



LOW ENERGY AND PASSIVE HOUSING

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The Public Housing Fund of the Municipality of Ljubljana

Ljubljana, december 2008

LOW ENERGY AND PASSIVE HOUSING



- ▶ **The Public Housing Fund of the Municipality of Ljubljana (Housing Fund) is maintaining about 3200 dwellings which are located in 1225 buildings,**
- ▶ **The buildings belong to different age, from middle ages until now,**
- ▶ **In those buildings running costs are rather high, which depend of the facade quality and installations quality,**
- ▶ **The main part of costs are specially the costs for energy supply (heating, hot water),**
- ▶ **To pay running cost in proper time are regularly the matter of bickers between tenants and house managers.**



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- **Because of low material conditions of the tenants The Housing Fund has to take over running costs that are not paid by some of them,**
- **To avoid problems in future The Housing Fund decided to find solutions how to reduce necessary costs and to make them as much economical as possible,**
- **It was decided to build the houses which separate dwellings are energy independent and in the same time the whole house has to meet higher environment standards,**
- **The decision was also in line with EU and Slovenian policy on sustainable development.**

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Collaboration with:

- ▶ **ZRMK , Building and Civil Engineering Institute, Ljubljana**
- ▶ **Faculty of Civil and Geodetic Engineering, UL**

Collaboration in programmes and projects:

- ▶ **Bulding Energy Certificate, Building and Civil Engineering Institute, Ljubljana**
- ▶ **How to restrict running costs in the blocks of flats that belong to the Municipality, Building and Civil Engineering Institute, Ljubljana**
- ▶ **5th FW, Projekt SUNRISE, Faculty of Civil and Geodetic Engineering, UL**
- ▶ **Programme EU IEE 2005 (Intelligent Energy - Europe), Energy Efficient Retrofitting – Training Courses for Social Housing Companies**
- ▶ **Programme COST, C23 L-CUBE**
- ▶ **Program EU IEE 2005 (Intelligent Energy - Europe), REBECCE – Renewable Energy and Building Exhibitions in the Enlarged Europe**









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Rebecee activities in Ljubljana 2007-2008:

Large scale of promotion activities and dissemination:

- realization of presentations of Rebecee aims through a lot of (20) events, conferences, workshops, exhibitions and media coverage,
- school event were carried out with 16 elementary and 6 high schools at the Technical museum Bistra,
- web site Rebecee.si was opened,
- 2008 exhibition in LJ. was carried out including coverage of several generated projects into the exhibition programme,
- many project's partners joined the project as exhibition partners and as sponsors.

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Rebecee activities in Ljubljana 2007-2008:

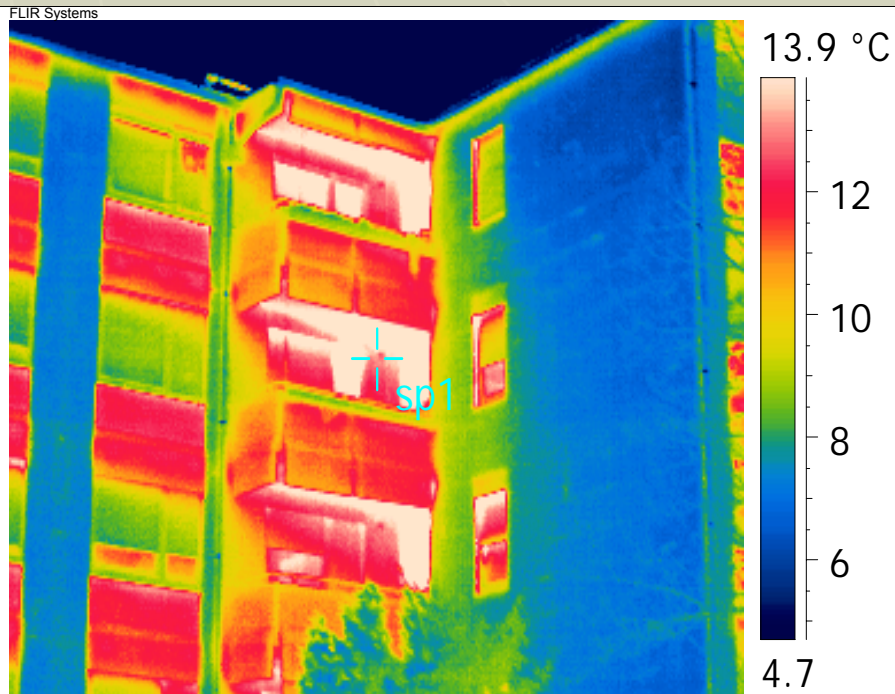
Realisation of architectural exhibition projects:

- ▶ **completed refurbishment of STELETOVA 8**
- ▶ **completed refurbishment of KVEDROVA 17**
- ▶ **completed designs for low energy housing in POLJE II**
- ▶ **completed designs for passive building in PIPANOVA road**
- ▶ **building permit procedure for both projects**
- ▶ **completed 15 one family houses STOŽICE, refurbishment in KAŠELJ, many LE and P houses**

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Steletova 8 ➤ 60 dwellings
➤ 1.800 m²



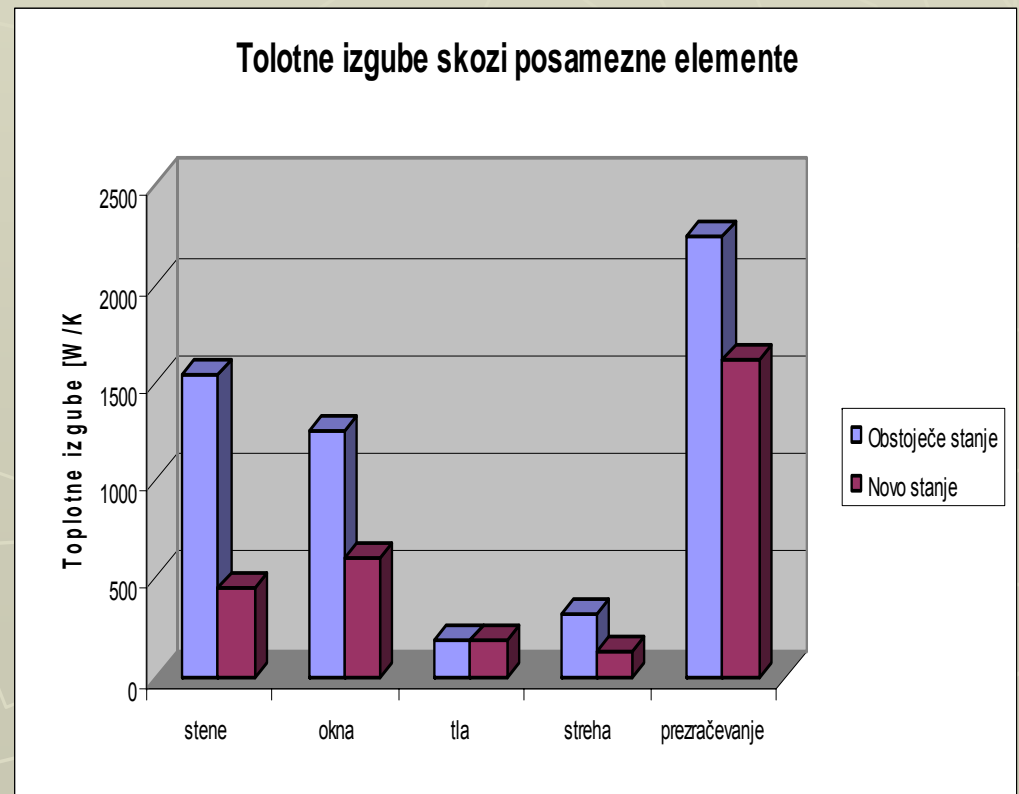
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Stoletova 8

- ▶ use of energy before refurbishment
- ▶ use of energy before/after refurbishment

