

Shielding Evaluation Required Information

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Most state regulations require that a shielding evaluation be performed whenever a facility acquires new radiation producing equipment, modifies existing shielded barriers or installs new equipment of a different type or higher power. This shielding evaluation determines the amount of radiation protective materials needed to be built into all walls and barriers of the exam room. This usually determines how much Lead lining must be installed in new walls or concrete for floors/ceilings. It also determines if current building materials in existing rooms will sufficiently shield for any changes in equipment or modification to the room.

The shielding evaluation looks at equipment and control booth location to assure that the operator never is exposed to direct radiation or primary scatter. It also lists the specifications for the size, dimensions, and placement of the control booth and viewing window.

Many state laws (including Minnesota, Wisconsin, North Dakota and Michigan) require the shielding evaluation report be submitted to and authorized by the state inspectors PRIOR to beginning construction. If the state does not accept the planned shielding specifications, any construction started prior to authorization may have to be demolished and re-built. Often state inspectors specify a 30-day turnaround time for their review and authorization (once they receive the report).

To perform the shielding evaluation, we need the following:

1. Architectural drawings of the room(s) used for the procedures as well as the surrounding areas
 - a. Floor plans of the exam room must show the exact location of x-ray equipment including location of table, wall stand, all x-ray tubes, & x-ray exposure button (in control booth)
 - b. Floor plans must show all protective barriers (walls, doors, windows, standing shields, control booth)
 - c. 1/4 Inch scale drawings (1/4 inch = 1 foot) are preferred for Interior Room Plans (showing exact location of equipment)
 - d. North must be indicated on all drawings
 - e. We usually require floor plans showing rooms at least 3 rooms out in each direction
 - f. The Type / Description of each room must be indicated to determine how often a person occupies that area (such as Office, Toilet, Storage, Exam Room)
 - g. If any barriers are outside walls, must indicate type of area outside (Parking Lot, Sidewalk, Picnic Area) and distance to this space as well as Distance to Nearest Exterior Building
 - h. Drawings of smaller scale (1/8 Inch) are sufficient to show the location & Room Types surrounding the exam room(s)
 - i. PDF versions of all floor plans are strongly preferred/required to assure the scale accuracy included with the report
 - i. CAD architectural files are NOT accepted (we do not have ability to view CAD files)
 - j. All floor plans must be Final Plans – any alterations to the location of the x-ray equipment, any protective barriers or type (usage) of rooms surrounding the exam room will require a re-evaluation (at additional cost)
2. The Type/Description of rooms Above and Below each procedure room (to determine how often a person occupies that area)
3. The Distance from floor surface to floor surface to the rooms Above and to the rooms Below
4. It is also very helpful to know the type and thickness of building materials in the Floor and Ceiling (usually so many inches of concrete - measured at its thinnest cross section)
5. It is helpful to know the existing or planned building materials and thickness in all barriers (lead / concrete / sheetrock / plate glass / solid wood / brick)
 - a. This allows us to determine if existing materials are sufficient and we can include this in the report
 - b. Concrete blocks & bricks MUST indicate just material thickness (holes/voids inside cannot be considered in thickness)
6. "Workload" or how many Patients per Week estimated for each Exam Room (estimate the maximum over the next 5 to 10 years of growth)
 - a. R&F rooms must indicate number of patients for Fluoro (which may also include radiographic images) AND must indicate separately number of patients receiving only general radiographic exams (no Fluoro at all)
7. The Average to Max length of Fluoro Time (fluoroscopic on beam time) per Patient (some types of exams may be 30 seconds other types may be 10 minutes or longer) – Specific to Fluoroscopy equipment (Especially Mobile C-Arms)
 - a. Fluoro Time info is REQUIRED for Mobile C-Arm equipment
 - b. For fluoro equipment other than Mobile C-Arms, Fluoro Time is not necessary but helpful
8. For Radiographic & R&F rooms, indicate which Wall (Direction) the x-ray tube will point for Cross Table Exams
9. Any manufacturer specification documents – Such as Scatter Radiation Diagrams (often necessary for CT Scanners)
10. Facility location & contact info: complete & official facility name, physical address, contact person's name/phone/email, and intended completion date of project

Most facilities take a bit of time to track down all the floor plans and workload estimates (often several weeks). After we (RPC) receive All the required information/plans as listed above, we require At Least 1 Month to perform the shielding evaluation and provide you with a report. If necessary, an expedited service may be available at an additional cost.

The shielding report we provide will indicate the Minimum Required amount of shielding for each barrier in the exam room. These are indicated as commercially available thickness. Typically, some walls will require more shielding than others in the same room (such as 1/32" Lead vs. 1/16" Lead). Therefore, we will also indicate our Recommended shielding materials for each barrier. In such situations we recommend shielding ALL barriers with the same thickness of shielding material due to the ease of ordering and installing (it also reduces errors in installing the wrong materials in the wrong barrier).

Some state laws (Minnesota) require that after construction a Shielding Placard must be posted in the exam room. This is a sign that lists the type and thickness of building materials for each barrier in the exam room. This must be created by the facility after construction. Sometimes facilities do not follow our recommendations (they install only what is Required) or a contractor installs more than recommended (which is often cheaper). The Shielding Placard must indicate what is physically built into all barriers (this may not be the same as indicated in our report). A blank Shielding Placard template will be included with the report.