

# WOOD FIRST for ILC-related facilities building

## ECONOMIC RIPPLE EFFECT BY UTILIZING LOCAL WOOD IN THE CONSTRUCTION OF WOODEN DETECTOR PREPARATION BUILDING FOR THE ILC EXPERIMENT

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B) Iwate University

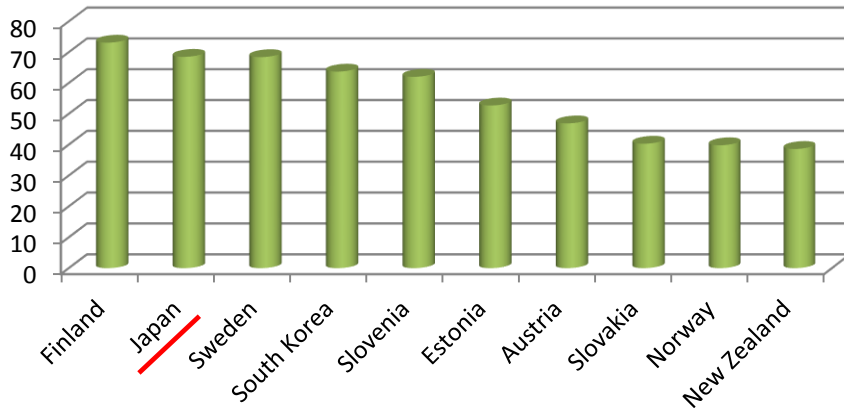
C) Iwate Prefectural Office

**Shelter**®  
Shelter Co.,Ltd.

 **岩手県**  
Iwate Prefecture

  
Iwate University

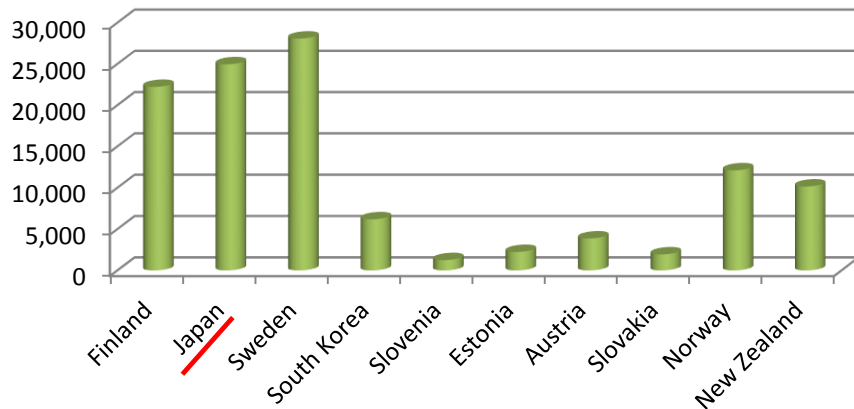
### Forest rate (%)



Forest rate in Japan is the world's second largest

Horyuji Temple, the world's oldest wooden five-storied pagoda (built in A.D.607)

### Forest area (10<sup>3</sup> ha)



Organization for Economic Co-operation and Development, OECD data





- The Shelter Corporation imagines a world of urban ‘forests’ - cities formed of timber-framed buildings.
- In our architectural and urban planning, we study and research our environment and environmental issues.

