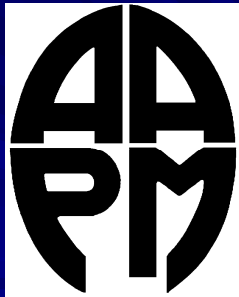


## 2007 Summer School



Minneapolis



**Table 2-3** Occupancy factors (T) for non-occupationally exposed personnel<sup>1</sup>

T	Type of area
1	Full Occupancy: work areas such as offices, shops, laboratories, children's play areas, occupied nearby buildings, living quarters, wards, nurses' stations
1/4	Partial Occupancy: corridors, rest rooms, elevators using operators (I have not seen one of these in years), unattended parking lots
1/16	Occasional Occupancy: waiting rooms, toilets, stairways, unattended elevators, janitors' closets, outside areas used only for pedestrians or vehicular traffic

<sup>1</sup>From NCRP Report No. 49 (NCRP 1976).

Occupancy factors (T) have been suggested by the NCRP (NCRP 1976) for the case where values are not available. Table 2-3 presents the recommended occupancy factors.

The values shown in Table 2-3 can be used in calculating the barrier transmission factor required to reduce the exposure from the source to 0.02 mSv per week or 1.0 mSv per year in uncontrolled areas, but a T value of one is used to evaluate the barrier transmission needed to ensure that nonoccupational personnel are not exposed to more than 0.02 mSv in any one hour of operation.

Excerpt from *Shielding Techniques* 2<sup>nd</sup> Ed.

Barrier Description	East Controlled	East Controlled	South Public	West Public	West Public
Occupancy Designation	Controlled	Controlled	Public	Public	Public
Max Perm Dose X <sub>p</sub> (Rem/wk)	0.0100	0.0100	0.0019	0.0019	0.0019
Use Factor U	1	0.25	1	1	0.25
Occupancy Factor T	1	1	0.0625	0.0625	0.0625
distance from source d (m)	8	8	5.4	5	5
Barrier Type	Secondary	Primary	Secondary	Secondary	Primary
Attenuation Factor B	0.00640	0.00003	0.00897	0.00769	0.00003
TVL needed	2.2	4.6	2.0	2.1	4.5
TVL (in. concrete per mfg.)	13.0	17.5	13.0	13.0	17.5
Minimum Thickness concrete (in.)	28	80	27	27	79

## Barrier Considerations

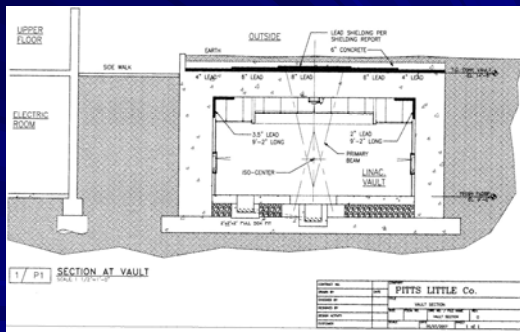
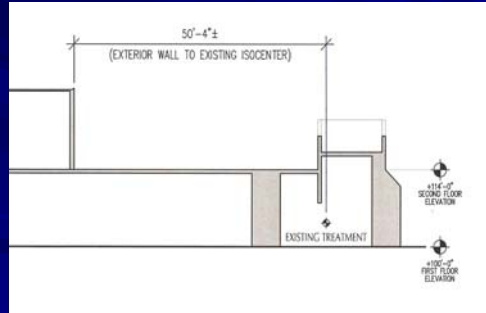
## Problem



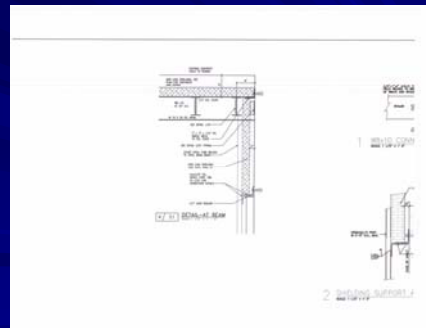
# Solution



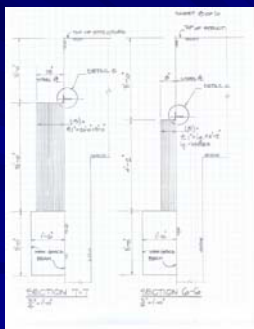
# 12" Roof Deck



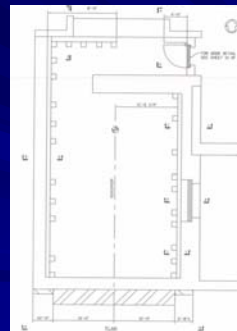
# Grade



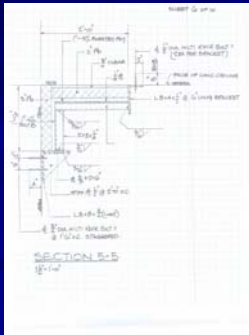
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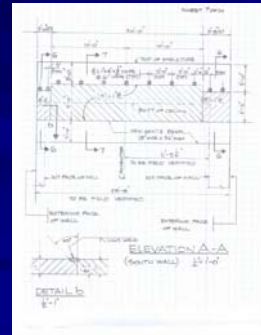
# Grade



