See RP NOTE 118 for details on use of this Spreadsheet

AP50 Pit Stairwell

Ep=	**8.00**	GeV				
Np=	**3.60E+13**	Protons	dimensions in feet			
R=	**7.16**	meters	23.5	feet		
Source Term=	**981**	**mrem**				
			width (feet)	height (feet)	radius	area ft^2)
Leg 1 area=	**1.99**	m**2	3.3	6.5		21.45
Leg 2 area=	**2.45**	m**2	3.3	8		26.4
Leg 3 area =	**2.11**	m**2	3.5	6.5		22.75
Leg 4 area =	**0.00**	m**2				0
Leg 5 area =	**0.00**	m**2				0
Leg 6 area =	**0.00**	m**2				0
Leg 7 area =	**0.00**	m**2				0
Leg 8 area =	**0.00**	m**2				0
			length			
Leg 1 length=	**7.01**	meters	23	feet		
Leg 2 length=	**0.91**	meters	3	feet		
Leg 3 length=	**7.32**	meters	24	feet		
Leg 4 length=	**0.00**	meters		feet		
Leg 5 length=	**0.00**	meters		feet		
Leg 6 length=	**0.00**	meters		feet		
Leg 7 length=	**0.00**	meters		feet		
Leg 8 length=	**0.00**	meters		feet		
Leg 1 ("units")=	4.97					
Leg 2 ("units")=	0.58					
Leg 3 ("units")=	5.03					
Leg 4 ("units")=						
Leg 5 ("units")=						
Leg 6 ("units")=						
Leg 7 ("units")=						
Leg 8 ("units")=						
	Atten.Fact.					
Leg 1	4.84E-02					
Leg 2	1.33E-01					
Leg 3	2.82E-03					
Leg 4	#VALUE!					
Leg 5	#VALUE!					
Leg 6	#VALUE!					
Leg 7	#VALUE!					
Leg 8	#VALUE!					
	D.E. After Leg					
	(mrem)					
Leg 1	**47.46**					
Leg 2	**6.31**					
Leg 3	**0.02**					
Leg 4	**#VALUE!**					
Leg 5	**#VALUE!**					
Leg 6	**#VALUE!**					
Leg 7	**#VALUE!**					
Leg 8	**#VALUE!**					
Parameters:						
ro=	1.40					
r1=	0.17					
r2=	1.17					
r3=	5.25					
K=	0.21					
J =	0.00147					

See RP NOTE 118 for details on use of this Spreadsheet

AP50 Pit Vent Shaft

Ep=	**8.00**	GeV				
Np=	**3.60E+13**	Protons	dimensions in feet			
R=	**7.16**	meters	23.5	feet		
Source Term=	**981**	**mrem**				
			width (feet)	height (feet)	radius	area ft^2)
Leg 1 area=	**0.13**	m**2			0.67	1.410260942
Leg 2 area=	**0.13**	m**2			0.67	1.410260942
Leg 3 area =	**0.13**	m**2			0.67	1.410260942
Leg 4 area =	**0.00**	m**2				0
Leg 5 area =	**0.00**	m**2				0
Leg 6 area =	**0.00**	m**2				0
Leg 7 area =	**0.00**	m**2				0
Leg 8 area =	**0.00**	m**2				0
			length			
Leg 1 length=	**2.44**	meters	8	feet		
Leg 2 length=	**3.75**	meters	12.3	feet		
Leg 3 length=	**4.27**	meters	14	feet		
Leg 4 length=	**0.00**	meters		feet		
Leg 5 length=	**0.00**	meters		feet		
Leg 6 length=	**0.00**	meters		feet		
Leg 7 length=	**0.00**	meters		feet		
Leg 8 length=	**0.00**	meters		feet		
Leg 1 ("units")=	6.74					
Leg 2 ("units")=	10.36					
Leg 3 ("units")=	11.79					
Leg 4 ("units")=						
Leg 5 ("units")=						
Leg 6 ("units")=						
Leg 7 ("units")=						
Leg 8 ("units")=						
	Atten.Fact.					
Leg 1	2.96E-02					
Leg 2	1.94E-04					
Leg 3	1.36E-04					
Leg 4	#VALUE!					
Leg 5	#VALUE!					
Leg 6	#VALUE!					
Leg 7	#VALUE!					
Leg 8	#VALUE!					
	D.E. After Leg					
	(mrem)					
Leg 1	**29.06**					
Leg 2	**0.01**					
Leg 3	**0.00**					
Leg 4	**#VALUE!**					
Leg 5	**#VALUE!**					
Leg 6	**#VALUE!**					
Leg 7	**#VALUE!**					
Leg 8	**#VALUE!**					
Parameters:						
ro=	1.40					
r1=	0.17					
r2=	1.17					
r3=	5.25					
K=	0.21					
J =	0.00147					

