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Wooden Houses an Ecofriendly and Innovative Structure

Ashnaya Ranaware, Student of Project & Construction Management Department, MIT College of Management, Pune, India, ashnayaranaware1998@gmail.com

Chaitanya Bhoite, Student of Project & Construction Management Department, MIT College of Management, Pune, India, chaitanyabhoite@gmail.com

Abstract - Wooden houses are a more ecological and economic alternative than homes made of traditional brick and concrete. Wood is not only a part of nature, but its use is beneficial for the environment. These wooden homes are made from natural, non-petroleum materials that are recyclable and biodegradable and are also considered 'ecological'. The wood used in sustainable construction is certified and originate in responsible logging: the manufacturers plant new trees for each tree they fell. For them, maintaining this balance is important.

Besides, building with wood requires less energy, has a lower environmental impact and smaller carbon footprint than conventional building methods: wood absorbs CO_2.

Keywords — wood, furniture, construction,building,planning,designing,houses,control,interior, properties.

I. INTRODUCTION

While certain highly admired, solid concrete houses are ready to be torn down after 40 years, in some northern European countries there are wooden homes that have been inhabited for over 200 years.

Fires: fires are most commonly started in homes by items inside the home: a cigarette butt not put out properly, a short-circuit, etc. and what catches fire is the furniture inside, so the risk of fire is the same. If the fire is not put out soon, the wood catches fire but burns very slowly. The worst result is that the home will be reduced to ashes if the fire is not put out quickly. However, the high temperatures in a house made of concrete can cause cracks that may also result in having to tear down the home

CHALLENGE

In recent times, building with wood in India has been largely limited to posts-and-beam, roofing and other decorative parts of construction. The use of wood in structural applications has met resistance due to skepticism regarding its ability to withstand weather conditions that include high humidity, extreme temperature change and the safety aspect. In addition, is the fear of high maintenance of wood and termite attacks.

Manufacturers like Pyramid Timber Associates Pvt. Ltd. are increasingly aware of the growing market potential for quality wooden houses. They wanted to enter this industry by offering solutions that are durable and built through sustainable supply of high-quality timber.

OPPORTUNITY

The hospitality industry is increasingly looking at building resorts using wood in structural applications. Also, there is an upward trend in increased usage of wood in the home category by leading architects, manufacturers and high net worth individuals (HNIs) looking at villas, country homes and farmhouses as a lifestyle statement. Canadian Wood has an ongoing relationship with Vagh Group, the parent organization of Pyramid Timber and MAS Furniture and saw an opportunity to support Pyramid in their efforts to build with wood. A three-storey demo house was built with the support of Canadian Wood on Hunsur Road in Mysore.

PRODUCT TRIAL

• The house was made using Spruce-Pine-Fir (S-P-F) J grade, .

• S-P-F was used across all structural elements like posts-and-beams, stud walls, floor joists and roof members to demonstrate its strength in construction.

The interiors of the house optimised on the opportunity to showcase extensive applications of other species of

Canadian wood -

• Western red cedar was used to showcase cladding and decking.

• The house was furnished with western hemlock furniture made by MAS Furniture to display interior applications and aesthetic value through multiple creations like center table, sofa sets, beds, side tables, study table, chairs, wardrobe, screen, kitchen and entertainment unit showcased across different levels.

KEY TAKEOUTS

Functional, versatile and beautiful wood in construction.

• The display home allows potential manufacturers and

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customers to experience the look, feel and quality of a wood frame timber construction home.

• It showcases the inherent strength and dimensional stability of S-P-F when it comes to multi-storeyed wood frame constructions.

• S-P-F is graded and grade-stamped in Canada which meet North American standards of strength and safety.

The wood is mature, fine grain, stable and light in colour with smaller knot structure. It is easily worked, glued, nailed and stained.

• Fast, easy to build and renovate, these constructions can meet or exceed code-established levels of fire safety and sound control.

• These houses can be prefabricated in a factory, are portable and can be assembled on site.