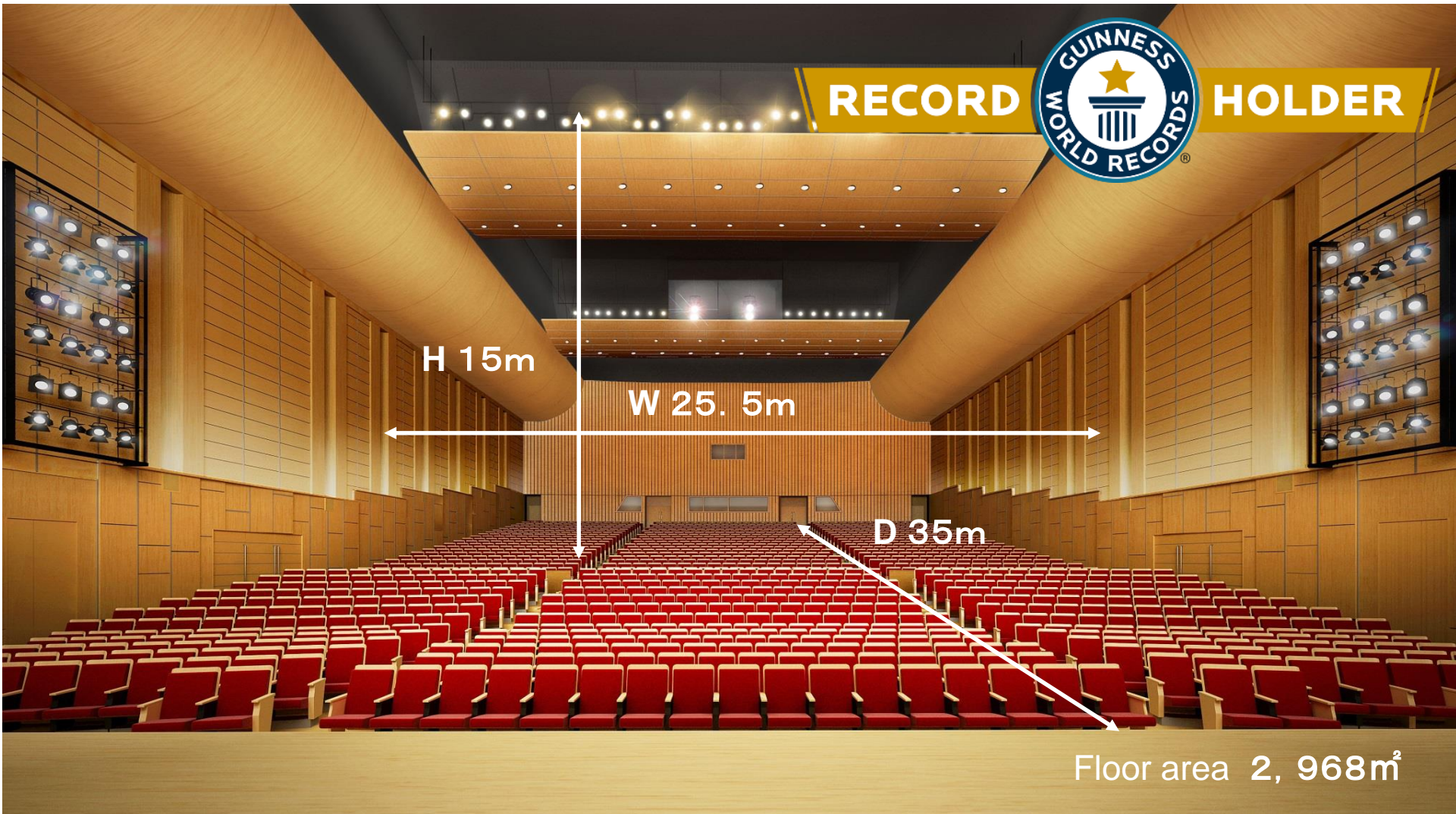
Examples of Shelter’s work:  
Town hall in Nan-yo city of  
Yamagata Prefecture





Number of seats:  
1403

- ① Locally produced wood
- ② Laminated timber production by local companies
- ③ Construction by local companies







