PETITION FOR DECLARATORY STATEMENT BEFORE THE FLORIDA BUILDING COMMISSION

Company: WCI Communities. INC
Address: 24301 Walden Center Drive
Bonita Springs, Florida 34134

Name: Vince Veccharella
Title: Vice President of Construction
Telephone: 954-340-2679
E-Mail: vincevecchar ella@WCICommunities.com

DS 2016-100

Project Information:

This petition applies to WCI Communities' various projects or subdivisions in Parkland, Florida. Some of these are already completed, some are under construction and some are in the pre-construction stage.

Heron Bay	> 300 homes with some completed subdivisions and others under construction.
Parkland Bay	522 homes in the pre-construction, permitting stage.

Code Section(s) on which the Declaratory Statement is sought:

Florida Residential Code M1602.2.4
Florida Residential Code M1507.2

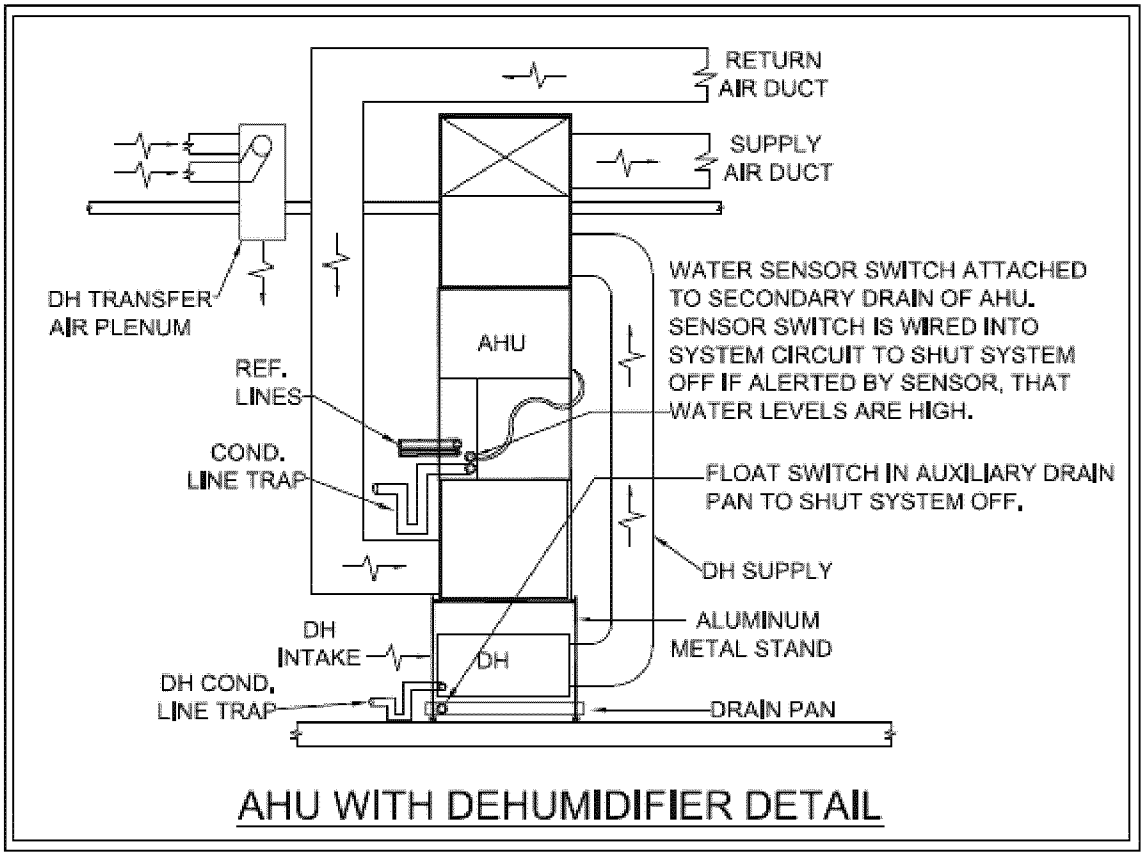
Background:
Petitioner is a Residential Home Builder currently engaged in a number of single-family projects and subdivisions in Parkland, Broward County, Florida. In the interest of providing the best indoor air quality and humidity control inside their homes, the Petitioner is in the process of designing and installing a Supplemental Dehumidification System in some of these homes. To achieve the most efficient and effective system possible the Petitioner has engaged a number of experts that have been measuring and recording temperatures, moisture levels, pressures and airflows. The result from these studies show that to achieve the desired goals the most effective method is to install a Dedicated Dehumidifier operating independently of the Central Air Conditioning System along with other measures that include attic venting strategies. This is especially important during the "shoulder season" when AC systems do not run long enough to remove building humidity and when the worst humidity problems have historically occurred.

