

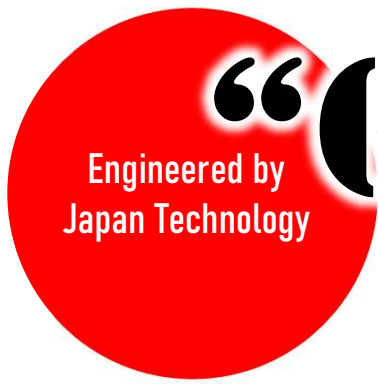
“GURA-SAFE”

THE WOODEN SHELTER FOR EARTHQUAKE & FIRE

The world's first "wooden earthquake & fire-resistant shelter" (one-hour fire-resistant structure), which is resistant to collapse of houses, earthquakes, and fires, was born with our unique Cell-Funen technology.

In the unlikely event of an earthquake, not only human lives but also "important memories" will be firmly guarded.

Installation work can be done while living at home, and termites and mold can be shut out.



“GURA-SAFE”

THE WOODEN SHELTER FOR EARTHQUAKE & FIRE

The world's first * wooden earthquake-resistant and fire-resistant shelter, which is resistant to the collapse of houses and disasters caused by huge earthquakes, was born with its own non-combustible technology. It can be installed on the premises while living in your own home. (* our company's research)



■ Special Features:

- 1. Seismic resistance:** Seismic resistance confirmed not to collapse even in experiments that reproduced the actual earthquake motions of Japanese biggest disaster in 2011.
- 2. Fire resistance:** Ensuring 1-hour fire resistance at 1000 °C using our patented “Cell-Funen technology for non-combustible material.
- 3. Non-combustible:** Not only is it resistant to flames, but it also "does not burn, does not emit smoke or hazardous gas" to prevent the spread of fire to the surrounding area even in densely populated residential areas.

■ Specifications:

External Dimensions*		W2900mm x D2155mm x H 2315mm
Internal Dimensions*		W2570mm x D1820mm x H2010mm
Doorway Dimensions		W750mm x H1500mm
Unit Weight		Approx. 2.5 – 3.0 ton
Fire-resistant Structure External		Non-combustible treatment of 25 mm thick Cedar LVL**, stacking two sheets and using as a 50 mm 1-hour fireproof coating layer
Seismic Structures	2nd layer 3rd layer 4th layer Bottom	54mm bearing wall with 30mm + 24mm thick Cedar structural plywood 50mm incombustible-treated Styrofoam is used as a heat insulating layer Uses Cedar plywood with 15 mm thickness of and non-combustible treatment Seismic rubber (up / down, left / right)
Options (Interior & Equipment)		Wall: Cell-Funen non-combustible wood cray wall, Washi paper, etc.
		Floor: Non-combustible Tatami etc.
		Trims: Thickness 9mm gypsum board
		Electricity/ Lightings: Emergency battery/ LED lights
		Ventilation: Air supply and exhaust from the bottom
		Temporary toilet
		Body waterproof specifications

(* a case of standard size, and can be customized as “semi order” upon the client’s needs) (** Laminated Veneer Lumber)



