Example of smart house in Japan
(Decarbonized wooden house)

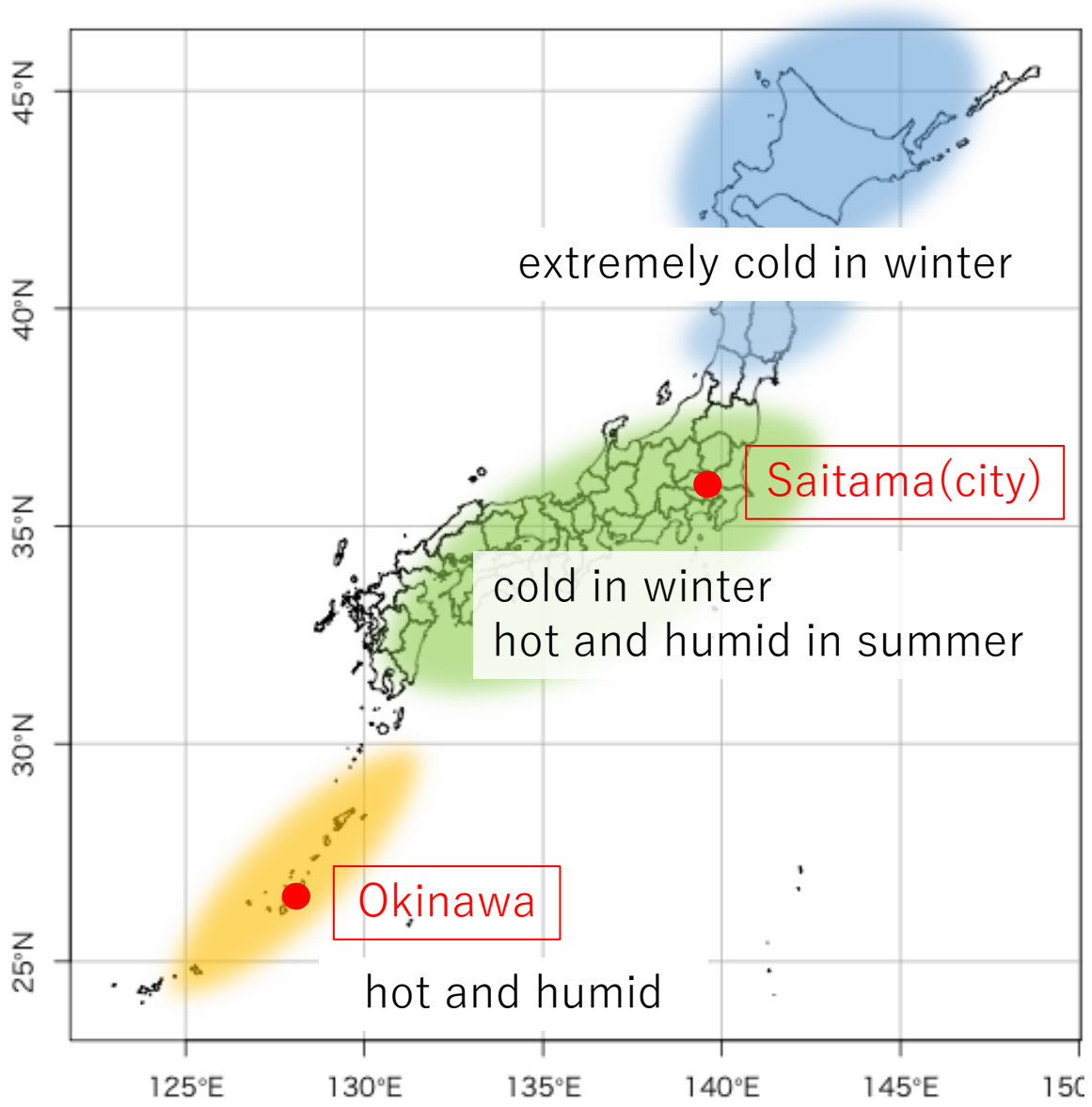
kaneka
The Dreamology Company
—Make your dreams come true—

高砂建設

Climate (Japan)

Houses in Japan need to be prepared for the cold of winter, the heat of summer, or both.

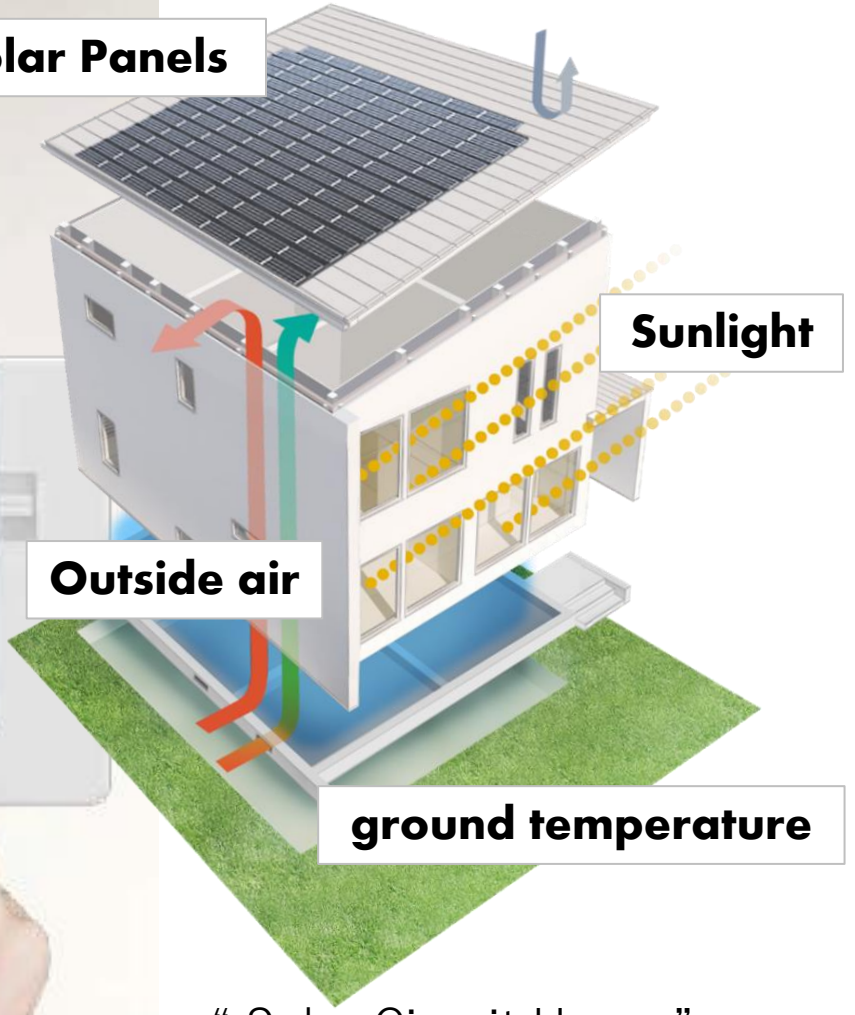
In addition, it is surrounded by the sea, so it is uncomfortable humidity in summer.



