

# Ergli Vocational School: An Integrated Approach

**Ervins Krauklis, architect, certified passive house designer**

K R A U K L I S  
G R E N D E



TEAM ECOCONSTRUCTION, LLP-LdV-TOI-  
2008-FR-117003

“ENERGIE et HABITAT” NAMUR

ERVINS KRAUKLIS, arch.  
PHL, EAV, LETTONIE

26.11.2010  
01-1



## Ērgļi Vocational School:

- Vocational school with 120 pupils established in 1960
  - most of the school buildings built 1965-1972; programs at Soviet period: agriculture machinery operation, truck drivers for Soviet Army, 380 pupils
  - Learning programs offered now:
    - Log house builder
    - Carpenter
    - Hotel service
    - Arboriculture
    - Several courses of adult education
- Pupils: 200-230



## Ērgļi Vocational School - problems:

- urgent need for refurbishment: poor condition of buildings, resulting in high energy bills, bad air quality and unstable (often 14-16°C) room temperatures during cold Latvian winter, overheating in summer; leaking roofs

- current “energy efficient” solutions: heating in two upper storeys (1500m<sup>2</sup>) of dormitory building switched off last year, workshops (2000m<sup>2</sup>) not heated at all! School can not pay full bill for its present energy demand.





## Ērgļi Vocational School - potential strengths:

- staff is active and energetic, and will not “give up without fight”
- more than 10 different projects realized, achieving real improvements of teaching process and technical equipment
- school was involved in several international projects of Leonardo Da Vinci Program. As result a new education program, “Arboriculture”, was introduced a few years ago
- production of garden furniture and simple timber frame buildings is organized at the school as a part of practice.

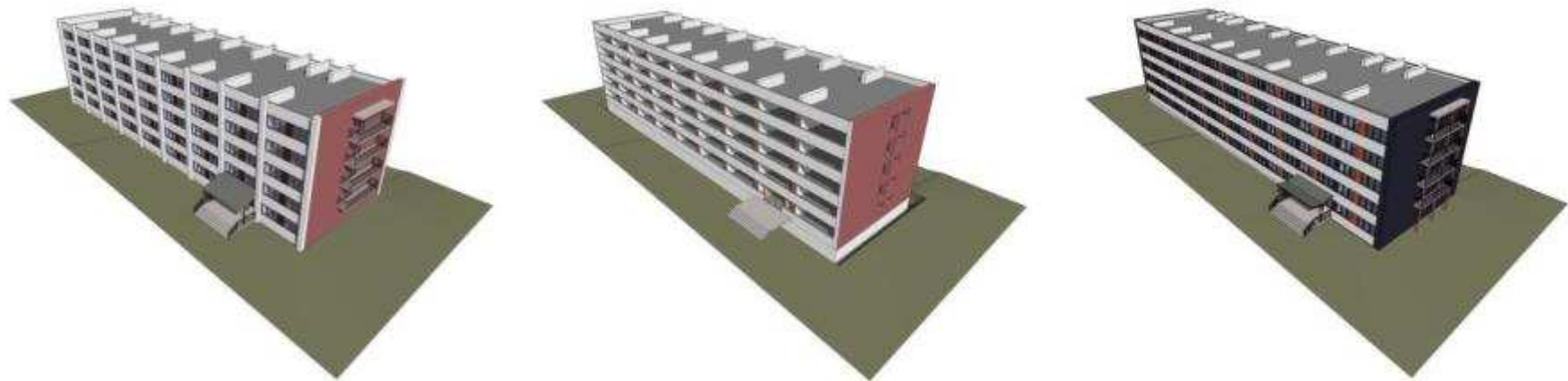
# How Can We Change Things To Better?

**A strong future vision is needed: we do it**

1. to reach the aims of CCFI in cutting greenhouse gas emissions,
2. realize refurbishment of school buildings as an PHI “EnerPHit” pilot project to comply with aims of EU: nearly zero-energy standard starting from 2020. Refurbishment can reach the same goals with reasonable efforts, and we are sure about that,
3. reach high comfort level and standards of working and learning environment with energy consumption as low as possible,
4. develop a resource center of low-energy refurbishment with environmentally friendly methods in cold Baltic climate.

# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

**A feasibility study on refurbishment of the dormitory building was made in autumn of 2009.**



# How Can We Change Things To Better?

**We need an event - a craftsmen pilot course:**

- to try our ideas,
- to share ideas,
- to try ourselves,
- to work together,
- to spread experience,
- to gain like-minded fellows and publicity.

# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: curriculum

Nr.	1	2	3	4	5
Diena	Pirmdiena	Otrdiena	Trešdiena	Ceturtdiena	Piektdiena
Datums	26.04.2010.	27.04.2010.	28.04.2010.	29.04.2010.	30.04.2010.
Vieta	EAV	EAV	EAV	EAV	EAV
Auditorija	...	...	...	...	...

Nr.	Laiks					
1	8:30 9:15	<b>Uzruna. Kursa ievadlekcija</b> <i>Andris Spaiļe, Ervins Krauklis</i>	<b>Termiskie tilti</b> <i>Agris Kamenders</i>	<b>Darbs darbnīcās. Rāmja elementi</b> <i>Lektori, māc. meistari</i>	<b>Darbs objektā. Rāmja montāža</b> <i>Lektori, mācību meistari</i>	<b>Pūšamās izolācijas iestrāde objektā</b> <i>Lektori, mācību meistari</i>
2	9:15 10:00	<b>Energoefektivitātes nozīme</b> <i>Ervins Krauklis</i>	<b>Siltumizolācijas ierīkošana</b> <i>Agris Kamenders</i>	<b>Darbs darbnīcās. Rāmja elementi</b> <i>Lektori, māc. meistari</i>	<b>Darbs objektā. Loga montāža</b> <i>Lektori, mācību meistari</i>	<b>Pūšamās izolācijas iestrāde objektā</b> <i>Lektori, mācību meistari</i>
	10:00 10:20	Kafijas pauze	Kafijas pauze	Kafijas pauze	Kafijas pauze	Kafijas pauze
3	10:20 11:05	<b>Zema energopatēriņa (ZEP) ēkas</b> <i>Ervins Krauklis</i>	<b>Logu montāža</b> <i>Krists Slokenbergs</i>	<b>Darbs darbnīcās. Rāmja elementi</b> <i>Lektori, māc. meistari</i>	<b>Darbs objektā. Loga montāža</b> <i>Lektori, mācību meistari</i>	<b>Pūšamās izolācijas iestrāde objektā</b> <i>Lektori, mācību meistari</i>
4	11:05 11:50	<b>ZEP ēku konstrukcijas</b> <i>Ervins Krauklis</i>	<b>Ārdurvju montāža</b> <i>Krists Slokenbergs</i>	<b>Darbs objektā. Rāmja montāža</b> <i>Lektori, māc. meistari</i>	<b>Darbs objektā. Loga montāža</b> <i>Lektori, mācību meistari</i>	<b>Kvalitātes kontrole objektā</b> <i>Lektori, mācību meistari</i>
	11:50 13:30	Pusdienas	Pusdienas	Pusdienas	Pusdienas	Pusdienas
5	13:30 14:15	<b>Ekoloģija būvniecībā</b> <i>Kārlis Kazāks</i>	<b>Kvalitātes kontrole</b> <i>Ervins Krauklis</i>	<b>Darbs objektā. Rāmja montāža</b> <i>Lektori, māc. meistari</i>	<b>Darbs objektā. Izolācija, apšūšana</b> <i>Lektori, mācību meistari</i>	<b>Kvalitātes kontrole objektā</b> <i>Lektori, mācību meistari</i>
6	14:15 15:00	<b>Ekoloģiski būvmateriāli</b> <i>Kārlis Kazāks</i>	<b>Kvalitātes kontrole</b> <i>Agris Kamenders</i>	<b>Darbs objektā. Rāmja montāža</b> <i>Lektori, māc. meistari</i>	<b>Darbs objektā. Izolācija, apšūšana</b> <i>Lektori, mācību meistari</i>	<b>Kvalitātes kontrole objektā</b> <i>Lektori, mācību meistari</i>
	15:00 15:20	Kafijas pauze	Kafijas pauze	Kafijas pauze	Kafijas pauze	Kafijas pauze
7	15:20 16:05	<b>Fibrolīts</b> <i>Andris Pavītols</i>	<b>Praktisko darbu apraksts</b> <i>Ervins Krauklis</i>	<b>Salmu mājas</b> <i>Andris Šillers, Aleksandrs Ļubinskis</i>	<b>Darbs objektā. Izolācija, apšūšana</b> <i>Lektori, mācību meistari</i>	<b>Kopsavilkums</b> <i>Lektori</i>
8	16:05 16:50	<b>Fibrolīts</b> <i>Andris Pavītols</i>	<b>Praktisko darbu instruktāža</b> <i>Mācību meistari</i>	<b>Salmu mājas</b> <i>Andris Šillers, Aleksandrs Ļubinskis</i>	<b>Darbs objektā. Izolācija, apšūšana</b> <i>Lektori, mācību meistari</i>	<b>Kopsavilkums</b> <i>Lektori</i>
	16:50 17:10	Kafijas pauze	Kafijas pauze	Kafijas pauze	Kafijas pauze	Kafijas pauze
9	17:10 17:55	<b>Ekoloģiski būvmateriāli</b> <i>Ražotāju prezentācijas. Diskusija</i>	<b>Praktisko darbu plānošana</b> <i>Diskusija</i>	<b>Salmu mājas. Praktiskie darbi</b> <i>Andris Šillers, Aleksandrs Ļubinskis</i>	<b>Ekoloģiski būvmateriāli</b> <i>Ražotāju prezentācijas. Diskusija</i>	<b>Noslēgums, saviesīgs vakars</b> <i>Dalībnieki, lektori, meistari</i>



# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: curriculum

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Nr.	Laiks					
1	8:30 9:15	THEORY	THEORY	PRACTICE	PRACTICE	PRACTICE
2	9:15 10:00					
	10:00 10:20					
3	10:20 11:05					
4	11:05 11:50	THEORY	PRACTICE	PRACTICE	PRACTICE	PRACTICE
	11:50 13:30					
5	13:30 14:15					
6	14:15 15:00					
	15:00 15:20	THEORY	PRACTICE	THEORY	PRACTICE	THEORY AND TEST
7	15:20 16:05					
8	16:05 16:50					
	16:50 17:10					
9	17:10 17:55	THEORY	THEORY	DIFFERENT PRACTICE	PRACTICE	THEORY AND TEST
				FUN		DINNER

# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: the demonstration wall



# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: lecturers and practice leaders

- 3 course lecturers: Energy Efficiency, Passive House Concept, Building Physics, Green Building, Ecology of Materials;
- 1 lecturer/leader of Airtightness, Blower door and Thermography practice,
- 3 lecturers representing material/component production companies: Windows and Window Installation, Fibrolite, Glass Wool (Isover)
- 2 special Building With Straw course and practice leaders,
- 2 leaders of Demonstration Wall practice, one of them with experience in Passive House construction,
- cellulose insulation demonstration: 2 people representing material production and one - insulation company

# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: the logistics





# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: motivation letter, flyer and application



The application form is titled "Apmācība kārns „Energoefektīva renovācija ar ekobūvniecības paņēmieniem”" (Training course "Energy-efficient renovation with eco-construction methods"). It includes a header with logos and a section for the applicant's personal information, including name, address, and contact details. The form also has a section for the applicant's motivation and a section for the course coordinator's signature. The form is dated 2010. gada 24. novembris.



# Craftsmen course of energy efficient refurbishment with eco-construction methods, Project Team Ecoconstruction

## Planning of the course: participants

**13 participants:**

- 1 architect,
- 2 civil engineers from design companies,
- 1 student engineer,
- 2 civil engineers from construction companies,
- 3 craftsmen,
- 1 energy consultant

