

13 00 00. SPECIAL CONSTRUCTION**13 34 00. PRE-ENGINEERED STRUCTURES**

- .1 **ENGINEERING DATA REQUIRED:** An analysis of framing and structural components is required. Data shall bear the seal and signature of a professional architect or engineer, registered in Ohio, attesting that the structures meet requirements of the specifications and comply with requirements of the OBC. Copies of this data shall be submitted to the University Architect.

13 42 00. BUILDING MODULES AND COMPONENTS**13 42 73 INTEGRATED INTERIOR MODULES**

13 42 73.15 INTEGRATED CEILING ASSEMBLIES

- .1 **COORDINATION OF INSTALLATION:** It is preferred that integrated ceilings be made a part of the General Contract and the General Contractor be required to coordinate the complete installation, including the work of the HVAC and Electrical Contractors. If the A/E feels that such ceilings should be installed by either of the other contractors, he should discuss the matter with the University Architect during the review conference for Design Development submittal. The A/E's HVAC and electrical consultants shall be present at this discussion.

13 49 00. RADIATION PROTECTION

- .1 **DESIGN:** Materials, thicknesses, and configurations for radiation protection shall be based on the radiation protection design and report prepared by the University's radiation health physicist. Materials and construction, including lead thickness, joints and fasteners, shall maintain continuity of radiation protection at all joints and in all directions equivalent to materials specified and locations indicated.

Materials and construction shall comply with applicable recommendations of the National Council on Radiation Protection and Measurements Reports No 147 and 151. Installation shall be in strict adherence with manufacturer's requirements and approved shop drawings.

- 1.1 NCRP Report 147 Structural Shielding Design for Medical X-Ray Imaging Facilities
- 1.2 NCRP Report 151 Structural Shielding Design and Evaluation for Megavoltage X and Gamma-Ray Radiotherapy Facilities



.1.3 RADIATION PROTECTION SURVEY: A radiation protection survey shall be performed by or under the direction of a qualified expert (see paragraph 1.3.2 below). The survey will consist of an inspection to verify that barriers are properly placed, contiguous, and free of voids and defects, and an evaluation of shielding adequacy to verify that barriers adequately attenuate exposures in nearby occupied areas.

.1.3.1 If the survey reveals deficiencies, additional shielding or modifications of equipment and procedures are required. If supplementary shielding is required, a survey shall be performed after its installation. A survey shall also be made after any change that might significantly reduce the level of radiation protection.

.1.3.2 A qualified expert is a medical physicist or medical health physicist who is competent to design radiation shielding in medical x-ray imaging facilities. The qualified expert is a person who is certified by the American Board of Radiology, American Board of Medical Physics, American Board of Health Physics, or the Canadian College of Physicists in Medicine.

.2 MATERIAL STANDARDS AND INSTRUMENTATION: Materials and equipment shall conform to applicable recommendations of the National Council on Radiation Protection and Measurements Reports No. 102, 145, and 148, and shall be furnished and installed in accordance with the Code of Federal Regulations, Department of Health, Education, and Welfare (FDA Division). Installation shall be in strict adherence with manufacturer's requirements and approved shop drawings.

NCRP Report No.	Title
102	Medical X-Ray, Electron Beam and Gamma Ray Protection for Energies to 50 MeV (Equipment, Design, Performance, and Use) Report 102 Supersedes Report 33
145	Radiation Protection in Dentistry Report 145 Supersedes Report 35
148	Radiation Protection in Veterinary Medicine Report 148 Supersedes Report 36

Per NRCP, Report 34 was superseded by Report 49. Report 49 then had parts superseded by Report 147 and certain others of Report 49 by Report 151.

When planning a structure containing facilities in which radioactive materials are to be used, such as laboratories or certain hospital rooms, the following references should be consulted:

Brodsky, A., Determination of facilities, equipment, and procedures requires for various types of operations, in "Handbook of Radioactive Nucleides", Wanh Y., Ed. CRC Press, Boca Raton, FL 1969, pp. 664-710.

.2 MATERIAL STANDARDS AND INSTRUMENTATION: (Cont'd)

Brodsky, A., Determining industrial hygienics requirements for installations using radioactive materials, in Handbook of Laboratory Safety", 2nd ed., Steere, NV, ED. Chemical Rubber Company, Cleveland, OH, 1971, pp. 482-502.

U.S. Nuclear Regulatory Commission, Regulatory Guides 1.86 and B.23 (Since they address surface contamination limits).

International Atomic Energy Agency - Safety Series books

No. 91982, Basic Safety Standards for Radiation Protection

No. 381973, Radiation Protection Procedures.

These references, and others are available for review at the Ohio State University Office of Radiation Safety, B-042 Graves Hall 333 W. 10th Avenue (614-292-0122). A/Es are encouraged to contact radiation safety officer here if there are any questions about facility suitability.

.3 RADIATION EQUIPMENT SURVEY AND TESTING: After the X-ray equipment has been installed and placed in operating condition, a radiation survey shall be performed by a qualified expert as recommended by NCRP. After radioactive material containment facilities are placed in operating condition, air flow rates shall be measured by a qualified expert (see paragraph 1.1.3.2 above) at all intakes and exhaust points of the ventilation system affected.

.4 LISTING REQUIRED: The University Office of Radiological Health and Safety has the responsibility of registering all sources of radiation generated by an electronic product, subject to Radiation Control for Health and Safety Act of 1968. A listing of all such devices, as well as all radioactive materials specified in the contract



documents, shall be submitted by the A/E to the University Architect with those documents. A/E shall coordinate prior to stakeholder's review for proper signage requirements using Ohio State signage standards. Devices include, but are not necessarily limited to:

- lasers and maser
- radar
- microwave generators
- electron microscopes
- infrasonic, sonic, and ultrasonic generators
- X-ray generators and accelerators
- electron welders
- diatherapy units
- infrared and ultra-violet sources
- TV sets (of the projection type only)

END OF DIVISION 13 - SPECIAL CONSTRUCTION