There are two different applications being proposed:

1. Installation of the Dehumidification System in New Homes not yet started or already under construction.
2. Installation of the Dehumidification System in Existing Homes already finished and now occupied.

Dehumidification System:

This Dehumidifying System consists of a Dehumidifier, Humidity Controls and Air Circulation Ducts.
From past experience the experts have determined that the most common places where high humidity and mold growth occurs in a home are in Bathrooms and in Closets. This is due to high moisture sources (Bathrooms) or lack of air movement (Closets). Thus the Dehumidifying System is designed to draw small amounts of air from such high humidity areas and have the air run through the Dehumidifier, which filters and dehumidifies it before inserting it back into the house. The system would be controlled and operated strictly on keeping Relative Humidity within normal limits, independently of whether the AC system runs or not. **(See typical diagram)**



The Dehumidifier is installed in the Mechanical Equipment Room (MER) under the AHU and under its' sealed return plenum. The DH's intake is open to the MER and creates a negative pressure in the room that draws air from the open duct in the ceiling. This duct is connected to various rooms according to the particular house model. The DH's discharge duct is connected to the AC supply duct to help distribution of the dehumidified air. There is a backdraft damper at the supply duct connection to prevent air from the AC to flow back into the DH whenever the AHU fan is running.
This becomes crucial in the "shoulder season" when the AC operates for a limited period or not at all, and the Dehumidifier is able to remove moisture from the house and prevent high Relative Humidity conditions. The DH fan is also programmed to run so as to maintain some air movement in closets or bathrooms where stagnant conditions can lead to mold growth.

Code Sections:

Florida Residential Code ***M1602 Return Air****. Return air shall be taken from inside the dwelling. Dilution of return air with outdoor air shall be permitted.*

Florida Residential Code ***M1602.2 Prohibited Sources.*** *Outdoor and return air for a* ***forced air heating or cooling system*** *shall not be taken from the following locations:*
1, 2, 3 not pertinent
4. A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room, unconditioned attic or other dwelling unit.

Florida Residential Code ***M1507.2 Recirculation of air. Exhaust*** *air from bathrooms and toilet rooms shall not be recirculated within a residence or to another dwelling unit and shall be* ***exhausted*** *directly to the outdoors.* ***Exhaust air*** *from bathrooms and toilet rooms shall not discharge into an attic, crawl space or other areas inside the building.*
(Bold letters to show relevance)

Rationale:

The Petitioner believes that the Florida Residential Code in describing **"Return Air"** and in listing the Prohibited Sources is referring to those having to do with a **Central Air Conditioning and/or Heating System** with a large volume of airflow but do not apply to an independent Dehumidification System which uses very small airflow volume to treat the air. The Dehumidification Systems are exclusively designed and controlled for achieving desired humidity levels with the added benefit of enhanced air filtration (MERV>14) and have a very limited and small air volume of air circulation. As a matter of fact, the Florida Residential Code does not address or even recognize the existence of these Dehumidification systems at present.
The prohibition of "Return Air " sources stems from occupant health concerns and the application of this Code Section to an Indoor Air Quality dedicated System, such as a Dehumidifier does not seem relevant.
The second Section regarding Bathroom **Exhaust** is addressing the discharge of Bathroom Exhaust Fans which do not treat or filter the air and therefore should not be allowed back inside the house. This is not the case with a Dehumidifier.

