UNIVERSITY OF MINNESOTA
TWIN CITIES

Department of Environmental Health and Safety
Boynton Health Service, Room W-140
410 Church Street S.E.
Minneapolis, Minnesota 55455
(612) 373-3167

August 22, 1984

Bruce Mallett
Director
Materials Licensing Section
Region III - NRC
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Dr. Mallett:

As discussed in our recent telephone conversation with Dr. William Adams of your office, we wish to amend NRC License #22-00187-52 to convert the cobalt teletherapy unit from a unit used for treatment of therapy patients to a panoramic irradiator to be used for non-human research purposes only.

The telepherapy unit will be relocated from its present location to an adjoining room which is presently used for a 13 MeV linear accelerator (Room B-146 Mayo). Attached is a copy of the floor plan and room shielding evaluation for B-146 Mayo provided by Dr. Faiz Khan, Department of Therapeutic Radiology. As shown in this evaluation, the shielding of the room is more than adequate for a Cobalt Therapy Unit. The unit will be relocated sometime during September 1984, and the move will be performed by individuals from AECL who are authorized to transfer the telepherapy unit. The 13 MeV Accelerator will be removed from B-146 prior to this transfer.

The room radiation monitor in use at the present location will also be relocated to Room B-146. The door interlock to the room and an audible alarm will be interconnected with this room monitor. If the door to B-146 is opened while radiation is still present in the room (source still open) the audible alarm will be sounded and the door interlock will activate withdrawal of the source to the storage ('off') position. The audible alarm will be in addition to the visible caution light presently installed above the door. Also, the room door will be locked when the control console (located near the door) is not attended by an authorized operator. The room is equipped with a television camera and microphone communications system to allow for viewing the interior of the room and to alert all personnel of intent to begin irradiation. As is the case now, the authorized operator will physically inspect the irradiator room and clear all personnel from the area before closing the door and starting an irradiation. Emergency procedures will be posted at the control console, and will instruct the operator to restrict access to the irradiation room by locking the door should the source drawer fail to close, and to immediately notify the

77376

Radiation Protection Program, and the head of the Radiation Physics Section, Dr. Faiz Khan or his designate,of any failure of safety systems or administrative controls and procedures.

If you have any questions or require additional information concerning this amendment request, please contact me.

Sincerely,

Jerome W. Staiger

Jerome W. Staiger
Radiation Protection Officer

JWS:bc
cc: Faiz Khan, Ph.D.
Enclosure

Control No. 77376

ATTACHMENT

RELOCATION OF COBALT TELETHERAPY UNIT
TO ROOM MAYO B-146

ROOM SHIELDING EVALUATION

The cobalt unit will be installed in room B-146. This room currently houses a linear accelerator, Toshiba LMR/13, which produces 10 MV x-ray beam and a number of electron beams. The linac will be taken out and the cobalt unit will be installed with its vertical central axis to pass through the present isocenter. Thus the cobalt unit will have the same barriers as they exist for the linac.

The machine will be primarily used for animal research. However, in case the other treatment machines (linear accelerators) in the department need repair the cobalt unit may be used to treat patients. Expected load for human treatments is estimated at 5 patients per week. Considering both the research use and some patient treatments, the workload is estimated at 80,000 R/week. Maximum dose rate at 100 cm SSD = 75 rad/min.

The following is the shielding evaluation of the various barriers:

West Wall: Primary barrier, use factor = 1/4,
occupancy factor for area (mechanical room) = 1/16, noncontrolled
distance = 22 ft.

Existing thickness	Required thickness	Expected transmitted dose rate
75" concrete	33" concrete	6.3×10^{-5} mR/hr

East Wall: Primary barrier, use factor = 1/4
Occupany factor for area (tunnel) = 1/4, noncontrolled
distance = 17 feet

Existing thickness	Required thickness	Expected transmitted dose rate
53" concrete	38" concrete	0.05 mR/hr

South Wall: Secondary barrier, use factor = 1,
occupancy factor (tunnel) = 1/4, noncontrolled
distance = 19 feet

Existing thickness	Required thickness	Expected transmitted dose rate
30" concrete	20" concrete	0.03 mR/hr

North Wall: Earth, no shielding required

Roof: Primary barrier, use factor = 1/4, occupancy factor (outside area, near footpath) = 1/16, noncontrolled distance = 20 ft.