A	25-40 kWh/m²
B	40-55 kWh/m²
C	55-70 kWh/m²
D	75-85 kWh/m²





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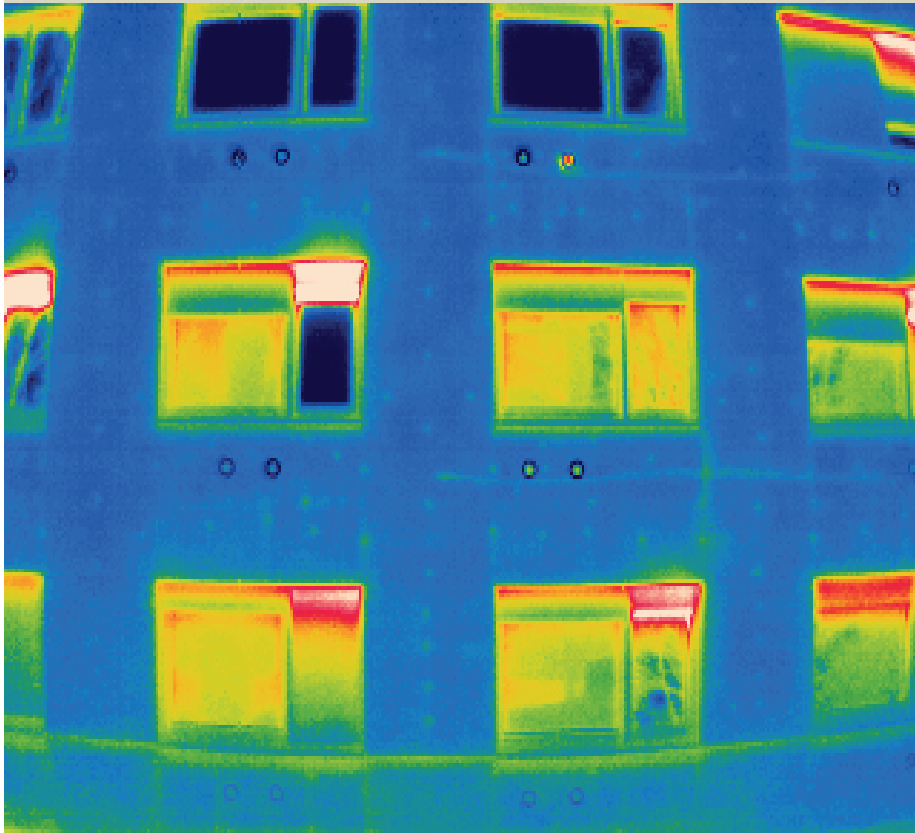
Accomplished measures at Steletova 8:

- additional thermal insulation on exterior walls, + 15 cm
- additional thermal insulation of the basement ceiling, + 8 cm
- additional thermal insulation of the attic ceiling, + 22 cm
- replacement of windows and facade doors with energy efficient products ($U=1,5 \text{ W/m}^2\text{K}$)
- application of external thermal shutters
- sanitation of balcony thermal bridges