Climate-friendly house design

- **High thermal insulation performance**
- **Use of passive heat sources (nighttime cold air, ground temperature, etc.)**
- **Solar power generation**

SC Navigator

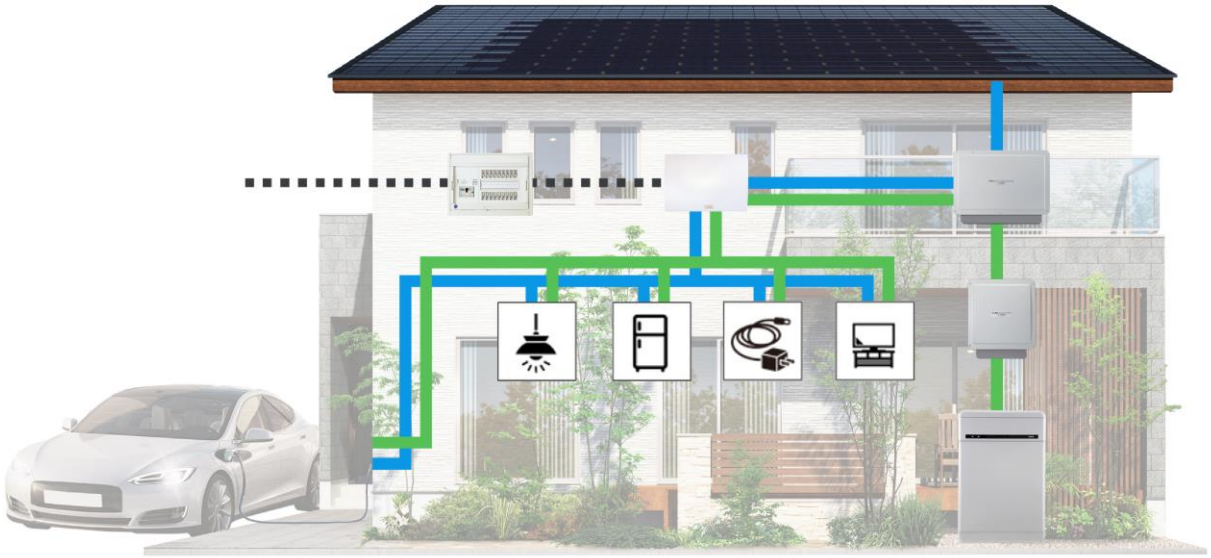


“ Solar Circuit House”

SC House

Synergistic smart house for energy saving and comfort living.

RENEWABLE HOME ENERGY AND A BATTERY BACKUP



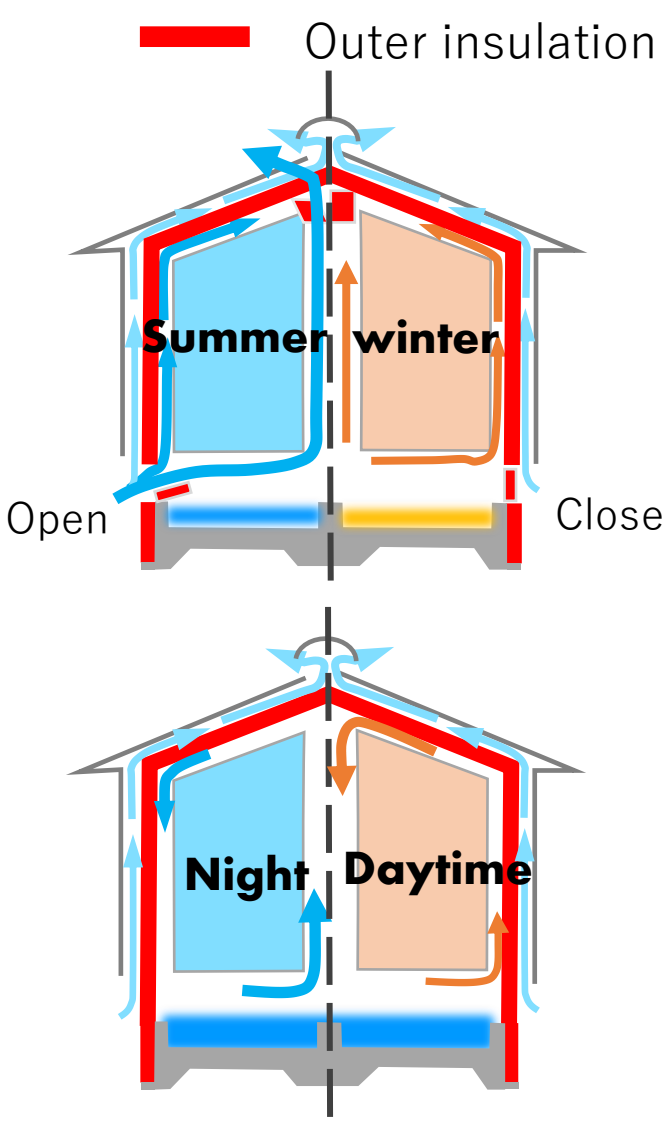
Outer insulation for easy tightness and thermal insulation. It is possible to reduce the heating and cooling load.

Ventilation system that can fill the room with dehumidified fresh air.

Termite control using stainless steel mesh instead of pesticides. Design with biodiversity in mind.