Given the seriousness of the potential hazard to occupant health caused by mold and humidity as well as the damage to property, the Dehumidifying System should be allowed to draw small amounts of air from bathrooms and after filtering and drying be able to reintroduce it into the inside of the home. The same applies to Closets which usually have very little airflow from the Central AC and that for parts of the year don't have any airflow whatsoever. Being able to draw small amounts of air from those closets into the Dehumidifier helps remove humidity as well as create some air movement.
The Petitioner has installed these systems in unoccupied "Test" houses equipped with Temperature and Humidity sensors throughout and achieved excellent results in keeping Relative Humidity below 55%.

Attachment A

We are attaching a letter from one of the most renowned experts in the field, Dr. Joseph Lstiburek, who makes the case for air to be drawn from Bathrooms and Closets. **Please take note that we are not advocating in this Petition for directly returning air to the Air Conditioning System, as Dr. Lstiburek proposes. That would require a change to the Code as is presently written**. The point he makes about avoiding mold issues in Bathrooms and Closets and why air movement in those rooms is important nevertheless confirms that portion of our design.

The arguments he makes are based on solid science and actual field tests he has conducted in the South Florida area. We have taken his knowledge and experience to apply it to the Dehumidification System.

Conclusion

The Petitioner wishes to offer these systems for their new homes in Parkland, Florida, as an Owner's Option as well as to be able to install the Option in existing Owner-occupied homes. To be able to install these systems the Petitioner would like to have the Florida Building Commission's affirmative answer to the Code compliance questions that might arise due to interpretation of the Sections cited above. The questions we believe need answering are below.

Questions:

For New homes or homes under construction:

1. In New Residential dwellings, can a dedicated, independent Dehumidifier draw or transfer air from a Closet to be filtered, dehumidified and introduced back into the house?

2. Likewise, can a dedicated, independent Dehumidifier draw or transfer air from a Bathroom, provided that the bathroom contains an enclosed toilet area and the air is being drawn from outside the toilet area. The air to be filtered, dehumidified and introduced back into the house?

3. Likewise, can a dedicated, independent Dehumidifier draw or transfer air from a Bathroom that includes a toilet, to be filtered, dehumidified and introduced back into the house?

For Existing occupied homes:

4. In Existing Residential dwellings, can a dedicated, independent Dehumidifier draw or transfer air from a Closet to be filtered, dehumidified and introduced back into the house?

5. Likewise, can a dedicated, independent Dehumidifier draw or transfer air from a Bathroom, provided that the bathroom contains an enclosed toilet area and the air is being drawn from outside the toilet area. The air to be filtered, dehumidified and introduced back into the house?

6. Likewise, can a dedicated, independent Dehumidifier draw or transfer air from a Bathroom that includes a toilet, to be filtered, dehumidified and introduced back into the house?

Summary:

The Petitioner respectfully believes that the answer to all of the above questions is **YES**. It is the petitioner's desire that the Florida Building Commission expresses, through the vehicle of a Declaratory Statement, that Residential Dehumidification Systems, independent of the AC or Heating System, are able to draw small amount of air from bathrooms and closets where the biggest occupant concern is to control high humidity and avoid potential mold growth which can affect their health and cause property damage.

Respectfully Submitted,
WCI Communities, Inc.

Vincent Veccarella

Digitally signed by Vincent Veccarella
DN: cn=Vincent Veccarella, o=WCI Communities Inc, ou=Vice President of Construction, email=vinceveccharella@wciCommunities.com, c=US
Date: 2016.12.21 20:32:02 -05'00'

Vince Veccharella
Vice President of Construction

Building Science Corporation

December 21, 2016

Vince Veccharella
Vice President of Construction
WCI Communities
24301 Walden Center Drive.
Bonita Springs, FL 34134
239.498.8233

Re: Petition for Declaratory Statement Before the Florida Building Commission

Dear Mr. Veccharella:

The existing Florida Building Code is causing problems relating to mold in closets and bathrooms when builders install R-38 attic insulation and the existing Florida Building Code is standing in the way of easy engineering solutions to the very problems that it is causing.