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Steletova 8

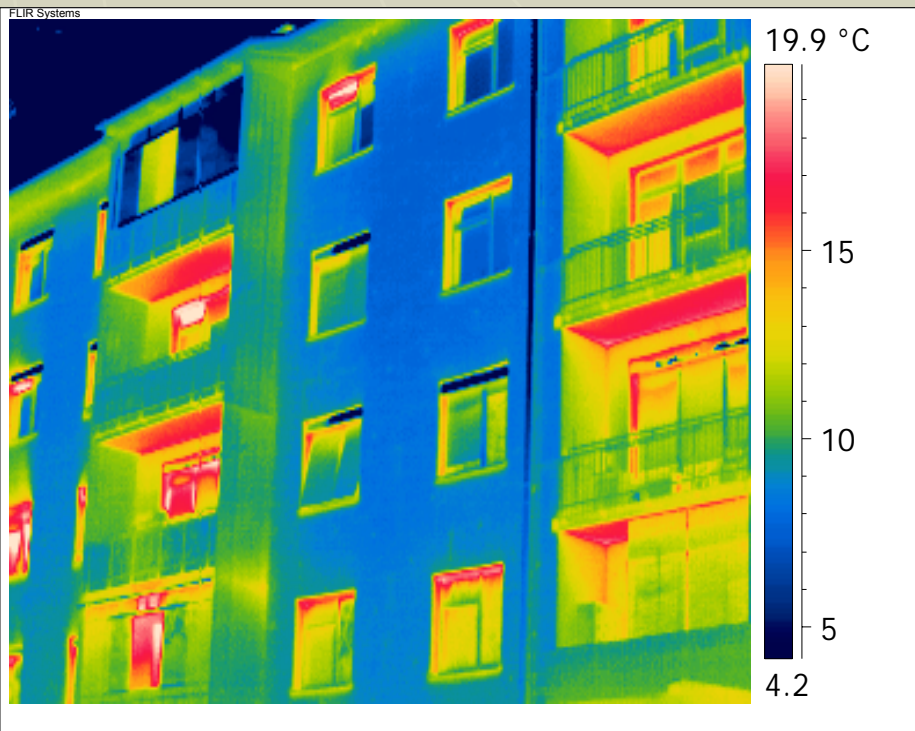


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Kvedrova 17

- ▶ 20 dwellings
- ▶ 1.000 m²



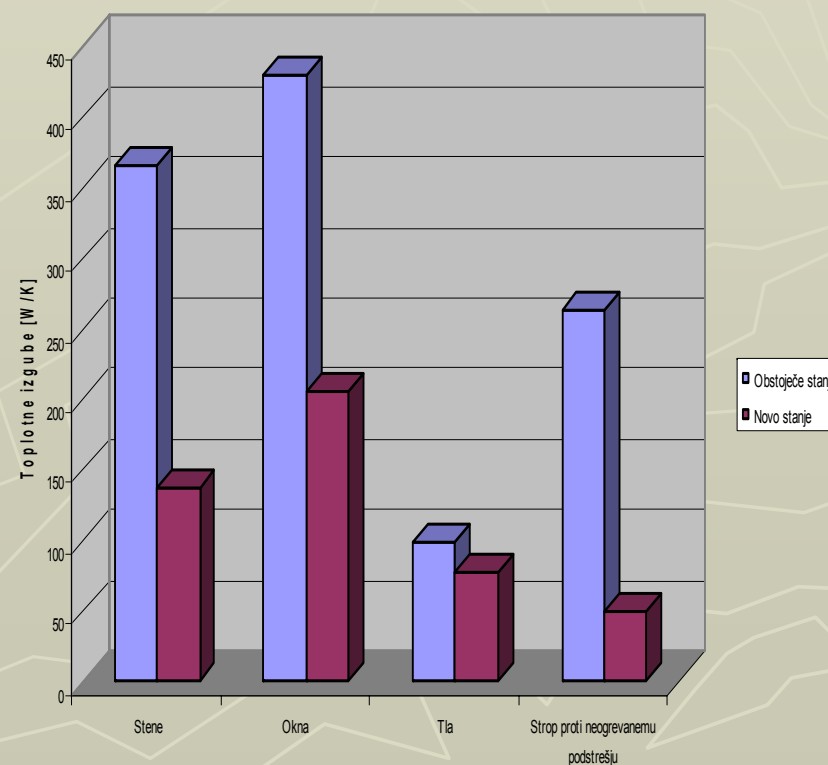
LOW ENERGY AND PASSIVE HOUSING



Kvedrova 17

- ▶ use of energy before refurbishment
- ▶ use of energy before/after refurbishment

A	25-40 kWh/m²
B	40-55 kWh/m²
C	55-70 kWh/m²
D	75-85 kWh/m²



LOW ENERGY AND PASSIVE HOUSING



Accomplished measures at Kvedrova 17:

- additional thermal insulation on exterior walls, +10 cm
- additional thermal insulation of the basement ceiling, + 8 cm
- additional thermal insulation of the attic ceiling, + 20 cm
- replacement of windows and facade doors with energy efficient products ($U=1,5 \text{ W/m}^2\text{K}$)
- application of external thermal shutters
- sanitation of balcony thermal bridges

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Kvedrova 17

LOW ENERGY AND PASSIVE HOUSING



**Kvedrova 17
Steletova 8**

- **application of
mechanical
ventilation
system with
75% heat
recovery**



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POLJE II

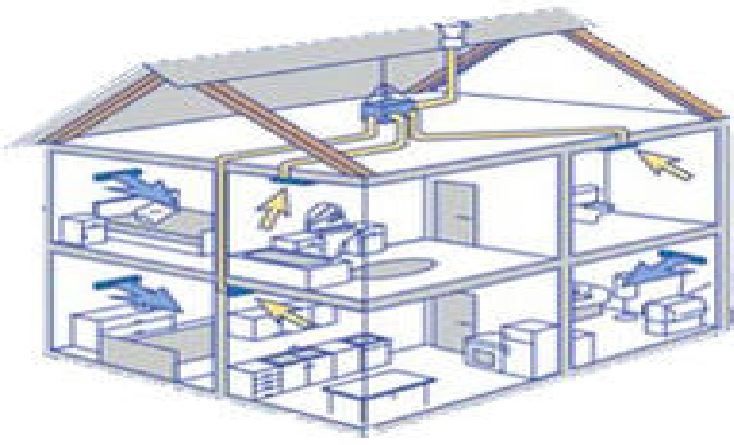


- All blocks:
LE standard,
hygro sensible
ventilation,
local collective
energy preparation
- One block:
thermal solar
system,
50 m² of solar
collectors
PV installation, 12kW