• Display house offers the very essential proof of concept in India, in various locations. Feedback to date is positive.

• Opportunities exist at resorts in beach locations, golf courses and hill stations.

II. RESEARCH METHODOLOGY

PLANNING AND DESIGN

A house is best designed for a specific building site. House size, the number and height of floors, the location and size of rooms and the type of heating system are planned early in the design process. These initial plans can be revised as more information is obtained and as the design becomes more detailed. The project cost should be checked as the design evolves to ensure that the desired features fit the budget.

This section provides a brief overview of the planning and design of a house and things that should be considered and perhaps adjusted as the design progresses. Frequent communication with

the local building department will help to ensure the evolving design meets building code and local requirements.

DRAWINGS, FINANCING AND PERMITS

Plan for the time required to complete the design and drawings; and to estimate costs, arrange for financing and obtain a building permit.

Arrange for access to the site and temporary power during this stage.

SITE PLANNING

Carefully plan to ensure the house is well situated in relation to property lines, road access, sunshine and shading, trees and other natural features.

Establish the house elevation to accommodate storm and wastewater disposal and site drainage (Figure 3).

Check with the building department for requirements for foundation drainage and basement plumbing.

Avoid leading water from roofs and driveways into the foundation drainage system or onto neighbouring properties. Drain this water away from the house to a storm drain or, where none is provided, to a drainage ditch.

Use gravity drainage for foundations, waste water and sewage wherever possible.

MOISTURE, AIR LEAKAGE, VAPOUR DIFFUSION AND HEAT TRANSFER CONTROL

In modern wood-frame houses, continuous insulation is needed to provide energy efficiency and comfort. A continuous air barrier system will restrict air movement into and out of a house, help provide thermal comfort, reduce heat loss and avoid moisture condensation in the walls and ceilings that can cause damage. A vapour barrier prevents water vapour from migrating into the framing and insulation. A sheathing membrane is installed over the exterior sheathing to prevent inward migration of water that penetrates beyond the cladding. The membrane should also allow vapour that has migrated from the conditioned space to dissipate to the exterior.

WATER PENETRATION CONTROL

Cladding (wood siding, brick, vinyl siding, stone, stucco, etc.) forms a first plane of protection and is detailed to limit the amount of water that gets past it.

The sheathing membrane is a second plane of protection that prevents water from entering the building envelope and allows water vapour to drain and diffuse out of a wall assembly.

Several materials can be used as sheathing membrane including asphalt-impregnated paper (tar paper), spun-bonded polyolefin (house wrap) and self-adhering or liquid waterproof membranes.

A rainscreen (a drained and vented air space acting as a capillary break between the cladding and sheathing membrane) is required in wet climates, to allow water that gets past the cladding to drain to the exterior and to allow the space to dry. A rainscreen design is recommended for all walls that will frequently be wet.

Heat Flow Control

All assemblies that separate the conditioned environment from the unconditioned environment, including attached garages, must be insulated. This includes roofs, walls, foundations, windows and doors.

The 2012 Interim Changes to the 2010 NBC regulate the “effective” insulation value for each assembly or component of the building envelope for six different Canadian climate zones. More than one type of insulation may be used to provide the effective insulation value. For example, batt insulation may be used between wall studs in combination with rigid insulation installed on the exterior.

The effective insulation value is the combined insulation value of the studs, sheathing, drywall and the insulation itself. Framing members, ducts and pipes reduce the space available

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for insulation materials and reduce the insulating value of the assemblies; therefore, the effective value is usually lower than the "nominal" value (the value of the insulation itself).

Different types of insulation are needed for different parts of the building. For example, only water-resistant insulation can be used on the exterior of the foundation below grade.

