picture 1

- (2) Sink faucet in Half Bath is corroded. Advise replacing to prevent future leaks.

- (3) Kitchen sink is chipped and has dropped below counter. This can allow water to enter the cabinet below. Recommend repairing the cause of the failure, and caulking around basin perimeter.

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**IN NI NP RR Inspection Items**


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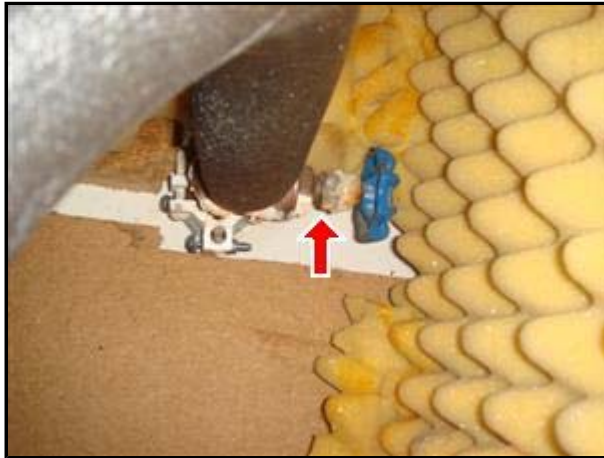
**IN NI NP RR Inspection Items**

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2.2 Picture 2

(4) The water shut off valve at water heater is corroded. Recommend replacement when water heater is replaced.



2.2 Picture 3

(5) Toilet in master bathroom is loose on floor. Recommend repair by a licensed plumber.

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**IN NI NP RR Inspection Items**

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**IN NI NP RR    Inspection Items**


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2.2 Picture 4

- 2.3 CORRECT PLUMBING AT FAUCETS (hot left, cold right)**  
Findings:

- 2.4 HOT WATER SYSTEMS, CONTROLS, CHIMNEYS, FLUES AND VENTS**  
**CAPACITY:** 40 GAL (1-2 PEOPLE)  
**MANUFACTURER:** GE  
**YEAR MANUFACTURED:** 1999  
**Findings:**

An active leak was observed at the water heater. Standing water was located inside the burner compartment. Recommend replacement by a licensed plumber to avoid leaks which could cause property damage.



2.4 Picture 1

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**IN NI NP RR    Inspection Items**


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**IN NI NP RR Inspection Items**

2.4 Picture 2

**2.5 WATER HEATER STRAPPING AND BRACING**  
**Findings:**

**2.6 MAIN WATER SHUT-OFF DEVICE (Describe location)**  
**Findings:**

**2.7 PRESSURE REGULATOR**  
**WATER PRESSURE: ADEQUATE**  
**Findings:**

I could not inspect the regulator due to excessive items stored in the garage.

**2.8 GAS STORAGE AND DISTRIBUTION SYSTEMS (Interior fuel storage, piping, venting, supports, leaks)**  
**Findings:**

**2.9 MAIN GAS SHUT OFF VALVE (describe location)**  
**Findings:**

The main gas shut off valve is located adjacent to the gas meter at the front left corner of the house (facing front).

**IN NI NP RR Inspection Items**

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The plumbing in the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. Washing machine drain line for example cannot be checked for leaks or the ability to handle the volume during drain cycle. Older homes with galvanized supply lines or cast iron drain lines can be obstructed and barely working during an inspection but then fails under heavy use. If the water is turned off or not used for periods of time (like a vacant home waiting for closing) rust or deposits within the pipes can further clog the piping system. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

Having a flood in your house can be devastating. Even a small leak can cause thousands of dollars of damage to your home and personal belongings. Leaks always seem to happen when the homeowner is away from their house. There are some simple steps you can take to avoid floods. New products exist which are easy to install, and they detect leaks and shut off the water automatically. We highly recommend installing automatic shut off valves to protect your property. We also recommend replacing valves that become corroded.

### 3. ELECTRICAL SYSTEMS

The home inspector shall observe: Service entrance conductors; Service equipment, grounding equipment, main over current device, and main and distribution panels; Amperage and voltage ratings of the service; Branch circuit conductors, their over current devices, and the compatibility of their ampacities and voltages; The operation of a representative number of installed ceiling fans, lighting fixtures, switches and receptacles located inside the house, garage, and on the dwelling's exterior walls; The polarity and grounding of all receptacles within six feet of interior plumbing fixtures, and all receptacles in the garage or carport, and on the exterior of inspected structures; The operation of ground fault circuit interrupters; and Smoke detectors. The home inspector shall describe: Service amperage and voltage; Service entry conductor materials; Service type as being overhead or underground; and Location of main and distribution panels. The home inspector shall report any observed aluminum branch circuit wiring. The home inspector shall report on presence or absence of smoke detectors, and operate their test function, if accessible, except when detectors are part of a central system. The home inspector is not required to: Insert any tool, probe, or testing device inside the panels; Test or operate any over current device except ground fault circuit interrupters; Dismantle any electrical device or control other than to remove the covers of the main and auxiliary distribution panels; or Observe: Low voltage systems; Security system devices, heat detectors, or carbon monoxide detectors; Telephone, security, cable TV, intercoms, or other ancillary wiring that is not a part of the primary electrical distribution system; or Built-in vacuum equipment.

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**IN NI NP RR Inspection Items**

**3.0 SERVICE AND GROUNDING EQUIPMENT, MAIN OVERCURRENT DEVICE, MAIN AND DISTRIBUTION PANELS**

**PANEL CAPACITY:** 100 AMP

**PANEL TYPE:** CIRCUIT BREAKERS

**ELEC. PANEL MANUFACTURER:** CHALLENGER

**Findings:**

(1) Knockouts noted missing from inside the panel. We advise installing cover inserts for safety.



3.0 Picture 1

(2) Wire clamp missing at main panel. A plastic bushing or wire clamp protects and secures the wiring as it enters into the electric box. We advise corrections by a lic electrician.

**IN NI NP RR Inspection Items**

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**IN NI NP RR    Inspection Items**


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3.0 Picture 2

- 3.1 BRANCH CIRCUIT CONDUCTORS, OVERCURRENT DEVICES AND COMPATIBILITY OF THEIR AMPERAGE AND VOLTAGE**  
**BRANCH WIRE 15 and 20 AMP: COPPER**  
**WIRING METHODS: ROMEX**  
**Findings:**

- 3.2 CONNECTED DEVICES AND FIXTURES (Observed from a representative number operation of ceiling fans, lighting fixtures, switches and receptacles located inside the house, garage, and on the dwelling's exterior walls)**  
**Findings:**  
 Weather proof covers are required at exterior receptacles.



3.2 Picture 1



3.2 Picture 2

- 3.3 EXTERIOR LIGHTING (Patio lights, motion sensors)**  
**Findings:**

- 3.4 POLARITY AND GROUNDING OF RECEPTACLES WITHIN 6 FEET OF INTERIOR PLUMBING FIXTURES, AND ALL RECEPTACLES IN GARAGE, CARPORT, EXTERIOR WALLS OF INSPECTED STRUCTURE**

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**IN NI NP RR    Inspection Items**


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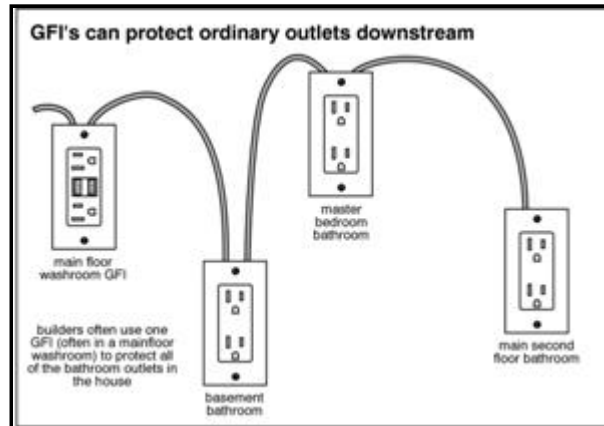
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**IN NI NP RR    Inspection Items**


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**Findings:**
    **3.5 OPERATION OF GFCI (GROUND FAULT CIRCUIT INTERRUPTERS)**
**Findings:**

There is more than one GFCI receptacle installed on the bathroom circuit. Only one GFCI is required to protect all of the receptacles past the GFCI. Having too many GFCI receptacles on one circuit is not a hazard, but can cause confusion to reset if one trips. Recommend having a licensed electrician identify proper installation and correct as necessary.



3.5 Picture 1

    **3.6 LOCATION OF MAIN AND DISTRIBUTION PANELS**
**Findings:**

Main panel is located at right corner of house (facing front).



3.6 Picture 1



3.6 Picture 2

    **3.7 SMOKE DETECTORS (describe location and number)**
**Findings:**

We recommend replacing all smoke detectors upon moving into home. Smoke detectors that are 10 years old or older may have a failure rate as high as 30%, and smoke detectors that are 15 years old or older may have a failure rate as high as 50% according to the National Fire Protection Association [www.nfpa.org](http://www.nfpa.org). We also recommend that a smoke alarm be installed in each bedroom, and at least one on each level outside of bedrooms. It is further recommended that all smoke detectors be inter-connected with a signal wire to sound all alarms if one is activated.

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**IN NI NP RR    Inspection Items**


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**IN NI NP RR Inspection Items**

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Hard-wired smoke detector in stairwell did not work when tested. Recommend replacement with like-kind detector.



3.7 Picture 1

 **3.8 CABLE AND TELEPHONE ENTRANCE Findings:**

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**IN NI NP RR Inspection Items**

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The electrical system of the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. Outlets were not removed and the inspection was only visual. Any outlet not accessible (behind the refrigerator for example) was not inspected or accessible. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.



## 4. HEATING & COOLING EQUIPMENT

The home inspector shall observe permanently installed heating and cooling systems including: Heating equipment; Normal operating controls; Automatic safety controls; Chimneys, flues, and vents, where readily visible; Solid fuel heating devices; Heat distribution systems including fans, pumps, ducts and piping, with supports, insulation, air filters, registers, radiators, fan coil units, convectors; and the presence of an installed heat source in each room. Cooling systems; Central air conditioning and permanently installed cooling systems including: Cooling and air handling equipment; and Normal operating controls. Distribution systems including: Fans, pumps, ducts and piping, with associated supports, dampers, insulation, air filters, registers, fan-coil units; and The presence of an installed cooling source in each room. The home inspector shall describe: Energy sources; and Cooling equipment type. The home inspector shall operate the systems using normal operating controls. The home inspector shall open readily openable access panels provided by the manufacturer or installer for routine homeowner maintenance. The home inspector shall describe: Energy source; and Heating equipment and distribution type. The home inspector shall operate the systems using normal operating controls. The home inspector shall open readily openable access panels provided by the manufacturer or installer for routine homeowner maintenance. The home inspector is not required to: Operate heating systems when weather conditions or other circumstances may cause equipment damage; Operate automatic safety controls; Ignite or extinguish solid fuel fires; or Observe: The interior of flues; Fireplace insert flue connections; Humidifiers; Electronic air filters; or The uniformity or adequacy of heat/cooling supply to the various rooms. The home inspector is not required to: Observe window air conditioners or operate cooling systems when weather conditions or other circumstances may cause equipment damage; Observe non-central air conditioners; or Observe the uniformity or adequacy of cool-air supply to the various rooms.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

**IN NI NP RR Inspection Items**



### 4.0 HEATING EQUIPMENT

**AGE OF FURNACE:** Less than 10 years

**Findings:**

(1) The furnace was manufactured in 2000. This is a newer furnace, but the furnace failed to operate when tested. Recommend further inspection and repair by a licensed HVAC contractor.



4.0 Picture 1

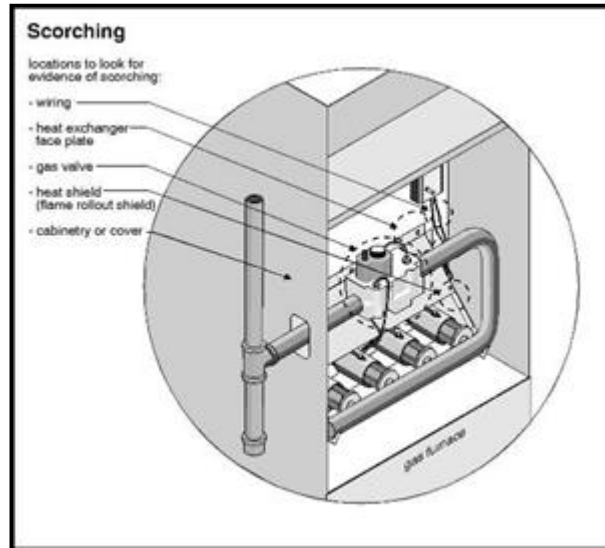
(2) Flexible gas supply pipe passes through furnace housing. Recommend installation of rigid cast pipe from gas regulator through furnace housing, to exterior of furnace housing. Vibration from furnace can wear through flexible gas pipe, and is no longer adequate.

