

TIMBER TRUSS EXPORT PROGRAM

This information will serve to introduce you to Timber Truss Housing Systems Inc. and to thank you for your interest in our products and services. Timber Truss has been in the business of supplying building components and home package materials to our local market for close to fifty years. In the past 20 years our company has marketed and exported homes globally and we try to use every opportunity to expand our business in the world market.

Designing for other country's customs and code variations has to be done in a way that will blend our system of building with the host country's local interests. We have sent projects to Japan, Germany, Israel, Greece, Spain, Mexico, Chile, China, Russia, Korea, Turkey and Northern Cyprus and have worked very closely in consultation with our customers to blend our system into homes that have met their highest expectations. To be successful in the export market, we feel you have to have flexibility and the willingness to help a potential customer meet their market demands. Our team has shown through past results that we can provide the services needed to make a project economical and efficient through good working relationships with our customers. The latest in computer technology, CAD software, email communications, and other company policies have helped earn Timber Truss Housing Systems respect from companies all over the world.

The economy of a wood frame home lies in a renewable resource material and the ability to pre-manufacture large components of the wood framed panelized home. Those components of the home such as wall panels, roof trusses, and floor trusses, are built in a quality controlled manufacturing plant without interference from weather conditions. These components are built under the supervision of quality conscious supervisors who are knowledgeable of both building codes and specifications. This construction technique and knowledge translates into a well designed and durable structure when erected. The cost of on-site labor is reduced and less qualified carpenters are needed to build the units when these large pre-built portions of the home are used. Panelized homes are erected very quickly, helping to lower construction financing expenses to a minimum.

Timber Truss Housing Systems, Inc. will make every effort to meet your project needs. If you have specific questions or would like to know more about our company please contact us at the location listed below. Our services and consultation are available and we would like to invite you to come and see our manufacturing operation at Timber Truss Housing Systems in Salem, Virginia. We look forward to hearing from you with your project needs.

Contact Information:

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TIMBER TRUSS HOME FABRICATION METHODS

EXTERIOR APPEARANCE:

The exterior of a wood frame structure can be made to look like traditional local construction or be made to look "typical America" in appearance. This will depend on each particular market and what the potential buyers prefer. Typically, the roofs in the Northern American construction are composed of fiberglass shingles, treated pine shakes, metal roofing or tiles of various types depending on the geographic location. Typical sidings are hardboard horizontal lap siding, cedar lap siding, fiber cement lap siding, vinyl siding, plywood siding, brick veneer, artificial stone veneer, Dryvit, and others.

SECURITY:

Every resident deserves the feeling of safety within their own home. Double locks are available on all exterior doors to the dwelling units whether they are individual homes or apartment units. Some patio doors have triple locking mechanisms. All windows have locks that resist being forced open during a burglary attempt. The exterior door units are made of steel, solid wood, or fiberglass skins with an insulated foam core to provide a very strong door that is very safe when locked and secured. Electronic burglar alarms and rolling shutters are other methods that are options available to provide more security.

FIRE RESISTANT CONSTRUCTION:

Wood frame construction has been used in North American markets since the early days of the seventeenth century. Many of these structures are still standing and many national landmarks are wood construction. Through the years because of the threat of fires, certain methods have evolved to help make these structures safer and to resist fire damage. Most fires originate in the interiors of homes and therefore most methods

are used on the interiors. Perhaps the most beneficial material in fire resistant frame construction is gypsum wall board, which is applied on all wall and ceiling surfaces. This material is about 12 mm thick and is applied with all joints "taped and compounded" to make a very good barrier between the wood and any potential fires. In some cases the wood framing itself can be specified as flame retardant or Dri-Con fire treated wood. The wood is pressure treated with a flame retardant chemical. Along with the procedures above, it is also necessary to include in each dwelling unit a smoke detector. Fire extinguishers are also recommended in each dwelling unit to stop a fire before it has time to spread. Various wood frame floor and ceiling systems are available with ratings ranging up to two hours. Although this is a different type of construction than is normally seen in many parts of the world, your clients should know that it is a proven method. Most of the citizens of The United States and Canada currently live in wood frame houses.