Outer insulation + double ventilation

—Two types of passive systems—

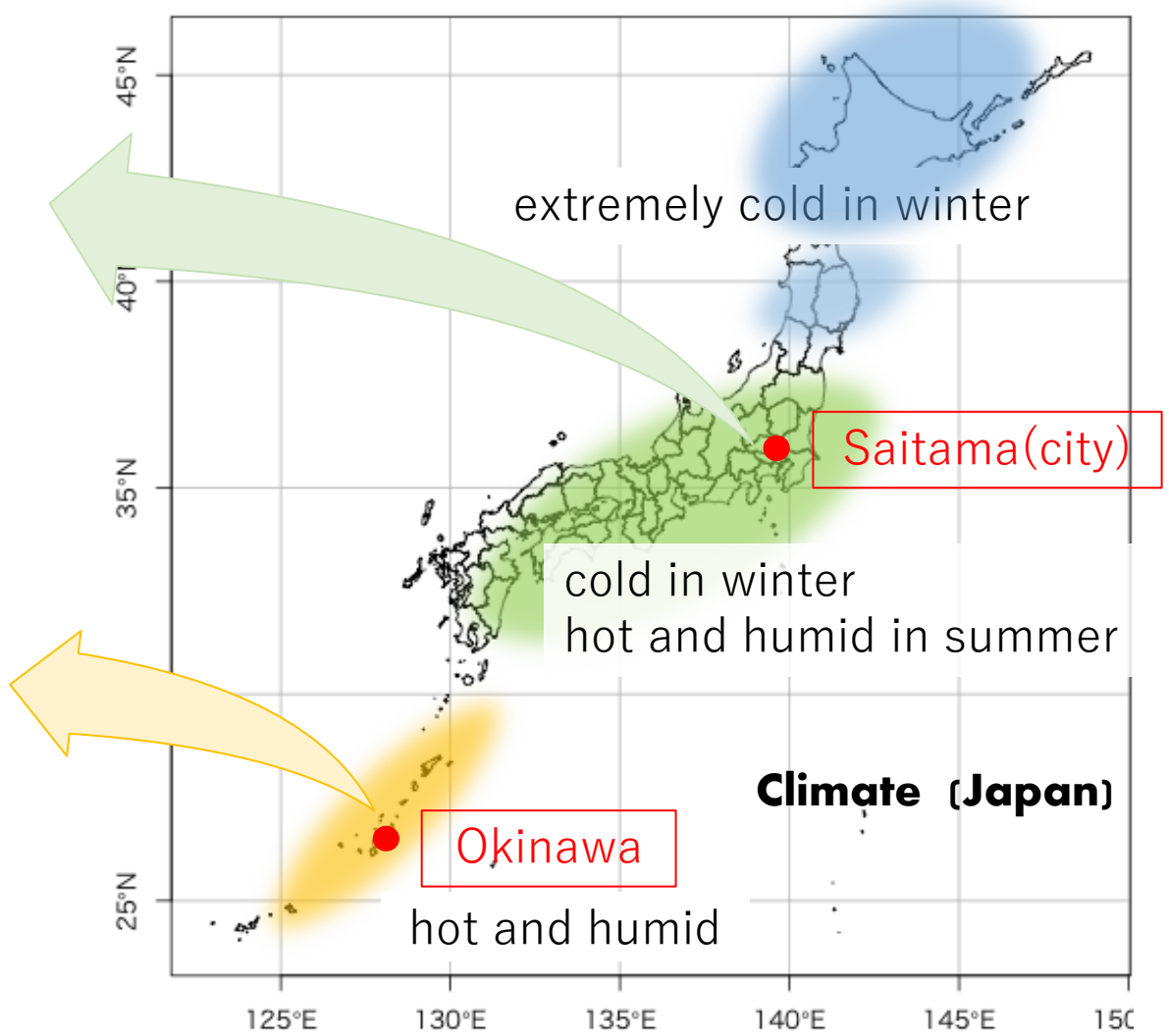


Type1　Designed for regions that require <u>both heat and cold</u> measures.

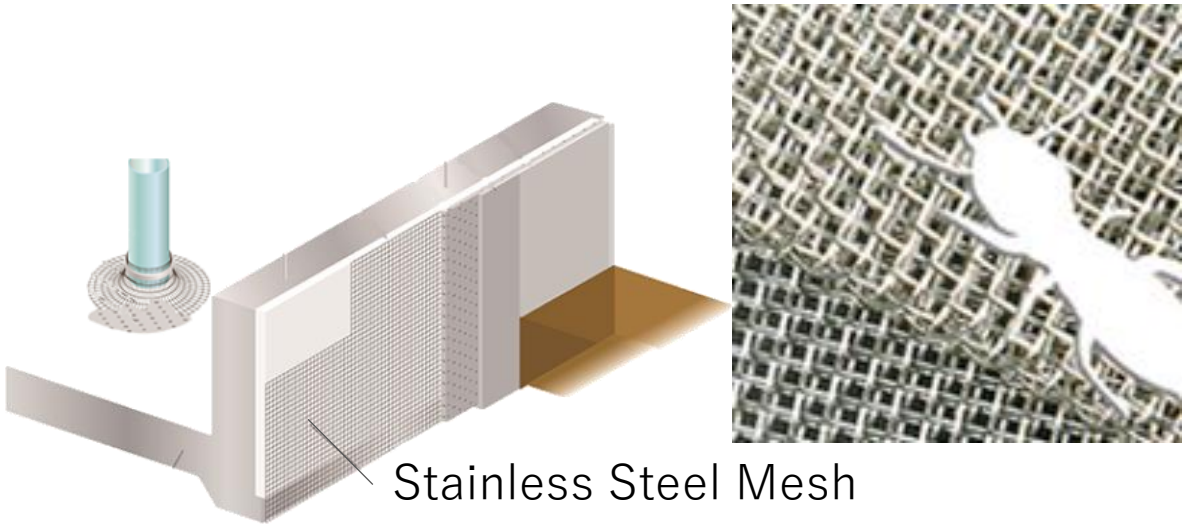
(ground temperature)
(nighttime cold air)

Type2　Designed for regions that require <u>heat and humid</u> measures throughout the year.

(ground temperature)



Outer insulation +Non-pesticide termite control



A mesh smaller than the size of a termite head physically blocks termite invasion.

No need to worry about the impact on indoor air quality.

Termites harm wood, but they play an important role in maintaining ecosystems.

Contribute to a sustainable society with attractive wooden houses and termite control without pesticides.

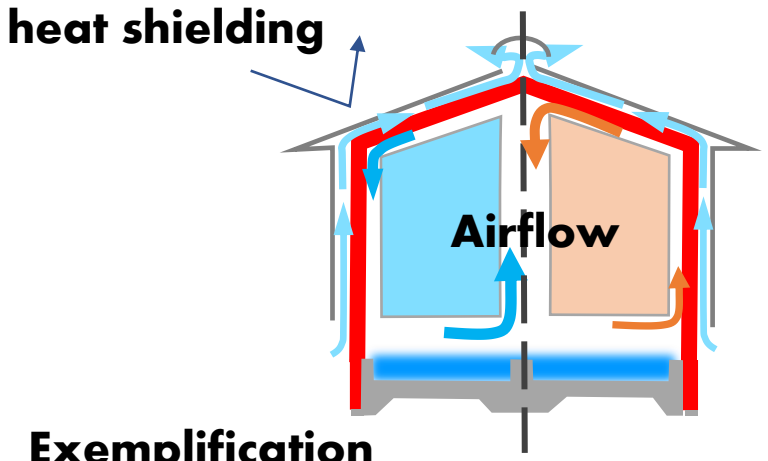
Reference information for the idea of a smart house in Malaysia

Priority measures.

- **Insulate the perimeter of the house to improve heat shielding.**

caution

- **Since the cooling temperature is close to the dew point, there is a risk of condensation and mold formation inside the highly moisture-permeable insulating material.**
- **Plastic foam insulation is recommended.**



