



September 09, 2011

[REDACTED]

**RE: DIAGNOSTIC X-RAY ROOM SHIELDING DESIGN REPORT**

Dear Dr. [REDACTED]

Enclosed please find the shielding design report for the Suni 3D cone beam dental CT x-ray installation. **Please review the report carefully for any inaccuracies and notify us for any revisions.**

- We have filed a copy of the report with the Oregon Radiation Protection Services on your behalf, and you should receive information from them shortly regarding approval and registration.
- You should check *Oregon Administrative Rules, Chapter 333*, for any additional regulations you need to meet. You can access the state regulations via the following website address: <http://www.oregon.gov/DHS/ph/rps/xray.shtml>
- Retain a copy of the report to document the calculated shielding required to meet dose limitations prescribed in *Oregon Administrative Rules, 333-120-0100* and *333-120-0180*.
- *Oregon Administrative Rules, 333-120-0020* **requires** you to develop, document and implement a radiation protection program. If you would like assistance developing a **site-specific Radiation Protection Program**, please contact our office for a quote, or for any other questions or services we can help you with.

Sincerely,

William DeForest, MS, DABR, CHP  
Health Physicist  
ProPhysics Innovations, Inc



September 09, 2011

[Redacted]

Dear Program Manager,

Enclosed please find a copy of the Diagnostic X-ray Room Shielding Design Report for:

Facility Name: Dr. [Redacted]  
Facility Address: [Redacted]  
Contact: [Redacted]  
Mailing Address: [Redacted]  
Contact Telephone: [Redacted]  
Contact Fax: [Redacted]  
Facility Type: Dental  
Machine Type: Cone Beam dental CT scanner  
Facility Workload: 6 cone beam scans/week & 6 pan scans/week

Should you have any questions regarding this shielding plan, please contact me at (800) 835-3615.

Thank you for your attention to this matter.

Sincerely,

William DeForest, MS, DABR, CHP  
Health Physicist  
ProPhysics Innovations, Inc



## PLAN REVIEW SHIELDING REPORT

[Redacted]  
[Redacted]

Suni 3D cone beam dental CT  
September 09, 2011

### Shielding Parameters

Design dose limits: Uncontrolled - 2 mrem/week (100/year); Controlled - 10 mrem/week (500/year)

Imaging Type	Workload (scans/week)	kVp	Scan Time (s)	Scatter profile (mR @1 meter)
Dental CT Scanner	6	90	8	0.21
Dental Pan	6	90	12.7	.023

### Shielding Recommendations

	Protecting	Type	OF	Recommended Shielding
AB	Operator	SC	1	Existing 1.0" gypsum is adequate (See Note 1)
BC	Restroom	SU	1/5	Existing 1.0" gypsum is adequate (See Note 1)
CD	Exterior	SU	1/40	Existing 0.5" gypsum is adequate
DE	Hallway	SU	1/5	Existing 1.0" gypsum is adequate (See Note 1)
EA	Operator	SC	1	Control access (See Notes 2 & 3)
Ceiling	Attic	SU	1/20	Any structural material is adequate (See Note 1)
Floor	Crawlspace	SU	1/40	Any structural material is adequate (See Note 1)

P = primary; S = secondary; C = controlled; U = uncontrolled; OF = occupancy factor

### Table Notes and Additional Information

- The recommended shielding is the total thickness of specified material needed to reduce the radiation dose below regulatory limitations.
- Note 1** - The calculated dose at this barrier is less than the design criteria; any planned or existing construction is adequate.
- Note 2** - Although the calculated dose at **EA** is less than the design criteria and no shielding material is required, access to the imaging area should be controlled during exposures to keep dose levels **As Low As is Reasonably Achievable (ALARA)**. **As a written radiation protection program is required by state regulation, the details of controlling access should be outlined in the facility's program for future reference, safety training and records inspection. The state agency may impose additional requirements, at any time, as it deems appropriate or necessary to minimize danger to public health, safety or property.**
- Note 3** - The operator views the patient through the doorway which is an area removed from the radiation source such that the exposure rate within the area due to normal operating procedures and workload does not exceed 2mR, in any one hour, or 100 mR in a year per *{Oregon Administrative Rules, Chapter 333, Division 106-0005(81)(a) & (b)}*.

[REDACTED]  
[REDACTED]  
**Suni 3D cone beam dental CT**  
**September 09, 2011**

- Areas beyond the immediate adjacent space to the barrier of interest have been considered when determining shielding recommendation.
- Wall shielding/construction should extend from the finished floor to a height of at least 84 inches.
- All shielded barriers, including view windows and frames, doors and door frames, should be of the specified shielding equivalencies or greater and should have no voids.
- Any penetrations in the shielding should be designed to afford the same shielding equivalency as specified for that barrier.
- Penetrations in the shielding (electrical boxes, cables, fasteners, etc.) should be secured in place with mechanical fasteners or by welding. Metal screws do not require lead caps and the use of tapes, adhesives or plastic materials as a fastener is not recommended.
- ProPhysics Innovations, Inc. is not responsible for errors in shielding requirements based on inaccurate information provided by the plan review requestor.
- **IMPORTANT** - This plan review is specific for the information provided by the requestor. Any changes in equipment, room layout, occupancy of adjacent areas, changes in x-ray workload, upgrades to additional imaging modalities, changes in field size of imaging receptors, or any other condition that may cause additional radiation to be produced will require re-evaluation of the shielding by a qualified physicist. If there are any doubts about what may constitute a change, please contact ProPhysics Innovations.
- These shielding specifications have been prepared in accordance with guidelines set forth in National Council on Radiation Protection and Measurements Report(s) No. 145 & No. 147, and Oregon Administrative Code.
- The state agency may impose additional requirements, as it deems appropriate or necessary to minimize danger to public health, safety or property.

**Shielding Calculations Performed by:**



William DeForest, MS, DABR, CHP  
Health Physicist  
ProPhysics Innovations, Inc

