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## FEATURES OF 149 PENA BLANCA LOOP

This 4,000 square foot three bedroom residence provides multiple high value features not typically found other homes. It is designed to minimize cost of ownership, maintenance and the impact of any emergencies that could arise, as well as to save energy and provide extraordinary convenience. To achieve this the highest quality materials and systems were used. The residence as sited has extraordinary views. To take fullest advantage of them without compromising these other advantages required a combination of features:

1. windows designed to minimize solar heating and to block damaging UV rays
2. solar shades programmed to further filter light, window by window, whenever they are in direct sunlight and to insulate excessive window temperatures year-round
3. insulated concrete walls
4. highly efficient air conditioning and fresh air exchange.

### <sup>1</sup> Windows

Window glass is the highest quality manufactured by Pittsburg Plate Glass (PPG), Solarban 70 XL (2), featuring low solar heating and blocking of ultra violet (UV) light, while transmitting the highest level of desirable light. Intense UV light in this high desert region if unchecked causes severe fading and deterioration of draperies, carpets, and upholstery. In the winter, the high U-value insulation of Solarban 70 XL (2) saves energy due to heat loss. Solar shades controlled by the smart home system further reduce heat loss.

### <sup>2</sup> Lighting — a “smart home”.

An atmospheric clock, which tracks the movement of the sun throughout the day and all seasons of the year, controls not only lighting but also automatically, closes solar shades as the sun reaches each window and opens them individually when it moves off again. It also operates ceiling fans as desired and can also be expanded to control home services such as home theater systems, and HVAC (heating, ventilation and air conditioning).

All three functions of lighting are computer controlled, programed to suit residents’ preferences.

- a. Task lighting - such as reading, meal preparation, and cleaning.
- b. Pathway lighting – essential lighting of common thoroughfares such as living room to garage, kitchen to den, or bedroom to bathroom for nighttime visits without awakening others.
- c. Atmospheric lighting – creating a pleasant environment highlighting artwork and other subtle lighting effects.

Virtually all lighting – all three functions - are ceiling or wall mounted. Lamps are optional to suit the décor.

### <sup>3</sup> Insulated Concrete Form (ICF)

Exterior walls are monolithic 6” thick reinforced concrete clad in 3” Styrofoam on both sides. Very Energy efficient.

### <sup>4</sup> Air Conditioning

Office, Media Room, and Guest Suite

Highly efficient, individually controlled air conditioning by mini-split heat pump.

Main Residence, Zone 1.

Central air conditioning by 4 ton heat pump

## AirCycler

Instead of opening windows, fresh outside air drawn-in by the central air handling unit every hour, is electrostatically filtered and conditioned, making the residence virtually dust free.

## Solar Power

6 KW, DC coupled, interactive grid-tied photovoltaic system.

Translation: The 24 panel array generates up to 6KW of direct current (DC) solar electricity (*photovoltaic*) which is conditioned by charge controllers, then sent to the inverter. The inverter first directs this DC to recharge batteries which power the system itself (*DC coupled*). It then converts the balance from DC to alternating current (AC) electricity. It directs this energy to power the home. Excess energy is sold back to the El Paso Electric Company (EPE) grid. Conversely, if solar power is insufficient to satisfy home demand, the inverter draws from the grid (*interactive grid tied*).

If the grid loses power, the inverter instantly disconnects from the grid and draws upon available solar and batteries to power designated critical loads. Currently, with limited stored energy, critical load goes to the guest suite where residents, with careful management can be reasonably comfortable in the event of an extended outage. Once grid power is restored, grid connection is restored.

EPE has not had an extended loss of grid power in our first 14 years of occupancy. In other words, an extended outage is a low risk event. Conversely, the consequences of no electricity for an extended can be severe! Nearly all photovoltaic systems in the area have *net metered* inverters. In the event of an outage other systems are unable to go *off-grid* and redirect solar energy to the home. In this respect, *net metered* systems become useless when needed most.

Our renewable energy solar system has proven extremely reliable, requiring no maintenance while substantially reducing electric bills. This system is sized to power the whole house. When built in 2005, superior lithium ion battery technology was not commercially available. Today, whole house Li Ion battery systems are a worthwhile consideration capable of offering even greater savings.

## BUILDING ZONES

### Layout

The residence is sited on a 5-acre lot. Its layout consists of five principal zones, listed below.