Exemplification

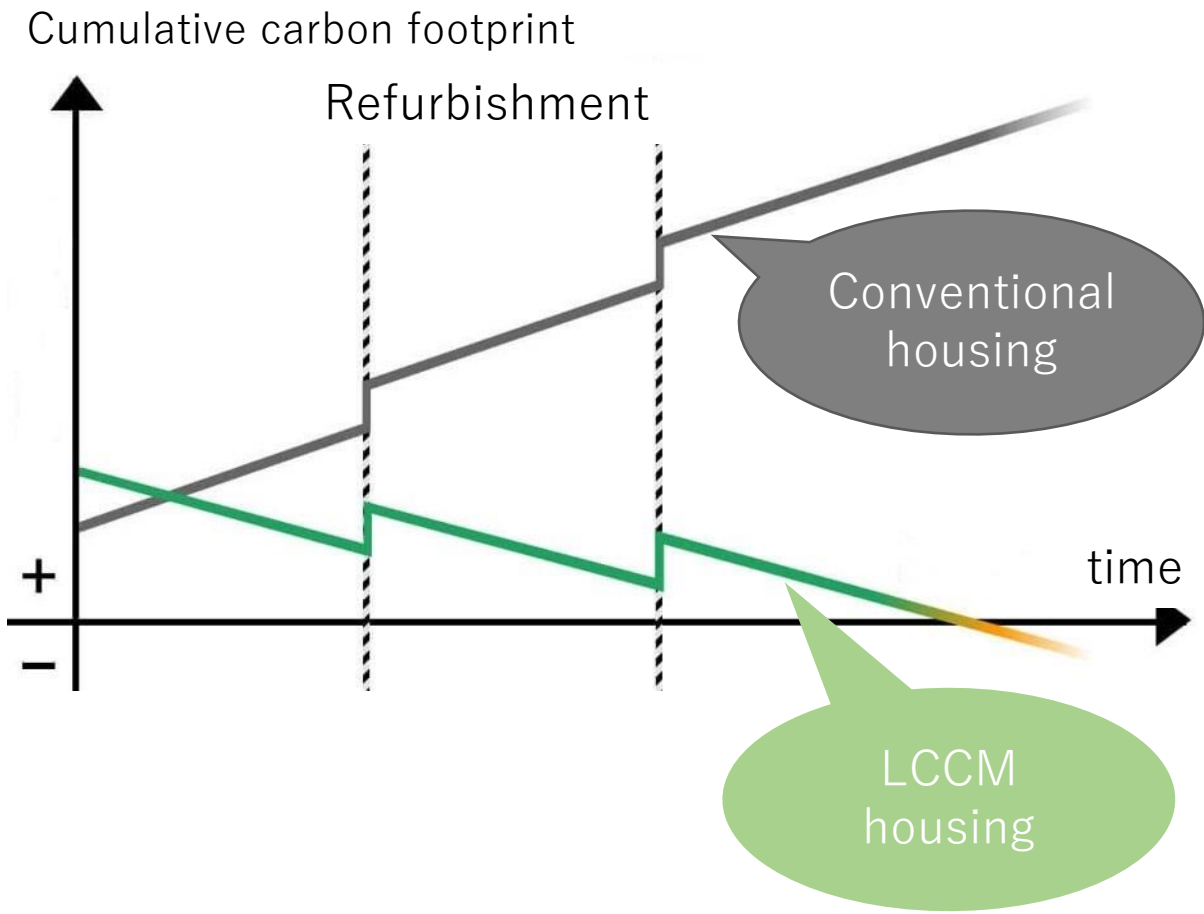
Outer insulation + double ventilation

What to expect.

- **Outer insulation →reduce cooling energy.**
- **The ventilation layer →promoting drying in the unlikely event of condensation inside the wall.**

Wooden House/ Life Cycle Carbon Minus Housing

Wood is an excellent material for carbon neutrality.

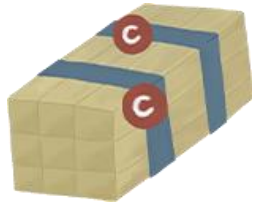


Toward realization of the goal of

carbon neutral society by 2050

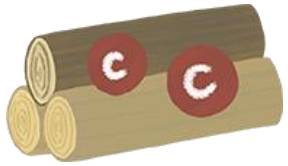
Creating homes that are friendly to people and the earth

Takasago's
ECO PROJECT



Growing the forest

Stop CO_2 emissions



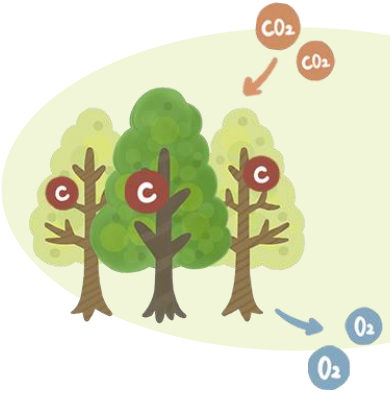
Protecting the environment &Building homes with locally-sourced lumber.

Working against climate change is a priority by protecting and supporting the forests around us.

Tree　plant

Planting three times as many trees as we cut down every year

A healthy forest promote the absorbs a lot of CO_2 and immobilizes carbon.



Grow the Forest

Forest trees absorb CO_2 from the air and fix carbon

Tree Cut

Cutting down trees to optimize

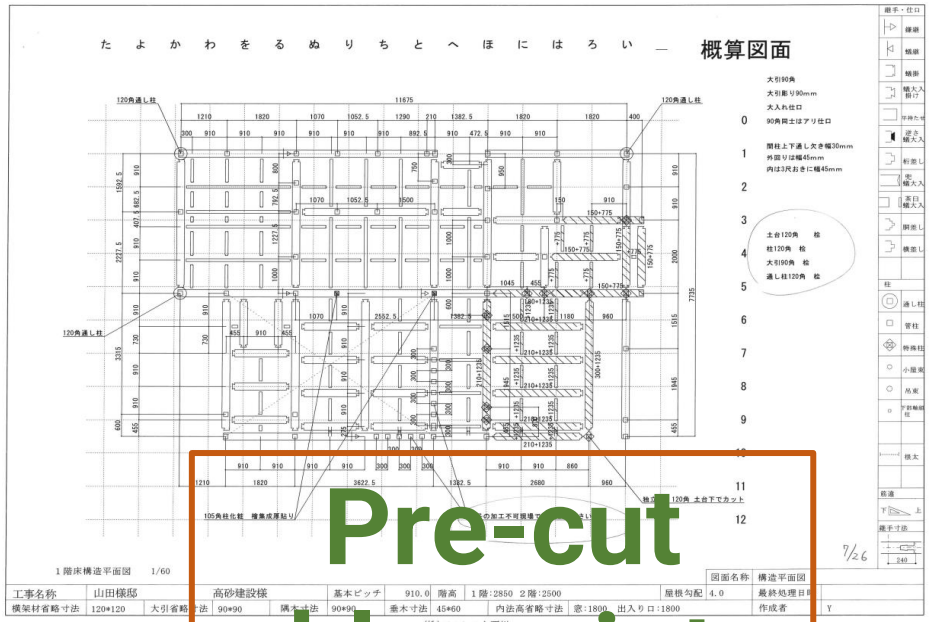
Guidelines for visualization of forest creation and wood use by companies

