BUCH NOTES

By Edmond Buch, AIA, CSI, CCS

The Bathroom, by Alexandra Kira, presents a comprehensive study of bathrooms undertaken in the late 1950s and 1960s by the Cornell University Center for Housing and Environmental Studies. The book is important for its history of personal hygiene practices and the evolution of facilities to accommodate them. It describes the Cornell research into the "human engineering", (ergonomics), of personal hygiene and how bathrooms and bathroom fixtures could be better designed to address comfort, safety, and human accommodation.

It's important to note that most of the fixture designs proposed in the book, which were functionally & physiologically derived, have not been incorporated into fixture designs in the intervening 60 years since the book was published. The reasons for this are many and varied but must include the cost of manufacturing fixtures, fixture aesthetics, as well as cultural aspects of "going to the bathroom." Since the book was written well before disabled accessibility was a commonly recognized design consideration, there's only limited discussion on this as a factor in fixture and bathroom design.

The book begins with the historical and cultural aspects of personal hygiene. The distinction is made between the "functional", strictly sanitary aspects of using a bathroom vs. the use of bathrooms throughout history for relaxation and pleasure. The Romans had luxurious baths, for a certain segment of their population, along with elaborate systems to provide hot and cold running water. Yet, in many countries of the world, including parts of the US, indoor running water, and bathrooms, weren't common until well into the 20th Century.

The social and psychological aspects of body cleansing are described. This is followed by the important functional considerations that ought to be taken into account in the design of bathing facilities and fixtures. Several alternative designs are presented for sinks, toilets and showers. These were developed by the Cornell researchers following their review of literature on the subjects, and including the results of field surveys on current attitudes and practices. Finally, the researchers conducted laboratory studies on fixture usage with subjects in controlled settings. Sinks for hand and face washing are described; the advantages and drawbacks of tubs and showers for total body washing are considered; and alternative toilet designs are presented.

The book concludes with guidelines for the planning of toilet rooms and bathing facilities. In addition to describing the fundamental problem of providing sufficient floor space for circulation within a bath or toilet room, privacy for users, the importance of fixture design, and toilet room designs that allow for easy cleaning are presented. Even today, except in cases where disabled accessibility is necessary, too often toilet or bathrooms are viewed as the last place to provide anything more than the absolute minimum floor area.

The Bathroom was published by Bantam Books in 1968. It has 233 pages and is full of well drawn exhibits and many useful photographs, (with modesty of the subjects intact). The book is long out of print but can be found at Alibris.com and other used book outlets.

An Introduction to Air Barriers

By Ryan Dalgleish, Air Barrier Association of America

What are the driving forces behind using air barriers?

As we move towards a better understanding of how buildings perform across the United States, a need to evaluate current building design and construction is essential. This coupled with the increasing pressures to improve building efficiency, reduce operating costs and provide more comfortable working and living environments has moved the industry towards technology that will assist in meeting these ever increasing demands and objectives.

One such example of meeting these demands is the incorporation of an "Air Barrier" into the building enclosure design and construction. The serious consequences of uncontrolled air going into and out of buildings have now been realized. Some of the consequences of uncontrolled air leakage are:

- High energy costs due to the increased workload of building heating and cooling systems. The US Department of Energy has estimated that 40% of energy used for heating and cooling is lost due to infiltration/exfiltration.
- Premature building deterioration due to moisture transport by air that can corrode anchor systems, steel studs and reduce the performance of other envelope materials
- Providing a path that allows pollutants, bacteria and other allergens into the building.
- Provide a mechanism that would support conditions favorable to the growth of mold and mildew

Air Barriers are not something new. They have been successfully incorporated as standard building practice in other countries for many years. In the US market, the first requirement for air barriers came into effect with the new Energy Code adopted in the State of Massachusetts in 2001. Since then, other states have adopted air barriers in their codes, while other states are considering this technology. In addition to current code requirements, a number of leading design professionals across the U.S. are reviewing and implementing this technology to improve the performance, comfort and longevity of their buildings.

What is an Air Barrier Material?

To effectively control air leakage, a building requires the use of an air barrier assembly to resist the various air pressures exerted on the building on a day-to-day basis.

So, what exactly is an air barrier material? An air barrier assembly? What materials meet the requirements to be deemed an "air barrier" material? These are all questions that many people are asking.

To start off with, an air barrier material is defined as a single material that has a low air permenace or resistance to air leakage. ASHRAE 90.1-2010 and the IECC requires that the material must have an air permeance rating of 0.004 cfm/sf at a pressure difference of 1.57 psf. The test protocol to determine the air permeance of a material is ASTM E2178.

The baseline material that meets this requirement is _ gypsum wall board, unpainted.

The more important focus should not be on a single material, but rather the assembly of materials that make up the system. An air barrier assembly is a combination of materials and components that meet the air permeance requirements of the code and together provide the principle resistance to air leakage.

As such, these air barrier assemblies need to meet 4 key requirements in order to become effective.

1. Air Impermeable
2. Continuous
3. Strong
4. Durable

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AN INTRODUCTION TO AIR

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Air Impermeable

All components that are chosen to be part of the air barrier assembly must be in themselves meeting the requirements of air pemeance.