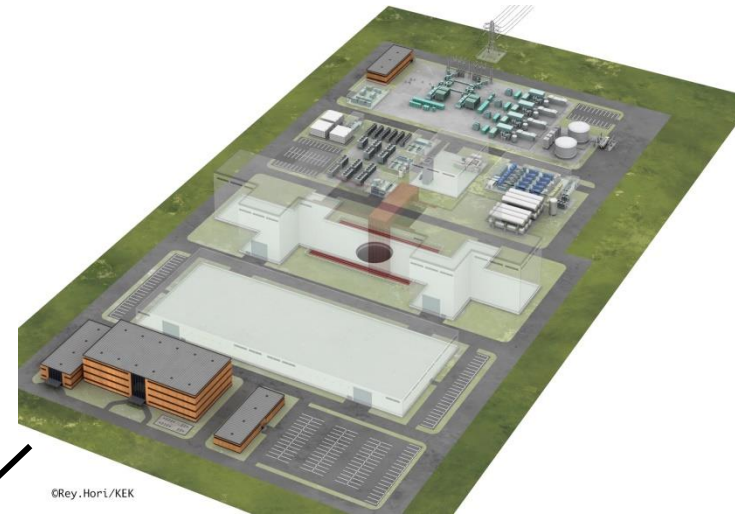


‘Green ILC city concept’ is based on 6 points.

- The research facilities will be built based on international consensus that pursue sustainability. ...1
- Second, we aim to realize a smart city that is based Green ILC. ...2
- A network of heat users will be built. ...3
- Community facilities for ILC related researchers and engineers, are also based on wooden architecture. ...4
- A system to circulate local resources and funds by local companies. ...5
- We make smart city that can enrich whole area by establishing recycling-base society. ...6



Surface facility  
A site specific design



©Rey.Hori/KEK

Collision point  
~8 Ha

Interaction Region

PM-10

electron linac

PM-8

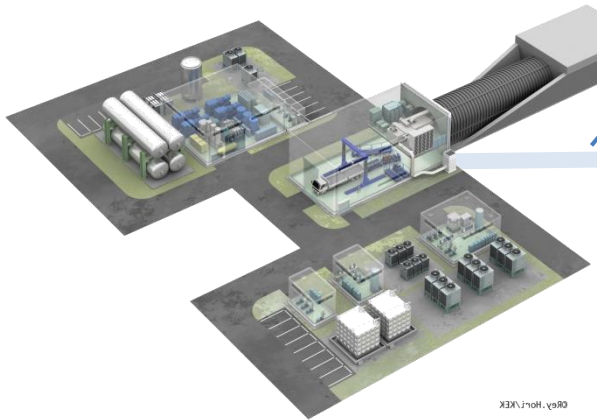
damping ring

PM+8

positron linac

PM+10

Linac and damping ring  
surface facilities  
1.7 Ha X 5point



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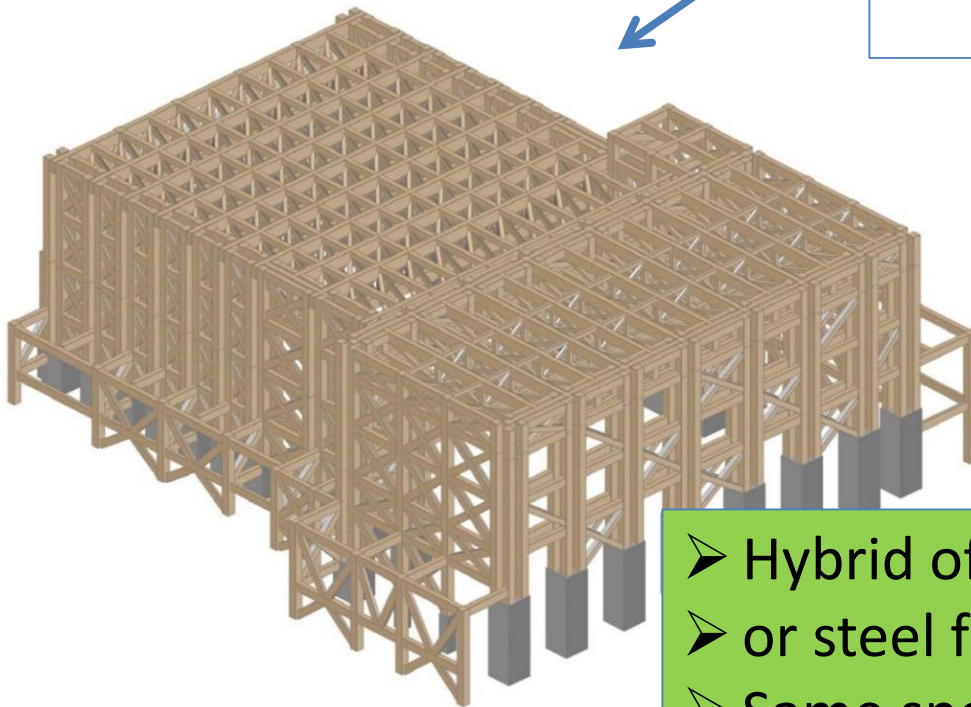
Precedents:  
SLS, Swiss Light Source, PSI