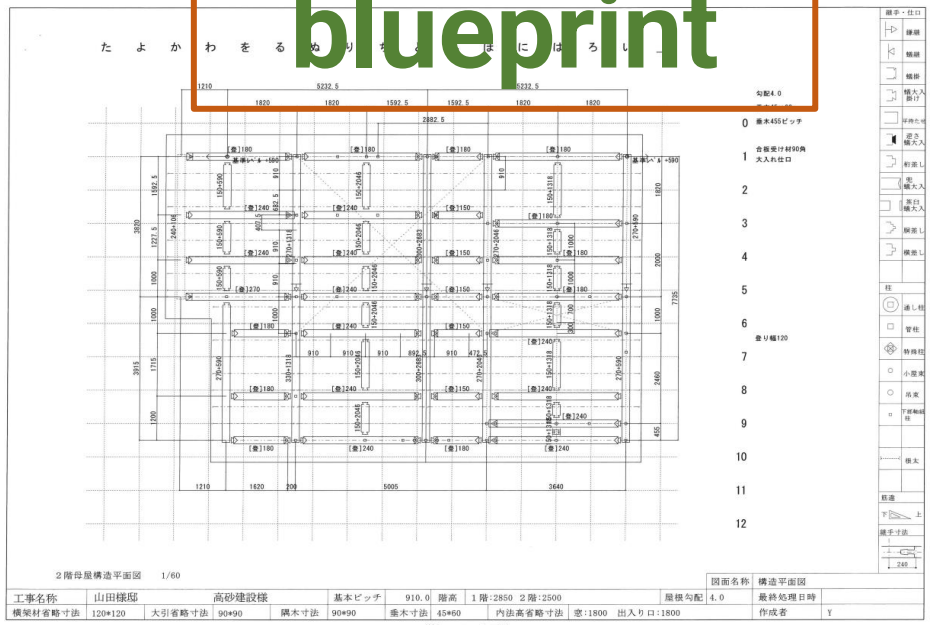
Forestry Agency

平成 28 年 2 月

林　　野　　庁
（委託先：一般財団法人林業経済研究所）

Fixed and visualized CO_2 using wooden houses





Pre-cut blueprint

構造躯体

産地	部位	樹種	W	H	長さ	本数	材積
西川材	土台	桧	0.105	0.105	4	19	0.8379
	大引	桧	0.09	0.09	4	9	0.2916
	大引	桧	0.09	0.09	3	1	0.0243
	柱	桧	0.105	0.105	3	96	3.1752
	特殊柱	桧	0.18	0.18	3	1	0.0972
	梁桁	杉(KD)	0.105	0.105	3	1	0.033075
	梁桁	杉(KD)	0.105	0.105	4	10	0.441
	梁桁	杉(KD)	0.105	0.15	3	5	0.23625
	梁桁	杉(KD)	0.105	0.15	4	4	0.252
	母屋	杉	0.105	0.105	3	7	0.231525
	母屋	杉	0.105	0.105	4	12	0.5292
	小屋束	杉	0.105	0.105	3	1	0.033075
	小屋束	杉	0.105	0.105	4	16	0.7056
	火打	杉(KD)	0.09	0.09	1.2	18	0.17496
						200	7.062885
						構造躯体の割合	53.22%
その他	梁桁	赤松集成	0.09	0.09	4	1	0.0243
	梁桁	赤松集成	0.09	0.09	4	4	0.062
	梁桁	赤松集成	0.105	0.12	3	3	0.07
	梁桁	赤松集成	0.105	0.12	4	1	0.0504
	梁桁	赤松集成	0.105	0.15	5	3	0.23625
	梁桁	赤松集成	0.105	0.18	5	2	0.1
	梁桁	赤松集成	0.105	0.21	4	2	0.1
	梁桁	赤松集成	0.105	0.21	5	2	0.2
	梁桁	赤松集成	0.105	0.21	6	1	0.13
	梁桁	赤松集成	0.105	0.24	4	1	0.1008
	梁桁	赤松集成	0.105	0.24	5	1	0.126
	梁桁	赤松集成	0.105	0.27	5	1	0.14175
	梁桁	赤松集成	0.105	0.3	4	1	0.126
	梁桁	赤松集成	0.105	0.3	5	1	0.1575
	梁桁	赤松集成	0.105	0.33	3	1	0.10395
	梁桁	赤松集成	0.105	0.33	6	1	0.2079
	梁桁	赤松集成	0.105	0.35	5	1	0.20475
	梁桁	赤松集成	0.105	0.39	6	1	0.2457
	梁桁	赤松集成	0.105	0.42	4	1	0.1764
	梁桁	米松(KD)	0.105	0.105	3	1	0.033075
	梁桁	米松(KD)	0.105	0.15	3	2	0.0945
	梁桁	米松(KD)	0.105	0.15	4	9	0.567
	梁桁	米松(KD)	0.105	0.18	3	2	0.1134
	梁桁	米松(KD)	0.105	0.18	4	2	0.1512
	梁桁	米松(KD)	0.105	0.21	3	8	0.5292
	梁桁	米松(KD)	0.105	0.21	4	3	0.2646
	梁桁	米松(KD)	0.105	0.24	3	2	0.1512
	梁桁	米松(KD)	0.105	0.24	4	1	0.1008
	梁桁	米松(化粧)	0.105	0.3	3	1	0.0945
	梁桁	米松(化粧)	0.105	0.3	4	5	0.63
	梁桁	米松(化粧)	0.105	0.39	5	1	0.20475
	登り梁	米松(KD)	0.105	0.15	3	6	0.2835
	登り梁	赤松集成	0.105	0.15	5	2	0.1575
	小屋束	赤松集成	0.09	0.09	3	3	0.0729
						74	6.208425
						構造躯体の割合	46.78%

Wood picking calculation table

羽柄材

産地	部位	樹種	W	H	長さ	本数	材積
西川材	根太	桧	0.06	0.06	4	13	0.1872
	間柱	杉(KD)	0.03	0.105	3	37	0.34965
	間柱	杉(KD)	0.045	0.105	3	25	0.354375
	間柱	杉(KD)	0.03	0.087	3	3	0.02349
	間柱	杉(KD)	0.03	0.096	3	2	0.01728
	間柱	杉(KD)	0.045	0.096	3	1	0.01296
	土台受け材	桧	0.058	0.058	3	13	0.131196
	仮筋交い	杉(KD)	0.03	0.105	4	40	0.504
						134	1.580151
						羽柄材の割合	15.12%
その他	筋交い	桧集成	0.045	0.09	3	53	0.64395
	筋交い	桧集成	0.045	0.09	4	15	0.243
	間柱	桧集成	0.045	0.105	3	47	0.666225
	間	桧集成	0.045	0.09	3	5	0.06075
	間	桧集成	0.045	0.105	3	80	1.134
	間	桧集成	0.03	0.105	3	50	0.4725
	間柱	桧集成	0.045	0.09	3	10	0.1215
	屋根垂木	米松(KD)	0.045	0.054	3	15	0.10935
	屋根垂木	米松(KD)	0.045	0.054	4	28	0.27216
	屋根垂木	米松(KD)	0.055	0.105	4	8	0.1848
	屋根垂木	米松(KD)	0.055	0.105	3	2	0.03465
	根太	米松(KD)	0.045	0.09	4	1	0.0162
							4.9553868
							17.28%

合板

産地	部位	樹種	W	H	厚み	本数	材積
その他	屋根	ラーチ	0.91	1.82	0.009	40	0.596232
	屋根	ラーチ	0.91	1.82	0.012	54	1.0732176
	床(1F)	ラーチ	0.91	1.82	0.012	30	0.596232
	床(2F)	ラーチ	0.91	1.82	0.024	47	1.8681936
	バルコニー	ラーチ	0.91	1.82	0.009	22	0.3279276
	バルコニー	ラーチ	0.91	1.82	0.012	10	0.198744
	通気パッキン	ラーチ	0.91	3	0.009	12	0.29484

構造躯体	西川材	7.062885	24.63%	西川材	8.643036
	その他	6.208425	21.65%		30.14%
羽柄材	西川材	1.580151	5.51%	その他	15.07623
	その他	8.867805	30.93%		52.58%
合板	その他	4.9553868	17.28%		
総合計		28.6746878		構造+羽柄	28.6746878