TERMITE PROTECTION:

Current methods to control termites mostly fall into the category of soil conditioning. At the appropriate time when some of the foundation has been completed and before the concrete slab has been poured for the floor, a coarse spray of chemicals dissolved in water is sprayed on the ground. These chemicals, in sufficient quantities per the manufacturer, will kill termites now and in the future. In addition to soil treatment, all wood that is in contact with concrete that would possibly be susceptible to termite infestation is termite treated wood. This treatment prevents termites from eating this wood. These two methods have conquered the termite problem in North America and will work for your market area as well.

PEST AND INSECT PROTECTION:

Pests, rodents, and insects can largely be controlled by good construction techniques and the use of quality materials and practices. Quality windows and doors with good weather seals, screens, and adjustable sills in doors can keep most uninvited pests on the outside where they belong. Window units with integral screens will serve as a barrier from interior living spaces and flying insects. A foam sill sealer is used between the bottom plate of the wall panels and the concrete slab of the floor to keep out small crawling insects. By applying all these practices and using quality products there is no reason to expect any problem with pests.

EARTHQUAKE AND NATURAL DISASTER PROTECTION:

Earthquakes are a major source of concern when anyone considers a building project in some parts of the world. There is no such thing as earthquake proof construction. There are, however, many building techniques available in wood frame construction that reduce the loss of buildings and lives during earthquake activity. Light wood frame construction is responsible for approximately 90% of residential construction in The

United States. Obviously, there are many areas in the United States, notably southern California and Alaska that also experience many earthquakes. Most structures in these areas are constructed of wood frame components. Earthquake prone areas in the United States are under very strict requirements from various code agencies. Generally, ground shaking and not ground rupture is responsible for the most building damage during an earthquake. To prevent severe damage a general philosophy of design for earthquake resistant structures can be stated as "keep it simple" and tie it together. Panel sheathing application lapped on to the floor system, metal straps from the foundation to the top plates of the walls, hurricane tie down straps to tie each truss to the wall system, oversized nail heads for roof shingle application, continuous main structural beams such as Parallam instead of spliced together laminated beams are known ways to resist ground shaking and high winds from storms and hurricanes. Proper cross bracing of roof truss systems is often overlooked in construction but it remains absolutely necessary to create a wind resistant structure. Along with state of the art engineering, quality products, and techniques currently on the market, wood frame construction can provide a quick, economical and safe solution to your building needs.

DESIGN PARAMETERS

FLOOR DESIGN:

Our floor systems are designed with wood components setting on masonry foundations. The wood floor systems are categorized into two types, floor joists and floor trusses. The floor joists are 2x8, 2x10, or 2x12 southern yellow pine boards. They are generally spaced 16 inches (40.64 cm) on center with a layer of $\frac{3}{4}$ inch (1.9 cm) plywood that is nailed and glued to the joists. This type of system will generally be used where spans of 12 feet to 16 feet (3.65 m to 4.87 m) are required. The joists are $1\frac{1}{2}$ inches wide (3.81 cm) by $7\frac{1}{4}$, $9\frac{1}{4}$, or $11\frac{1}{4}$ inches tall (18.4, 23.9, 28.57 cm). This system does require an intermediate bearing wall or beam to support the joists often located in the center of the floor plan or basement. The other type of floor system is called flat chord floor trusses and is a manufactured truss component. These floor trusses use 2x4 southern yellow pine lumber for the top chords, bottom chords and the webs. Floor trusses are generally 18 inches to 24 inches deep and $3\frac{1}{2}$ inches wide (45.72 to 60.96 cm deep and 8.89 cm wide). Floor trusses are generally spaced 24 inches on center (60.96 cm) and are covered with the same sort of plywood mentioned above. Trusses are used when spans of 20 feet to 30 feet (6.09 m to 9.14 m) are needed. Interior load bearing walls are not needed and that allows for more innovative floor plans. There are fewer pieces involved and less labor is needed to erect such a system. It also provides openings to run wiring, plumbing, and duct work through the floor system perpendicular to the truss span. Both of the systems are designed to carry 268.54 kilograms per square meter or 55 pounds per square foot. The deflection is limited to L/480 in the trusses and L/360 in the joist system. The L in the equation represents the span or "length" of the structural member.

