RASTRA

A Better Way to Build

RASTRA is the ultimate building solution for economical and environmentally-friendly construction. RASTRA is the solution for this century to build environmentally conscious, energy efficient buildings that provide a safe and healthy living environment. Over 9 million units in service worldwide.

The Building Shell

The largest and most important component of any building is the building shell. It's the building shell that provides security and protects you from weather. Because the building shell is the first line of defense against the elements, it suffers the most wear and consumes the majority of your maintenance expense throughout the life of the property.

Since the days of log cabins, wood has been the material of choice for new construction. Today, wood remains the dominant building material but timber resources have been depleted, causing suppliers to import more wood, increasing prices dramatically – not to mention harming the environment.

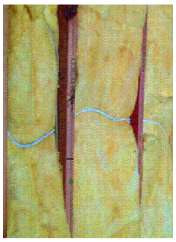
Like other areas of construction, new technology now provides better solutions that not only protect the environment, but provide a stronger, safer, and more cost-effective building shell. To fully understand the improvements now available, it's important to first understand the weaknesses of a wood frame wall.

First the obvious. Wood frame walls are susceptible to fire, insects, wood rot and mold. As soon as moisture penetrates a wood frame wall, the decomposition process begins. As it dries, wood begins to warp and walls loosen, creating gaps for moisture filled air and water to enter. This accelerates the decomposition process. HVAC systems must then work harder to control humidity, costing you money and shortening the unit's service life.

But the biggest shortcoming of a wood frame wall results from its outdated design which assures poor thermal performance. A wood frame wall is not one solid insulating panel, but instead a combination of 2x4s and fiberglass insulation which is installed *between* framing members (studs). The insulation is typically cut (or torn) by hand and pressed in place, leaving gaps and thermal breaks. At every point where insulation meets a stud, an unavoidable seam is created that allows air to leak both in and out.

The U.S. Department of Energy issued the following statement regarding air leakage. "The most common insulation, fiberglass, does not stop air leakage" (Technology Fact Sheet 10099-767). USDE research shows that air leakage through exterior walls is the primary factor in moisture accumulation and heat loss. "Wind pressures of only 20 mph can easily double air infiltration, resulting in increased energy use".

In addition, the 2x4s that make up an average 15% of the wall surface only provide an R-5 rating. So while your building may be insulated with R-19 fiberglass, 15% of the wall surface is only rated R-5 and includes a significant amount of thermal break to allow air leakage.



Fiberglass insulation is compromised even further when electrical and plumbing lines are added that compress the insulation, causing it to lose most of its rated R-value. Electrical boxes represent another example of a thermal break. In all, the collective thermal breaks found in a typical 2,500 square foot house is equivalent to leaving a 36" wide window open all of the time.

A RASTRA wall represents the most technically advanced wall system available today. Panels are built from a composite material made of recycled polystyrene and concrete then filled with steel reinforced concrete. This simple yet advanced system provides benefits just not possible with a wood frame wall. Thermal breaks are virtually eliminated and Effective R-values of up to R-48 are achieved. RASTRA's superior thermal performance and air tightness greatly reduces heat loss and lowers energy consumption. By increasing the Effective R-value with RASTRA, HVAC equipment operates less often, reducing energy costs. Because less moisture filled air penetrates exterior walls, air conditioners don't work as hard to remove humidity from the air. Heat loss from hot water pipes is also reduced.

In addition to improving the insulating performance of the building shell, **other important benefits** are achieved including . . .

Fire Protection

RASTRA's superior fire rating helps protect from the devastating loss caused by fire. When an independent testing lab exposed a RASTRA wall to constant 2000° F flames for 5 hours, the opposite side of the panel increased in temperature by only 7° F, with no ignition, smoke or airborne toxins.

Strength

Superior strength is expected from a wall system made of a steel reinforced concrete grid over one made of wood. The impressive feature is just how much stronger. Dynamic shear tests designed to simulate earthquakes have measured strength up to 700% stronger than wood frame walls. Strength where you need it.

Safety

One of the most important features of any building is its ability to protect human life. RASTRA's steel reinforced concrete walls provide a safe and secure environment.

Safety features include:

- :: Highly fire resistant – 4 hour rated @2000°F; material will not ignite; produces no toxins, zero flame spread; smoke density of 5 (450 is permissible).
- :: Effective barrier from wind-driven debris.
- :: Earthquake tested up to magnitude level 8 with no structural damage.
- :: Cleaner indoor air quality.

Cost-of-Ownership

RASTRA costs slightly more than traditional building materials. However RASTRA provides savings in several other areas including downsizing the HVAC unit, potential tax credits, eliminating membrane and wire mesh on stucco installations; eliminating the need for an additional vapor barrier which make the product very competitive.

RASTRA is the least expensive option by far over the life of the property. Heating and cooling costs are reduced at least 40% each and every year. Maintenance costs are reduced because timber that degenerates is replaced by RASTRA. HVAC units have a longer service life. RASTRA provides the lowest cost-of-ownership available.

Indoor Air Quality

The unique composition of RASTRA enables better control over indoor air quality. Because RASTRA does not hold or wick water the way concrete block or wood products do, RASTRA will not promote or sustain mold and mildew.

The composition of RASTRA allows a slow interchange of air, which in turn allows the building to "breathe." The exchange is slow enough that it does not allow heat or cold to escape but helps maintain good air quality, preventing "sick building syndrome." This slow exchange of air also prevents condensation that can lead to mold growth.

Comfort

Being in a RASTRA building is a comfortable experience. This results from more consistency in room-to-room temperature & humidity, improved air quality, and a much quieter space.