**IN NI NP RR Inspection Items**

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**IN NI NP RR    Inspection Items**


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4.0 Picture 2

**4.1 COOLING AND AIR HANDLER EQUIPMENT**  
**Findings:**

**4.2 NORMAL OPERATING CONTROLS (Thermostat)**  
**Findings:**

**4.3 AUTOMATIC SAFETY CONTROLS**  
**Findings:**

**4.4 FLUES AND VENTS (Chimneys for heating system)**  
**Findings:**

**4.5 DISTRIBUTION SYSTEMS (including fans, pumps, ducts and piping, with supports, insulation, air filters, registers, radiators, fan coil units and convectors)**  
**FILTER TYPE: DISPOSABLE**

Extra Info : Located in attic at furnace

**Findings:**

Poor repairs were observed at the ducting in the attic. The ducts were repaired with duct tape, but duct tape fails over time. Recommend having the ducts sealed by a licensed heating contractor.

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**IN NI NP RR    Inspection Items**

**IN NI NP RR Inspection Items**

4.5 Picture 1

**4.6 FIREPLACES (including Gas/LP firelogs) AND CHIMNEYS**  
**Findings:**

**4.7 DAMPER CLAMP**  
**Findings:**

A damper clamp is required at the damper when concrete gas logs are used in the fireplace. This damper clamp prevents the damper from closing all the way as a safety precaution. If the damper is closed, Carbon Monoxide gas can enter the living space which is undetectable. Recommend installation of a damper clamp.



4.7 Picture 1

**4.8 PRESENCE OF INSTALLED HEAT SOURCE IN EACH BEDROOM**  
**Findings:**

**IN NI NP RR Inspection Items**

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The heating and/or cooling system of this home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. The inspection is not meant to be technically exhaustive. The inspection does not involve removal and inspection behind service door or dismantling that would otherwise reveal something only a licensed HVAC contractor would discover. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

## 5. INTERIORS

The home inspector shall observe: Walls, ceiling, and floors; Steps, stairways, balconies, and railings; Counters and a representative number of installed cabinets; and A representative number of doors and windows. The home inspector shall: Operate a representative number of windows and interior doors; and Report signs of abnormal or harmful water penetration into the building or signs of abnormal or harmful condensation on building components. The home inspector is not required to observe: Paint, wallpaper, and other finish treatments on the interior walls, ceilings, and floors; Carpeting; or Draperies, blinds, or other window treatments.

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**IN NI NP RR Inspection Items**

### 5.0 CEILINGS

**CEILING MATERIALS:** SHEETROCK

**Findings:**

Water stains were observed at several locations in the house. Stains in the family room appear to be from a plumbing leak at the master bathroom. The water stains in the living room appear to be from roof leaks.



5.0 Picture 1

### 5.1 WALLS

**WALL MATERIAL:** SHEETROCK

**Findings:**

### 5.2 FLOOR COVERINGS

**FLOOR COVERING(S):** CARPET, TILE

**Findings:**

(1) Floor covering was removed from the laundry room.

(2) Carpet padding was removed from the downstairs 1/2 bathroom. This appears to be the result of a water leak in the laundry room.

### 5.3 TUB/SHOWER ENCLOSURE

**Findings:**

Window noted installed too low at shower stall. Windows are required to be installed at least five feet above the shower floor to prevent water damage to the window frame. We advise contacting a licensed general contractor to make necessary corrections. This window may be the cause of the water leaking into the family room.

**IN NI NP RR Inspection Items**

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**IN NI NP RR      Inspection Items**


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5.3 Picture 1

**5.4 STEPS, STAIRWAYS, BALCONIES AND RAILINGS****Findings:****5.5 COUNTERS AND A REPRESENTATIVE NUMBER OF CABINETS****CABINETRY:** WOOD, PARTICLE BOARD**KITCHEN COUNTERTOP:** TILE**Findings:**

(1) Cabinets are original and worn. Two drawers are missing from the kitchen cabinets.

(2) Mold and mildew odor noted under the kitchen sink. This may be a health and safety concern. We advise obtaining further evaluation from a qualified expert to determine the extent of the necessary corrective measures required.



**IN NI NP RR      Inspection Items**

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5.5 Picture 1

**5.6 DOORS (REPRESENTATIVE NUMBER)**  
**INTERIOR DOORS: HOLLOW CORE**  
**Findings:**

**5.7 WINDOWS (REPRESENTATIVE NUMBER)**  
**Findings:**

**5.8 AUTO CLOSER (GARAGE DOOR)**  
**Findings:**

**5.9 FIRE-RATED DOOR (garage)**  
**Findings:**

**5.10 ATTIC**  
**Findings:**  
 Due to the configuration of the engineered roof trusses, forced air handling components, and structure of the roof, some areas of the attic could not be inspected.

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**IN NI NP RR      Inspection Items**

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The interior of the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. The inspection did not involve moving furniture and inspecting behind furniture, area rugs or areas obstructed from view. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

## 6. EXTERIOR

The home inspector shall observe: Wall cladding, flashings, and trim; Entryway doors and a representative number of windows; Garage door operators; Decks, balconies, stoops, steps, areaways, porches and applicable railings; Eaves, soffits, and fascias; and Vegetation, grading, drainage, driveways, patios, walkways, and retaining walls with respect to their effect on the condition of the building. The home inspector shall: Describe wall cladding materials; Operate all entryway doors and a representative number of windows; Operate garage doors manually or by using permanently installed controls for any garage door operator; Report whether or not any garage door operator will automatically reverse or stop when meeting reasonable resistance during closing; and Probe exterior wood components where deterioration is suspected. The home inspector is not required to observe: Storm windows, storm doors, screening, shutters, awnings, and similar seasonal accessories; Fences; Presence of safety glazing in doors and windows; Garage door operator remote control transmitters; Geological conditions; Soil conditions; Recreational facilities (including spas, saunas, steam baths, swimming pools, tennis courts, playground equipment, and other exercise, entertainment, or athletic facilities); Detached buildings or structures; or Presence or condition of buried fuel storage tanks. The home inspector is not required to: Move personal items, panels, furniture, equipment, plant life, soil, snow, ice or debris that obstructs access or visibility.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

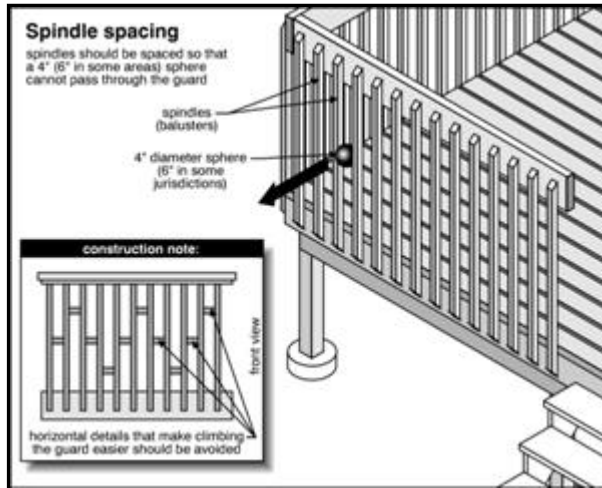
IN	NI	NP	RR	Inspection Items
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>6.0 WALL CLADDING FLASHING AND TRIM</b> <b>SIDING MATERIAL:</b> COMPOSITE BOARD, STUCCO <b>Findings:</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>6.1 DOORS (Exterior)</b> <b>MAIN ENTRY DOOR:</b> WOOD <b>GARAGE DOOR MATERIAL:</b> WOOD <b>Findings:</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>6.2 GARAGE VEHICLE DOORS</b> <b>Findings:</b>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>6.3 GARAGE DOOR OPERATORS (Report whether or not doors will reverse when met with resistance)</b> <b>Findings:</b> The garage door were not opened or closed due to personal items in the garage.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>6.4 WINDOWS (frames, panes, screens)</b> <b>WINDOW TYPES:</b> SINGLE PANE ALUMINUM <b>Findings:</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>6.5 DECKS, BALCONIES, STOOPS, STEPS, AREAWAYS, PORCHES AND APPLICABLE RAILINGS</b> <b>APPURTENANCE:</b> PATIO <b>Findings:</b> While the railing/baluster spacing may have been standard at time of construction, it does not comply with current safety standards. The large openings can allow pets or children to fall through. Recommend installing additional pickets, or other form of barrier to prevent injuries.

IN NI NP RR Inspection Items

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**IN NI NP RR Inspection Items**


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6.5 Picture 1


**6.6 VEGETATION, GRADING, DRAINAGE, AND RETAINING WALLS (With respect to their effect on the condition of the building)**
**DRIVEWAY: CONCRETE**
**Findings:**

Some water collects at the plaster at rear of house. Recommend correction by raising the level of soil or installing a yard drain.



6.6 Picture 1


**6.7 DRIVEWAYS, PATIOS, WALKWAYS**
**Findings:**

**6.8 EAVES, SOFFITS AND FASCIAS**
**Findings:**

Several areas were observed with damaged wood. recommend referring to the pest inspection report for a full evaluation and suggested remedies.



**IN NI NP RR Inspection Items**

6.8 Picture 1



6.8 Picture 2

**6.9 FENCE****Findings:****6.10 OUTDOOR AREA****Findings:**

Unsecured items in the yard may be hazardous to people, especially small children. These items include large pots, bird baths, fountains, statues, benches, tables, etc. which can fall over and cause injury or death. Inspecting these items for proper installation is beyond the scope of a general home inspection. These items should be checked by you to ensure proper installation and securing, or removed for safety.

**IN NI NP RR Inspection Items**

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

The exterior of the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

## 7. ROOFING

The home inspector shall observe: Roof covering; Roof drainage systems; Flashings; Skylights, chimneys, and roof penetrations; and Signs of leaks or abnormal condensation on building components. The home inspector shall: Describe the type of roof covering materials; and Report the methods used to observe the roofing. The home inspector is not required to: Walk on the roofing; or Observe attached accessories including but not limited to solar systems, antennae, and lightning arrestors.

There are many different roof types, and every roof will wear differently relative to its age, the number of its layers, the quality of its material, the method of its application, its exposure to direct sunlight or to other prevalent weather conditions, and its maintenance. However, regardless of its design-life, every roof is only as good as the waterproof membrane beneath it, which is concealed and cannot be examined without removing the roof material, and this is equally true of almost all roofs. In fact, the material on most pitched roofs is not designed to be waterproof only water-resistant. There are two basic roof types, pitched and flat. Pitched roofs are the most common, and the most dependable. They are variously pitched, and typically finished with composition shingles that have a design life of twenty to twenty-five years, or concrete, composite, Spanish, or metal tiles that have a design-life of forty to fifty years, and gravel roofs that have a lesser pitch and a shorter design-life of ten to fifteen years. These roofs may be layered, or have one roof installed over another, which is a common practice but one that is never recommended because it reduces the design-life of the new roof by several years and requires a periodical service of the flashings. These are serviced with mastic, which eventually shrinks and cracks and provides a common point of leakage. However, among the pitched roofs, gravel ones are the least dependable, because the low pitch and the gravel prevent them from draining as readily as other roofs. For this reason, they must be conscientiously maintained. In this respect, the least dependable of all roofs are the flat ones, which are also called built-up ones. Some flat roofs are adequately sloped toward drains but many are not, and water simply ponds and will only be dispersed by evaporation. However, the most common cause of leakage results when roofs are not serviced or kept clean, and foliage and other debris blocks the drainage channels. What remains true of all roofs is that, whereas their condition can be evaluated, it is virtually impossible for anyone to detect a leak except as it is occurring or by specific water tests, which are beyond the scope of our service. Even water stains on ceilings, or on the framing within attics, will not necessarily confirm an active leak without some corroborative evidence, and such evidence can be deliberately concealed. Consequently, only the installer can credibly guarantee that a roof will not leak, and they do. We cannot, and do not give any such guarantees. We will examine every roof, evaluate it, and even attempt to approximate its age, but we will not predict is remaining life expectancy, nor guarantee that it will not leak. Naturally, the sellers or the occupants of a residence will generally have the most intimate knowledge of the roof and of its history. Therefore, we recommend that you ask the sellers about it, and that you either include comprehensive roof coverage in your home insurance policy, or that you obtain a roof certification from an established local roofing company.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