In vented attics increasing the thermal resistance from R-30 to R-38 when coupled with tile roofs lead to significantly colder gypsum board ceilings that are located under the attic insulation. This reduction in ceiling temperature is leading to an increase in the relative humidity of the air adjacent the ceiling leading to mold. The problem is manifesting itself in closet ceilings and bathroom ceilings.

Closets have no thermal load and therefore have no need of conditioning and therefore have no air change and therefore have no mechanism of removing moisture. Providing supply air to closets makes the problems worse as it makes the closets colder leading to more mold.

Bathrooms have higher levels of moisture and also have inadequate moisture removal. Exhaust ventilation does not remove enough moisture and leads to an overall increase in moisture in the residence as a result of inducing the infiltration of exterior hot humid air. Exhaust ventilation addresses moisture issues in cold climates in bathrooms but does not address moisture issues in hot humid climates. Providing increased supply air to bathrooms makes the problems worse as it makes the bathrooms colder leading to more mold.

The easy engineering solution for closets is to elevate the temperature of the closet ceilings by providing return air in the closets. Providing a return duct at the ceiling of closets pulls warm air into the closet elevating the temperature of the gypsum board ceilings lowering relative humidity.

The easy engineering solution for bathrooms is to elevate the temperature of the bathroom ceilings by providing return air in the bathrooms. Providing a return duct at the ceiling of bathrooms pulls warm air into the bathroom elevating the temperature of the gypsum board ceilings lowering relative humidity.

Florida Residential Code M1602.2 prohibits return air for a forced air heating or cooling system to be taken from closets and bathrooms. The original reasons for this prohibition were based on reasonable historic practice.

Prohibiting return air from being taken from closets prevented builders from hiding unsightly return ducts in closets. Taking all of the return air from closets would prevent the forced air systems from functioning adequately. However, limiting the total amount of return air taken from closets to 10 percent of the total return flow would not affect the performance of the forced air systems and allow a small amount of return air to be pulled from closets addressing the mold problems in closet ceilings.

Prohibiting return air from being taken from bathrooms was intended to prevent odors and moisture from bathrooms to be transferred to the rest of the residence. Note that this prohibition is no longer effective. Building enclosures are now constructed tight – a Florida Building Code requirement. Supply air is allowed to be provided to bathrooms. This supply air pushes air from the bathroom back into the residence. The supply air does not pass through the bathroom walls and ceiling to the exterior. Supplying 100 cfm of air from the air conditioning system to a bathroom results in close to 100 cfm of air being pushed back into the residence. The air change in the bathroom with the rest of the residence is approximately 100 cfm. Installing a return in the ceiling of the bathroom that also extracts 100 cfm does not change this air change. However, it has a large impact on reducing moisture levels at the bathroom ceilings and increases the temperature in the bathroom.

The odor issue in bathrooms is best addressed by exhaust fans located in toilet rooms. These exhaust fans are best run intermittently – 10 to 15 minutes when lights in toilet rooms are turned on – as is now common practice in hotels.

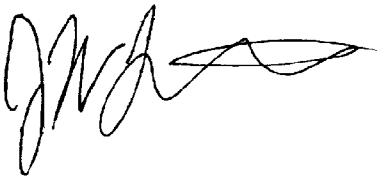
The Florida Building Code should allow return air to be taken from bathrooms that also contain toilet rooms where the toilet rooms also have exhaust ventilation to the exterior.

Two simple straightforward changes to the Florida Building Code will address the majority of the mold problems caused by going from R-30 ceiling insulation to R-38 ceiling insulation when coupled with tile roofs.

First. Allow return air to be taken from closets but limit the total amount of return air taken from closets to no more than 10 percent of the total return air flow.

Second. Allow return air to be taken from bathrooms that also contain toilet rooms where the toilet rooms also have exhaust ventilation to the exterior.

Yours truly,



Joseph Lstiburek, Ph.D., P.Eng.
Principal, Building Science Corporation