Existing thickness	Required thickness	Expected transmitted dose rate
42"concrete + 48" sand and earth (packed)	33" concrete	0.001 mR/hr

Control Area: Secondary barrier, use factor = 1, occupancy factor = 1, controlled distance = 19 ft

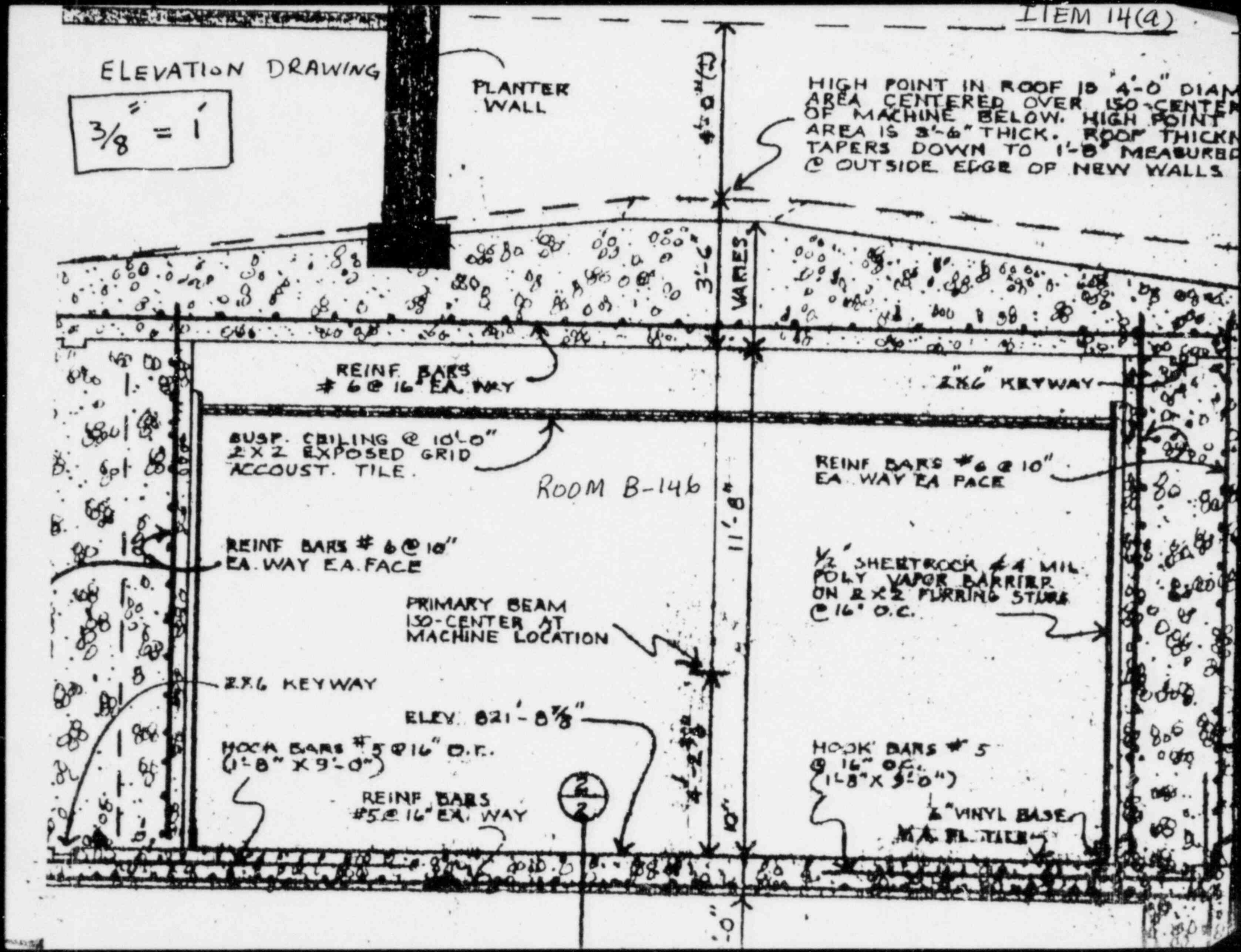
Existing thickness	Required thickness	Expected transmitted dose rate
64" concrete	18" concrete	2×10^{-6} mR/hr