Shelter's experiences



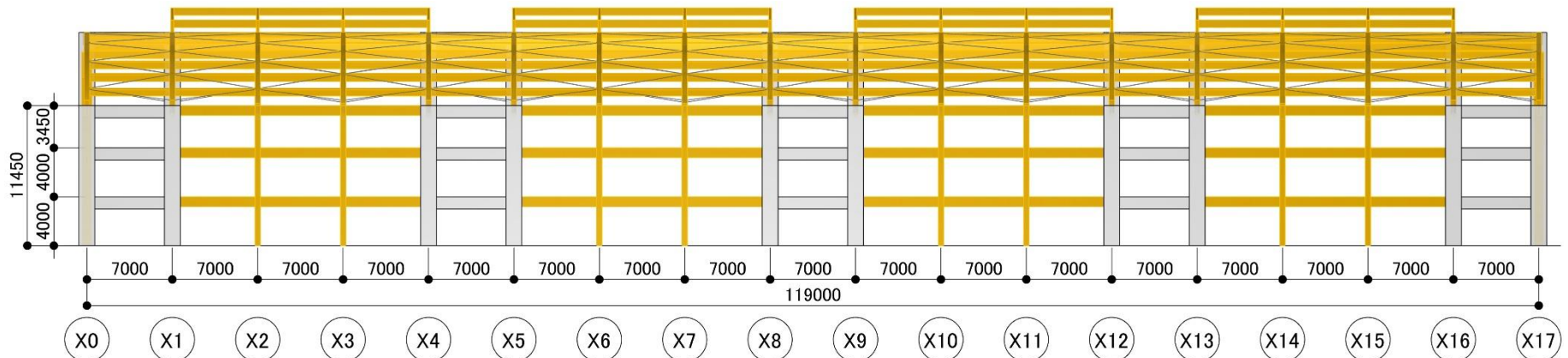
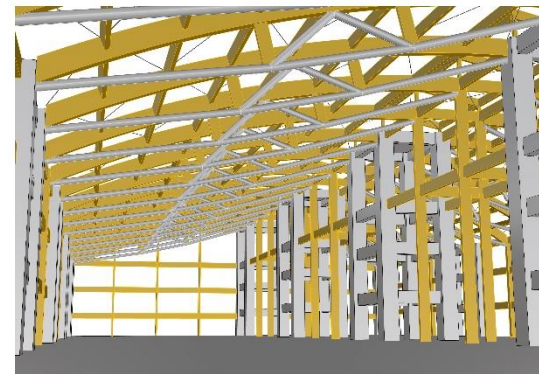
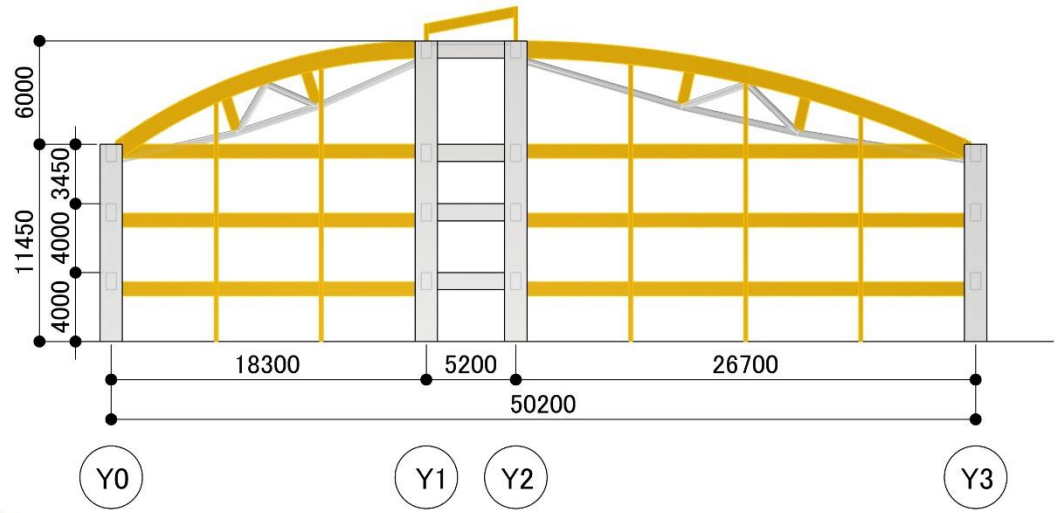