ROOF SYSTEMS:

The structural roof system consists of wood roof trusses or wood roof rafters. Trusses are designed from specifications and plans for individual projects. Trusses are not produced as a stock item. They are designed per order and manufactured for specific conditions. The pitch or angle of the roof, the loading and structural capabilities, the length of overhang at the eaves, the spacing that is required, and many other details comprise the specifications of each design. Most roof trusses are made from southern yellow pine lumber, grown in the southern region of the USA, that has been kiln dried and heat treated to kill any insects and put together with galvanized metal connector plates. Roof trusses are manufactured into panels of triangular shapes that create a very stable and strong structural system. They must be installed in a plumb and vertical position, and braced properly according to the loading that is specified. Many trusses are made from 2x4 (3.81 cm x 8.89 cm) lumber and are placed 24 inches (60.96 cm) on center according to the design needed. Many angles, shapes, load capacities, and other details are available with a wood roof truss system. The trusses are covered with oriented strand board (O.S.B.) sheathing or plywood that is 1/2" (12.7 mm) thick and then a building paper (30# felt) and fiberglass roof shingles or other roofing material. Occasionally the roof structural system is formed by using 2x8, 2x10, or 2x12 lumber or I-joist rafters with the same sizes described above for the floor system. Normally the rafters are placed 16" (40.64 cm) on center and are covered with the same O.S.B. or plywood sheathing described with the roof truss system. Trusses are very economical to use and most of the time are preferable to a wood rafter system. They save time, and are an engineered system to provide professionally designed roof structures.

EXTERIOR AND INTERIOR WALL PANELS:

Prefabricated walls are provided in the packages for the exterior and the interior walls. Exterior walls come with all the rough openings for the windows and doors framed into the walls. Construction of the walls is done in a controlled manufacturing environment with quality controlled procedures to ensure an excellent product. The walls are made from 2x4 or 2x6 (3.81 cm x 8.89 cm or 3.81 x 13.97 cm) studs that are placed 16" (40.64 cm) on center and attached to top and bottom plates. A second top plate is added at the job site at time of erection to tie the individual panels together. If the walls are sitting on concrete, the bottom plates are termite treated. All headers (beams) above windows, doors, and other openings are engineered to carry the various loads that are imposed on them by floors or roofs above. Wood framed walls usually are used in buildings three stories tall or smaller depending on load requirements. The exterior walls will have sheathing attached to them with structural nails. A variety of sheathing's are available to choose from including O.S.B., plywood, poly-iso-cyanurate foam, Styrofoam, intermediate, DOW, and several types of exterior gypsum board sheathing's. The walls are built to a standard height of 8'-1 1/8" (2.46698 m) and will load easily into a "high cube" container for shipment to most any project. Walls can be built to special heights of 2.6 meters for your local code requirements. These walls do not contain any pre-installed wiring, plumbing, insulation, or other systems. Interior walls do not have any sheathing or gypsum board attached to them.

THERMAL PERFORMANCE:

The panelized packages have the latest energy saving building techniques and materials available. Fiberglass batt insulation is included with various R-ratings to form

a thermal barrier in the walls and the ceilings. Insulation is also available for slab floors or frame floors. "TYVEK" housewrap is available to provide protection from air infiltration and water penetration of exterior wall surfaces during driving rains. Energy efficient windows with insulated glass and metal or fiberglass insulated doors with very high energy efficiency ratings create a well insulated home. The wall panels have an R-3 or R-5.5 foam sheathing available to make an even better building envelope to resist heat and cold. A foam sill sealer is supplied under foundation plates to combat air infiltration. Proper attic ventilation to vent out heat in the summer and water vapor in the winter is included in all the packages.

HANDICAPPED CONSIDERATIONS:

Our design capability will allow proper facilities such as larger bath areas, roll in showers, wider doors, roll under kitchen counters, oversized doors in garages for handicapped vehicles, and other items to be included in appropriate designs for your projects.