

Sample Problem:

You are the Health Physicist for a mid-sized Canadian University that is proposing to install a Cs-137 irradiator in a planned new facility. The architect sends you a sketch (below) and asks “will this be enough shielding?”

The irradiator specs are:

- Source: 100 TBq of ^{137}Cs
- Orientation: Fixed downward
- Leakage: Less than $10\ \mu\text{Sv/h}$ at 30 cm from outside faces
- Irradiation plane: Fixed at 1m from the source
- Irradiation field size: 1m^2

You talk to the experimental group planning to use the instrument and discover the following:

- They intend to use the facility initially about 1500 hours per year.
- They will be irradiating samples of various sizes at the nominal 1m irradiation plane.

The CNSC has provided the following design guidelines (requirements) for such a facility:

- Annual dose in Controlled Areas: $500\ \mu\text{Sv}$
- Annual dose to Uncontrolled Areas: $50\ \mu\text{Sv}$

What is your recommendation to the architect?