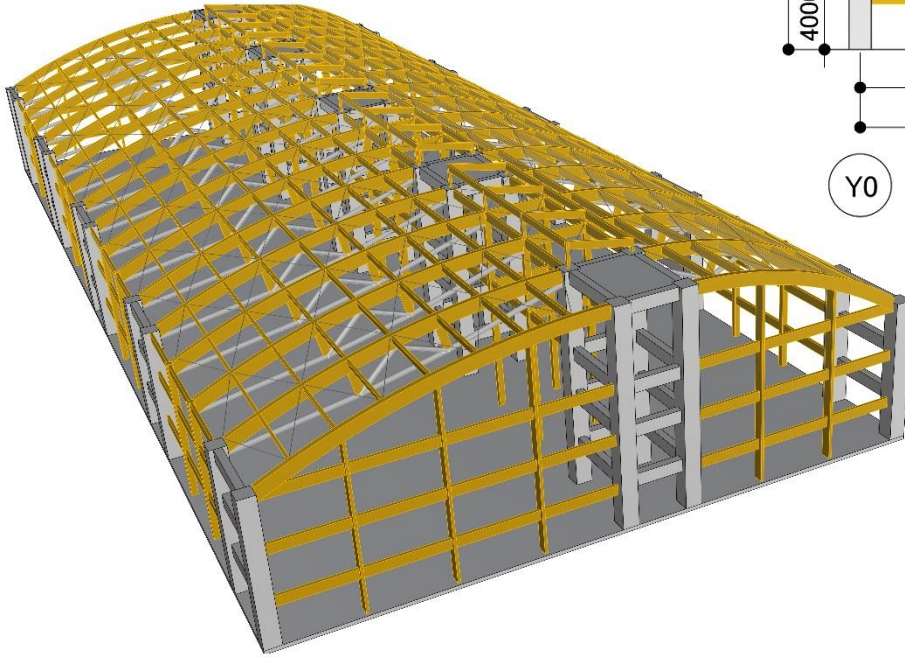
Adopt the KEK-ATF hall for a case study  
50m × 120m (6000m<sup>2</sup>)