**IN NI NP RR Inspection Items**



### 7.0 ROOF COVERINGS

**ROOF COVERING:** CONCRETE, TILE

**VIEWED ROOF COVERING FROM:** LADDER, ATTIC

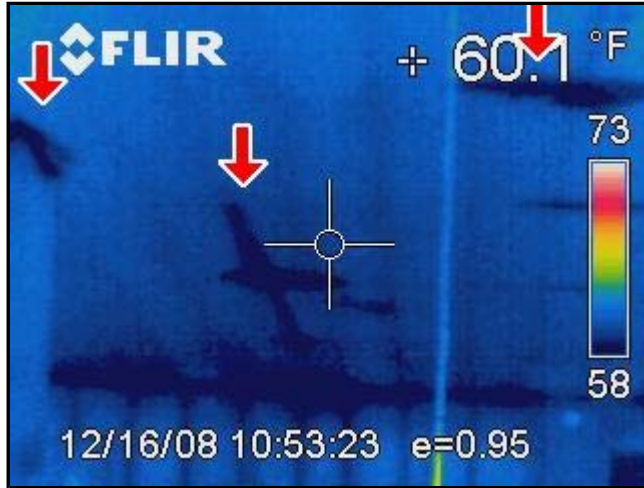
**Findings:**

(1) Thermal imaging reveals evidence of roof leaks were observed in the living room. At least two broken tiles were observed and several tiles are out of position. Recommend having the roof inspected and repaired by a licensed roof contractor.

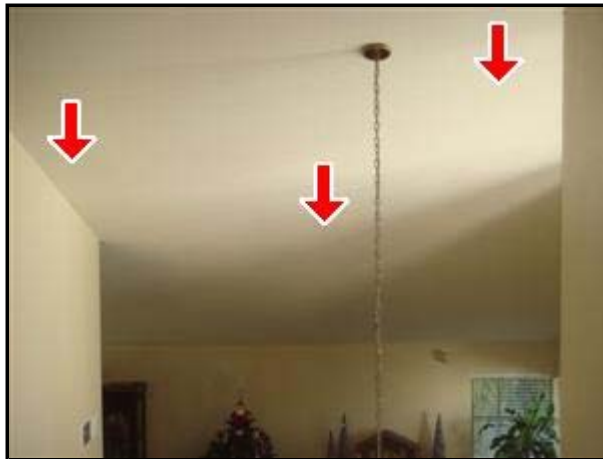
**IN NI NP RR Inspection Items**

**IN NI NP RR Inspection Items**

Thermal Infrared Imaging helps find leaks and moisture. This makes repair easier. Just give a copy of the report to your contractor.



7.0 Picture 1 Thermal image of ceiling



7.0 Picture 2

(2) Pictures of cracked tiles.



7.0 Picture 3



7.0 Picture 4

**7.1 FLASHINGS**  
Findings:

**7.2 ROOFING DRAINAGE SYSTEMS**  
Findings:

**IN NI NP RR Inspection Items**

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

The roof of the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of

concern, some areas can go unnoticed. Roof coverings and skylights can appear to be leak proof during inspection and weather conditions. Our inspection makes an attempt to find a leak but sometimes cannot. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

## 8. STRUCTURAL COMPONENTS

The Home Inspector shall observe structural components including foundations, floors, walls, columns or piers, ceilings and roof. The home inspector shall describe the type of Foundation, floor structure, wall structure, columns or piers, ceiling structure, roof structure. The home inspector shall: Probe structural components where deterioration is suspected; Enter under floor crawl spaces, basements, and attic spaces except when access is obstructed, when entry could damage the property, or when dangerous or adverse situations are suspected; Report the methods used to observe under floor crawl spaces and attics; and Report signs of abnormal or harmful water penetration into the building or signs of abnormal or harmful condensation on building components. The home inspector is not required to: Enter any area or perform any procedure that may damage the property or its components or be dangerous to or adversely effect the health of the home inspector or other persons. Not all areas of the slab will be observable due to floor coverings such as carpet, hardwood floors, tile, etc. There may be no indication of a slab crack even though one may exist.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

**IN NI NP RR      Inspection Items**

**8.0 FOUNDATIONS (Observable Evidence of Structural Defects)**  
**FOUNDATION: POURED CONCRETE**  
**METHOD USED TO OBSERVE CRAWLSPACE: NO CRAWLSPACE**  
**Findings:**  
 Due to floor coverings throughout house, foundation was not visible.

**8.1 WALLS (Structural)**  
**WALL STRUCTURE: 2 X 4 WOOD**  
**Findings:**

**8.2 FLOORS (Observable Evidence of Structural Defects)**  
**FLOOR STRUCTURE: SLAB**  
**Findings:**  
 Due to floor coverings throughout house, structural components of the floor were not visible.

**8.3 CEILINGS (structural)**  
**CEILING STRUCTURE (below attic): 2X4**  
**Findings:**

**8.4 ROOF STRUCTURE AND ATTIC**  
**ROOF STRUCTURE: ENGINEERED WOOD TRUSS**  
**ROOF-TYPE: GABLE**  
**Findings:**

**IN NI NP RR      Inspection Items**

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

The structure of the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

## 9. INSULATION AND VENTILATION

The home inspector shall observe: Insulation and vapor retarders in unfinished spaces; Ventilation of attics and foundation areas; Kitchen, bathroom, and laundry venting systems; and the operation of any readily accessible attic ventilation fan, and, when temperature permits, the operation of any readily accessible thermostatic control. The home inspector shall describe: Insulation in unfinished spaces; and Absence of insulation in unfinished space at conditioned surfaces. The home inspector shall: Move insulation where readily visible evidence indicates the need to do so; and Move insulation where chimneys penetrate roofs, where plumbing drain/waste pipes penetrate floors, adjacent to earth filled stoops or porches, and at exterior doors. The home inspector is not required to report on: Concealed insulation and vapor retarders; or Venting equipment that is integral with household appliances.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

### IN NI NP RR Inspection Items

#### 9.0 INSULATION AND VAPOR RETARDERS (in unfinished spaces)

**ATTIC INSULATION:** FIBERGLASS BATT

**ATTIC VENTILATION:** PASSIVE

**Findings:**

#### 9.1 VENTILATION OF ATTIC AND FOUNDATION AREAS

**Findings:**

#### 9.2 VENTING SYSTEMS (Kitchens, baths and laundry)

**DRYER POWER SOURCE:** 220 ELECTRIC, GAS CONNECTION

**DRYER VENT:** FLEXIBLE METAL

**Findings:**

### IN NI NP RR Inspection Items

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

The insulation and ventilation of the home was inspected and reported on with the above information. While the inspector makes every effort to find all areas of concern, some areas can go unnoticed. Venting of exhaust fans or clothes dryer cannot be fully inspected and bends or obstructions can occur without being accessible or visible (behind wall and ceiling coverings). Only insulation that is visible was inspected. Please be aware that the inspector has your best interest in mind. Any repair items mentioned in this report should be considered before purchase. It is recommended that qualified contractors be used in your further inspection or repair issues as it relates to the comments in this inspection report.

This section contains photos of the house.

### 10. COMPLIMENTARY PHOTOS

These pictures are provided for your convenience and are not intended to indicate a repair item.

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

**IN NI NP RR      Inspection Items**

#### 10.0 KITCHEN

**Findings:**  
Kitchen



10.0 Picture 1

#### 10.1 DINING AREA

**Findings:**  
Dining Area.



10.1 Picture 1



10.1 Picture 2

#### 10.2 LIVING ROOM

**Findings:**  
Living room.

**IN NI NP RR**

**Inspection Items**

**IN NI NP RR**      **Inspection Items**

---



10.2 Picture 1



**10.3 FAMILY ROOM**

**Findings:**  
Family Room.



10.3 Picture 1



**10.4 MASTER BEDROOM**

**Findings:**  
Master Bedroom.

---

**IN NI NP RR**      **Inspection Items**



**IN NI NP RR**      **Inspection Items**

---



10.4 Picture 1

     **10.5 MASTER BATHROOM**  
**Findings:**  
Master Bathroom.



10.5 Picture 1

     **10.6 2ND BEDROOM**  
**Findings:**  
2nd bedroom.

---

**IN NI NP RR**      **Inspection Items**

**IN NI NP RR**      **Inspection Items**

---



10.6 Picture 1

**10.7 3RD BEDROOM**

**Findings:**  
3rd bedroom.



10.7 Picture 1

**10.8 1/2 BATH**

**Findings:**  
1/2 bathroom.

---

**IN NI NP RR**      **Inspection Items**

**IN NI NP RR**      **Inspection Items**

---



10.8 Picture 1

     **10.9 SHARED BATHROOM**  
**Findings:**  
Shared bathroom.



10.9 Picture 1

     **10.10 REAR YARD**  
**Findings:**  
Rear yard.

---

**IN NI NP RR**      **Inspection Items**

**IN NI NP RR      Inspection Items**

---



10.10 Picture 1

**10.11 LAUNDRY ROOM/AREA**

**Findings:**  
Laundry room.



10.11 Picture 1

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**IN NI NP RR      Inspection Items**

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

## 11. OUTDOOR COOKING EQUIPMENT

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

**IN NI NP RR Inspection Items**



### 11.0 COOKING EQUIPMENT

**FUEL SOURCE:** NATURAL GAS

**Findings:**

Picture of cooking equip.



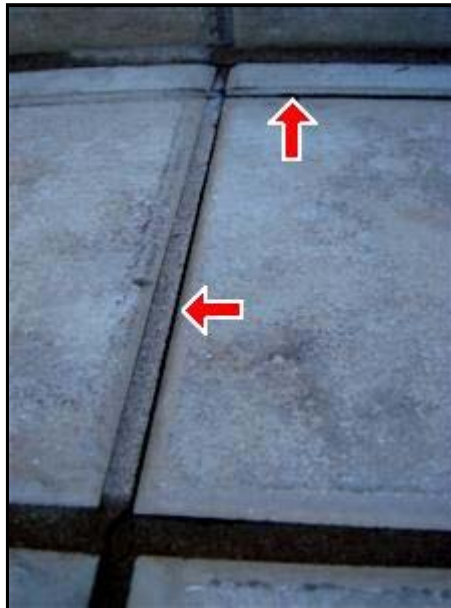
11.0 Picture 1



### 11.1 OUTDOOR COUNTERS

**Findings:**

Some of the tiles are cracking. It appears that moisture has gotten between the tiles. Several tiles are loose.



11.1 Picture 1

**IN NI NP RR Inspection Items**

IN=Inspected, NI=Not Inspected, NP=Not Present, RR=Repair or Replace

The General Summary summarizes just the repair items. This makes creating a request for repairs easy.

## General Summary



The San Diego Real Estate  
Inspection Company



**Customer**  
Home Buyer



**Address**  
777 Mac Court  
San Marcos CA 92069

San Diego Real Estate Inspection Co.  
1672 Main St., Suite E125, Ramona, CA 92065  
(760) 203-9682

The following items or discoveries indicate that these systems or components do not function as intended or adversely affects the habitability of the dwelling; or appear to warrant further investigation by a specialist, or requires subsequent observation. This summary shall not contain recommendations for routine upkeep of a system or component to keep it in proper functioning condition or recommendations to upgrade or enhance the function, efficiency, or safety of the home.

**This Summary is not the entire report. The complete report may include additional information of concern to the customer. It is recommended that the customer read the complete report.**

## **1. BUILT-IN KITCHEN APPLIANCES**

### **1.0 DISHWASHER**

#### **Repair or Replace**

(1) The dishwasher is in poor condition. The door hinges are broken and the door springs are not functioning properly. The interior has a heavy layer of calcium. The dishwasher was not run due to the poor condition. Recommend replacement.

(2) No air gap was installed for the dishwasher. An air gap is required to prevent dirty water from being sucked back into the water supply. Recommend installation of an air gap by a qualified plumber.

### **1.1 RANGES/COOKTOP**

#### **Repair or Replace**

The electric range is in poor condition. The front right coil was missing, and the griddle was missing. Recommend replacement.

