

To: J Epstein[jeevacation@gmail.com]
From: BMG
Sent: Wed 5/29/2013 1:39:38 PM
Subject: Fwd: Zorro Ranch

Jeffrey

Attached is the preliminary report from Beaudin Ganze for your review
Regards

Brice Gordon
49 Zorro Ranch Rd
Stanley, NM 87056

Ph: [REDACTED]

Begin forwarded message:

From: "Morgan Royce" <[REDACTED]>
Date: May 28, 2013, 6:05:35 PM MDT
To: "Richard Kahn" <[REDACTED]>
Cc: "Brice Gordon" <[REDACTED]>
Subject: Zorro Ranch

Richard,

We made our site visit last Thursday to refresh memories, investigate electrical and meet with Brice.

Overall the visit was very informative.

The Pool Space was within reasonable tolerances even though the pool conditioning system was not functioning in dehumidification but was re-circulating air.

We looked for additional drawings of the space and with Brice's help we were able to find a SUP set that showed/implied the system layout of ductwork, etc. Nothing definitive but still helpful.

We looked at the Mechanical space in general to determine how the system is currently set up for evaluation. We will begin a detail analysis shortly.

We briefly discussed schedule on modifications and are of the understanding that a direction/solution needs to be in place no later than end of August.

As you all know there are problems. The most Notable are listed below:

1. The current unit is not functioning and when it is functioning there appears to be a restriction in the air flow.
 - a. We would request that the existing ductwork be investigated by Camera to verify routing and condition of the Ductwork.
 - b. Air flow is critical in controlling condensation and overall pool environmental quality.

- c. Too little air flow causes excessive condensation on perimeter wall/ceilings and also in the conditioning equipment that eventually causes failures.
 2. There is no exhaust from the pool or more specifically over the hot tub/spa.
 - a. This is a significant humidification load to the overall space that is best rejected to the exterior versus removal by the pool system.
 - b. While there appears to be a connection for ventilation or outside air this is not likely or if likely is causing other issues in the space.
 - i. If there is outside air the room is being pressurized introducing odors and moisture to the surrounding space.
 - ii. If there is no outside air the room does not meet current code requirements.
 - iii. If there is inadequate ventilation/exhaust the humid air can become corrosive which can cause damage to the pool equipment during dehumidification
 3. There does not appear to be any insulation or vapor barrier on the walls/ceiling of the pool area. This includes exterior and interior.
 - a. Insulation is critical to reduce the amount of energy lost through the perimeter of the pool. Location and quantity of insulation has an effect on the location of the vapor barrier.
 - b. A vapor barrier is critical to controlling humidity in a pool area.
 - i. Without a barrier moisture will migrate higher to lower level areas.
 - ii. Improperly positioned vapor barriers can cause moisture to collect in the wrong areas causing failures in structures and or mold growth.
 4. Operation of the pool versus space
 - a. Pools systems are design to operate at a desired steady state. Space Relative Humidity range of 40-60%. Space Temperature Range 82-85 Deg F. Water temperature 82 to 86 Deg F.
 - i. If the temperatures of the space to pool change dramatically then the pool evaporation rate and subsequent relative humidity changes along with it. This can have an overwhelming effect on the pool equipments ability to remove excess humidity.
 - ii. If pool unit is not capable of maintaining a space temperature above dew point (point of condensation) during winter then the pool area will also produce condensate.

These are just a few of the concerns related to the site observation.

Again as you know this is a complex issue. We are in the process of starting the analysis of the pool loads to determine if the equipment is sized properly. We are also investigating ways to exhaust/ventilate the pool area.

If you have any question, please feel free to contract me.

Sincerely

Morgan B. Royce, PE | Associate Principal
BEAUDIN GANZE CONSULTING ENGINEERS, INC.

7007 Wyoming Blvd. NE, Suite F-2
Albuquerque, NM 87109

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