# And Finally: The Course!



**Agris  
Kamenders, Mg.  
Sc. Ing., RTU  
Building Physics**

## And Finally: The Course!



**People could be skeptical at the beginning –**  
*What can we learn from this theory guy?*



## And Finally: The Course!



**Arturs Gredzens,**  
*Artiva,*  
**Blower Door,**  
**Airtightness and**  
**Thermography**  
**Practice**

## And Finally: The Course!



**Practical things  
are always  
interesting,  
*Aleksandrs  
Budigins,  
participant***



## And Finally: The Course!



**What will be the difference?**

## And Finally: The Course!



Leakage of this room exceeds Latvian legislation 6 times, *Kārlis Apinis*

**Building Physics**

20.11.2010

01-20

## And Finally: The Course!



**Demonstration  
wall is started**



## And Finally: The Course!



**Intars Šulcs,**  
*builder of the  
first Latvian  
passive house,  
leader of  
practical part*



## And Finally: The Course!



**Window  
mounting frame  
is assembled**



## And Finally: The Course!



**Agris  
Kamenders:  
lecturers can be  
helpful, too**

## And Finally: The Course!



**Little participant**



## And Finally: The Course!



Window frame is ready...

## And Finally: The Course!



**...and at place in  
5 minutes. No  
foam used, no  
additional  
leveling  
needed**



## And Finally: The Course!



**Airtightness  
tape tried, too**



## And Finally: The Course!



Frame elements  
in process



## And Finally: The Course!



Frame structure  