### **1.5 WALL OVEN**

#### **Repair or Replace**

Wall oven was tested and functional at time of inspection. The timer and timer knob are damaged.

## **2. PLUMBING SYSTEM**

### **2.0 INTERIOR DRAIN, WASTE AND VENT SYSTEMS**

#### **Repair or Replace**

(1) Tub drains slowly in the upstairs hall bathroom. Recommend drain service by a licensed plumber.

### **2.2 FIXTURES AND CONNECTED DEVICES**

#### **Repair or Replace**

(1) Toilet tank lid in master bathroom is broken. Recommend replacement.

(2) Sink faucet in Half Bath is corroded. Advise replacing to prevent future leaks.

(3) Kitchen sink is chipped and has dropped below counter. This can allow water to enter the cabinet below. Recommend repairing the cause of the failure, and caulking around basin perimeter.

(4) The water shut off valve at water heater is corroded. Recommend replacement when water heater is replaced.

(5) Toilet in master bathroom is loose on floor. Recommend repair by a licensed plumber.

### **2.4 HOT WATER SYSTEMS, CONTROLS, CHIMNEYS, FLUES AND VENTS**

#### **Repair or Replace**

An active leak was observed at the water heater. Standing water was located inside the burner compartment. Recommend replacement by a licensed plumber to avoid leaks which could cause property damage.

## **3. ELECTRICAL SYSTEMS**

### **3.0 SERVICE AND GROUNDING EQUIPMENT, MAIN OVERCURRENT DEVICE, MAIN AND DISTRIBUTION PANELS**

#### **Repair or Replace**

(1) Knockouts noted missing from inside the panel. We advise installing cover inserts for safety.

(2) Wire clamp missing at main panel. A plastic bushing or wire clamp protects and secures the wiring as it enters into the electric box. We advise corrections by a lic electrician.

### **3.2 CONNECTED DEVICES AND FIXTURES (Observed from a representative number operation of ceiling fans, lighting fixtures, switches and receptacles located inside the house, garage, and on the dwelling's exterior walls)**

### 3. ELECTRICAL SYSTEMS

#### Repair or Replace

Weather proof covers are required at exterior receptacles.

#### 3.7 SMOKE DETECTORS (describe location and number)

#### Repair or Replace

We recommend replacing all smoke detectors upon moving into home. Smoke detectors that are 10 years old or older may have a failure rate as high as 30%, and smoke detectors that are 15 years old or older may have a failure rate as high as 50% according to the National Fire Protection Association [www.nfpa.org](http://www.nfpa.org). We also recommend that a smoke alarm be installed in each bedroom, and at least one on each level outside of bedrooms. It is further recommended that all smoke detectors be inter-connected with a signal wire to sound all alarms if one is activated.

Hard-wired smoke detector in stairwell did not work when tested. Recommend replacement with like-kind detector.

### 4. HEATING & COOLING EQUIPMENT

#### 4.0 HEATING EQUIPMENT

#### Repair or Replace

(1) The furnace was manufactured in 2000. This is a newer furnace, but the furnace failed to operate when tested. Recommend further inspection and repair by a licensed HVAC contractor.

(2) Flexible gas supply pipe passes through furnace housing. Recommend installation of rigid cast pipe from gas regulator through furnace housing, to exterior of furnace housing. Vibration from furnace can wear through flexible gas pipe, and is no longer adequate.

#### 4.5 DISTRIBUTION SYSTEMS (including fans, pumps, ducts and piping, with supports, insulation, air filters, registers, radiators, fan coil units and convectors)

#### Repair or Replace

Poor repairs were observed at the ducting in the attic. The ducts were repaired with duct tape, but duct tape fails over time. Recommend having the ducts sealed by a licensed heating contractor.

#### 4.7 DAMPER CLAMP

#### Repair or Replace

A damper clamp is required at the damper when concrete gas logs are used in the fireplace. This damper clamp prevents the damper from closing all the way as a safety precaution. If the damper is closed, Carbon Monoxide gas can enter the living space which is undetectable. Recommend installation of a damper clamp.

### 5. INTERIORS

#### 5.0 CEILINGS

#### Repair or Replace

Water stains were observed at several locations in the house. Stains in the family room appear to be from a plumbing leak at the master bathroom. The water stains in the living room appear to be from roof leaks.

#### 5.2 FLOOR COVERINGS

#### Repair or Replace

(1) Floor covering was removed from the laundry room.

(2) Carpet padding was removed from the downstairs 1/2 bathroom. This appears to be the result of a water leak in the laundry room.

#### 5.3 TUB/SHOWER ENCLOSURE



## 5. INTERIORS

### Repair or Replace

Window noted installed too low at shower stall. Windows are required to be installed at least five feet above the shower floor to prevent water damage to the window frame. We advise contacting a licensed general contractor to make necessary corrections. This window may be the cause of the water leaking into the family room.

### 5.5 COUNTERS AND A REPRESENTATIVE NUMBER OF CABINETS

#### Repair or Replace

(1) Cabinets are original and worn. Two drawers are missing from the kitchen cabinets.

(2) Mold and mildew odor noted under the kitchen sink. This may be a health and safety concern. We advise obtaining further evaluation from a qualified expert to determine the extent of the necessary corrective measures required.

## 6. EXTERIOR

### 6.5 DECKS, BALCONIES, STOOPS, STEPS, AREAWAYS, PORCHES AND APPLICABLE RAILINGS

#### Repair or Replace

While the railing/baluster spacing may have been standard at time of construction, it does not comply with current safety standards. The large openings can allow pets or children to fall through. Recommend installing additional pickets, or other form of barrier to prevent injuries.

### 6.6 VEGETATION, GRADING, DRAINAGE, AND RETAINING WALLS (With respect to their effect on the condition of the building)

#### Repair or Replace

Some water collects at the plaster at rear of house. Recommend correction by raising the level of soil or installing a yard drain.

### 6.8 EAVES, SOFFITS AND FASCIAS

#### Repair or Replace

Several areas were observed with damaged wood. recommend referring to the pest inspection report for a full evaluation and suggested remedies.

## 7. ROOFING

### 7.0 ROOF COVERINGS

#### Repair or Replace

(1) Thermal imaging reveals evidence of roof leaks were observed in the living room. At least two broken tiles were observed and several tiles are out of position. Recommend having the roof inspected and repaired by a licensed roof contractor.

(2) Pictures of cracked tiles.

## 11. OUTDOOR COOKING EQUIPMENT

### 11.1 OUTDOOR COUNTERS

#### Repair or Replace

Some of the tiles are cracking. It appears that moisture has gotten between the tiles. Several tiles are loose.

---

Home inspectors are not required to report on the following: Life expectancy of any component or system; The causes of the need for a repair; The methods, materials, and costs of corrections; The suitability of the property

for any specialized use; Compliance or non-compliance with codes, ordinances, statutes, regulatory requirements or restrictions; The market value of the property or its marketability; The advisability or inadvisability of purchase of the property; Any component or system that was not observed; The presence or absence of pests such as wood damaging organisms, rodents, or insects; or Cosmetic items, underground items, or items not permanently installed. Home inspectors are not required to: Offer warranties or guarantees of any kind; Calculate the strength, adequacy, or efficiency of any system or component; Enter any area or perform any procedure that may damage the property or its components or be dangerous to the home inspector or other persons; Operate any system or component that is shut down or otherwise inoperable; Operate any system or component that does not respond to normal operating controls; Disturb insulation, move personal items, panels, furniture, equipment, plant life, soil, snow, ice, or debris that obstructs access or visibility; Determine the presence or absence of any suspected adverse environmental condition or hazardous substance, including but not limited to mold, toxins, carcinogens, noise, contaminants in the building or in soil, water, and air; Determine the effectiveness of any system installed to control or remove suspected hazardous substances; Predict future condition, including but not limited to failure of components; Since this report is provided for the specific benefit of the customer(s), secondary readers of this information should hire a licensed inspector to perform an inspection to meet their specific needs and to obtain current information concerning this property.

*Prepared Using HomeGauge <http://www.homegauge.com> SHGI (c) 2000-2007 : Licensed To The San Diego Real Estate Inspection Co.*

New optional Energy Efficiency Evaluation report. This report offers an evaluation of efficiency, and recommendations on how to improve efficiency.

## Energy Efficiency Evaluation

(This is an optional service)



The San Diego Real Estate  
Inspection Company



**Customer**  
Home Buyer



### Address

777 Mac Court  
San Marcos CA 92069

The materials from which a building was constructed, as well as the systems and appliances installed, can dramatically affect the amount of energy that a building will consume over its lifetime. The following Energy Efficiency Report is an evaluation of the house you are purchasing. The intent of the report is to inform you of the overall efficiency of the house in its current state, and suggest improvements. These improvements will help you save money over time by reducing energy consumption. By increasing efficiency of the house, you can decrease your energy consumption while maintaining or improving the comfort level of the house.

If your goal is to reduce consumption for environmental reasons, or simply save money, the way to maximize those goals is through applying a set of systems that work together. For example a high efficiency furnace is a great start, but adding double-pane windows will further decrease energy consumption and increase the comfort level of the house. Adding insulation will increase the thermal efficiency of your house even more. Although there is an initial expense, you can recover that expense and more by reducing the amount of fuel used to heat your house.

This guide offers many suggestions on how to improve efficiency and lists rebates or government programs that can help lower the cost of the upgrades. In some cases the report will refer to other online resources and many

links are included to provide you with a lot of information.

## 12. EER - HEATING SYSTEM



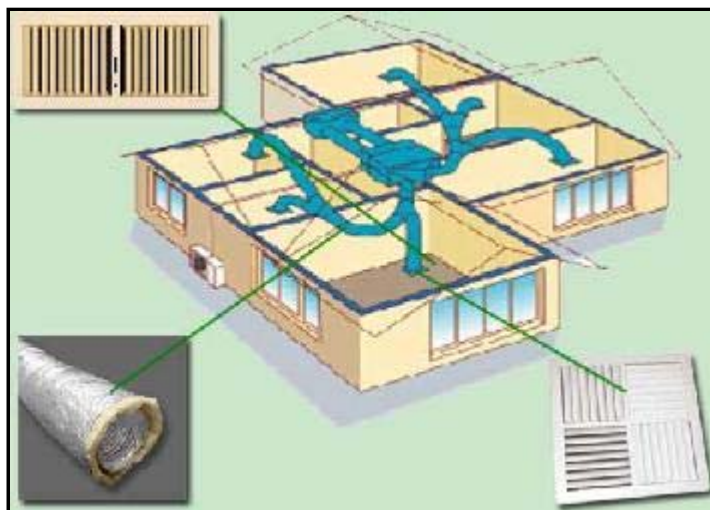
### 12.0 SPACE HEATING - GENERAL INFORMATION

Central "forced air" heating is most often used in modern homes. Such a system contains a furnace, or heat pump, to heat air in a central location. The system also contains a distribution system of ducts to carry the heated air to different parts of the home. Vents or "registers" diffuse the warm air into the different rooms of the house. During warm weather the same ductwork can be used for air conditioning. The furnace is typically located in the attached garage, a furnace closet, or in the attic. The forced air can also be filtered or put through air cleaners.

Furnaces can use several different types of fuel including electricity, natural gas, liquefied propane, oil, wood, and even corn! The most common fuels used in California are natural gas and propane (LP). Heating can also be provided from electric, or resistance heating using a filament that becomes hot when electricity is caused to pass through it. This type of heat can be found in electric baseboard heaters, portable electric heaters, and as backup or supplemental heating for heat pump (or reverse heating) system. The most efficient systems are those that burn natural gas or LP, and are thus the cheapest to operate.

If your HVAC equipment is more than 10 years old or not keeping your house comfortable, you should have it looked at by a professional HVAC contractor. If it is not performing efficiently or needs upgrading, consider replacing it with a unit that has earned the ENERGY STAR designation. Depending on where you live, replacing your old heating and cooling equipment with ENERGY STAR qualified equipment could cut your annual energy bill by nearly \$200. But before you invest in a new HVAC system, make sure that you have addressed the big air leaks in your house and the duct system. Sometimes, these are the real sources of problems rather than your HVAC equipment.

Remember that getting the proper size and a quality installation is essential to getting the most from your new equipment. When replacing HVAC equipment, bigger doesn't always mean better. If the unit is too large for your home, you will be less comfortable and might actually have higher utility bills. Oversized equipment will operate in short run cycles, not allowing the unit to reach efficient operation and remove humidity from the air — resulting in an uncomfortable home.