Cut samples of LVL



Composite with multiple layers



Miniature model

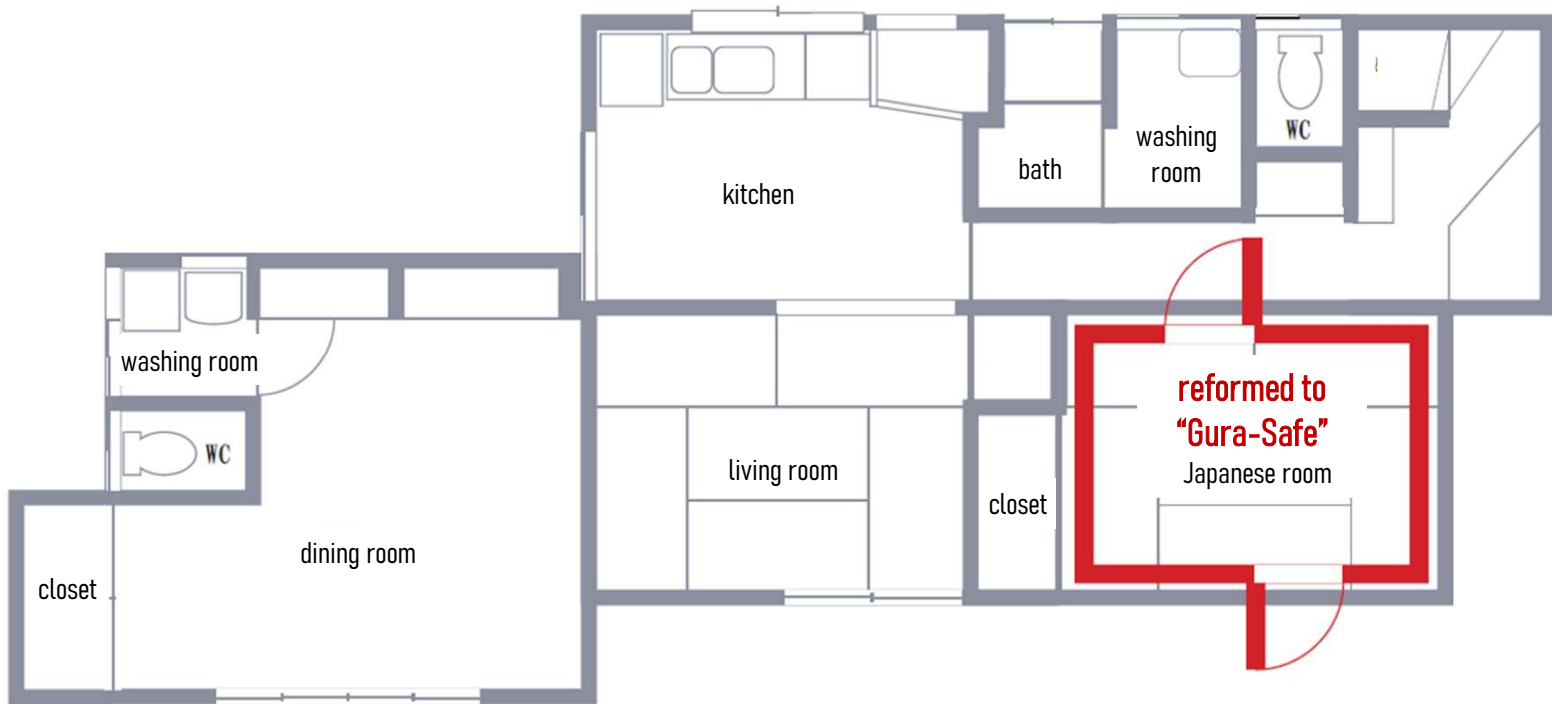
Recommended by the Academic Experts

Prof. Shinichi Sugawara (Professor Emeritus, The University of Tokyo / Tokyo University of Science)

