Basis For Shielding Specifications

Exposure/dose limits: Facilities shall be designed such that the exposure limits specified in 17 CCR and 10 CFR for controlled and uncontrolled areas are not exceeded when use and occupancy factors are taken into account.

- In accordance with the intent of ALARA (As Low As Reasonably Achievable), shielding should be designed with the goal of not exceeding 10 mrem/week in controlled areas.
- In accordance with 10 CFR 20.1301, shielding should be designed so that the dose in uncontrolled areas does not exceed 2 mrem in any one hour.

10 CFR 20 and 35
10 CFR 20.1201, 1301 and 1302
17 CFR 30305(a) (5)
24 CCR 2 3101C?3104C
24 CCR 12-31C-101

References Related to the Specification of Shielding

NCRP 35, 39, 49, and 51: In these references, the shielding specified for uncontrolled areas is based upon an exposure limit of 500 mrem/yr rather than the current 100 mrem/year. In addition, some of the methodologies and assumptions (e.g., radiation attenuation data) have been updated since they were originally published. Even though there have been changes in some regulations, methodologies and assumptions, the basic information contained in these publications is sound and can serve as a basis for conservative shielding specifications if they are corrected for the current exposure limits. The California Building Code requires the use of NCRP 49 even though the NCRP has recently issued an update to that report (NCRP 147).

Recommendations in Selected Health Physics and Medical Physics Journal Article
In the following journal articles, new methodologies, assumptions and attenuation data are described for specifying shielding. The concepts and practices proposed in these publications have been incorporated into NCRP 147.

Simpkin, D.J., Shielding a Spectrum of Workloads in Diagnostic Radiology, H. Phys. 61, 259-261 (1991)
Simpkin, D.J., Diagnostic X-Ray Shielding Calculations for Effective Dose Equivalent, H. Phys. 21, 893 (1994)