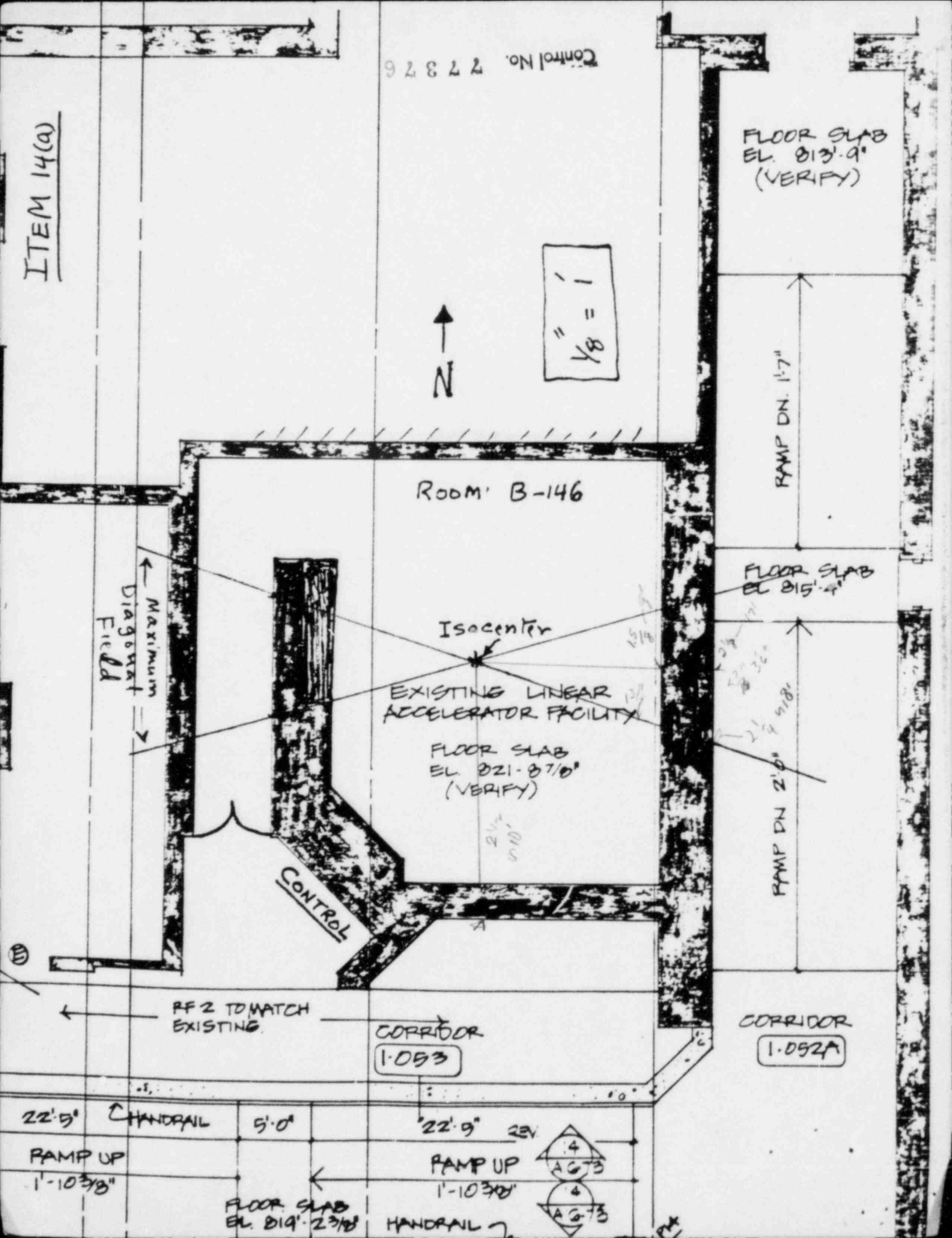
The above shielding evaluation of the room indicates that the existing barrier thicknesses are adequate for environmental protection. A complete survey will be performed after the cobalt unit is installed and before the unit is commissioned for use.

ITEM 14(a)

ELEVATION DRAWING

3/8" = 1'




Control No. 77376
ITEM 14(a)
1" = 1/8'-0"
N
FLOOR SLAB
EL. 813'-9"
(VERIFY)
RAMP DN. 1'-7"
ROOM B-146
FLOOR SLAB
EL 815'-4"
Maximum Diagonal Field
Isocenter
EXISTING LINEAR ACCELERATOR FACILITY
FLOOR SLAB
EL. 821-8 7/8"
(VERIFY)
RAMP DN 2'-0"
CONTROL
RF 2 TO MATCH EXISTING
CORRIDOR
1.053
CORRIDOR
1.052A
22'-5"
HANDRAIL
5'-0"
22'-9"
RAMP UP
1'-10 3/8"
RAMP UP
1'-10 3/8"
FLOOR SLAB
EL. 819'-2 3/8"
HANDRAIL