Plumbing, Electrical, Heating and Ventilation

Determine the type of domestic hot water heating systems to be used early in the design process, considering system efficiencies, local practice and the availability and cost of fuel and energy. High-efficiency appliances have replaced the mid-efficiency equipment used previously and are now required by the building code. Plan plumbing and ductwork in conjunction with floor framing to avoid conflicts. Avoid penetrating the air barrier system with plumbing, electrical or other components. When fixtures such as dryer vents, water pipes or electrical conduit must penetrate the air barrier system, take special care to seal around the penetrations. See Chapters 19 and 20 for more information.

AIR LEAKAGE CONTROL

The air barrier system must be continuous around the entire surface that separates the conditioned (heated or cooled) environment from the unconditioned (outdoor) environment. Therefore, the components that make up this "environmental separator" (such as walls, windows, doors and membranes) must be sealed to each other to make the air barrier system airtight. Consideration must be given to how the connections are made, for example, around rim joists between floors during the design. The air barrier system must be capable of resisting wind loads.

For house construction in Canada, the primary material used in the air barrier system is most often 0.15 mm (6 mil) polyethylene installed on the interior (warm side) of the insulation with all joints and penetrations taped or sealed. In this case, the polyethylene also serves as the vapour barrier. It resists wind loads by being supported by the insulation and the dry

TYPES OF WOODS

DOUGLAS FIR

Douglas fir is one of the best known timber producing species in the world. In British Columbia (B.C.), Canada, there are two varieties of Douglas fir—coastal and interior. The coastal variety occurs along the southern mainland coast and across Vancouver Island. The interior variety is found throughout southern and central B.C. Douglas fir is a large tree reaching heights of 85 metres on the coast and 42 metres in the interior.

Fig no. 1

Common uses

Douglas fir is seen as a first-class wood for the manufacturing of sash, doors and windows. The wood is also used for a wide variety of products including general millwork, furniture, cabinets, veneer, vats, ship and boat construction, transmission poles and marine pilings, and for structural purposes including laminated arches and roof trusses. Structurally it is used in the form of lumber, timber, piles and plywood. Douglas fir is commonly used for building and construction purposes due to its extraordinary strength-to-weight ratio and availability in large dimensions. In India, it has been used in post and beam construction and is highly recommended for solid doors and door frames.

What is the difference between coastal and interior Douglas fir?

Coastal Douglas fir is a much bigger tree than interior Douglas fir. The timber from the coastal region is generally lighter in colour and more uniform in texture than that grown in the interior. One of the main differences is that interior Douglas fir is less permeable to preservative treatments. Besides the mentioned properties the two varieties have the same wood properties.

Working properties

Douglas fir has excellent strength properties and is well known for its workability. The wood dries rapidly with small dimensional movement and little tendency to check. It is relatively easy to work, with good machining qualities. It turns, planes and shapes well and can be sanded to a smooth finish. The wood glues easily, has good nail and screw holding ability and takes a good finish

PHYSICAL PROPERTIES

Stiffness / MOE (MPa)	Air dry	13600
Strength / MOR (MPa)	Air dry	88
Density (KG/M3)	Air dry	487
Compression Parallel (Mpa)	Air dry	50.1
Shear (Mpa)	Air dry	9.53
Shrinkage (air dried-12%)	Tangential/radial ratio	1.5

Table no. 1

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3.2 WESTERN HEMLOCK

Western hemlock is the single most plentiful tree species on the coast of British Columbia (B.C.). It grows along both the east and west sides of the coastal mountain ranges, as well as in the interior of the province. On average it typically grows 30 to 50 metres tall and 1 to 1.5 metres in diameter. It seldom grows in pure stands, and instead usually grows in mixed stands with Douglas fir, Amabilis fir, Sitka Spruce and western red cedar. Of B.C.'s total growing stock, Hemlock makes up 17.7% of the total volume and close to 60% of the coastal volume.

Common uses

Hemlock is firmly established as an outstanding wood for mouldings and interior woodworking. Other uses include doors, windows, floors, suspended ceilings, ladders and utility purposes where a high grade is needed. Hemlock is recommended in India for furniture, solid doors, finger joint door frames and other interior uses. Hemlock is also used for general construction, roof decking and plywood. It is popular for laminating stock and the production of glue-laminated beams sold into the Japanese market.