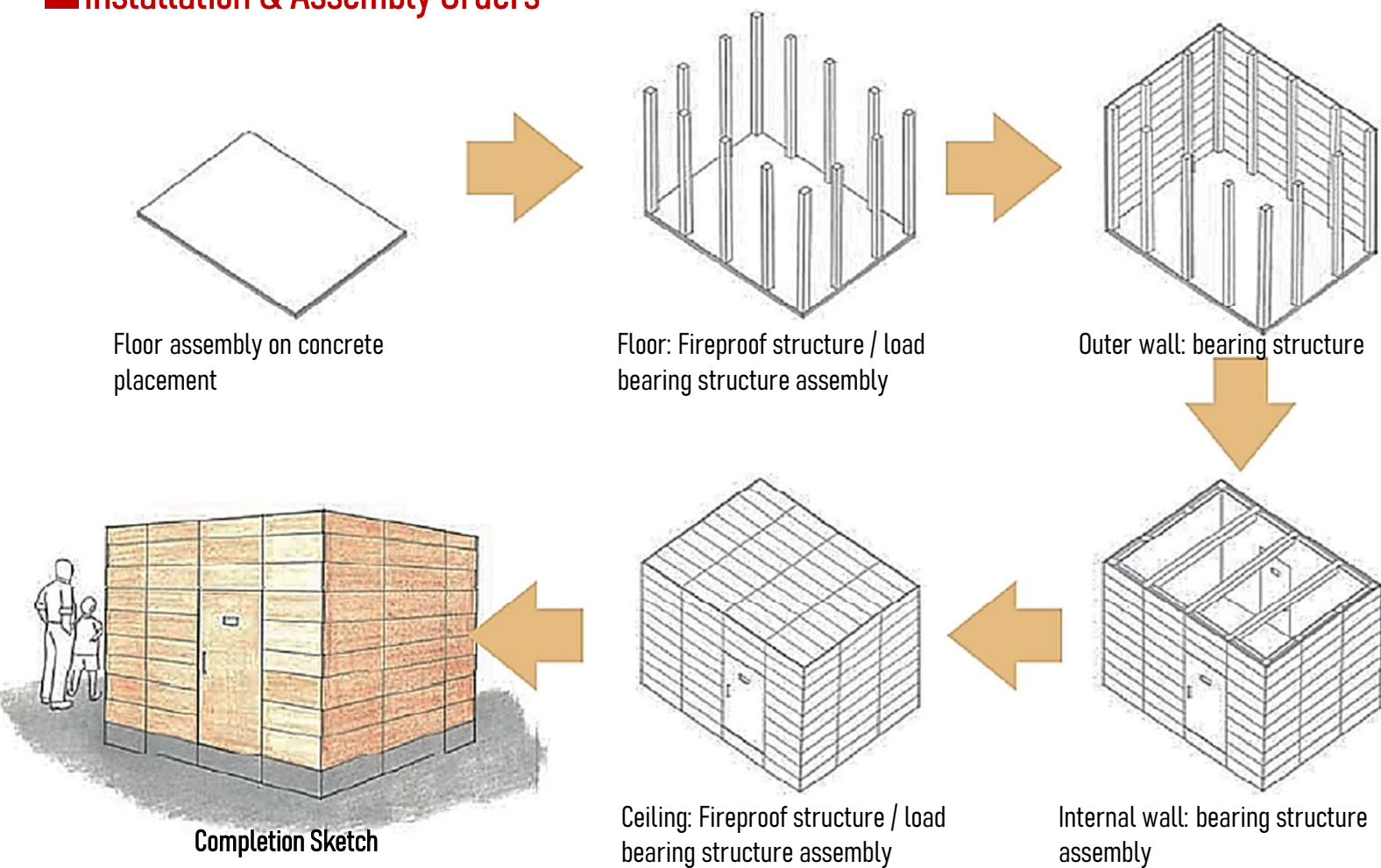


“Earthquakes are occurring all over Japan, and it is an era that ‘when’ and ‘where’ of a major earthquake’s occurrence is quite unknown.
Previously, the evacuation measures for earthquakes and fires was separated, but now they are to be reconsidered.
Under such circumstances, it is highly significant that the **disaster prevention shelter "Gura-Safe"**, which has both of earthquake resistance and fire resistance was born.
And what I would like to pay more attention is that it is made of non-combustible wood.
In a situation that tends to be mentally unstable, a shelter space made of wood, which has been familiar to the people for a long time, will give users a sense of comfort and security.”

■ Installation Example at (Japanese) House



■ Installation & Assembly Orders



■ Fire Resistance (1 hour) Performance Test

In a heating test of 1,000 °C for 1 hour according to ISO standards, even if the external temperature reaches 1,000 °C, the indoor temperature rises by about 4 °C with respect to the outside temperature at the maximum (+0 °C specifications are also available). It has fire prevention performance that protects property from flames of 1,000 °C.



Inside the furnace during the fire resistance test. The temperature inside the furnace is 1,000 °C and the red color is the refractory LVL of the external surface material.