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POLJE II



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POLJE II



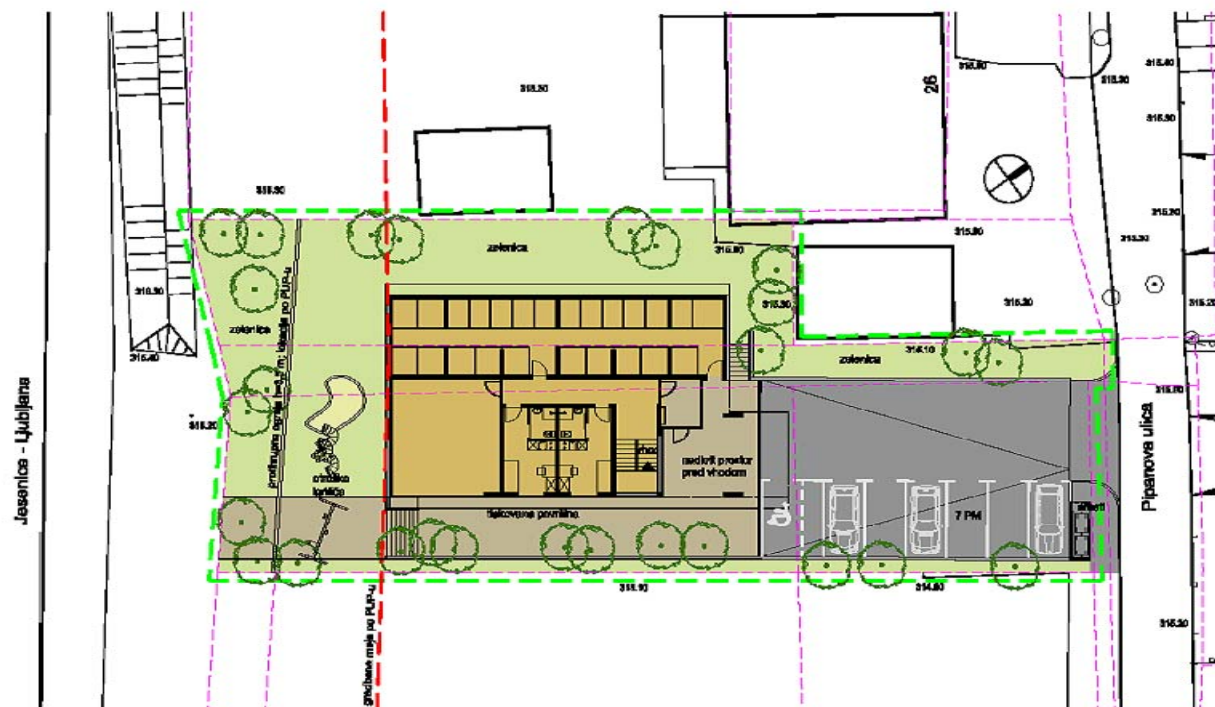


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Pipanova road

NEPROJEKTNÁ STAVBYNÁJA - DRUHÉ EROTE V RENTVIDU

NATEČAL, JANUÁR 2027



DANS ARCHITECT, NOVÝ TRH 8, LILBLANA

SITUACIA 1:200

- building in passive standard
- PV instalation, 12kW
- central ventilation system with costantly delivered fresh air

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Pipanova road



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Pipanova road



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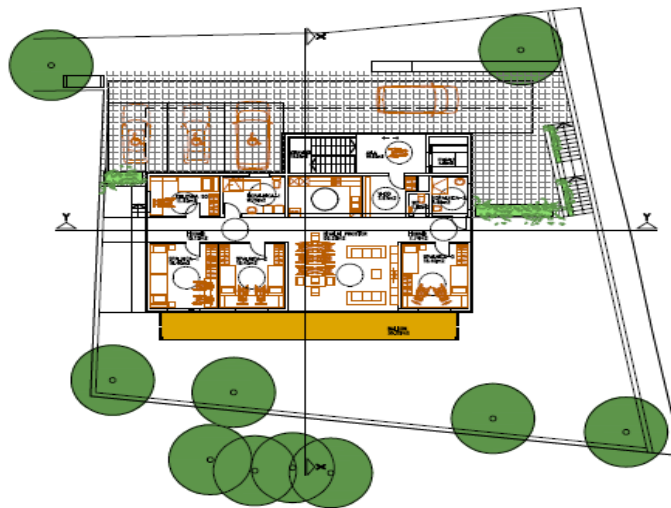
Vinčarjeva road