12.0 Picture 1

### 12.2 HOW TO CALCULATE PAYBACK PERIOD

## 12. EER - HEATING SYSTEM



### Should you upgrade your furnace?

There are two main factors to consider when you have an old furnace (considered pre-1990). The first factor is safety. New furnaces are far safer than furnaces made 20 years ago. This is due to the added safety features built into the new furnaces. If you have an older furnace, you should absolutely install a Carbon Monoxide detector in your house.

The second factor is the cost of operating the furnace. You want to squeeze as much heat as possible out of every dollar you spend on fuel. An old furnace may only be 60% efficient. That means for every dollar you spend on fuel (natural gas or LP) you are only getting \$.60 worth of heat. The rest is going up the flue. You may be losing additional money through leaking and poorly insulated ducts. To maintain a level of comfort in your home you are spending more money and burning more fuel than you would if you installed a new system.

### What is the furnace payback period?

Purchasing a new furnace is expensive. So how do you justify upgrading your furnace? You may want a safer unit for your family. Old furnaces can leak Carbon Monoxide, which is deadly. You may want to lower your utility bills. Or, you may want to reduce the amount of fossil fuels you are using to heat your house. Regardless of your motivation, you want to choose the highest efficiency furnace you can afford to meet your objectives.

The most common method of measuring a furnace's efficiency is the Annual Fuel Utilization Efficiency or AFUE. Higher-efficiency models use less fuel each month, so they cost less to operate. However, the initial cost of the furnace and installation is higher. The payback period is the amount of time it takes to pay off your investment through the savings on your heating bill.

Let's imagine that you were considering two furnaces: a mid-efficiency (80% AFUE) model and a more expensive high-efficiency (90% AFUE) model. For instance, suppose that the low-efficiency model would cost \$4,500 installed, and the high efficiency furnace would cost \$5,500.

The first step is to figure out the average expected reduction in your fuel bill. Typically you would begin by pulling together your old fuel bills. (Here's a hint: compare your average bill in the summer with your average winter bills. Since you don't run your furnace in the summer, the difference between the two bills is a good estimate of your heating costs.) Add up the costs for each month to come up with an average annual cost. In this example, we'll assume that your average annual fuel costs are \$1500. The second step is to figure out the average expected reduction in your fuel bill.

You need to compare the efficiency of your existing furnace to the two alternatives you're considering. If you don't know the exact efficiency of your furnace, here are a few commonly-used rules of thumb: 10-12 years old: 75% efficient; 20+ years old: 60% efficient. So, if your 60% efficient furnace costs you \$1500 per year, how much would you expect the 80% and 90% efficient furnaces to cost? Simply divide the increase in efficiency by the higher efficiency.

The 80% efficient furnace is  $(20\%/80\% = 25\%)$  25% more efficient than the 60% efficient furnace. You should expect to save 25% on fuel  $(\$1500 \times .25) = \$375$  in savings per year. The 90% furnace is 33% more efficient  $(30\%/90\% = 33\%)$ , so the 90% efficient unit will save approximately  $(\$1,500 \times .33) = \$500$  per year.

The 80% efficient furnace will pay for itself in  $4500/375 = 12$  years.

The 90% efficient unit will pay for itself in  $5500/500 = 11$  years.

## 13. EER - AIR CONDITIONING



### 13.0 AIR CONDITIONING - GENERAL INFORMATION

Central air conditioners use electric energy to pump heat out of your home and dump it outside. They distribute cooled air throughout your house and remove moisture from the indoor air.

The efficiency of Central A/C units is governed by U.S. law and regulated by the U.S. Department of Energy. Every A/C unit is assigned an efficiency rating known as its seasonal energy efficiency ratio (SEER). The SEER is defined as the total cooling output (in Btu - British thermal units) provided by the unit during its normal annual usage period divided by its total energy input (in Watt-hours) during the same period.

The SEER is displayed on a yellow label affixed to the A/C unit. Higher SEERs are better. The minimum SEER allowed by law for a central A/C is 13 for a split system. The best available SEER is about 24, while many older units have SEER ratings of 6 or less. Most consumers should look for a SEER of 13 or higher when buying a new A/C system.

- Central A/C units are more efficient than window or through-the-wall units. They are also out of the way, quiet, and convenient to operate.
- High-efficiency A/C units save money on your utility bills.
- High-efficiency A/C units result in fewer environmentally harmful emissions.

### 13.1 AIR CONDITIONING - RECOMMENDATIONS

Your current AC unit has a SEER rating of 10. By upgrading your AC with a rating of 10 SEER to a unit with a rating of 13 SEER, you will reduce electric consumption by approximately 25% (1-10/13). This adds up to several hundred dollars per year depending upon the temperatures and usage patterns. In addition, by reducing the amount of electricity you use to cool your home, you reduce the amount of fuel burned at the power plant that produces your electricity. As a result, you reduce carbon dioxide emissions, a greenhouse gas, and other pollutants.

You may want to have a licensed HVAC contractor service your furnace and inspect the duct system. Chances are great that the ducts are leaking and should be replaced or sealed to prevent loss of heated air. If you are interested in reducing the amount of natural resources you use, then you should consider upgrading your furnace to a high efficiency furnace with the guidance of a licensed HVAC contractor.

REBATES AVAILABLE:

- [Residential Energy Efficiency Tax Credit](#) up to \$300 on qualifying systems

## 14. EER - HVAC (Control, Distribution)



### 14.0 DUCTS - GENERAL INFORMATION

Ducts are an integral part of a forced-air system such as a furnace, heat pump, or central air conditioner. Ducts distribute heated or cooled air evenly to every room in a house. In most modern houses, most of the ducting travels through the attic or crawlspace. These spaces can be very hot in the summer, and very cold in the winter. In order to maintain the temperature of the conditioned air, ducts are insulated. With adequate insulation cooled air stays cool even when traveling through an attic that can reach 120 degrees or more. When the insulation fails, or the ducting leaks, you are pouring energy - and money - into the attic.

Poorly performing ducts can leak conditioned air and reduce your system's efficiency by 20% or more.

## 14. EER - HVAC (Control, Distribution)



Older duct systems were sealed with duct tape, which dries out. When this happens, the ducts can literally separate, and conditioned air will blow into the attic. Any leaks in the duct system cost you money and waste energy by causing your HVAC system to work harder to keep your home at a temperature set on the thermostat. Your first indication that there is a leak in the system is uneven air flow. One or more rooms in the house will not receive as much conditioned air as other rooms.

Another failure of flex ducting, particularly the grey ducting installed in the 1980's and early 1990's, is due to UV exposure. Even minimal sunlight shining through gable vents can deteriorate the outer grey plastic sleeve around the duct. Once the plastic sleeve is deteriorated, the insulation falls away from the inner flexible duct. Even though this does not cause pressure loss, it will cause heat transfer which can dramatically diminish the performance of your HVAC system. Cooled air will become hot when it travels through the attic during the summer. In the winter, heated air will become cold when travelling through the attic. Both situations cause your HVAC system to work much harder to achieve the temperature you have set on the thermostat.

Any failure of the ducting should be repaired right away. In some cases this may call for replacement of the ducting. Ducts are commonly concealed in walls, ceilings, attics, basements, or crawl spaces, which can make them difficult to access and repair. EPA recommends using a professional contractor for duct improvements. Many contractors who install heating and cooling systems also repair ductwork.



14.0 Picture 1

### 14.1 DUCTS - RECOMMENDATIONS

(1) Leaks were observed at the ducting. These leaks are often caused by duct tape which has failed. Leaks range from slight to major leaking due to ducts that are disconnected altogether. Leaking ducts can greatly reduce the efficiency of your HVAC system by causing your equipment to work very hard to achieve the temperature that you have set. Recommend having the duct work inspected and repaired by

## 14. EER - HVAC (Control, Distribution)



a licensed HVAC contractor. A duct inspection should include a pressure test of the duct system.

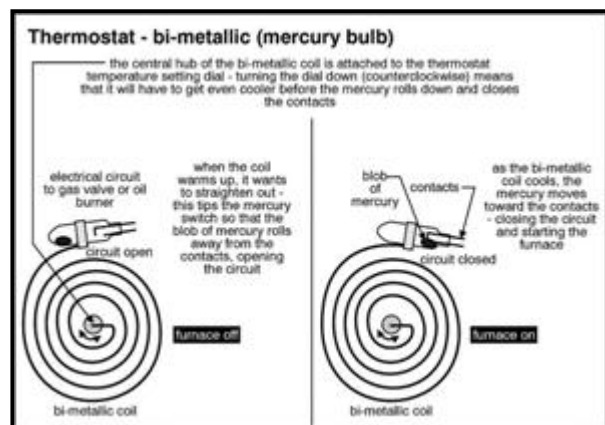
(2) Some of the ductwork has been damaged by exposure to UV rays (sunlight) through the roof vents. UV rays deteriorate the plastic sleeve around the duct allowing the insulation layer to fall away from the duct, reducing efficiency. Sometimes these ducts can be repaired, but it is usually better to replace the damaged sections of the duct.

### 14.2 THERMOSTAT - RECOMMENDATIONS

There is a mechanical thermostat installed in the house. You should consider switching to a programmable electronic model. Look for thermostats that allow you to program daily cycles, weekly schedules, and override default settings.

Using a programmable thermostat, you can eliminate considerable wasted energy. As a rule of thumb, every degree you turn down a thermostat will save 3% of energy costs over a 24-hour period. In other words, if you turn down the temperature from 70 to 61 degrees for an 8-hour period every night, you can save about 9% on your heating bill. Reducing daytime usage similarly can double your savings.

NOTE: Many older mechanical thermostats contain a small amount of Mercury which is known to be an environmentally hazardous material. Please dispose of your old thermostat properly. To determine if your old thermostat contains mercury, pry the cover off and look for a small glass bulb filled with a metallic liquid. If it does, or if you are in doubt, please take the whole thermostat to a qualified recycling center.



14.2 Picture 1

### 14.3 FILTER - RECOMMENDATIONS

Your forced air system has a washable filter. Washable filters do a poor job of filtering the air and only serve to keep large airborne particles and pet hair from entering the system. Many people consider washable filters to be "permanent", and therefore rarely clean them. We recommend replacing the washable filter with a high quality disposable filter.

Disposable filters are available in different price ranges, and offer various levels of filtration. The cheapest filters do the minimal filtering required, and only keep large particles or pet hair from entering the distribution system. Better filters are available which offer filtration of dust, pollen, dander and other airborne pollution down to mere microns. If someone in your family has allergies or health problems, you may be interested in investing in a higher quality filter.

Regardless of the quality of your filter, you should change it frequently. This can range from monthly to every few months depending upon your usage and the environment where you live. If your house is



## 14. EER - HVAC (Control, Distribution)



adjacent to a dirt road, for example, your filter will need to be changed more frequently. A dirty filter restricts the air flow through your system and makes the unit work much harder to cool or heat the air. This increased use of energy costs you money. Changing your filter is one of the cheapest ways to maintain the highest possible efficiency of your forced air system.

## 15. EER - ATTIC (Insulation, Ventilation)



### 15.0 ATTIC INSULATION - GENERAL INFORMATION

No matter what kind of insulation you currently have in your attic, one quick way to determine if you need more is to look across the span of your attic. If your insulation is just level with or below your floor joists (i.e. you can easily see your joists), you should add more. If you cannot see any of the floor joists because the insulation is well above them, you probably have enough and adding more may not be cost effective.

Insulation levels are specified by R-Value. R-Value is a measure of insulation's ability to resist heat flow traveling through it. The higher the R-Value the better the thermal performance of the insulation. The recommended level for most attics in San Diego is to insulate to R-30 or about 9 inches depending on insulation type.

When adding additional insulation, you do not have to use the same type of insulation that currently exists in your attic. You can add loose fill on top of fiberglass batts or blankets, and vice versa. If you use fiberglass over loose fill, make sure the fiberglass batt has no paper or foil backing - it needs to be "unfaced." If you choose to add loose fill, it may be wise to hire a professional, as the application requires the use of a blowing machine - yet some home improvement stores offer rentals of this machine.