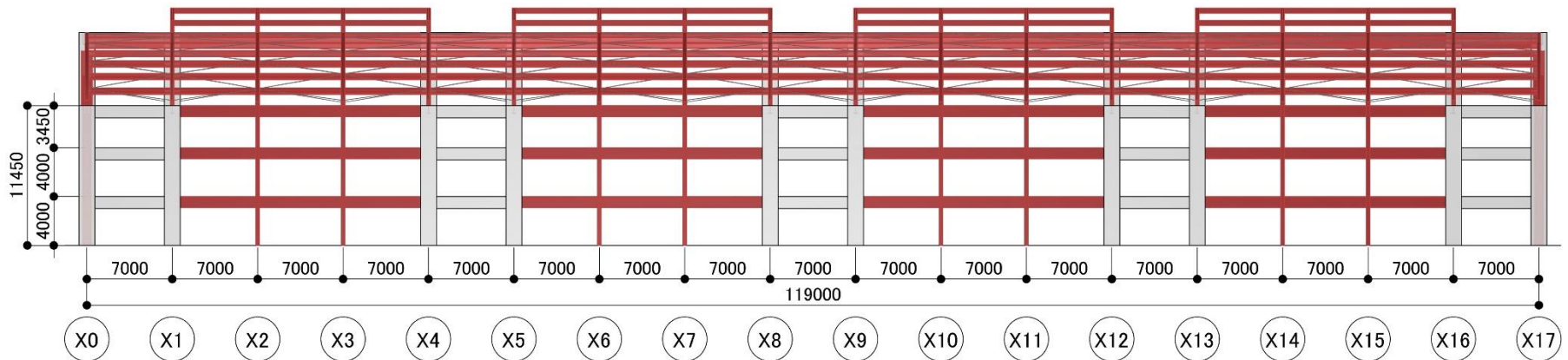
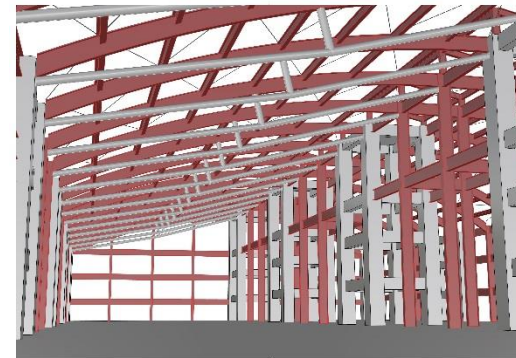
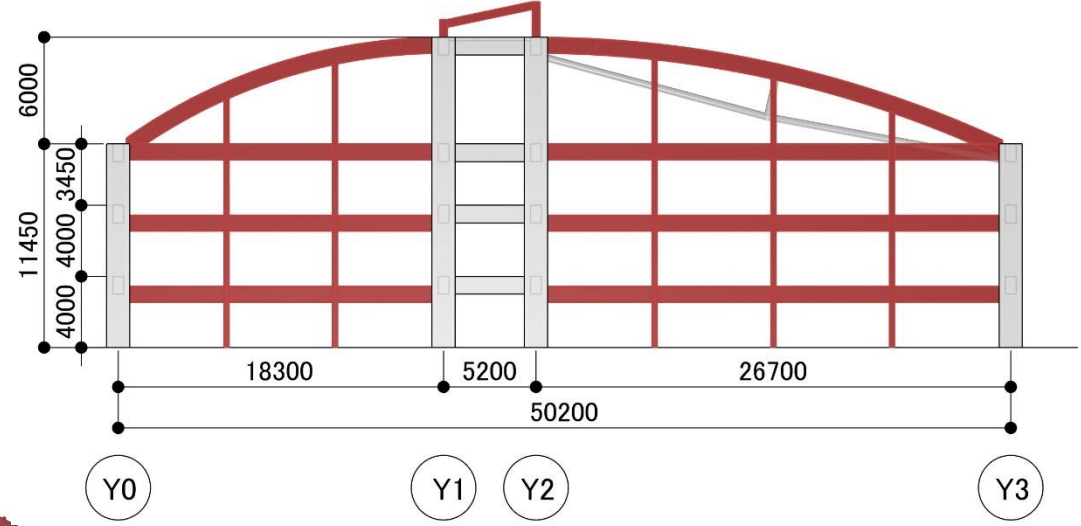