# Grade



# Grade



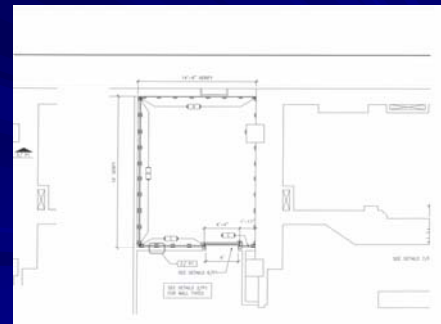
# HDR

# HDR



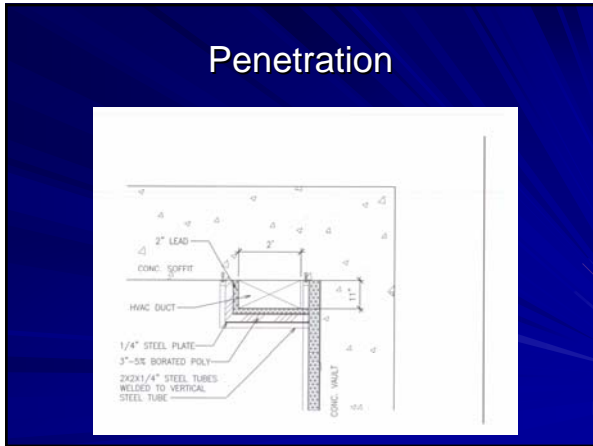
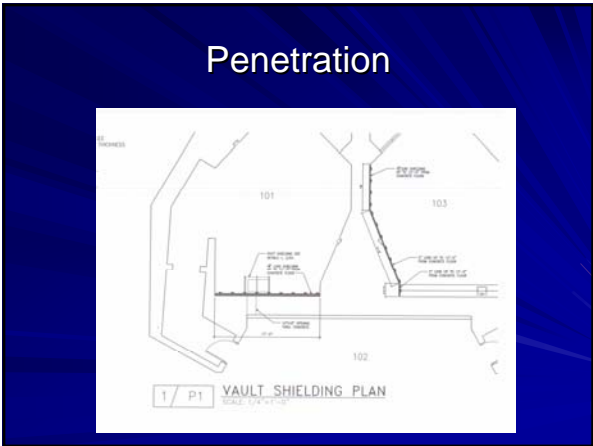
# HDR

# HDR

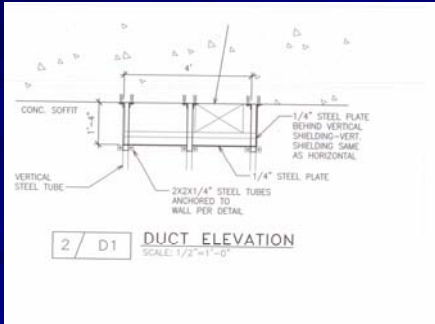




Cable Penetration



## Penetration



## Cable Penetration



## Cable Penetration



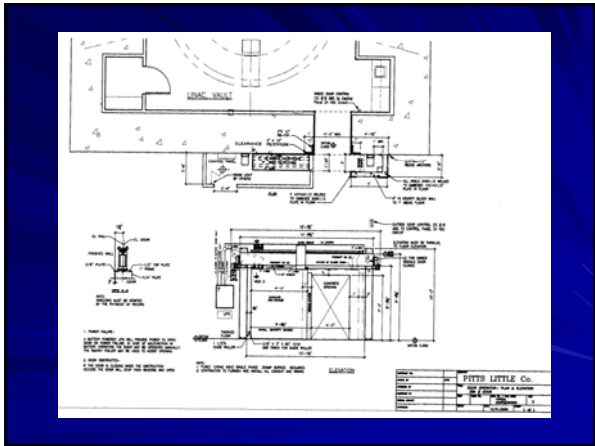
## Cable Penetration



## Cable Penetration



## Sliding Doors



## Embedded Jamb Shielding

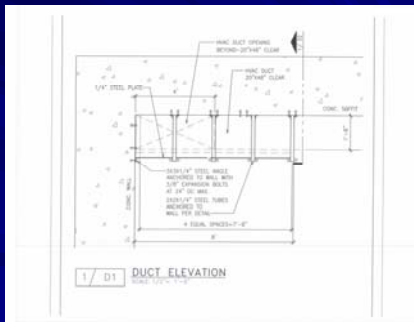


## Sliding Door

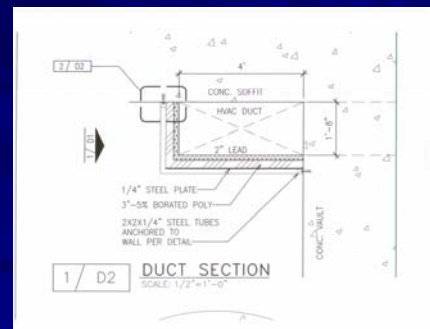


## Duct Shielding

## Duct Shield



## Duct Shield



## Duct Shield

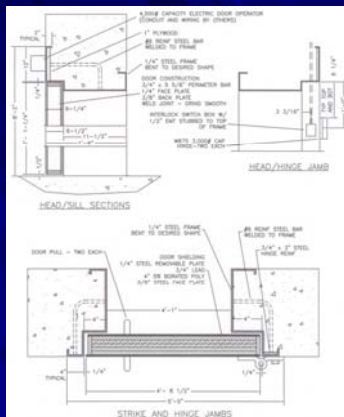


## Duct Shielding



## Swing Doors

## Door



## Interlocking Lead Brick Wall