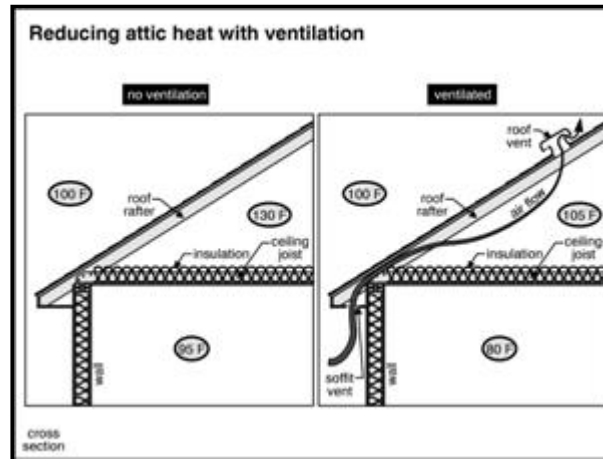


15.0 Picture 1

### 15.2 ATTIC VENTILATION - GENERAL INFORMATION

The attic is the area between the uppermost ceiling in the house, and the roof. This is where you will most often find your ducting, insulation, and sometimes your forced air unit, or furnace. A properly designed attic should be well ventilated with vents along the bottom of the roof, called soffit vents, and at the gable ends of the roof. Newer roofs are vented at the top. These vents provide natural exchange of air through the principles of convection. The air in the attic heats up during the day. Since hot air naturally rises, it exits the attic through the upper gable or roof vents and draws cooler air in through the soffit vents. This action can be improved by adding turbine vents, or thermostatically controlled attic vents to push the hot air out of the attic more rapidly. This helps keep the house cool in the summer which makes your Air condition work less, and saves you money.

## 15. EER - ATTIC (Insulation, Ventilation)



15.2 Picture 1

## 16. EER - APPLIANCES

### 16.0 APPLIANCES

**High-Efficiency Clothes Washer (HEW)** When compared to standard top-loading models, HEW's

- Use 65% less water.
- Use 55% less energy and detergent.
- Clean better.
- Can cut drying time in half saving energy in the dryer, too.

Get a rebate of up to \$185 when you buy a high-efficiency clothes washer from The Metropolitan Water District on behalf of the Water Authority, its member agencies, and San Diego Gas & Electric. HEWs must be from the list of approved models with a water efficiency factor of 5.0 or less. See Rebate section for details.

### 16.1 REFRIGERATOR

A refrigerator is the single biggest energy consuming appliance in most household kitchens. Consider replacing your refrigerator with a new Energy Star refrigerator. A new Energy Star refrigerator will use up to 40% less electricity than a traditional refrigerator sold as recently as 2001! And if your refrigerator was purchased more than 10 years ago, you are throwing money away. Please visit the [Energy Star Refrigerator Savings Calculator](#) to see how much you can save with a new unit.

You can also reduce the amount of electricity used by your refrigerator by:

- Positioning your refrigerator away from heat sources such as an oven, dishwasher, or direct sunlight from a window.
- Position your refrigerator so that air can easily flow around the unit. Leave space between the walls or cabinets, and keep the coils clean.
- Check the seal of the doors. You can do this by closing a piece of paper in the door and if it is easily removed, your seals may be bad.
- Set your refrigerator between 35 and 38 degrees, and set the freezer at 0 degrees.
- Minimize the amount of time the door stays open.

## 17. EER - ELECTRICAL

### 17.0 LIGHTING

Some or all of your exterior lights are controlled by a traditional on/off switch. By installing a light sensor or motion control, you can save up to **\$86 per year** per fixture. Motion sensor-controlled lights save electricity by not having the lights on during the day, and only when people are near the light.

## 18. EER - PLUMBING (Water usage)

### 18.0 GENERAL INFORMATION

Water usage can be a major expense for a homeowner. The largest amount of water used inside your home goes toward flushing the toilet. In fact, toilets account for 30% of the water used inside your home. That means the 140,000 flushes you are likely to make during your lifetime can really add up! But how much water your toilet actually needs to flush properly is less than you think!

The average water usage per person is 180 gallons per day. Many incentives exist to help you reduce water usage both inside and outside of your home. Since water rates are set to increase dramatically, saving water is more important than ever. For the most up-to-date rebate information on everything from toilets to clothes washing machines, visit [www.20gallonchallenge.com](http://www.20gallonchallenge.com) where you can confirm that rebates are still available, get water saving tips, and apply for rebates.

### 18.1 WATER HEATER

The water heater in the house is 15 years old or older. These are inefficient.

### 18.3 TOILETS

Ultra Low Flush Toilets (ULFT's) are installed in the house. These toilets use far less water than traditional older, non-efficient toilets which use 3.5 gallons per flush or more. ULFT's use only 1.6 gallons per flush.

You can save approximately 20% more water by installing new High Efficiency Toilets (HET's) which only use 1.28 gpf. The average water savings for HET's is estimated to be 38 gallons per day when replacing an average, non-efficient toilet and 7 gallons per day when replacing a ULFT.

No rebates exist unless you are replacing a traditional toilet (3.5 gpf or more).

## 19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)

### 19.0 WEATHER STRIPPING - GENERAL INFORMATION

**Caulking and Weatherstripping** Caulking and weatherstripping may be the easiest form of sealing leaks for homeowners. Not only does caulking and weatherstripping prevent air from entering or escaping the home, it also prevents the spread of moisture, particularly around pipes, drains, and faucets.

**Getting Started** Conduct a visual inspection to locate caulk that is cracked or deteriorated and weatherstripping that has gaps in the seal. You may also be able to tell if a window or door need better weather stripping by trying to rattle the door or window, or by looking around the edges to see if any light penetrates through the cracks.

## 19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)



**Selection and Application of Caulk** Caulk comes in cartridges that will be inserted into half barrel caulking guns. For small caulking jobs, you can find it in small squeeze tubes or ropes. Expect to use about a half-cartridge per window or door and four cartridges for the foundation sill, and at least one more for around faucets, vents, pipes, and electrical outlets.

**Types of caulk generally used on houses include:**

- Oil or resin-based caulk: The least expensive, but also the least effective. It is readily available and will bond to most surfaces. It tends to harden and crack after 2 to 4 years.
- Latex and butyl-based caulk: A little more expensive, but much more durable than oil-based. It lasts from 6 to 20 years and holds up well to building expansion and contraction caused by changes in temperature. Latex is paintable and it comes in white or colored finishes.
- Elastomeric Sealants: Usually most expensive, but allows for the most building expansion and is readily paintable. Good to use on taller multi-family buildings that experience more movement and wind pressure. These sealants typically have a life of 20 years or more.

Directions for application will be on the tube and should be followed carefully. In general, about a half inch of the caulking cartridge nozzle should be cut off at a 45 degree angle and the tip should be punctured. Once the caulk is applied, you can finish the surface with a moistened finger or something smooth.

**Apply caulking to all fixed joints, including:**

- Around windows and doors where frames meet siding
- Between window sills and siding
- Between frame wall plates and the foundation
- Around all holes for pipes, ducts, or electric conduits through outside walls
- Around all holes through walls, separating heated and unheated spaces, such as attached garages, storerooms, or attics.
- Between unheated porches and the main body of the house
- Where the chimney or masonry meets the siding
- Around outside water hose faucets

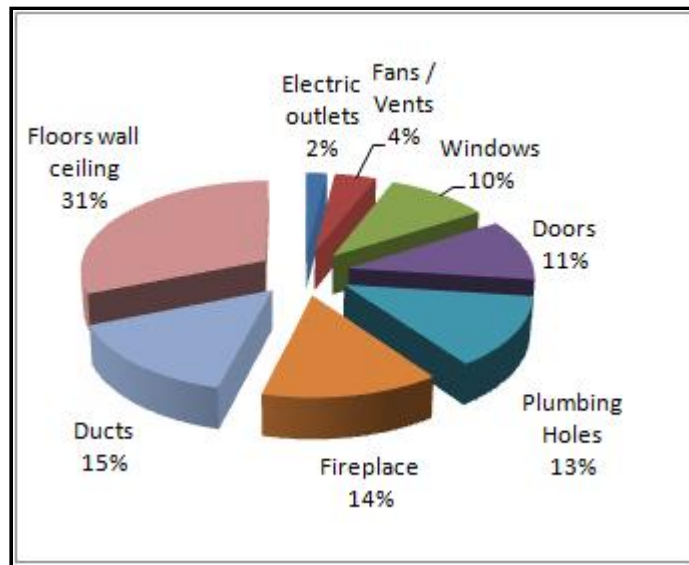
**Selection and Application of Weatherstripping** Weatherstripping performs a similar function as caulking but is used for movable parts, like the bottom of a window or door where the seal will be formed. Installing weatherstripping is also a simple process. All you will need is the contents of the kit you buy at a home improvement store. Keep in mind that this is being applied to a movable surface so you don't want to purchase a flimsy product that can wear easily.

Thin-spring metal weatherstripping can be used on both doors and windows. Though it is somewhat difficult to install, it is the most durable (and most expensive) type of weatherstripping. It is virtually invisible when installed.

Rolled or flexible vinyl is durable and easy to install. It is made with a metal backing for doors and without a backing for windows.

Felt and foam rubber weather stripping are inexpensive types that are easy to install. These materials are not very durable. Varieties with self-adhesive backing should not be used in locations where friction will occur.

## 19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)



19.0 Picture 1

### 19.2 WINDOWS - GENERAL INFORMATION

#### UNDERSTANDING WINDOWS

Any opening in a building's envelope - in its outer shell - is technically called fenestration, a term that includes windows, skylights and doors. Obviously, fenestration is important if you're concerned about energy efficiency.

A typical house can lose 30 percent of its energy dollars out the windows and doors, according to the California Energy Commission.

To put that in perspective - the amount of energy lost through doors and windows in the U.S. every year is roughly equivalent to all the energy we get from the oil carried by the Alaska pipeline!

Since windows outnumber doors in most buildings, they deserve the most attention. You can either fix them to make them as efficient as possible, or you can replace them with some of the new technology that has been introduced in the last several decades.

**Today's Windows - How They Work** Early windows were little more than holes cut in walls to let light and air into rooms. With the addition of glass in movable frames, a major improvement in building comfort was achieved, allowing closed windows to let in light and block the winter chill.

Over the past 20 years, windows have become increasingly more sophisticated, using new materials with more energy-efficient properties. Single-pane glass has been replaced by double, triple and even quadruple panes, with insulating materials separating the layers. Inert gasses have been pumped between the panes, adding to the window's insulating properties. Even the glass itself has been coated to reflect heat.

These innovations mean that windows can significantly contribute to a home's comfort and energy efficiency. By letting in sunlight, they provide warmth in winter, which will save energy and lower monthly heating bills. Proper design and the use of exterior shading can also lower cooling costs in the summer.

**How Energy Flows** To appreciate the improvement in today's windows, it is helpful to understand three ways that energy can flow through them.

## 19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)



- Air can carry heat in or out of a window. Intentional air flow is called ventilation. Unintentional air flow - leakage - is called infiltration.
- Heat - or cold - can flow *through* the frame and the glass.
- Solar radiation - sunlight - can pass through the glass and can heat whatever is inside the building.

**Ventilation and Infiltration** Well-placed windows allow for natural **ventilation**, which can significantly reduce cooling costs in the summer. But **infiltration** - unplanned air leakage through a window's joints, cracks, frames and sashes - can account for as much as 15 percent of a home's heating and cooling losses. It can make a home much less comfortable and more costly to operate.

Different types of windows can allow more infiltration. For example, a horizontal sliding window may not be as airtight as a window with a swinging sash. In addition, the overall quality of the window can affect infiltration - some windows are built better than others.

**Modern Windows - Think of Them as Thermos® Bottles** When there is a difference between inside and outside temperatures, heat transfers through a window. It's lost to the outside during the heating season and is gained from the outside during the cooling season.

A window's thermal performance - which can be measured at the center of glass, the edge of glass and the frame - is rated with a U-Value, its overall ability to resist heat flow. Think of drinking hot coffee from a drinking glass. You know that glass is a very good heat conductor. The outside of the container can quickly become too hot to hold. Using two layers of glass with an air space between - the idea behind the Thermos bottle, dramatically cuts the heat flow.

Single-pane windows can act like that drinking glass, easily conducting heat. Dual-pane windows, with a 1/2 inch to 3/4 inch air space between sheets of glass, work like a Thermos bottle to cut down the flow of heat. If you replace the air between the panes with an inert gas like carbon dioxide, argon or krypton, the window will transfer even less heat and be even more efficient.