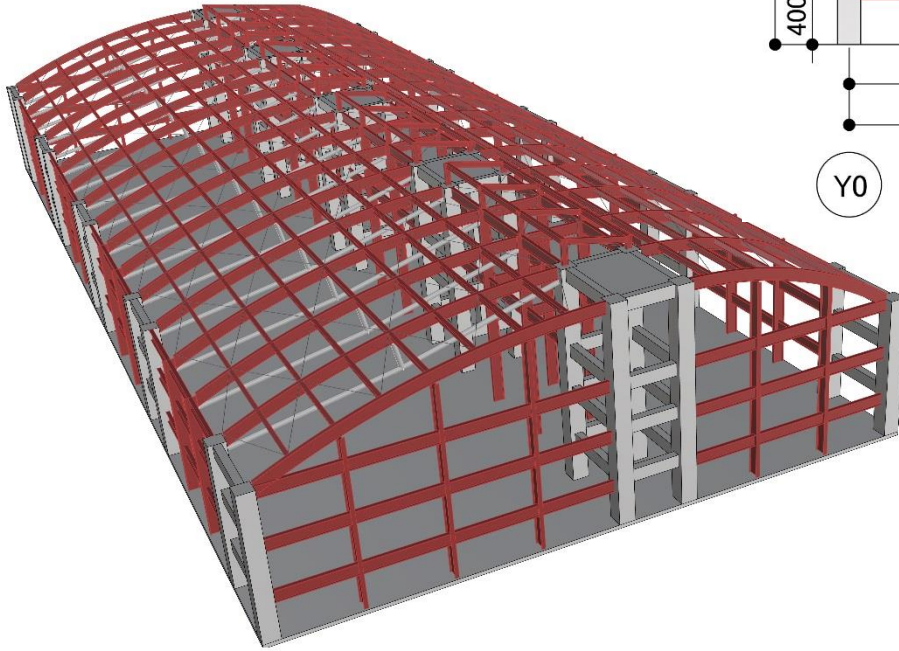
- Hybrid of wooden and reinforced concrete
- or steel frame and RC
- Same specifications, conditions