Fixed and visualized CO_2 using wooden houses

針葉樹とは
Coniferous wood
広葉樹とは
Hard wood

Carbon dioxide fixation amount/total calculation table by using wood

御　社　名	株式会社　高砂建設
プロジェクト名称	脱炭素プロジェクト
担　当　者　名	小川　尚信
連　絡　先	
作 成 年 月 日	2021年4月8日

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
プロダクト名・製品名等の区分	樹種区分	明細件数	総木材利用量(㎥)	総CO2固定量 t－CO2	m3当り CO2固定量	内訳　トレーサビリティ											
						都道府県産材			合法性証明材			森林認証材			その他木材		
						利用量	t－CO2	m3当り CO2固定	利用量	t－CO2	m3当り CO2固定	利用量	t－CO2	m3当り CO2固定	利用量	t－CO2	m3当り CO2固定
構造材(西川材)	針葉樹	2	7.0629	4.92	0.70	7.06	4.92	0.70									
Structural materials	広葉樹																
	樹種不明																
	計	2	7.0629	4.92	0.70	7.06	4.92	0.70									
構造材(その他)	針葉樹	2	6.2084	4.45	0.72				3.22	1.93	0.60	2.99	2.52	0.84			
Structural materials	広葉樹																
	樹種不明																
	計	2	6.2084	4.45	0.72				3.22	1.93	0.60	2.99	2.52	0.84			
羽柄材(西川材)	針葉樹	2	1.5802	0.98	0.62	1.58	0.98	0.62									
Underlayment material	広葉樹																
	樹種不明																
	計	2	1.5802	0.98	0.62	1.58	0.98	0.62									
羽柄材(その他)	針葉樹	4	8.8678	6.34	0.71				3.10	1.85	0.60	5.57	4.37	0.78			
Underlayment material	広葉樹																
	樹種不明																
	計	4	8.8678	6.34	0.71				3.10	1.85	0.60	5.57	4.37	0.78			
合板等	針葉樹	1	4.9554	2.97	0.60				4.96	2.97	0.60						
Plywood	広葉樹																
	樹種不明																
	計	1	4.9554	2.97	0.60				4.96	2.97	0.60						
その他登録外	針葉樹																
	広葉樹																
	樹種不明																
	計																
合　計	針葉樹	11	28.6747	19.65	0.69	8.64	5.90	0.68	11.27	6.74	0.60	8.57	6.89	0.80			
Total	広葉樹		Wood usage fee	CO 2immobilization													
	樹種不明																
	計	11	28.6747	19.65	0.69	8.64	5.90	0.68	11.27	6.74	0.60	8.57	6.89	0.80			

Fixed and visualized CO_2 using wooden houses

◆柱や梁には針葉樹が最適

Coniferous wood is best for pillars and beams.

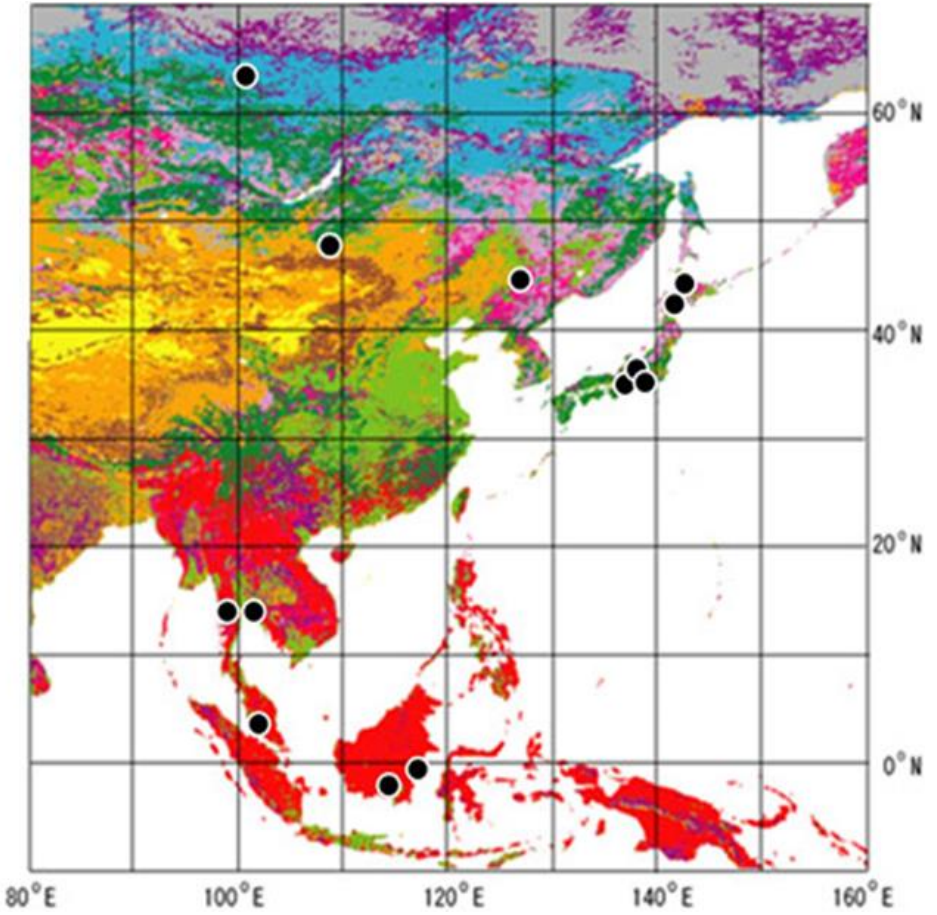
◆東南アジアでは広葉樹しか取れない

In Southeast Asia, only hard woods can be harvested.

樹種	樹形	葉の形	木の性質	木材の用途
針葉樹	幹が上にまっすぐのびている 	針のように細くとがった形状が特徴 	比較的軽くて強い	建築用の柱や梁などに最適 
広葉樹	幹が枝分かれして横幅に広がっている 	広くて平べったい形状が特徴 	重くて硬い	家具や内装材が最適 

◆針葉樹と広葉樹の分布

Distribution of Coniferous wood and Hard wood



Building materials made from Malaysian trees

フタバガキ科（広葉樹）

YUASA ユアサ木材株式会社

Dipterocarpaceae（Hard wood）

The dipterocarp family (broad-leaved trees) is collectively called lauan.
Lauan plywood is made by laminating lauan wood veneers together alternately.
In addition, it can also be used as a raw material for particle board and MDF, which are made by mixing small pieces with adhesive and molding them under heat.
65% of the total export volume in 2020 was
Lauan plywood and party products for Japan (680,000m3)
Japan was the largest export destination for Kurbord.