**The Frames** Before dual-pane windows, the material used for window frames was not of great concern, since a single pane of glass conducts heat about the same as a solid aluminum frame. With more efficient glazing, however, new materials and new designs were used to make window frames themselves less conductive. Today, wood, fiberglass, vinyl or vinyl-clad wood window frames will generally perform better and provide more comfort than metal frame windows that do not have a thermal break - a buffer of non-conductive material sandwiched between the metal parts to cut down the flow of heat.

**LOW E** Even in dual-pane windows with less conductive frames, the type of glass and type of spacers used to create the air space can improve energy performance. Low Emissivity (or "Low-E") coatings can help to increase U-values. A low-E coating is a microscopically thin layer of metal or metal oxide deposited on window glass. The coating reflects warmth back into the home in the winter and prevents unwanted heat from entering the home in the summer.

When shopping for windows, look for the overall U-value rating. The lower the U-value, the better the window's energy performance will be.

**Windows that Help Block the Sun** Sunlight passing through a window adds heat to a room - desirable in winter, but generally unwanted in the summer. Solar heat gain through windows may account for 30 percent or more of a home's summer cooling requirements.

The amount of heat from direct sunlight through a window is measured with a shading coefficient. The lower the coefficient, the less solar heat gain.

## 19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)



Window tints such as bronze and green keep out more of the sun's heat than clear glass does. Low-E coatings used to lower window U-values may also reduce a window's shading coefficient. Keep in mind, however, that by tinting your windows to keep out heat, you may make it harder to see through them.

Consider a window's orientation to the sun before selecting window tints. South facing windows gain the most beneficial heat in winter, so their shading coefficients should be high. If these windows are properly shaded - say, by deciduous trees - they will allow little heat gain in summer.

Shading coefficients for north windows can also be high, since they get little direct sun and do not contribute much heat any time of the year. East and west facing windows should have low SCs, since they get direct morning and evening sun and are responsible for most of the solar heat gain during summer.

Often the best strategy to reduce heat gain in the summer is to provide exterior shading through overhangs, awnings, shade screens and trees.

The National Fenestration Research Council ([www.nfrc.org](http://www.nfrc.org)) has developed a rating system used by most window manufacturers. When making your window purchase, look for the NFRC label to determine how each product performs. The rating system uses five categories.

A. U-Factor measures how well a product prevents heat from escaping a home or building. U-Factor ratings generally fall between 0.20 and 1.20. The lower the U-Factor, the better a product is at keeping heat in. U-Factor is particularly important during the winter heating season.

B. Solar Heat Gain Coefficient (SHGC) measures how well a product blocks heat from the sun. SHGC is expressed as a number between 0 and 1. The lower the SHGC, the better a product is at blocking unwanted heat gain. Blocking solar heat gain is particularly important during the summer cooling season.

C. Visible Transmittance (VT) measures how much light comes through a product. VT is expressed as a number between 0 and 1. The higher the VT, the higher the potential for day lighting.


D. Air Leakage (AL) measures how much outside air comes into a home or building through a product. AL rates typically fall in a range between 0.1 and 0.3. The lower the AL, the better a product is at keeping air out. AL is an optional rating, and manufacturers can choose not to include it on their labels.

E. Condensation Resistance (CR) measures how well a product resists the formation of condensation. CR is expressed as a number between 1 and 100. The higher the number, the better a product is able to resist condensation. CR is an optional rating, and manufacturers can choose not to include it on their NFRC labels.

Go to <http://www.nfrc.org/label.aspx> for help reading the NFRC label.

While the NFRC label is the best source for window energy performance information, you should also look to purchase ENERGY STAR-certified windows. **Energy Star requires a U-Factor that is less than or equal to 0.35.** Energy Star windows also have low-e coatings and other energy efficient features.

**19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)**

 National Fenestration Rating Council® <b>CERTIFIED</b>	<b>World's Best Window Co.</b> Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: <b>Vertical Slider</b>	
	<b>ENERGY PERFORMANCE RATINGS</b>	
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient	
<b>A 0.35</b>	<b>B 0.32</b>	
<b>ADDITIONAL PERFORMANCE RATINGS</b>		
Visible Transmittance	Air Leakage (U.S./I-P)	
<b>C 0.51</b>	<b>D 0.2</b>	
Condensation Resistance		
<b>E 51</b>		
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>		

19.2 Picture 1

**19.3 WINDOWS - RECOMMENDATIONS**

**Single Pane Aluminum Windows** The house has windows constructed of a single pane of glass with an aluminum frame. These are considered among the least efficient windows because they have a high emissivity. They allow a large amount of heat to transfer through the windows. Since heat is absorbed by cool, hot air will transfer into your house during the summer. This will heat up your house, and make your air conditioner work harder. In winter, the heated air in your house will escape through these windows to the cold air outside. This will make your furnace work harder.

As much as 35% of the energy you use (and pay for) to heat or cool your house can be lost because of these windows. Upgrading windows is one of the most effective ways to use less energy to heat or cool your home.

Many different types of high efficiency windows are available. Differences include the number of panes of glass (2, 3, or even 4), type of frame (vinyl, fiberglass or wood), Low-E coatings, and inert gases. Each of these features provides different levels of thermal efficiency, and of course, cost varying amounts of money. Depending on the climate where the house is located, the effectiveness of the windows can change. For example, in extreme climates, more expensive windows can be justified. You'll need excellent thermal properties to prevent transfer of heat through the windows. In more mild climates, you will experience diminished return on investment because you simply don't use as much energy to



## 19. EER - BUILDING ENVELOPE (Windows, Doors, Weather stripping)



heat or cool a house, and the payback on your investment will be reduced as the price of the windows goes up. Consider the cost of the windows and your climate when evaluating the payback on your investment.

Additional reasons to replace your windows include sound reduction, aesthetics, and security.

## 20. EER - ENERGY SAVINGS



### 20.0 ENERGY SAVING TIPS (Changing habits)

**Change some light bulbs.** by changing the five most used lights in your house from standard incandescent bulbs to Compact Fluorescent Light bulbs (CFL), the average household can save up to % 70 per year in electricity usage according to Energy Star. Please remember that CFL's contain Mercury and must be disposed of properly. Please see the [CFL disposal guide](#) .

**Change your air filter regularly.** As much as half of the energy used in your home can go towards heating and cooling depending on the climate where you live (coast, inland, mountains). Part of that energy is consumed by the fan in your forced air system. A dirty filter makes the fan work harder to move the same amount of air. Imagine trying to breath through a straw. You should check your filter every month. It should be changed at least every three months and perhaps more if you live in a dusty area. A clean filter will also prevent dust from entering your system which can lead to early failure of the system, or more frequent maintenance.

**Install a Programmable Thermostat.** Did you know that properly using a programmable thermostat in your home is one of the easiest ways you can save energy, money? An ENERGY STAR qualified programmable thermostat helps make it easy for you to save by offering four pre-programmed settings to regulate your home's temperature in both summer and winter — when you are asleep or away.

The average household spends more than \$2,000 a year on energy bills — nearly half of which goes to heating and cooling. Homeowners can save about \$180 a year by properly setting their programmable thermostats and maintaining those settings. The pre-programmed settings that come with ENERGY STAR qualified programmable thermostats are intended to deliver savings without sacrificing comfort. Depending on your family's schedule, you can see significant savings by sticking with those settings or adjust them as appropriate for your family. The key is to establish a program that automatically reduces heating and cooling in your home when you don't need as much. Use the ENERGY STAR Programmable Thermostat Calculator to see what you can save with set-back temperatures that work for your family. The pre-programmed settings for an ENERGY STAR qualified programmable thermostat are:

#### Programmable Thermostat Setpoint Times & Temperatures

Setting	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
<b>Wake</b>	6:00 a.m.	<= 70° F	>= 78° F
<b>Day</b>	8:00 a.m.	Setback at least 8° F	Setup at least 7° F
<b>Evening</b>	6:00 p.m.	<= 70° F	>= 78° F
<b>Sleep</b>	10:00 p.m.	Setback at least 8° F	Setup at least 4° F

For additional information on Energy Star thermostats, and savings calculator, visit [Thermostats](#) on the Energy Star website.

**Tune up your HVAC system yearly.** A tune up on your car can improve gas mileage. The same is true

## 20. EER - ENERGY SAVINGS



for your HVAC system. Annual tune-ups can keep your system running at top efficiency and keep you more comfortable. You can even get a free tune up for your residential AC unit by visiting the [AC Time Program](#) website. The AC TIME Program is limited to SDG&E® customers. Residents and Businesses in All Climate Zones may participate (call 1-800-289-2440 for more info).

**Unplug Home Electronics when not in use.** Electricity use by electronic products is responsible for up to 15% of a household's total electricity use According to Energy Star. Even when electronic devices are "off", they still draw electricity for things like internal clocks, timers, fans, or even just waiting for your remote to turn it on. Even transformers for cell phone chargers, battery chargers, or laptop power supplies continue to draw electricity even when they are not powering anything. Unplug electronic items that are not in use. Set up a charging station using a power strip that can turn off the electricity to several chargers with one switch.

**Whole House Fans.** For customers in mild climate zones, such as the coastal areas, a whole house fan can be an efficient cooling alternative during all but the hottest times of the day.

- If you have both a whole-house fan and a central air conditioner, you will get the most efficient cooling performance by alternating their use.
- Don't run a whole-house fan and air conditioner at the same time, the fan will push the cooler, air-conditioned air out from the house, wasting your air-conditioning dollars.
- If your house has been closed during the day and hot air has built up, use your whole-house fan to remove the hot air first. Then, use your central air conditioner. If the outside air is relatively cool and dry, you may find that you don't need to use your air conditioner.
- Even if you use your air conditioner during the day, consider running the whole-house fan at night when the outside air is cooler.

**Visit Energy Star.** To find out more about what the Energy Star rating means, visit the [Energy Star](#) website. There you will find resources and information on all types of products, and how choosing a product with the Energy Star rating can save energy.

**Use ceiling Fans.** Ceiling fans help save energy and improve comfort in winter and summer.

During winter, run them clockwise (upward motion) at a low speed, to circulate heat that gathers near the ceiling. In summer, or in hot climates, run them counterclockwise (or downward) to cool. Most fans have a switch to reverse the spin. When cooling, always turn off your ceiling fan when you leave the room, just as you do your lights (a fan only cools you, not a room, by creating a "wind-chill effect").

## 21. EER - REBATE CENTER

### 21.0 REBATE CENTER

**High-Efficiency Clothes Washer Rebate \$185:** Get a rebate of up to \$185 when you buy a high-efficiency washer (HEW). When compared to standard top-loading models, HEW's

- Use 65% less water.
- Use 55% less energy and detergent.
- Clean better.
- Can cut drying time in half saving energy in the dryer, too.

The Metropolitan Water District operates this program on behalf of the Water Authority, its member agencies

## 21. EER - REBATE CENTER

Diego Gas & Electric. HEW's must be from the list of approved models with a water efficiency factor of 5.0 or

To receive your rebate, call 1-888-376-3314 or visit the Clothes Washer Rebate website at <http://www.conservationrebates.com/programs/MWD/washers.html>

**Free AC Tune-Up \$100+ value:** Save energy and money this summer with a check-up on your central air conditioning system. Home cooling and heating can be 50% of your energy use. So make sure your system is running efficiently. *TIME Program is funded by California utility customers and administered by San Diego Gas & Electric Company (SDG&E®) under the auspices of the California Public Utilities Commission, through a contract awarded to Services Inc. California customers who choose to participate in this program are not obligated to purchase additional services offered by the contractor.*

Call 800-289-2440 to find a contractor in your area or visit [Air Conditioner Tune-Ups](#)

**Attic Insulation Rebate \$.15/sq. ft.:** Up to 40% of a home's heat loss takes place due to inadequate insulation. Insulation levels are specified by R-Value, which is a measure of insulation's ability to resist heat traveling through it. The higher the R-value, the greater the insulating effectiveness. The R-value of thermal insulation depends on material, its thickness, and density.

- REBATE - \$.15 per square foot on R-30 (or better) attic insulation
- REBATE - \$.15 per square foot on R-13 (or better) wall insulation

### Insulation Savings

Utility rebates of \$.15/sq. ft. add up to about \$180 for the average home. With proper insulation, you could save \$18 monthly (or up to 25%) on your winter heating costs. Contact [SDG&E Insulation Rebate](#) for details.