Fig no. 2

Working properties

Hemlock has a relatively good strength-to-weight ratio and is known for its excellent working properties. The wood requires special care when drying but yields a quality product. It is relatively easy to work with, and has good machining qualities. It turns, planes and shapes well and can be sanded to a smooth finish. The wood glues satisfactorily, has moderate nail and screw holding ability and polishes beautifully. Hemlock lumber is seasoned uniformly in dry kilns. Kiln drying improves its strength and stiffness, and increases resistance to decay and insect attack.

PHYSICAL PROPERTIES

Stiffness / MOE (MPa)	Air dry	12300
Strength / MOR (MPa)	Air dry	81
Density (KG/M3)	Air dry	429
Compression Parallel (Mpa)	Air dry	46.7
Shear (Mpa)	Air dry	6.48
Shrinkage (air dried-12%)	Tangential/radial ratio	1.6

Table no. 2

3.3 YELLOW CEDAR

Yellow cedar grows along the coast and is common west of the coastal mountains of British Columbia (B.C.), Canada. A species quite unique to this corner of the world, it grows so slowly that it requires over 200 years to reach a marketable size. It is a medium-sized tree growing up to 24 metres tall and 90 centimetres in diameter when mature. It often grows singly or in small clumps in a mixture with other conifers. It is a rare and beautiful tree that is tough, solid and extremely durable.

Fig no. 3

COMMON USES

This wood is incredibly easy to work and therefore is prized for applications such as joinery and carpentry, decorative panelling, furniture, mouldings and cabinetwork. Due to its durability, yellow cedar is used for shingles, posts, poles, marine pilings, small boat hulls, oars and paddles, water and chemical tanks, exterior door and window boxes. Structural grades are commonly used for exterior applications such as bridges, decking stairs and for landscaping. It is sometimes used in specialty construction projects such as temples and shrines

WORKING PROPERTIES

Yellow cedar is known for its exceptional working properties and can be easily machined and finished. It turns, planes and shapes well and can be sanded to a smooth finish. The wood glues satisfactorily has good nail and screw holding ability and takes a good finish. Yellow cedar is one of the world's most durable woods with exceptional longevity. Its fine, even texture makes it a top choice for carvings. In India, it has proven popular for door frame manufacturing

Stiffness / MOE (MPa)	Air dry	10200
Strength / MOR (MPa)	Air dry	80
Density (KG/M3)	Air dry	431
Compression Parallel (Mpa)	Air dry	45.9
Shear (Mpa)	Air dry	9.21
Shrinkage (air dried-12%)	Tangential/radial ratio	1.6

Table no. 3

3.4 SPRUCE PINE FIR

The three softwoods comprising the principal species in the spruce-pine-fir (SPF) species group share many common

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characteristics and properties, as well as the same native habitat in the montane, boreal and subalpine forest regions of British Columbia (B.C.) and Alberta. White spruce, Lodgepole pine and Alpine fir are all trees of medium size, averaging 30 metres in height and up to 80 centimetres in diameter. They are hardy trees, relatively slow-growing and yield high-grade timber with small, sound, tight knots. Well suited to the cold winters and hot summers that characterize the continental climate of their northern forest area, trees of the SPF group are the most abundant softwoods in Canada and the most commercially important. Forest reserves are estimated at more than 500 million cubic metres, and reforestation efforts already in place assure excellent continuity of supply over the long term.