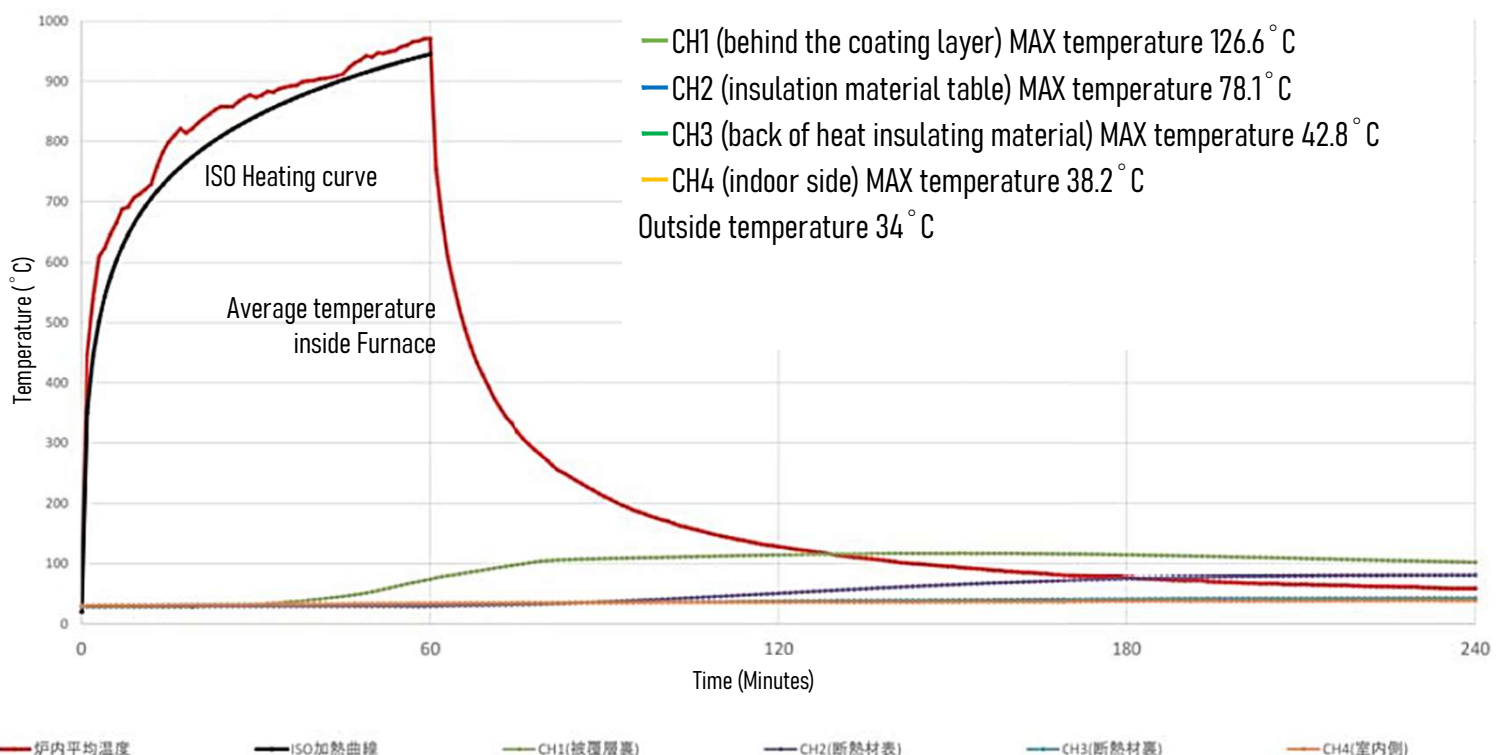


Fireproof LVL of external surface material after fire resistance test at 1,000 °C for 1 hour. The surface is carbonized.



Due to the performance of the fireproof structure with an external surface material thickness of 50 mm, the seismic structural members are not affected.

■ Thermal Change Graph of the Performance Test



■ Seismic / Vibration Test

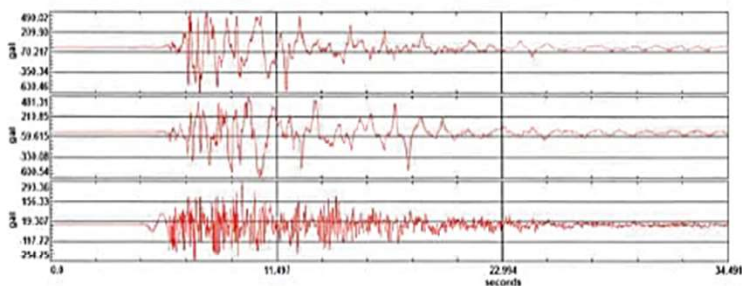
The disaster prevention shelter "Gura-Safe" was placed on a large three-dimensional shaking table to reproduce the actual seismic waves. (At Japanese Public Works Research Institute)

As a result of fixing the acceleration converter to the bottom of the shaking table and the roof of "Gura-Safe" and recording the acceleration data during vibration, the correlation function of the displacement waveform of the shaking table and "Gura-Safe" is very similar. It was confirmed that there were no cracks or damage.