# Hybrid of wooden and reinforced concrete

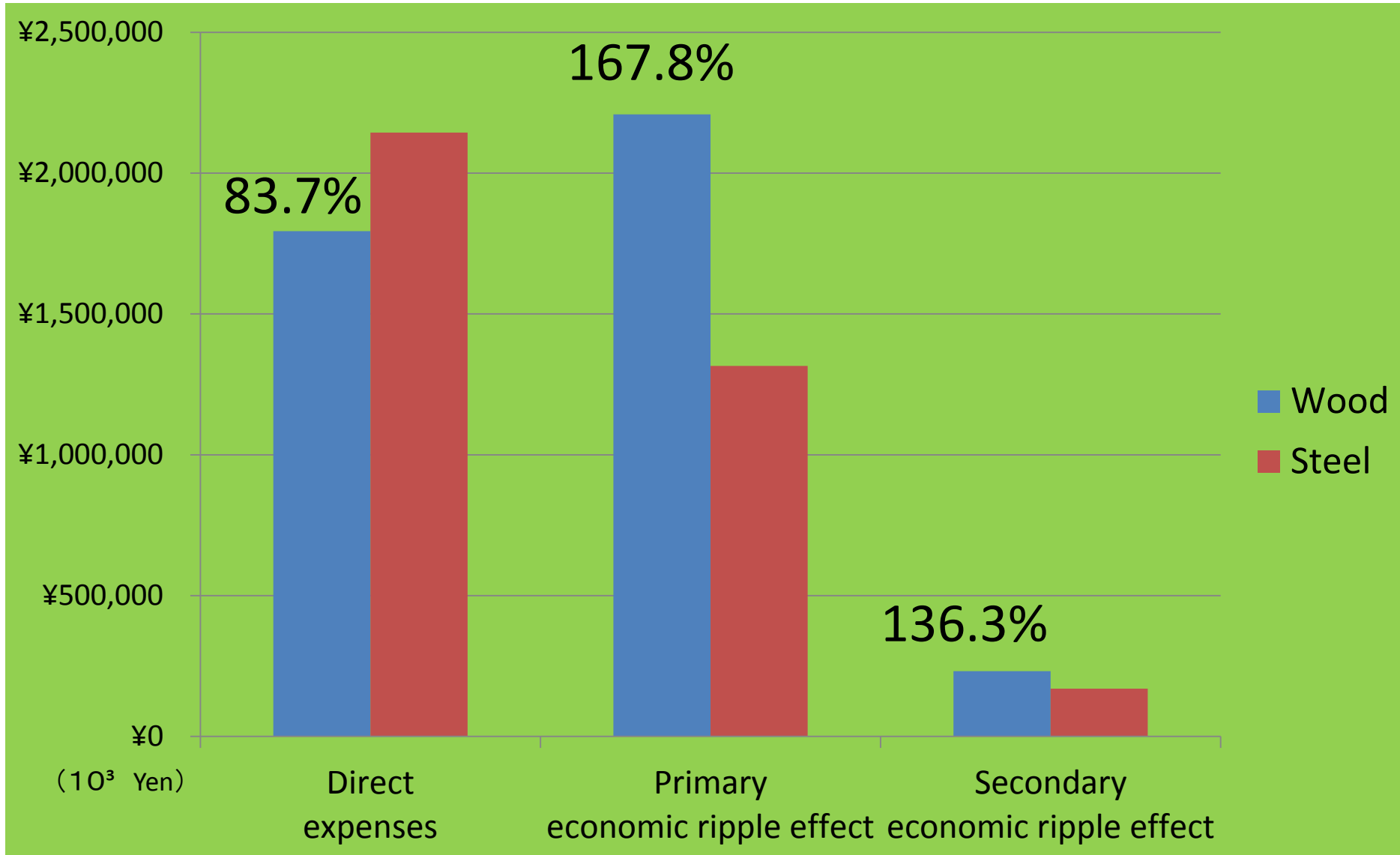


# Hybrid of steel frame and reinforced concrete





# Estimation of direct expenses and primary economic ripple effect



# Induced employment(person) and induced employees(person shown in parentheses)

	Employer-induced effect			
		Primary effect	Secondary effect	Total
Gluelam	The number of employed persons	155	18	173
	Number of employees in employed person	128	15	143
Steel	The number of employed persons	90	10	100
	Number of employees in employed person	78	7	85



# Summary of economical ripple effect

## ➤ Direct expenses

Wood (17.9 Billion yen) is **83.7%** of Steel (21.4 Billion yen)

## ➤ Economical ripple effect

Wood (2.2 Billion yen) is **167%** of Steel (1.3 Billion yen)

## ➤ Employer-induced effect

Wood (173 person) is **174 %** of Steel (100 person)

These are the results of following:

- ① Locally produced wood
- ② Laminated timber production by local companies
- ③ Construction by local companies

# Conclusions

- "Wood + RC" can have the same quality with "Steel + RC" such as strength, required construction period, and etc.. In addition, wooden building is friendly to people.
- Direct expenses of "Wood +RC" is 16.3 % cheaper than "Steel + RC". The steel price is not stable in Japan, because of the large amount of steel frame will be required in near future in Iwate for the semiconductor companies.
- Local industries are the main player of this business. The policy of "WOOD FIRST" is very friendly for the local society because of the economical ripple effect and Increase of employment.
- Increase in timber demand is increasing the number of unused biomass, which is important for "Green ILC strategy"





- We have been also working to make an urban design for ILC researchers, engineers and their families from all over the world.
- All houses will be made of local timbers by local companies.

Thank you  
for your attention