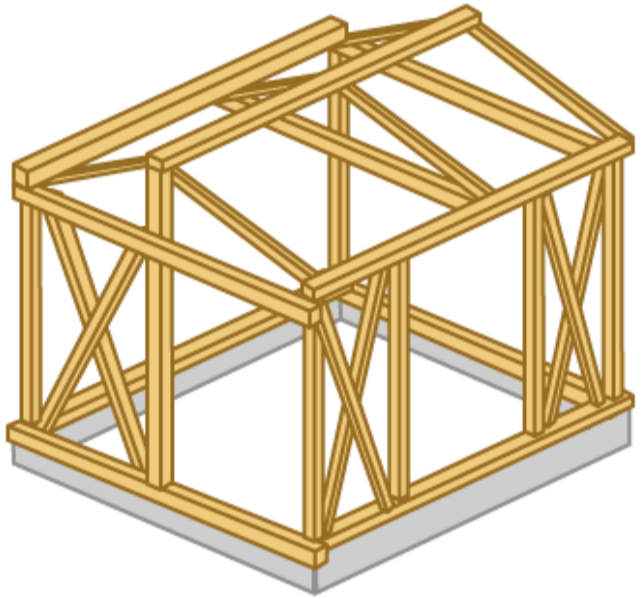
Information on legally harvested timber, etc.: Malaysia (Sarawak Island): Forestry Agency (maff.go.jp)

Two methods of building a wooden house

◆Wooden framework method

This is a traditional construction method that has been used in Japan since ancient times. This is a construction method in which columns, beams, and braces are combined to form a frame (frame) and the building is supported by "lines.“

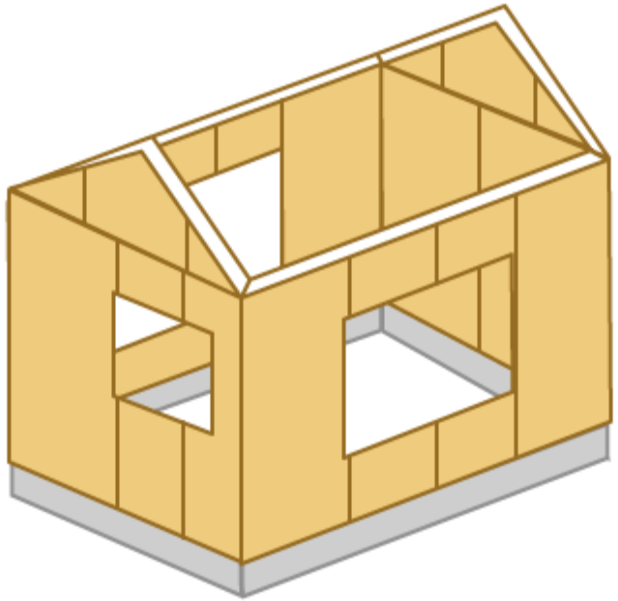
（針葉樹：Coniferous wood ）

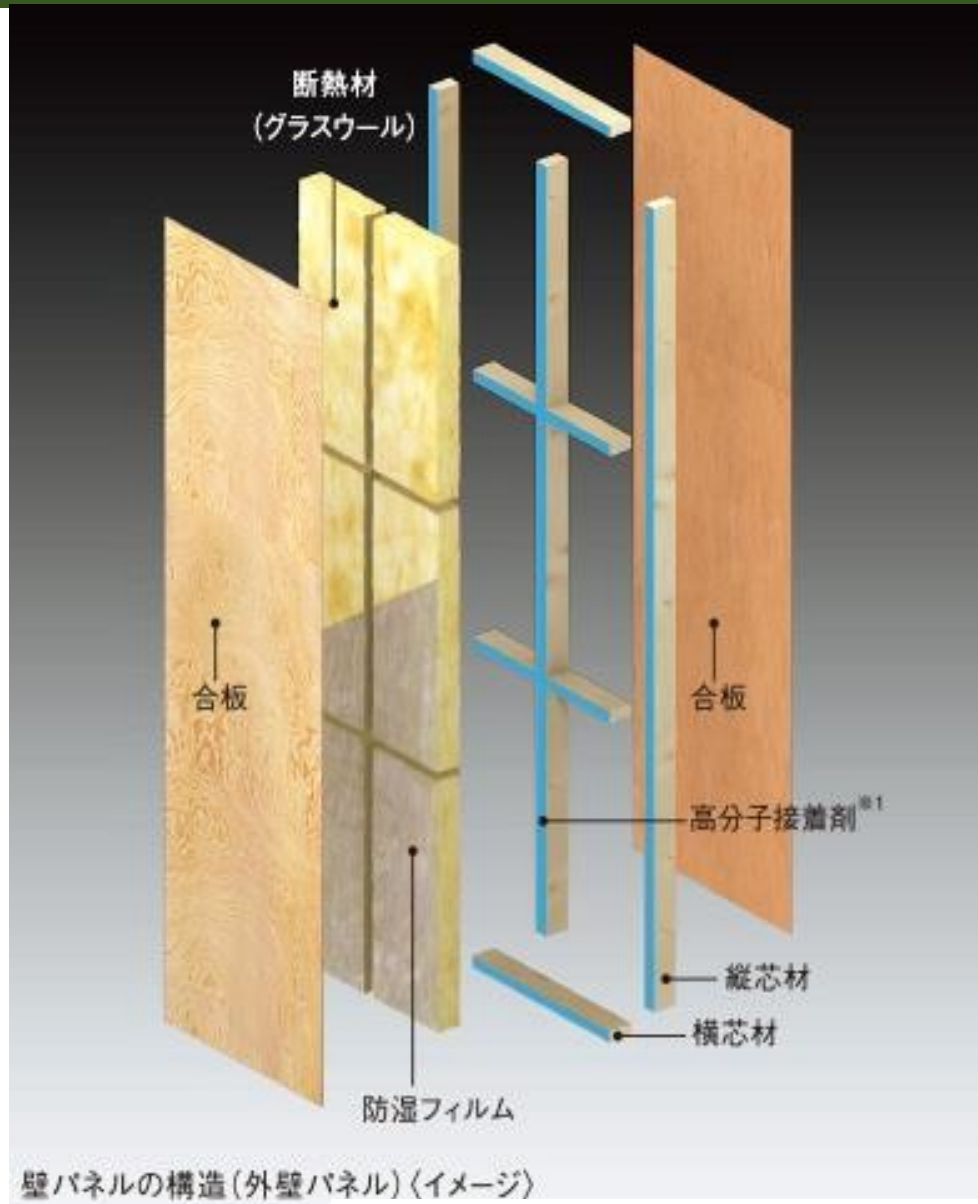


◆Wood panel construction method

A wall construction method in which the structural frame is made of wood panels produced in a factory. A construction method in which walls, floors, ceilings, etc., which are the core of a building's structure, are made in a factory as standardized panels and assembled on site.