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Vinčarjeva road



UPPER FLOOR PLAN

0 1 2 3 4 5 10 15



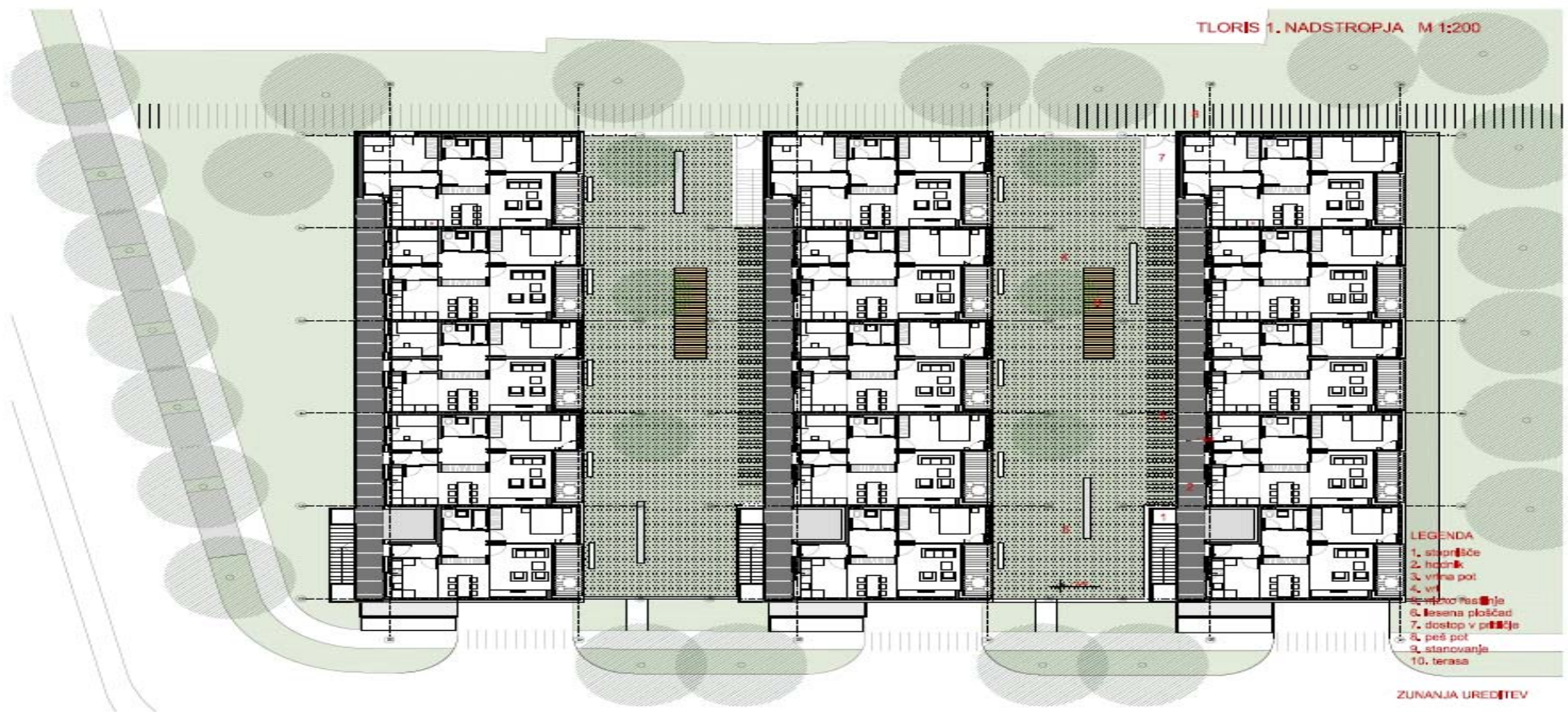
LOWER FLOOR PLAN

0 1 2 3 4 5 10 15

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Dolgi most



LOW ENERGY AND PASSIVE HOUSING



Dolgi most



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Dolgi most