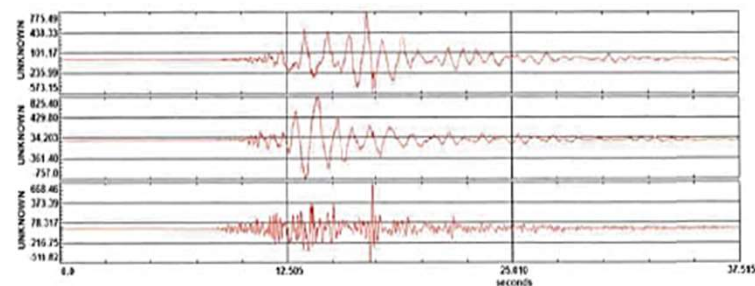


Installed on a shaking table

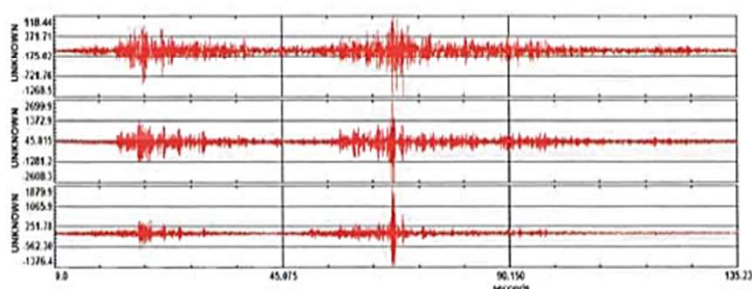
"Great Hanshin-Awaji Earthquake" in 1995