In an independent survey, owners of 74 new ICF homes and 73 new wood frame homes were asked what features they liked. Over 80% of the ICF owners mentioned the great comfort, compared with 22% of wood frame homeowners.

Insects

RASTRA provides an undesirable inert environment for insects. Concrete fills the interior channels and pores of the surface, thereby eliminating channels that termites and other insects could use for migration and nesting. RASTRA provides an effective barrier from termites and carpenter ants.

Environmentally Friendly

RASTRA is 85% recycled polystyrene, which otherwise would have ended up in landfills never to disintegrate.

RASTRA buildings reduce energy consumption, and with energy savings comes environmental benefits. Specifically, the reduction of fossil fuels burned to create energy. By reducing energy consumption, we reduce combustion by-products that lead to smog and contribute to global warming. Over the life of a 30-year mortgage, a home built with RASTRA saves our atmosphere 60-90 tons of carbon dioxide (CO_2) emissions. Another measure of sustainability is increased service life. Products that last longer make a large impact on our solid landfills.

If not you . . . who?

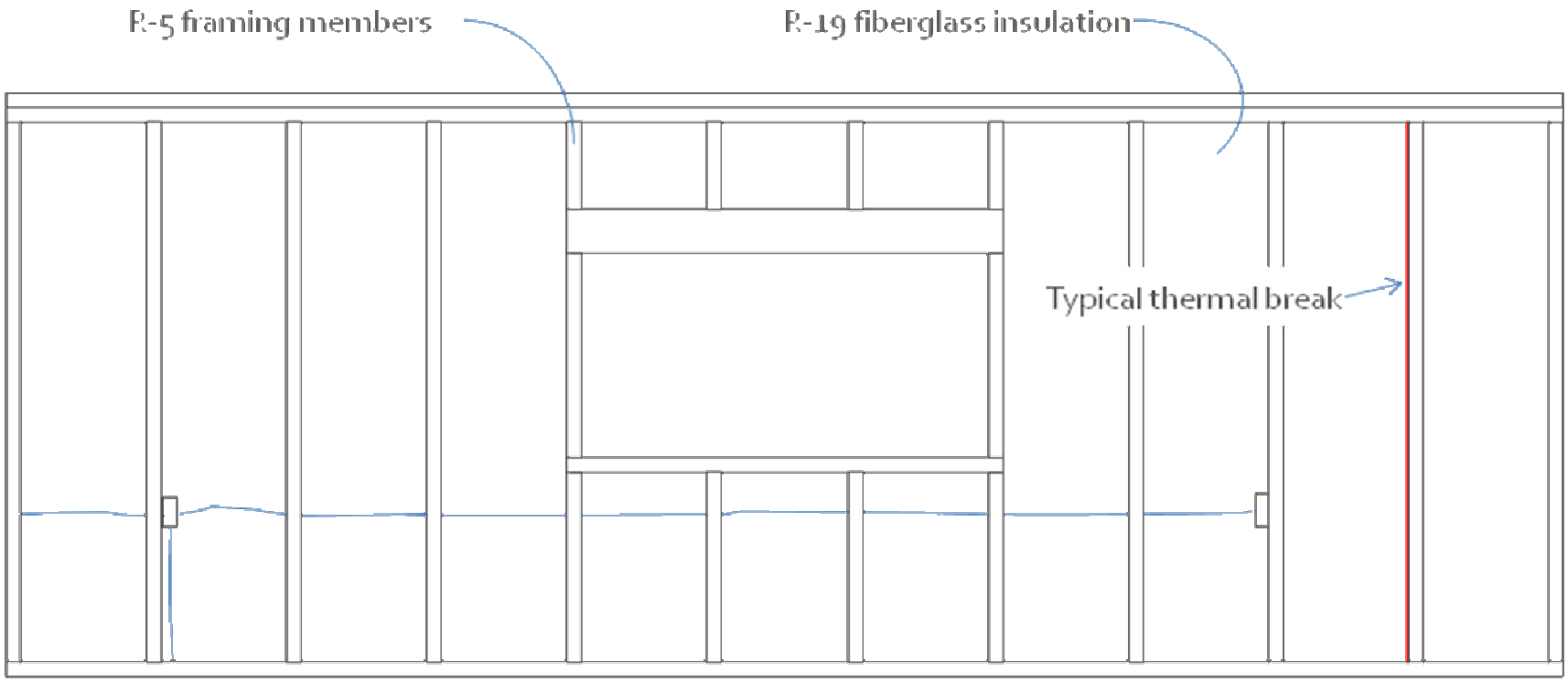
Maintenance

Traditional wood frame construction is prone to decay and insects caused by moisture which deteriorates wood. With RASTRA, wood rot is a thing of the past. Most stucco cracks are actually caused by unstable substrate walls – this problem is virtually eliminated with RASTRA. RASTRA is dimensionally stable and protects your property by maintaining a more watertight layer of protection that greatly reduces maintenance. HVAC systems require less maintenance.

Quiet

RASTRA provides outstanding acoustical performance. The increased mass and density of RASTRA provides a very effective sound barrier, keeping outside noise from penetrating the exterior wall.

Compared to a typical wood frame wall, 75% to 85% less sound passes through a RASTRA wall. Scientists describe loud speech on the opposite side of a RASTRA wall as, "a listener would strain to hear loud speech. It is virtually inaudible."



Typical 15′ x 9′ exterior wood frame wall built 16″ on center with one window

2,472″ (206′) of thermal break
2,934 square inches (20.4 s.f.) of wall surface rated R-5
14.8% of total wall surface rated R-5
2 electrical boxes; 130″ of compressed insulation