INTRODUCTION
The laser research centre ELI Beamlines:

- the first facility of planned four of the envisioned European ELI (Extreme Light Infrastructure) Project
- to be built in Dohní Břežany, Czech Republic
- shall develop a new generation of secondary sources for interdisciplinary applications in physics, medicine, biology and material sciences

Modern lasers are able to focus ultra-short high-intensity pulses onto targets and thus generate ionizing radiation. Therefore, radiation safety of workers needs to be explored and ensured.

RESULTS
Radiological classification

<table>
<thead>
<tr>
<th>µSv/day Occupancy</th>
<th>Control Rooms</th>
<th>Corridors</th>
<th>Labyrinths</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0 &lt;1 high</td>
<td>120 cm</td>
<td>120-160 cm</td>
<td>100 cm</td>
</tr>
<tr>
<td>R1 &lt;4 high</td>
<td>10^-4 - 10^-1</td>
<td></td>
<td></td>
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<tr>
<td>R2 &lt;25 low</td>
<td>10^-10 - 10^-3</td>
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<tr>
<td>R3 no limit no entry</td>
<td></td>
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<tr>
<td>R1/R3 Higher classification</td>
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<tr>
<td>R2/R3 during laser operation</td>
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</tbody>
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Civil structure design

- Typical wall thickness:
  - control rooms: 120 cm
  - corridors: 120-160 cm
  - labyrinths: 100 cm
- Concrete - ordinary
- magnetite the most exposed parts

Dose map calculation, e.g. 3 GeV proton source, 6x10^11/shot, 0.1Hz, total operating time 15 min/day

OBJECTIVES
Assessment, evaluation and design of

- Civil structure
- Minimal wall thickness
- Influence of main technology penetrations
- Local dumps
- Dimensions, shape, material

METHODS
Targeted effective dose limit:

- public <0.1mSv/year
- personnel <1mSv/year

- Radiological classification of areas
- Dose rate maps to assess penetrations

Calculations using:

- Monte Carlo codes: FLUKA, MCNPX
- Discrete ordinates code: ATTILA

CONCLUSIONS
ELI Beamlines will host prompt high energy sources of electrons, photons and protons. Bulk and local shielding has been designed and assessed using Monte Carlo and discrete ordinates codes to ensure radiation safety of personnel.

REFERENCES