- Instead of linear layout, exterior walls are angled at 45 degrees to the north-south Organ Mountain range. This greatly expands the mountain views up and down range which rise another 3,000 feet directly behind us, while to the west we have a nearly 180 degree view of the Rio Grande River valley 1,400 feet below. Electric utilities are underground in our north end of Pena Blanca Loop, thereby eliminating the clutter of utility poles and wires from the grand views.
- Expanding the interior sense of spaciousness, the ceilings in the main living area, the great room, are 11 feet high, and doors 8 feet high. (The conventional door height standard is 6' 8".) In the angled wings, Zones 2 and 3, the ceilings and doors are 9 feet and 7½ feet high, respectively.
- Each zone is separately keyed for privacy and security.
- The main areas of the home are centrally air conditioned, while the remaining living areas are individually controlled by highly efficient mini-split air conditioners.
- A Beam central vacuum system serves all four zones.
- The main floor, zones 1 thru 3, as well as patios are wheel chair accessible.

## Zone 1

Great room: living room, dining room, and kitchen.

- Zones 1 and 2 are heated and cooled by a four ton heat pump. The air handler is in the Mechanical room, Zone 5, below.
- Rosewood flooring, among the hardest of hardwoods, highlight the living and dining rooms. The rooms are demarked by a color-coordinated tile aisle which extends from kitchen to garage. It is useful in conveying groceries from the car to kitchen using a wheeled trolley, (<https://www.architonic.com/en/product/1446272>). The trolley's primary purpose, as a serving cart to shuttle meals to the patios for outside dining, was garaged behind cabinet doors in the spacious kitchen island.
- Cherry wood cabinet counters are topped with stunning "Verde Bamboo" granite from Brazil.

## Zone 2

Master suite: bedroom, bath, laundry, reading area, and fitness room.

### Master bathroom

Includes:

- A spacious vanity with two sinks.
- A wheel chair accessible shower with main showerhead, hand shower, and jets focused on the lower back. A built-in bench is located within easy reach of the hand shower.
- A discretely partitioned alcove beyond the shower provides a toilet, men's urinal, and a wheel chair accessible pedestal sink.

### Master closet

- Two levels of clothes racks provide ample space for hanging clothes.
- Shoe racks are provided at both ends for everyday wear.
- Glass faced cabinets for convenient protective storage of clothes, sweaters, and dress shoes.
- Both closet and cabinets are illuminated by motion switched lighting.
- Plush carpet, aqua

### Laundry

- Washer and Dryer are installed on a raised platform for easy access. (A platform extension located in the garage storeroom is provided should either appliance need to be moved for service access.)
- Cherry-wood cabinets provide storage for laundry supplies and six drawers particularly suited for socks, underwear and the like. The countertop is sized to hold a large suitcase for convenient packing, while there are overhead rails to temporarily hang out clean laundry or clothes for packing.
- NuTone wall cabinet contains a fold-away ironing board and iron, with light and timer controlled electric outlet for safety.

### Reading area

- A quiet nook with western views which opens into the bedroom. It is partitioned so as not to disturb a partner's sleep. In evenings it takes the drowsy reader only a few steps to tumble into bed. The reading room is also a convenient location to discretely monitor a bedridden patient without disturbance.
- Plush carpet, aqua

### Fitness room

- Swim against the current in an “Endless Pool”, a 7 by 14 foot ICF concrete pool with vinyl liner and convenient variable speed control. Swimming is an excellent low-impact exercise for all ages.
- This indoor pool requires very low maintenance: a cup of bleach every other day and a check of water quality monthly. Insulated concrete construction results in highly efficient low cost temperature control.
- A similarly low maintenance hot tub with a mountain view provides a relaxing finish after a satisfying workout.
- Carpeted area for yoga and fitness exercises with full length mirrors.
- Located adjacent to the master suite you are only steps away from a shower and change of clothes.

## Zone 3

### Guest Suite

A studio apartment with full size kitchen appliances, a queen-size Murphy bed, Jack & Jill bathrooms (separated by tub/shower room), and a small walk-in closet with built-in dresser and double sliding doors faced with full-length mirrors. When furnished with a pair of love seat sofa beds, the suite comfortably slept a visiting family of four.

Potential uses include: Visiting family and friends, a teenage family member or returning adult children, live-in aging parents, or caregivers for the primary residents.

### Bedroom and media rooms

These rooms with closets and direct access to Jack and Jill bathrooms are well suited for use as bedrooms and other functions according to the needs of residents and guests. Surround sound speakers with woofer are installed in the media room.

## Zone 4

### Garage

Spacious 3-car garage, recycle/compactor room, large secure storeroom, and a “shop” alcove. The center garage bay is outfitted for car washing. The floor slopes to a gray water drain. Two hose bibs each with hose racks and 25 foot hoses are mounted, one on each side of the middle garage door.