Continuous

The assembly must be continuous, without interruption. In essence, you should be able to trace the air barrier assembly through the building enclosure system without lifting your pen or pencil. That means you must connect to other components in the wall assembly along with connecting to the roof, foundation and completing sealing any penetrations. The moving joints should be flexible and well sealed.

Strong

As the air barrier assembly becomes the most airtight component in the wall system, it must then resist the loads placed upon the building by both wind, stack and HVAC pressures. It must withstand both positive and negative pressures and transfer any loads onto the structure. As such, the material must be fastened or adhered so that the component does not rupture or displace other components in the wall assembly. The material should be robust in the fact that it would not tear easily.

Durable

An air barrier assembly must be either durable or maintainable. If placed with a wall assembly, it must perform for the life of the wall assembly. During that time, it must resist the environmental factors such as moisture, temperature, ultra-violet radiation and the presence of other materials.

Products Used Today

There are a variety of materials that are air barriers, but less that can work together as an assembly. Most of the common air barrier materials used today in construction are:

- Self-adhering Membranes
- Spray or Trowel applied liquid membrane
- Sprayed Urethane Foam
- Extruded Polystyrene Insulation
- Exterior Grade Gypsum Board
- Commercial Building Wraps

A number of materials, in themselves do not meet the air permeance requirements such as:

- Uncoated concrete block
- Expanded polystyrene
- Batt and semi-rigid fibrous insulation
- Perforated house wraps
- Asphalt impregnated felt, 15 or 30 lb

When it comes to installation of these products, communication is very important. This requires a team approach between the designer, building contractor and various sub-trades. The "wall" air barrier assembly must be connected to the roof air barrier, below-grade components and windows. As this requires various trades, the sequence of construction should be determined early into the construction phase through the use of site meetings.

To Wrap It All Up…

The concept of "tightening" buildings provides many benefits to the building owner and tenants/occupants of the building. With the recent changes to ASHRAE 90.1-2010, IECC and other state codes, air barriers will move from a good standard design practice, to a code requirement.

Resources are available for the construction community to learn more about air barriers by visiting the Air Barrier Association of America (ABAA) website at www.airbarrier.org. ABAA also holds an annual conference each spring to provide education on air barrier design, construction, installation and quality control. Further information on this event can also be found at the ABAA website.

WOLFE'S HOWL

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responsibilities were reduced; the architect now was required only to "make periodic visits to the site" and was not required to "make exhaustive or continuous on-site inspections…."

In the 1966 A201, the definitions of responsibilities of both the architect and the contractor were expanded. The brief comments regarding the contractor's supervision of the work and paying for "light and power" were supplemented, by making the contractor "solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract." And if that wasn't clear enough, Article 2 - Architect, states the same thing, as a negative, for the architect: "The Architect will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work…" (my emphasis).

Read again what is said about the responsibilities of the architect and of the contractor. In essence, the architect is responsible for showing what the building should look like, and what materials should be used where, and the contractor is responsible for pretty much everything else. Note there is nothing that requires the architect to tell the contractor, or manufacturer, or installer how to do their jobs. In fact, it states "The contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work…"

In 1970, the last vestige of the architect's former power was removed. The power to "stop the work" was taken from the architect and given to the owner. This was important, as architects continued to be found liable for worksite injuries, despite the exculpatory provisions of the general conditions. In effect, courts found the "stop the work" clause to mean the architect remained in control of the project, had a duty to understand the hazards associated with all types of work, and should take appropriate action to prevent injuries. Since then, the requirement to "make periodic visits" was changed to "visit the site at intervals appropriate to the stage of construction", to further reduce liability.

Some may argue that none of this diminishes the architect's position as Master Builder, but AIA commentaries suggest otherwise. The commentary to the 2007 A201 states, regarding the means and methods clause in 4.2.2, "The last sentence [which ends with "since these are solely the Contractor's rights and responsibilities,] underscores the statement of the contractor's responsibilities in 3.3.1 and reinforces the dividing line between the contractor's responsibilities and those of the architect (my emphasis). Regarding 1.2.1, which states, "The intent of the Contract Documents is to include all items necessary…what is required by one shall be as binding as if required by all…", the comment is, "The contractor is expected to make reasonable inferences…[if] the documents show wall partitions covered by drywall…it may be inferred that some reasonable method will be used to attach the drywall to the underlying framework."

Clearly, those who write the general conditions no longer see the architect as responsible for much beyond a general description of the intended results, and now expect the contractor to play a more prominent role in execution of the contract.

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CPSE 2011 EXHIBITORS

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ORANGE PEAL

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Post Office Box 8899
Anaheim, CA 92812

Meeting Schedule and Information

Make reservations by the Friday preceding the meeting.
Call the Chapter Hotline at (714) 434-9909

UPCOMING MEETINGS:

March 12 — **Board Meeting (5:30 p.m.)**
Location to be announced

March 19 — **Joint WWCCA & OCCCSI Meeting (3:00 p.m.)**
Phoenix Club - Pavilion
1340 S. Sanderson Avenue
Anaheim, California

April 1 — **Newsletter Deadline**

April 9 — **OCCCSI Board Meeting (5:30 p.m.)**
Thompson's Design Center
1716 Case Road
Orange, California

April 16 — **OCCCSI Annual Golf Tournament**
Black Gold Golf Club
One Black Gold Drive
Yorba Linda, California 92886