in process

## And Finally: The Course!



It's lunchtime



## And Finally: The Course!



**Building With  
Straw Lecture:  
try something  
completely  
different!**



## And Finally: The Course!



**Building With  
Straw Practice:  
try something  
completely  
different!**

## And Finally: The Course!



**Building With  
Straw Practice:  
try something  
completely  
different!**



## And Finally: The Course!



**Back at the  
demonstration  
wall**



## And Finally: The Course!



**Different  
materials tried**



## And Finally: The Course!



**Different  
materials tried**

## And Finally: The Course!



Everybody's in a hurry



## And Finally: The Course!



Cellulose  
blowing  
machine

## And Finally: The Course!



**Cellulose is  
ready**



## And Finally: The Course!



**Cellulose  
blowing**



## And Finally: The Course!



**Cellulose  
blowing can be  
observed  
through special  
windows in the  
structure**

## And Finally: The Course!



**Fibrolite made in Latvia.**  
**Some more theory about fire resistance issues**



## And Finally: The Course!



**Demonstration  
wall finalized**

## And Finally: The Course!



Final test in  
process



## And Finally: The Course!



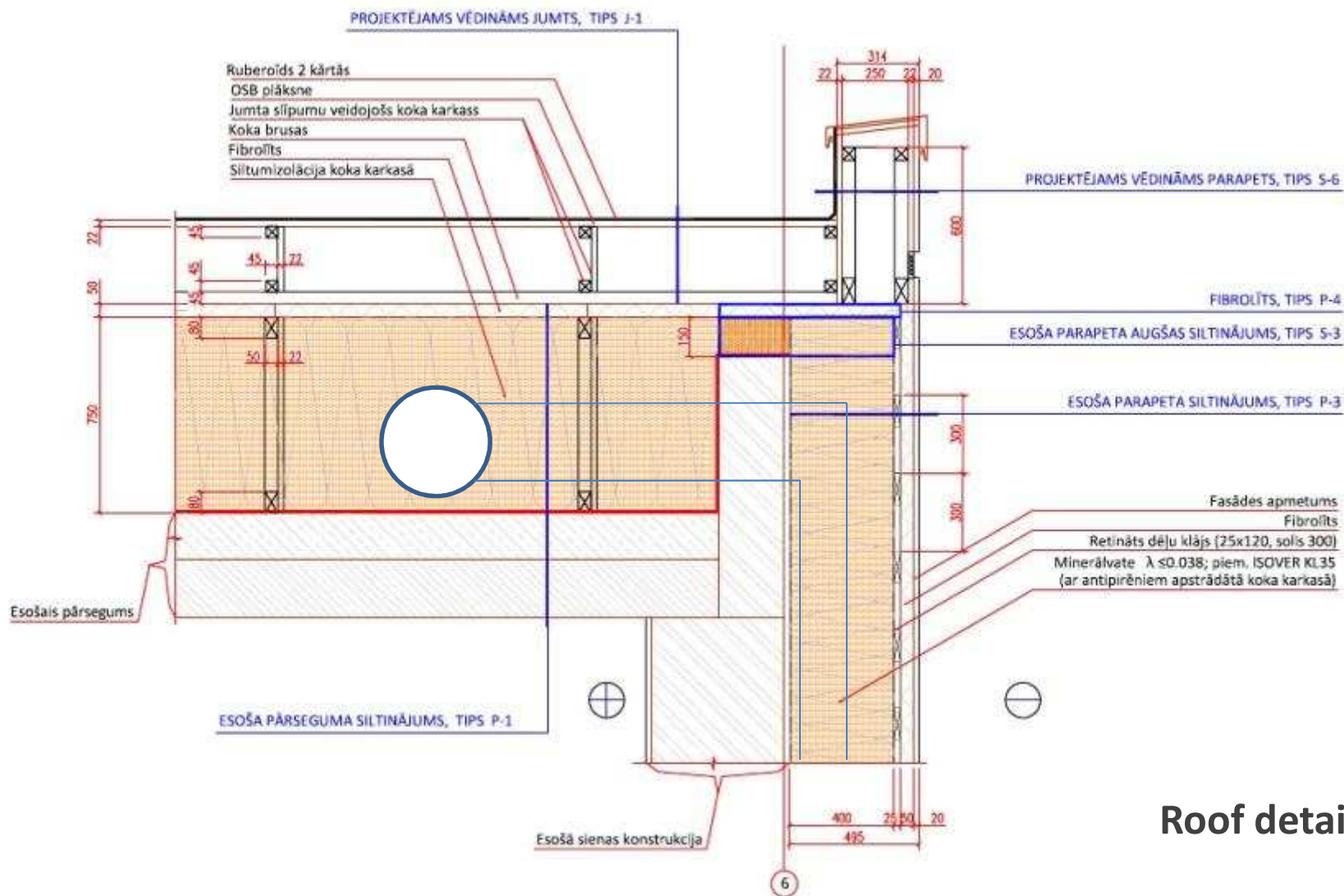
**Certificates  
issued: all  
participants  
passed the test!**

Dormitory building  
refurbishment is  
designed to reach  
“EnerPHit” standard  
of Passive House  
Institute