（広葉樹：Hard wood）





壁パネルの構造（外壁パネル）〈イメージ〉

wall panel structure

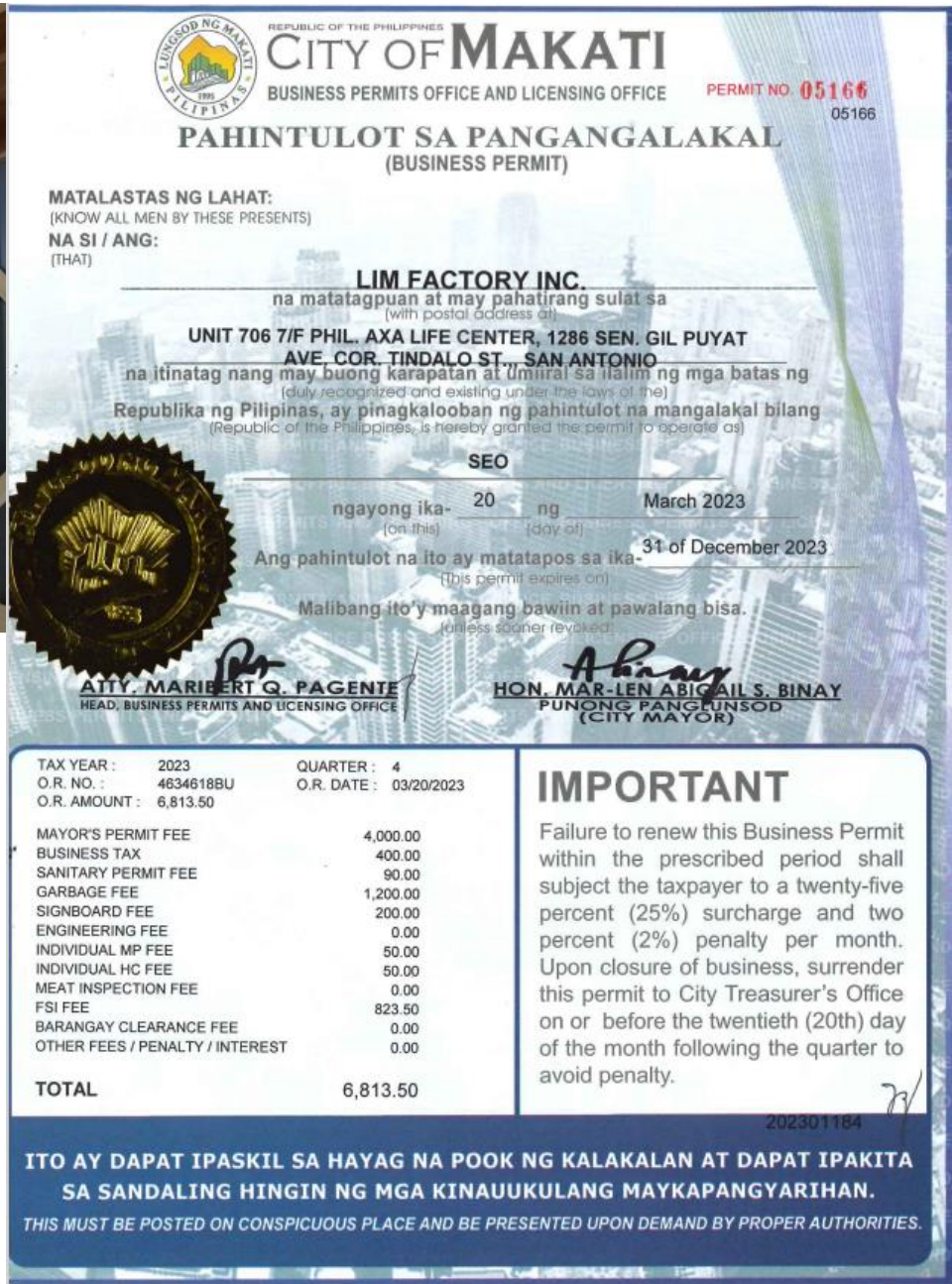
Development of wood-based panels

Performance test of hard floor panels

A shear test of the floor structure was conducted at the Tsukuba Architectural Testing Center, proving that Nishikawa lumber (local wood) has earthquake resistance 1.5 times higher than the Building Standards Act.
Developed earthquake-resistant rigid floor panels

一般財団法人
ベターリビング
より良き住まい　より良き住環境　より良き建築の実現

2023 Established a local corporation in Makati, Philippines



REPUBLIC OF THE PHILIPPINES
CITY OF MAKATI
BUSINESS PERMITS OFFICE AND LICENSING OFFICE
PERMIT NO. 05166
05166

PAHINTULOT SA PANGANGALAKAL
(BUSINESS PERMIT)

MATALASTAS NG LAHAT:
(KNOW ALL MEN BY THESE PRESENTS)
NA SI / ANG:
(THAT)

LIM FACTORY INC.
na matatagpuan at may pahatirang sulat sa
(with postal address at)
UNIT 706 7/F PHIL. AXA LIFE CENTER, 1286 SEN. GIL PUYAT AVE. COR. TINDALO ST., SAN ANTONIO
na itinatag nang may buong karapatan at umiiral sa ilalim ng mga batas ng
(duly recognized and existing under the laws of the)
Republika ng Pilipinas, ay pinagkalooban ng pahintulot na mangalakal bilang
(Republic of the Philippines, is hereby granted the permit to operate as)
SEO

ngayong ika- 20 ng March 2023
(on this) (day of)
Ang pahintulot na ito ay matatapos sa ika- 31 of December 2023
(this permit expires on)
Malibang ito'y maagang bawiin at pawalang bisa.
(unless sooner revoked)

ATTY. MARIBERT Q. PAGENTE
HEAD, BUSINESS PERMITS AND LICENSING OFFICE

HON. MAR-LEN ABIGAIL S. BINAY
PUNONG PANGLUNSOD
(CITY MAYOR)

TAX YEAR :	2023	QUARTER :	4
O.R. NO. :	4634618BU	O.R. DATE :	03/20/2023
O.R. AMOUNT :	6,813.50		

MAYOR'S PERMIT FEE	4,000.00
BUSINESS TAX	400.00
SANITARY PERMIT FEE	90.00
GARBAGE FEE	1,200.00
SIGNBOARD FEE	200.00
ENGINEERING FEE	0.00
INDIVIDUAL MP FEE	50.00
INDIVIDUAL HC FEE	50.00
MEAT INSPECTION FEE	0.00
FSI FEE	823.50
BARANGAY CLEARANCE FEE	0.00
OTHER FEES / PENALTY / INTEREST	0.00
TOTAL	6,813.50

IMPORTANT

Failure to renew this Business Permit within the prescribed period shall subject the taxpayer to a twenty-five percent (25%) surcharge and two percent (2%) penalty per month. Upon closure of business, surrender this permit to City Treasurer's Office on or before the twentieth (20th) day of the month following the quarter to avoid penalty.

202301184

ITO AY DAPAT IPASKIL SA HAYAG NA POOK NG KALAKALAN AT DAPAT IPAKITA SA SANDALING HINGIN NG MGA KINAUUKULANG MAYKAPANGYARIHAN.
THIS MUST BE POSTED ON CONSPICUOUS PLACE AND BE PRESENTED UPON DEMAND BY PROPER AUTHORITIES.

Technical training in Japan

We have been building houses in Japan until now, and will soon be celebrating 50 years since our founding.

Less Is More
LIM FACTORY INC.

In order for overseas engineers to learn the technology we have cultivated up to now, we are establishing overseas bases and are working to train designers.

Possible Next Steps

マレーシア工科大学と弊社で木質パネルの開発

Development of wood-based panels with Universiti Teknologi Malaysia and our company

マレーシア産の木材で脱炭素な高気密高断熱住宅の実証事業

Demonstration project for a carbon-free, highly airtight, highly insulated house made from wood sourced in Malaysia