Fig no. 4

COMMON EXTERIOR USES

Spruce-pine-fir's strength, light weight, ease of handling and good working properties have made it a popular wood for framing applications in all types of construction. Strong, stiff and stable, SPF is well-known and highly regarded not only in North America, but also in Europe and Japan. Readily available in a wide range of sizes and lengths, including finger jointed lengths up to 12 metres, it is an extremely versatile lumber for residential, commercial, industrial and agricultural buildings. SPF is a particular favourite with house builders, who appreciate its high structural performance as well as its pine appearance. The prefabrication industry is also a major user of SPF because of the wood's strength, dimensional stability and superior gluing properties. Manufacturers of modular houses, trusses and other structural components, regularly specify kiln-dried SPF as a wood they can rely on for consistent quality and ready availability in precise dimensions

APPEARANCES AND PROPERTIES

In contrast with other commercial softwoods, SPF is a distinctly white wood, with very little colour variation between springwood and summerwood. The wood has a bright, clean appearance, ranging in colour from white to pale yellow, with a pine straight grain and smooth texture. SPF has a high strength to weight ratio and is well known for its outstanding working properties. It takes and holds nails exceptionally well and is easily worked with hand power tools. It has good gluing, painting and staining properties. Lumber of this species group is seasoned uniformly in dry kilns to a moisture content of 19 percent or less. Kiln drying inhibits natural staining of the wood, improves its strength and stiffness, enhances its appearance, and also increases its resistance to decay and attack by insects. The drying process also improves the wood's dimensional stability, finishing qualities and thermal resistance while at the same time reducing shrinkage, warping and checking in storage.

PHYSICAL PROPERTIES

		SPRUCE	PINE	FIR
Stiffness / MOE (MPa)	Air dry	10000	10900	10200
Strength / MOR (Mpa)	Air dry	63	76	56
Density (KG/M3)	Air dry	380	430	351
Compression Parallel (Mpa)	Air dry	36.9	43.2	35.4
Shear (Mpa)	Air dry	6.79	8.54	6.74
Shrinkage (air dried-12%)	Tangential/radial ratio	2.2	1.4	2.8

Table no. 4

3.5 WESTERN RED CEDAR

Western red cedar grows at low to mid elevations along the coast and in the wet belt of the interior of British Columbia (B.C.), Canada, where the climate is cool, mild and moist. It is a large tree, up to 60 metres tall when mature and 2.5 metres in diameter. It is often found along side Douglas fir, Sitka Spruce, Black Cottonwood and Red Alder, as it is rarely found in pure stands. Western red cedar makes up approximately 8% of B.C.'s total growing stock and is one of the country's most commercially valuable species. Due to its unique properties, western red cedar products have been developed for a variety of applications.

Fig no. 5

COMMON EXTERIOR USES

A major benefit is its excellent durability and dimensional stability leading to uses such as roof shingles, exterior sliding, exterior cladding, weather boarding, greenhouses, portable buildings, poles, posts, fences, ship and boat building, as well as for boxes and crates. Due to its tendency not to splinter, western red cedar is also popular for decking, outdoor furniture and playground equipment.

COMMON INTERIOR USES

Western red cedar is an extremely attractive wood that is also popular in interior applications. It is popular for sash, ceiling and wall panelling, as well as for millwork. Due to its dimensional stability it is perfectly suited for uses such as sauna

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paneling, mouldings and window blinds. Western red cedar is also a good choice for musical instruments due to its superb acoustic resonance properties. Western red cedar lumber is often sold unseasoned; however, kiln drying greatly increases product stability. Cedar wall panelling, cladding and use in exterior pergolas has been greatly admired in India for quality projects.

PHYSICAL PROPERTIES

Stiffness / MOE (MPa)	Air dry	8200
Strength / MOR (Mpa)	Air dry	54
Density (KG/M3)	Air dry	339
Compression Parallel (Mpa)	Air dry	33.9
Shear (Mpa)	Air dry	5.58
Shrinkage (air dried-12%)	Tangential/radial ratio	2.1

Table no. 5

USING METAL HARDWARE WITH WESTERN RED CEDAR

Hot-dipped galvanized or stainless steel nails are essential for use with western red cedar as the acidity of the extractives in the wood can accelerate the corrosion of metals and leave a black stain when the wood is wet. Stainless steel, brass, aluminium, copper or metals with a protective coating must be used when applying fittings, fixtures or fasteners to western red cedar products.