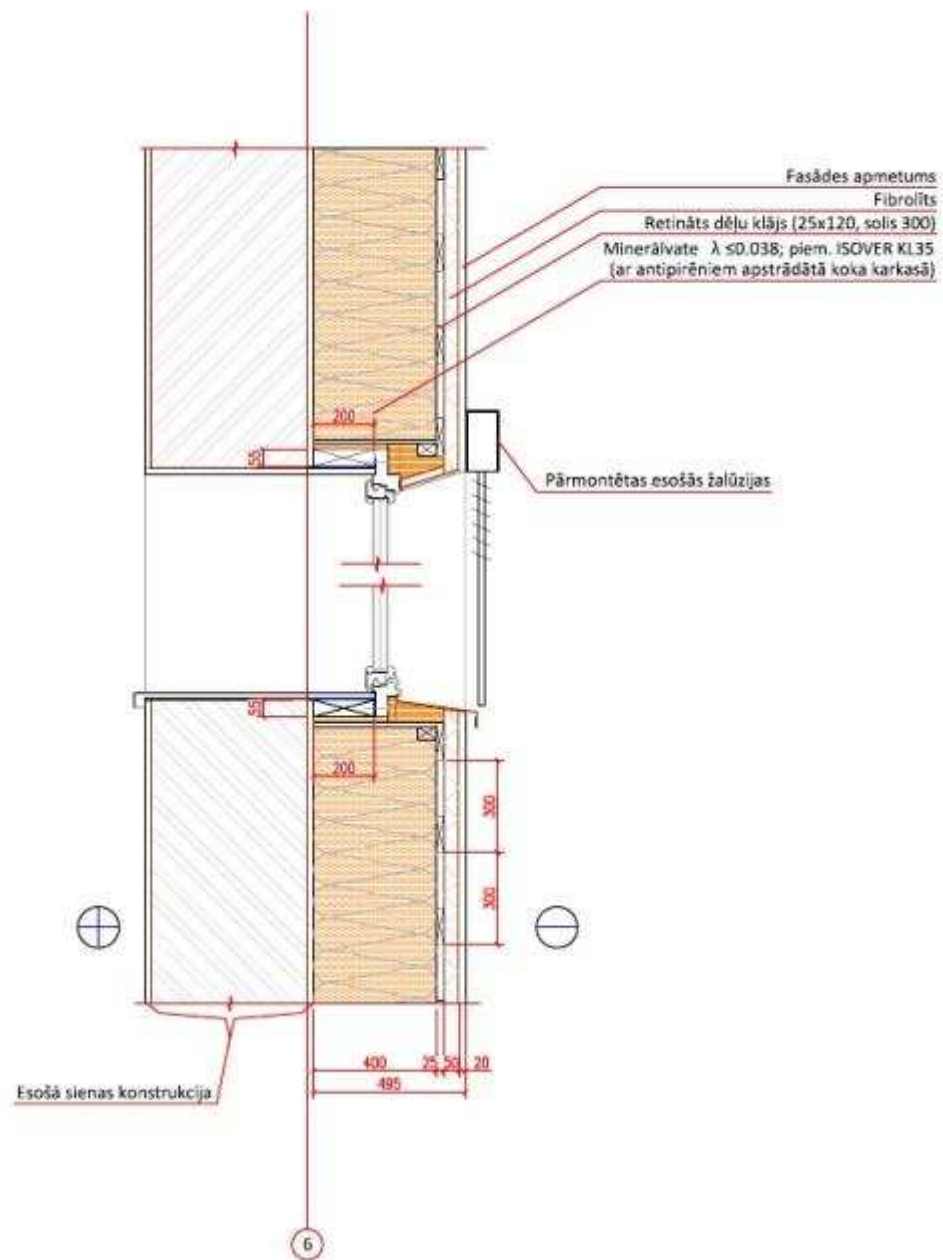
1 Perspektīve 1



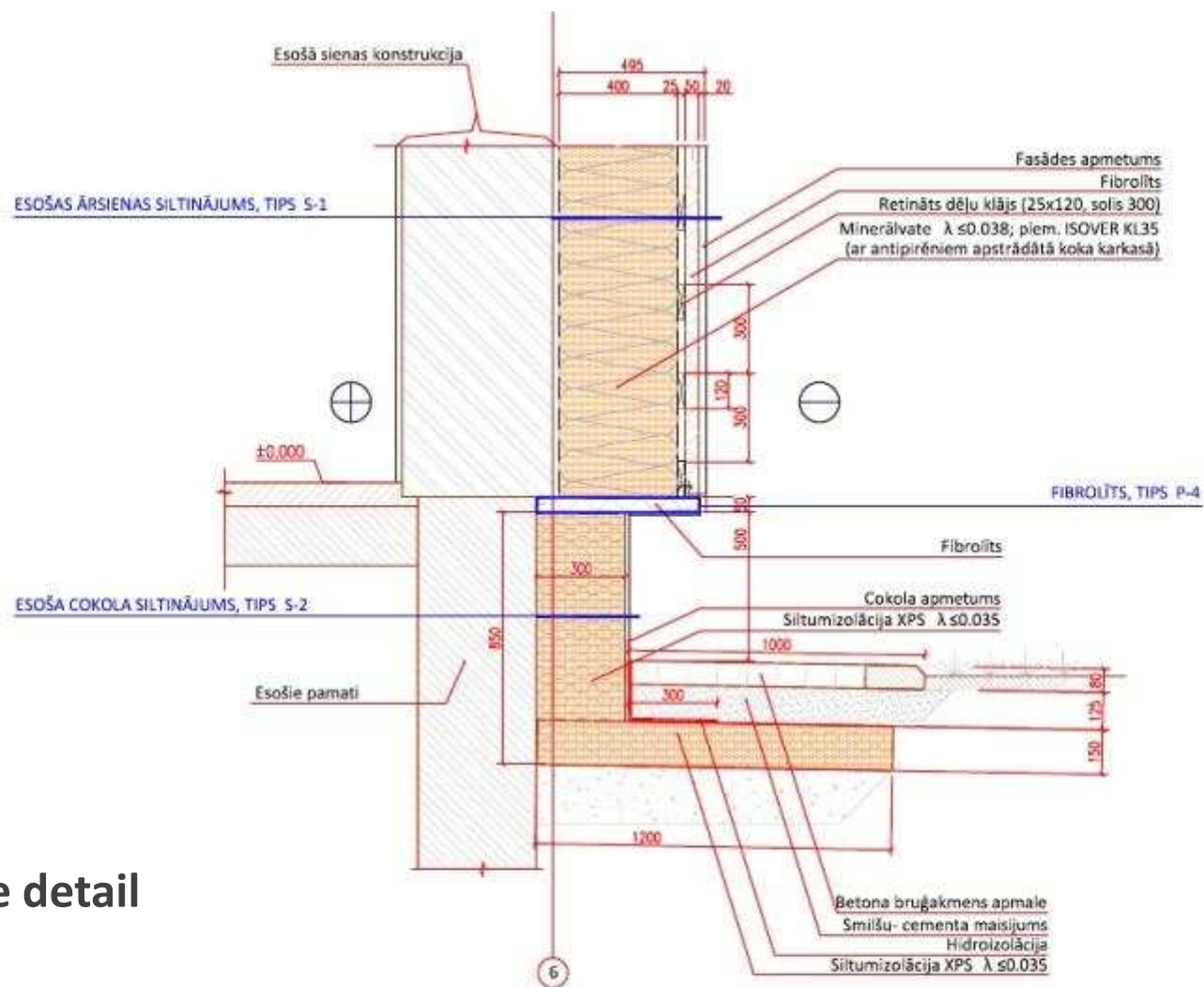


**Roof detail 1**

## Window detail

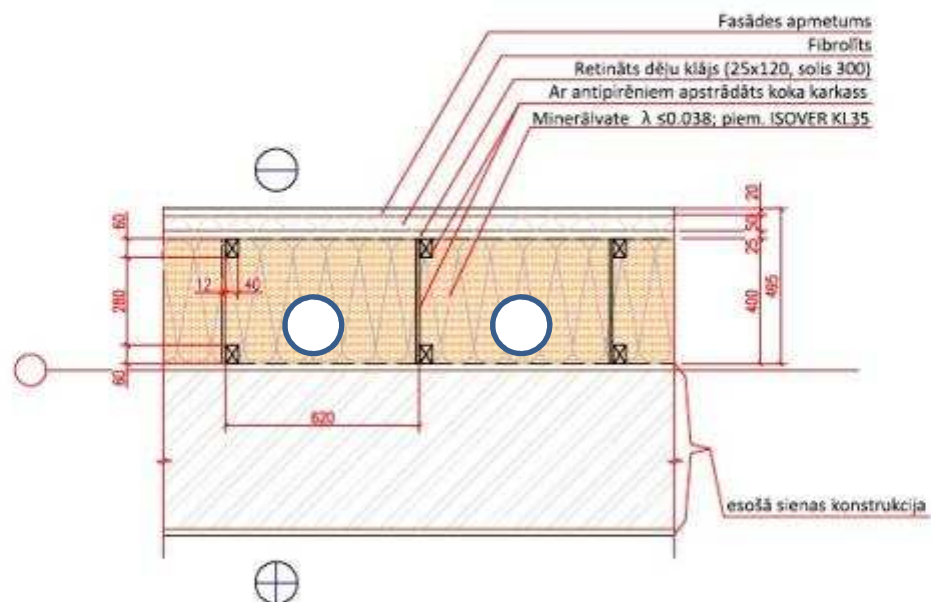






Sockle detail

HORIZONTĀLAIS SIENAS GRIEZUMS 1-1 M1:20  
ESOŠAS ĀRSIENAS SILTINĀJUMS, SIENAS TIPS S-1





# Target:



# Thank You!



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[eav@ergliarods.lv](mailto:eav@ergliarods.lv)

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G R E N D E

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Passive House Latvija  
[WWW.PASSIVEHOUSE.LV](http://WWW.PASSIVEHOUSE.LV)