## Zone 5

### Mechanical Room

This home is prominently sited on a high slope. Rather than prevailing concrete slab-on-grade construction with utility services in slab or above ceiling, this residence takes advantage of the sloping terrain for a basement accessible at the lower ground level. Each utility has a dedicated area in this spacious, well-lit mechanical room.

Utility areas include:

- Electrical
- Solar system
- Smart home
- Air conditioning
- Water - Potable, Waste, Gray water, and Rain-Bird irrigation
- Pool - hydraulic, heating, and filtration
- Central vacuum

Original architectural drawings of all systems are mounted on one wall behind glass panels.

Servicemen use a separate driveway for direct access of service vehicles to the Mechanical Room through double doors, minimizing need to enter living areas on the main floor.

## BUILDING FEATURES

### Roof

Commercial grade, 80 mil TPO single membrane, twice the thickness of the hail-damaged original PVC membrane (TPO = Thermoplastic Polyolefin).

Reroofed November 2018. 10 year warranty + lifetime limited. (Original owner).

### Stucco

Re-stucco'ed November 2011 in accordance with STO specifications. STO certified the project on site and issued a 10 year warranty.

### Icynene Insulation

Highly effective fire & sound retardant and air barrier sealing in all interior partitions and underside of roof. (Consequently, central conditioning ducts above the ceilings are at room temperature minimizing heat/cooling losses.)

## COMMUNICATIONS

### Internet

FASTWAVE - a microwave line-of-sight service.

PROs: Reliable and affordable. Speed is adequate for most users. Used by seller.

CONs: Microwave is susceptible to interference by occasional extreme winds and severe storms.

### SATELLITE

PROs: High speed. Possibly more reliable

CONs: Higher cost. Possibly susceptible to extreme weather.

### Cell Phone

Verizon provides adequate, reliable service. Is used by owner. Signal strength and price of other services varies.

## EMERGENCY SERVICES

### Fire

With ICF concrete construction, fire retardant walls and roof, and smoke alarm system, extensive damage by fire from within is highly remote. Outside, desert grasses and other combustible foliage, have been replaced with decorative stone and xeriscape landscaping to provide at least twice the combustion free distance recommended by fire code. Hose bibs are strategically placed on all sides of the building, and according to the fire department, the swimming pool holds twice the amount of water needed to control a residential fire.

### Computer backup

Buried in an obscure area of the mechanical room is a small concrete vault with electric and Cat 5E cable running directly to it from the media equipment closet above. Its purpose is to locate and protect from destruction a backup computer hard drive. It was constructed as an alternative to the inconvenience of maintaining off-site

backup to back-up a 2TB Network Attached Server (NAS). Largely watertight and with two gravity drains, it is expected to survive destruction of the residence by fire or natural disaster.

## Water Utility

### Well

Water is supplied by an 800 foot deep well at the southwest corner of the lot. It requires no treatment; it has consistently tested perfectly potable and is ideally soft. Water is pumped to a 500 gallon tank in the mechanical room, then pressurized to 40 to 60 psi in a 15 gallon pressure tank. The life of the submerged pump is significantly extended by the 500 gallon tank. Fill levels in the tank are set such that it refills typically every other day, rather than repeatedly upon demand which substantially wears electrical contacts.

Should a well pump fail, well service typically takes a week, leaving residents totally without water for the duration. This has been avoided here by a running a gravity fed water line from the Endless Pool to the 500 gallon tank. In the event of well pump failure, treated pool water can be substituted for showers, flushing and any other needs, other than drinking water, which can be purchased locally. Water pressure is maintained by the booster pump tank, as usual.

### Domestic Water Pressure Pump

In the event of failure of the booster pump, valves on either side of the pump can be closed for servicing. Water pressure can be maintained by simply toggling two switches on a panel mounted directly above the 500 gallon tank. These switching procedures are described in detail the provided 3-ring binder entitled "SYSTEMS SUSTAINMENT".

### Hot water

Hot water to showers and sinks in Zones 1 and 2, and Guest Suite, are supplied by two separate 40 gallon tanks, respectively. In the event of failure of a heating element resulting in loss of hot water, simply use the facilities in the other zone.

Replacement heating elements have been provided. Instructions for replacing elements are provided in the "SYSTEMS SUSTAINMENT" binder. A qualified service provider can restore hot water within an hour.

## RECREATION

### Fire Pit

A central feature of the west patio is a fire pit of large boulders, fueled with propane. Its radiated warmth extends the enjoyment of western views and glorious sunsets as crisper autumn evenings move in.

### Bocce Ball

A bocce ball court is sited on the middle-west terrace, measuring 80 feet by 11 feet. To learn more about this fun game, Google search "Bocce ball".