**Dishwasher \$30:** Purchase a new Energy Star qualified dishwasher (with an energy factor of 0.65 or greater) and receive a \$30 rebate. Most retailers will provide you with a rebate form otherwise contact SDG&E at (800) 644-6133.

**Pool Timer Reset \$25:** Let SDG&E reset your pool timer and receive a \$25 rebate. To qualify, the timer must be reset during off-peak hours (before noon or after 6PM) year-round, and reduce filtering time by one hour each week during the off-season (minimum 6 months, Oct - Apr). Call SDG&E at (800) 644-6133.

**Water heater \$30:** Purchase a new water heater of 30 gallons or more and receive a rebate of \$30 per unit. Gas water heaters must have an Energy Factor of 0.62 or greater, and electric water heaters must have an Energy Factor of 0.93 or greater to qualify.

**Refrigerator Recycling \$50.** Recycle older or second refrigerators and receive \$50. For more information on refrigerator recycling, contact Appliance Recycling Centers of America, Inc (ARCA) at 1-800-599-5792.

**New Refrigerator Rebates \$25.** SDG&E offers a \$25 rebate on qualifying Energy Star refrigerators. Please visit our website for a [list of qualifying refrigerators](#).

**Pool Pump Rebate - \$100:** If you have a swimming pool, chances are you have a higher-than-average energy consumption. Pools are commonly equipped with pumps that are larger than needed. Replacing standard pumps and motor assemblies with high-efficiency units or with a multi-speed pump can generate savings in energy cost, with a reduction in cleaning effectiveness.

According to SDG&E, Moving water more slowly with a multi-speed pump is an effective way to reduce energy consumption for filtration. Reducing pump speed by half reduces the power requirement to one-quarter of that required for a standard pump. The multi-speed pump must run twice as long at low speed to filter the same amount of water, but the unit uses only one-quarter of the energy used at full speed. This means that running the pump for 16 hours on low speed uses approximately half as much energy as running eight hours on high speed. Be sure to check with your pool contractor for more information.

## 21. EER - REBATE CENTER

information and details on the best way to run a new filtration system.

Reducing filtration run time on single speed pool pumps is a big energy saver. Reducing the filtration time per day (for a 1hp pool pump) can save an average of \$10.00 per month. Run time varies according to pool and other factors like the amount of debris in the water, but a general rule of thumb is to filter the water one hour per day.

If you use a pool maintenance service, make sure you consult with them about reducing the filtration time. If a pool is heavily used, it is recommended that the pool pump be operated manually and that the filtration system run longer under such conditions.

- REBATE - Multi-Speed or Variable-Speed Pool Pump and Motor - **\$100**
- *Most variable-speed pool pumps do not require an automatic controller.*
- *A qualifying automatic controller is required for most multi-speed pool pump and motor sets.*

Visit [SDG&E Pool Pumps](#) for details about the qualifications for the pool pump rebate.

### Residential Energy Efficiency Tax Credit

#### Summary:

The federal tax credit for energy efficient home improvements was established by the Energy Policy Act of 2005. After expiring on December 31, 2007, the credit was extended by The Energy Improvement and Extension Act of 2008 (H.R. 1424, Division B), and now applies to eligible equipment purchased between January 1, 2009 and December 31, 2009. *Equipment purchased during calendar year 2008 is not eligible for the tax credit.* In addition to extending the credit, H.R. 1424 modified the efficiency requirements for geothermal heat pumps; removed the geothermal heat pump credit from 26 USC § 25C and moved it to 26 USC § 25E; extended the credit to stoves that use biomass fuel and asphalt roofs with appropriate cooling granules.

The credit applies to energy efficiency improvements in the building envelope of existing homes and the purchase of high-efficiency heating, cooling and water-heating equipment. Efficiency improvements must serve a dwelling in the United States that is owned and used by the taxpayer as a principal residence. The maximum amount of homeowner credit for all improvements combined is \$500 per year period of the tax credit (2006, 2007 and 2009). Geothermal heat pumps were originally included in the credit and subject to a \$300 cap. Geothermal heat pumps are now covered by the [Residential Renewable Energy Tax Credit](#), with a \$2,000 cap.

#### Building Envelope Improvements

Owners of existing homes can receive tax credits of up to 10% of the cost of upgrading the efficient building's envelope. Components eligible for the credit include:

- insulation materials and systems designed to reduce a home's heat loss or gain;
- exterior doors and windows (including skylights); and
- pigmented metal roofs designed to reduce heat gain, asphalt roofs with appropriate cooling granules.

Credits for windows may not exceed \$200, and the total amount of credits for building envelope measures on other qualified energy property outlined below must not exceed \$500.

Improvements should be expected to remain in use for at least five years. Metal roofs and asphalt roofs must meet Energy Star requirements, and all other improvements must meet 2000 International Energy Conservation Code criteria, including supplements. Manufactured homes conforming to Federal Manufactured Home Construction and Safety Standards also qualify.

#### Heating, Cooling, and Water Heating Equipment

Purchasers of qualified energy efficient property are eligible for tax credits up to the total expenditure for the property. The credit can also be applied to labor costs for assembly and original installation of this property. Eligible property and maximum credit amounts are as follows:

- electric heat pump water heaters: \$300;
- electric heat pumps: \$300;

## 21. EER - REBATE CENTER

- central air conditioners: \$300;
- natural gas, propane or oil water heaters: \$300;
- natural gas, propane or oil furnace or hot water boilers: \$150;
- advanced main air circulating fans: \$50; and
- biomass stoves that use "any plant-derived fuel available on a renewable or recurring basis, including agricultural crops and trees, wood and wood waste and residues (including wood pellets), plants (including aquatic plants), grasses, residues, and fibers": up to \$300.

Performance and quality standards for tax credit eligibility vary by technology. See 26 USC § 25C at 1424 above for details. Additionally, the Internal Revenue Service (IRS) has provided the following guidance relating to the credit: [IRS Notice 2006-26](#).

For more detailed information on qualifying products, visit the [Energy Star web site](#).

### Contact:

#### Public Information - IRS

Internal Revenue Service  
1111 Constitution Avenue,  
N.W.

Washington, DC 20224

**Phone:** (800) 829-1040

**Web site:** <http://www.irs.gov>

**Whole House Fan.** A whole house fan can help you lower your home cooling cost by reducing the need to central air conditioner. A whole house fan works by pulling cool outdoor air inside, and pushing warm indoor air outside. They also cost approximately 20% less to run than an air conditioner.

REBATE - \$50 per qualified Whole House Fan. *To qualify for the rebate, the home where the fan will be installed must have existing central air conditioning.*

## 22. EER - GLOSSARY

### 22.0 GLOSSARY

**AMBIENT AIR TEMPERATURE** - Surrounding temperature, such as the outdoor air temperature around a building.

**AFUE (annual fuel utilization efficiency):** is the measurement of how efficiently a gas furnace or boiler will operate over an entire heating season. The AFUE is expressed as a percentage of the amount of energy consumed by the system that is actually converted to useful heat. For instance, a 90% AFUE means that for every Btu worth of gas used over the heating season, the system will provide 0.9 Btu of heat. The higher the AFUE, the more efficient the system.

When comparing efficiencies of various gas furnaces, it is important to consider the AFUE, not the steady state efficiency. Steady state refers to the efficiency of the unit when the system is running continuously, without cycling on and off. Since cycling is natural for the system over the course of the heating season, steady state doesn't give a true measurement of the system's seasonal efficiency. For instance, gas furnaces with pilot lights have steady-state efficiencies of 78% to 80%, but seasonal efficiencies AFUE's closer to 65%.

Virtually all gas forced-air furnaces installed in this area from the 1950s through the early 1980s had AFUE's of around 65%. Today, federal law requires most gas furnaces manufactured and sold in the U.S. to have minimum AFUE's of 78%. (Mobile home furnaces and units with capacities under 45,000

## 22. EER - GLOSSARY

Btu are permitted somewhat lower AFUE's.) Gas furnaces and boilers now on the market have AFUE's as high as 97%.

**Efficiency:** the degree to which a certain action or level of work can be effectively produced for the least expenditure of effort or fuel. For instance, a light bulb that uses 15 watts of electricity to produce 900 lumens of light would operate with much greater efficiency than one that required 60 watts to produce the same light level.

**FENESTRATION** Any transparent or translucent material plus any sash, frame, mullion or divider. This includes windows, sliding glass doors, French doors, skylights, curtain walls and garden windows.

**Insulation:** a product that inhibits *conductive* and *convective* heat transfer. Some materials are naturally better insulators than others because they contain more "dead air" pockets. These pockets of trapped gas help to slow the movement of heat. However, if processed properly, virtually any product, including glass, cotton, paper, and plastic, can be used to make insulation.

**R-value:** is the measurement of how effectively a material resists the transfer of heat via conduction. The higher the R-value, the less heat transfer can take place.

Some materials are more resistant to heat transfer than others, giving them higher R-values. One of the best ways to enhance the product's R-value is to increase the amount of gas (including air) inside or immediately surrounding it. For instance, the glass of a single-pane window has virtually no R-value, but the thin film of air that normally exists on either side of the glass gives the window an R-value of about 0.83. Adding a second pane of glass and sealing the space between the panes will increase the thickness of one of the insulating gas layers, thereby more than doubling the window's R-value.

Another example of how the presence of dead-air spaces affect a product's R-value can be seen with wood. Hard woods, like oak, typically have an insulating value of R-1 per inch of thickness. However, softer woods, such as pine, might have R-values twice as high due to their greater number of air-filled pores.

Products developed especially for the purpose of impeding unwanted heat transfer are called insulation. Insulation can be made of a variety of materials, including old newspapers and wood fibers, glass fibers, and synthetic foams. It can also come in a variety of configurations, including soft blankets, rigid boards, or fluffy granular loose-fill, but what they all have in common, is their abundance of air-filled pores or pockets.

The actual R-value of insulation products can vary greatly, depending on their composition and form. The least resistant and least common are perlite and vermiculite loose-fills, at R-2.2 to R-2.7 per inch of thickness; the most resistant are polyisocyanurate rigid boards, at R-7 per inch of thickness. Fiberglass blankets and cellulose loose-fills, two of the most common residential insulations have R-values of 3.1 to 3.7 per inch.

**SEER (seasonal energy efficiency ratio):** measures how efficiently a residential central cooling system (air conditioner or heat pump) will operate over an entire cooling season, as opposed to a single outdoor temperature. As with EER, a higher SEER reflects a more efficient cooling system. SEER is calculated based on the total amount of cooling (in Btu) the system will provide over the entire season divided by the total number of watt-hours it will consume:

$$\text{SEER} = \frac{\text{seasonal Btu of cooling}}{\text{seasonal watt-hours used}}$$

By federal law, every central split cooling system manufactured in the U.S. today must have a seasonal energy efficiency ratio of at least 13.0.

## 22. EER - GLOSSARY

**SHADING COEFFICIENT** - The ratio of solar heat gain through a specific glazing system to the total solar heat gain through a single layer of clear, double-strength glass.

**U-Value:** U-value is the measurement of how much heat can be conducted through a building component (such as a wall or window). As such, it is the opposite of R-value, which measures the ability of material to resist heat conduction. The higher the U-value, the more heat the material(s) will allow to be transferred through it. The lower a material's U-value, the higher its R-value will be. U-values are always expressed in decimals (e.g., U-0.166).

To determine the R-value of a product for which the U-value is given, you first convert the U-value to its equivalent fraction and then invert it. For instance, the equivalent fraction of U-0.166 would be 166/1000 or 1/6. This inverts to 6/1 or 6, giving you an R-value of 6.

For most consumers, U-value is likely to be of concern only when shopping for new windows, where efficiency is frequently stated in terms of U-value rather than R-value.

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The information in this report was compiled from many sources including [Flex Your Power](#), [The Department of Energy](#), Utility Companies, [Energy Star](#), [San Diego Gas & Electric](#),

*This report contains a lot of information from a variety of sources. We make our best effort to keep the information current and accurate. Some information may change without our knowledge such as rebates or tax incentives. Please verify that a rebate or tax incentive is still in place before making any purchasing decisions, or spending money on services. Occasionally a rebate program will start with a set amount of money. Over time this fund gets depleted and there may not be any funds to honor the rebate. Again, please verify that funds, rebates, or tax incentives are still available before you pay for products or services.*

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