WORKING PROPERTIES

Western red cedar is a fairly lightweight wood, which is moderately soft and low in strength. It is known for its excellent working properties, resulting in a smooth, satiny finish using sharp tools. It has good machining qualities, planes and shapes well and can be sanded to a smooth finish. The wood glues easily, has moderate nail and screw holding ability and polishes well.

MAINTAINANCE

Air-dried logs

Some log home companies let the fresh-cut logs (or milled timbers) sit outside in the open air to dry naturally. The timbers may be stacked with spacers (known as "stickers") between them. This process allows the moisture content of the logs to naturally fall as the timber dries. In areas of high humidity, it may require as much as one year per inch of log thickness to dry. Arid climates may require less. A log with a diameter of 8 inches will usually reach equilibrium in about 18 months in the Rocky Mountains of North America. Air circulation is critical or the logs may begin to rot before properly drying, especially in humid regions. If the logs are to be dried to equilibrium with the local climate the process may take several years, depending on the location and size of the timbers. In some environments, the logs must be kept under some type of roof or cover to reduce the impact of rain storms on the drying process.

Once the logs have dried for the desired length of time, they are profiled prior to shipping. Profiling usually does not take place until shortly before shipment, to ensure that the logs stay as uniform as possible. It is uncertain whether this process is advantageous; it depends on many factors such as local climate, wood species, its size, and the location of the log structure.

Kiln-dried logs

Mills that have a kiln on site have the option of artificially accelerating the drying process. Green timber is placed inside a large oven, where heat removes moisture from them; however, they can suffer severe checking and cracking if the kiln controls are not properly monitored during the drying process. Use of a kiln can reduce the drying time from many months to several weeks. Kiln-drying usually results in an average moisture content of 18-20% ("average" means the average moisture content of the outside and the center of the log).

In North America, logs reach equilibrium moisture content at about 6% and 12%;[8] since most kiln-dried logs are dried down to about 18% to 20% moisture content, kiln-dried logs can be expected to shrink and settle over time, but to a lesser extent than green logs

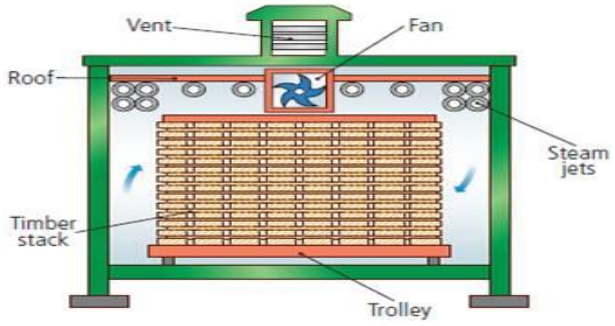

Fig no. 6

Glue-laminated timber

"Laminated" or "engineered" logs are a different approach to log-house building. Full trees or (alternatively) sawn cants (unfinished logs to be further processed) are brought to a mill with a dry kiln, the bark is removed and the trees are sawn into boards usually no more than two inches thick. These boards are then taken to the dry kiln, where (because of their size) they can be dried without causing severe damage to the wood. Timber destined for glue lamination must be brought down below 15% moisture before the lamination process will work, so typically these timbers are dried to around 8-10% moisture. The drying process varies on the species of lumber, but can be done in as little as a week. Once the drying process is complete the planks are sent through a surfacer (or planer), which makes the face of the lumber perfectly smooth. These planks travel to a machine, which then spreads a special glue on the interior boards.

Depending on the type of glue and type of mill, there are two ways to finish the lamination process. One type of glue reacts with radio-frequency (RF) energy to cure the glue in minutes;

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the other uses a high-pressure clamp, which holds the newly reassembled timbers under pressure for 24 hours. Once the glue has dried, the result is a "log cant" that is slightly larger than the buyer's desired profile. These log cants are run through a profiler, and the end result is a log that is perfectly straight and uniform. Some mills are capable of joining together small timbers by using a combination of face and edge gluing and a process known as finger- jointing. Boards which would be scrap at another mill may be used in the center of a laminated log or beam to minimize waste.

