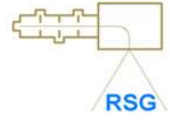


RADIATION SERVICES GROUP

Incorporating



RADIATION SERVICES AUSTRALIA PTY LTD

Radiation Shielding Suppliers ABN 14 002 813 309

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RADIATION SERVICES CONSULTING PTY LTD

Radiation Shielding Consultants ABN 17 488 139 862

Roberts Pizzarotti

Monday 9th of December 2019

**Concord Repatriation Hospital
Hospital Road, Concord NSW**

Radiation Services Consulting (RSC) have been engaged by Roberts Pizzarotti in the design and construction phase of these two high energy linear accelerator bunkers for this large metropolitan hospital. RSC has been involved in constructing these bunkers for more than four decades and have never had a bunker we have designed fail to comply with local state regulatory requirements.

These bunkers have been designed using conventional concrete and steel to keep adjacent dose regulations below the occupancy corrected NSW public regulatory dose limit as set within the NSW Radiation Control Act 2013, schedule 5 of no more than 1 mSv per year.

To ensure these requirements are met the bunker MUST not have any direct paths the radiation can pass without being attenuated by the full prescribed thickness of the concrete. As both these bunkers will have a high workload and utilise 18MV energies, these barriers need to be continuous to prevent elevated doses of photons and neutrons being detected to adjacent occupied areas. Due to the penetration of high energy photons (6MV-18MV) significant concrete barriers are required. The primary barriers for linear accelerators can range from 2400-2000mm thick and secondary barriers can be 1000-1400mm thick.

Control joints are to be minimised and will be treated as critical areas that will need additional testing to ensure they have the necessary integrity to keep these barriers sealed. If the concrete shrinks in these joints opening a direct path out additional expensive steel and borated polyethylene may be required. The easiest way to limit these joints and the need to retrofit additional materials is to use a continuous pour for these thick concrete wall radiation barriers.

All the hundreds of bunkers RSC have worked on across Australia and Asia are all poured in one continuous effort. It has been the most effective method in ensuring these barriers are built with the necessary integrity and met the requirements of the radiation shielding design report (RSDR) that has provided the radiation shielding requirements needed for these areas.

The benefits of completing this bulk pour in a single effort have been proven in many similar bunker projects. RSC strongly recommends following this proven method to minimise joints in the necessary radiation barriers for these high energy radiation areas.

Should you have any further questions, feel free to give me a call to discuss.

Sincerely,

Lewis Cardew

Radiation Physicist

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