"Kumamoto Earthquake" in 2016



"Great East Japan Earthquake" in 2011

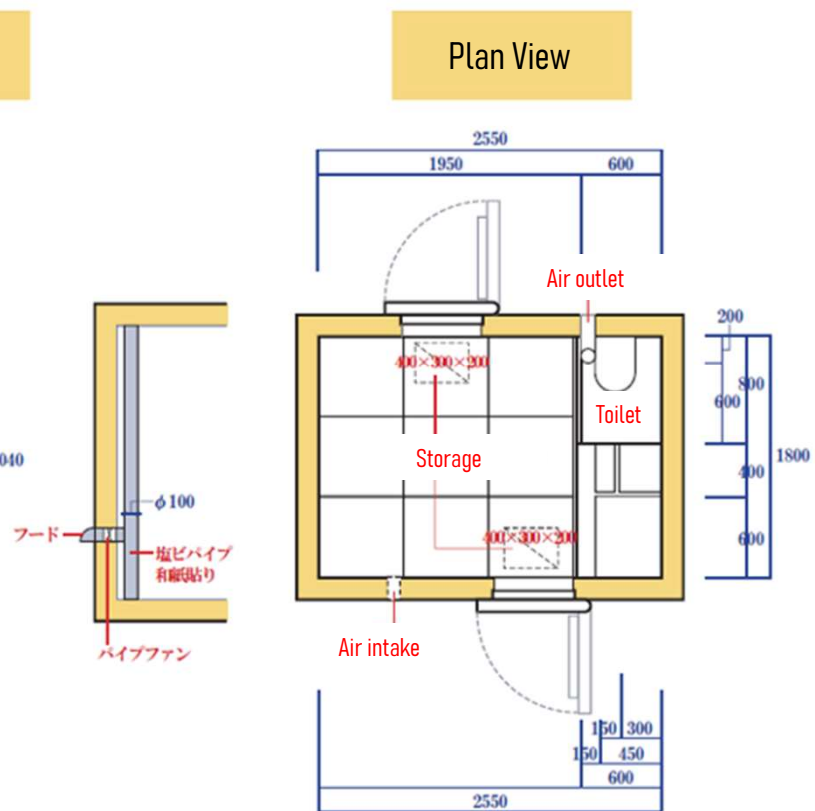
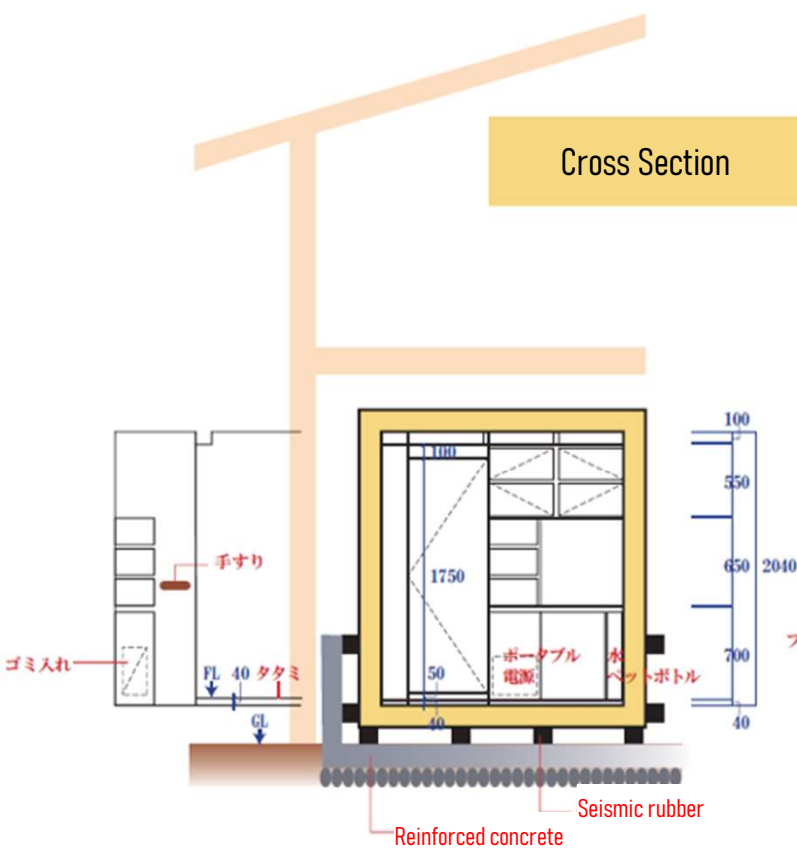


Even at the three major earthquakes in recent years reproduction in the test succession, there was no damage inside or outside the "Gura-Safe".

It has been proven to withstand and have a robust resistance to the Mega-Earthquakes actually happened in Japan;

"Great Hanshin-Awaji Earthquake" in 1995
"Great East Japan Earthquake" in 2011 and
"Kumamoto Earthquake" in 2016

they were unprecedented disasters above Japanese Magnitude 7.



Optional Items

Interior/ Wall Materials

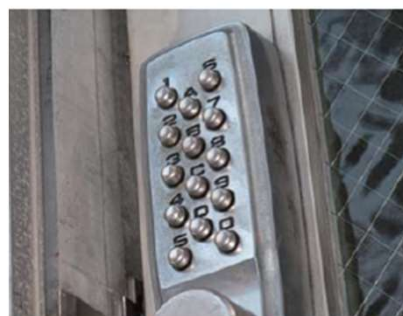
- ▶ "Cell-Funen" Non-Combustible lumbers
- ▶ "Cell-Funen" NC wood cray wall
- ▶ "Cell-Funen" NC Washi oriental papers

Flooring Materials

- ▶ "Cell-Funen" Non-Combustible lumbers
- ▶ "Cell-Funen" NC Tatami straw covering

Instruments

- ▶ Electric lock
- ▶ Air ventilation system/ Lightings
- ▶ Lithium portable power supply (AC100V 250A USB socket)
- ▶ Temporary toilet/ Deodorant unit
- ▶ Water-proof treatment overall





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