4.0 BREADTH – INDOOR AIR QUALITY STUDY

4.1 UNIQUE APARTMENT AMENITY

As mentioned in the building overview section of this report, the Art Institute of Pittsburgh plans to offer many amenities to its students who will inhabit the Try Street Terminal Building. The design includes many features to enhance their living and educational experience. In spirit of this effort to create an optimum place to live, it is felt that an additional benefit that could be added to this list is contaminate free apartments.

4.2 ULTRAVIOLET GERMICIDAL IRRADIATION

Indoor air quality is said to be one of the five most urgent environmental risks to public health according to the EPA. Therefore, the interest in using of ultraviolet germicidal irradiation (UVGI) as a technology in building applications has been renewed. UVGI systems are used for air and surface disinfection. Airborne and surface microbial problems include: allergens, mold spores, viruses, bacteria, and mold. In general, this technology can be applied to any type of building seeking to improve indoor quality. It is important recognize that UVGI systems are a complicated technology and the many types are available, each of which have there own design parameters. The International Ultraviolet Association draft documents identify 11 distinct types. Some of the most common units are: in-duct, standalone recirculation units, microbial growth control in an AHU, and upper air distribution.

4.3 CREON2000 SYSTEM

After an exhaustive search it was determined that the CREON2000 system would best meet the design needs of the Try Street Terminal Building. The General Innovation and

Good Inc. offers the Creon2000 for residential, commercial, and in-room uses. Because the apartments have outdoor air supplied by make-up air units and water source heat pumps that recirculate the room air the question was where to locate the UVGI system. It was decided that a room unit would be the best possible solution. This option would allow the Art Institute of Pittsburgh to decide how many apartments to apply this system to if they chose to do so.

The CREON2000 system destroys cells of bacteria, mold, spores, and other germs by employing germicidal ultraviolet light which impedes there ability to reproduce and infect people. Its patented technology focuses the power of the ultraviolet light onto the microbes while magnifying the ultraviolet light's ability to kill them. Figure 4.3-a below demonstrates how this works. Compared to the electronic and HEPA type filters which reduce the number of microbes in indoor air by 2-3 time, the CREON2000 can reduce the number by 20 times. The CREON2000 offers a low maintenance design which only requires a replacement bulb and filter after one year of use under normal operating conditions.

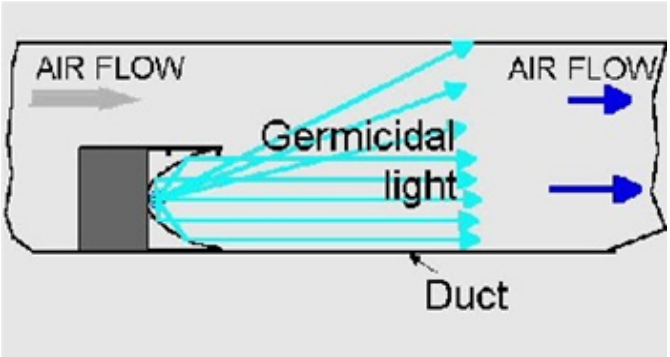

Figure 4.3-a CREON2000 - how it works

An article from the Journal of Asthma titled "Health Effects of Ultraviolet Irradiation in Asthmatic Children's Home," also features a study comparing which compares the

symptoms of children in the homes with a CREON2000 system verse those children in a placebo group without the system. The study showed that they severity of asthma symptoms was less for the children in the CREON2000 group. These children also experienced less frequent chest tightness and shortness of breath. This result is listed in the figure below.

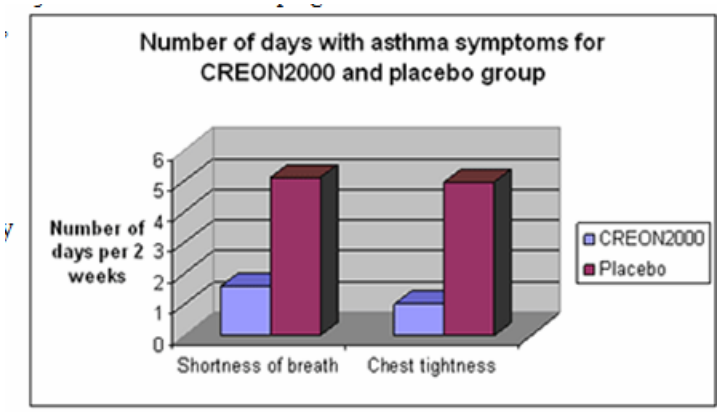

Figure 4.3-b Graph from Journal of Asthma article

4.4 SUGGESTIONS FOR IMPROVED IAQ

Based on the information presented, the CREON2000 system appears to be a possible solution towards improving the indoor air quality in the apartments. This room unit was also suggested because it could offer the Art Institute of Pittsburgh the flexibility of choosing how many apartments they would want to advertise as contaminant free. Even if only applied to a handful of apartments it is reasonable to believe that this unique amenity would be appealing to many, especially those with medical problems.