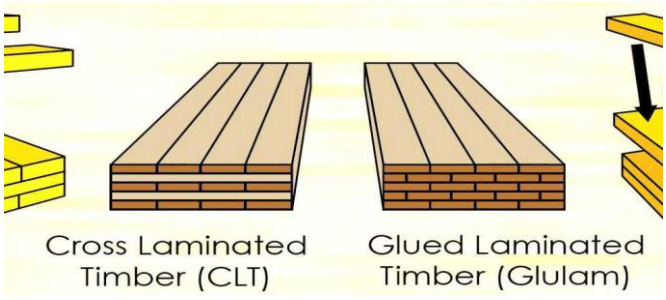

Fig no. 7

III. FUTURE OF WOODEN HOUSE

- Earth quake Resistant
- Fire Resistant
- Water proofing–100%
- Termite resistant
- Heat & Sound Insulated
- Environment friendly Wooden houses
- All weather resistant, perfect Stability. – Already Tried and Tested for last 10years in Indian conditions and globally these houses are a phenomena
- Energy Saving and Environment Healing houses. (A step beyond environment – friendly)
- Highly cost efficient -Visit us to understand the economics. Installed In Required Time for Installation – average of 7-30 days General Information :
- These houses are flexible and can be modified and re-modeled at any point of time and in no time.
- The houses if dismantled can be re-fabricated, re-used and have a value at any point of its life span.
- Kiln dried wood, Canadian Spruce Wood, Quality – 'J–grade' AND
- The Wood Used in all these structures come from Responsible Sustainable sources From Canada, Europe, Russia.
- The Wood Used in Pine & Qualities of Pine, which is seasoned and clean dried with Moisture content 5%

Guarantee of 50 (Yes Fifty) years.

III. RESULTS AND DISCUSSION

Sustainable, Green Building Material

British Columbia (B.C.) is Canada and the world's leader in sustainable forest management. The rigor of B.C.'s forest management laws is demonstrated by third-party forest certifications (PEFC/FSC).

Long Term Performance

Wood's versatility, character and individuality are unmatched. If it is properly maintained, wood can be reused, repurposed, and reapplied to other projects. Canadian wood species produce stable lumber with consistently straight grain. The wood is easy to work, finish and glue.

Easy to Manufacture

With low-to-moderate density values, species like western hemlock, Douglas-fir, yellow cedar, western red cedar and Spruce-Pine-Fir (S-P-F) are all easy to face-laminate, edge-glue, and/or finger-joint.

Quality Assurance

Canadian wood species from B.C. are separated into a wide variety of grades and each grade is intended for a specific end use. Factory grades are intended for ripping or cross cutting to recover the wood's clear fibre; the clear grades help produce knot-free products in a length range of 8-20 feet. This variety of grades allows buyers to choose a quality that suits both their needs and their price considerations.

Multipurpose Applications

Because of their low tangential to radial shrinkage (T/R) ratio, softwoods typically have better stability than hardwoods. Softwoods are well-suited to many applications across interiors, outdoors and structural uses.

Sustainability is a pivotal aspect which is very essential in the today environment. Most commonly sustainable development means meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. The study shows with the urge of India, as developing nation to achieve the sustainability in each and every sector and society. This paper explains sustainability achievements and issues in 3 main sectors: energy, tourism and business organizations. It talks about swacha bharat abhiyan, corporate social responsibility funds, use of renewable energy sources in various government projects and entering into global partnerships to come up the effects of climate change and promoting sustainability as a way of life. The study presents the latest plans in India at the central and state level to achieve the objective of sustainability as stated in the global forums. It is finally concluded through research that sustainability is the top priority in all policies of India and defiantly a goal for development. The research can further be explored in all domains of management and society.

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