See RP NOTE 118 for details on use of this Spreadsheet

ACC/DEB Escape Trunk

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**2.10**	meters
Source Ter	**11384**	**mrem**
Leg 1 area=	**2.23**	m**2
Leg 2 area=	**2.23**	m**2
Leg 3 area	**0.70**	m**2
Leg 4 area	**0.00**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**1.52**	meters
Leg 2 lengt	**1.83**	meters
Leg 3 lengt	**4.11**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	1.02	
Leg 2 ("units	1.22	
Leg 3 ("units	4.93	
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	3.35E-01	
Leg 2	6.24E-02	
Leg 3	3.04E-03	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**3807.98**	
Leg 2	**237.73**	
Leg 3	**0.72**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

6.9	feet		
width (feet)	height (feet)	radius	area ft^2)
3	8		24
3	8		24
2.5	3		7.5
			0
			0
			0
			0
			0
length			
5	feet		
6	feet		
13.5	feet		
	feet		
	feet		
	feet		
	feet		
	feet		

See RP NOTE 118 for details on use of this Spreadsheet

ACC/DEB Airshaft

Ep=	**8.00**	GeV					
Np=	**3.60E+13**	Protons	dimensions in feet				
R=	**2.10**	meters	6.9	feet			
Source Ter	**11384**	**mrem**					
			width (feet)	height (feet)	radius (feet)	area ft^2)	
Leg 1 area=	**2.23**	m**2	3	8		24	
Leg 2 area=	**2.23**	m**2	3	8		24	
Leg 3 area	**0.27**	m**2			0.9583333	2.8852474	
Leg 4 area	**0.00**	m**2				0	
Leg 5 area	**0.00**	m**2				0	
Leg 6 area	**0.00**	m**2				0	
Leg 7 area	**0.00**	m**2				0	
Leg 8 area	**0.00**	m**2				0	
			length				
Leg 1 lengt	**1.52**	meters	5	feet			
Leg 2 lengt	**1.83**	meters	6	feet			
Leg 3 lengt	**4.57**	meters	15	feet			
Leg 4 lengt	**0.00**	meters		feet			
Leg 5 lengt	**0.00**	meters		feet			
Leg 6 lengt	**0.00**	meters		feet			
Leg 7 lengt	**0.00**	meters		feet			
Leg 8 lengt	**0.00**	meters		feet			
Leg 1 ("units	1.02						
Leg 2 ("units	1.22						
Leg 3 ("units	8.83						
Leg 4 ("units							
Leg 5 ("units							
Leg 6 ("units							
Leg 7 ("units							
Leg 8 ("units							
	Atten.Fact.						
Leg 1	3.35E-01						
Leg 2	6.24E-02						
Leg 3	3.17E-04						
Leg 4	#VALUE!						
Leg 5	#VALUE!						
Leg 6	#VALUE!						
Leg 7	#VALUE!						
Leg 8	#VALUE!						
	D.E. After Leg						
	(mrem)						
Leg 1	**3807.98**						
Leg 2	**237.73**						
Leg 3	**0.08**						
Leg 4	**#VALUE!**						
Leg 5	**#VALUE!**						
Leg 6	**#VALUE!**						
Leg 7	**#VALUE!**						
Leg 8	**#VALUE!**						
Parameters:							
ro=	1.40						
r1=	0.17						
r2=	1.17						
r3=	5.25						
K=	0.21						
J =	0.00147						

See RP NOTE 118 for details on use of this Spreadsheet

ACC/DEB Elevator Shafts

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**2.13**	meters
Source Ter	**11061**	**mrem**
Leg 1 area=	**1.37**	m**2
Leg 2 area=	**2.24**	m**2
Leg 3 area	**2.24**	m**2
Leg 4 area	**2.24**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**3.05**	meters
Leg 2 lengt	**1.22**	meters
Leg 3 lengt	**2.74**	meters
Leg 4 lengt	**1.07**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	2.60	
Leg 2 ("units	0.81	
Leg 3 ("units	1.83	
Leg 4 ("units	0.71	
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	1.22E-01	
Leg 2	9.43E-02	
Leg 3	3.70E-02	
Leg 4	1.08E-01	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**1353.01**	
Leg 2	**127.52**	
Leg 3	**4.72**	
Leg 4	**0.51**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

7	feet		
width (feet)	height (feet)	radius	area ft^2)
3.6	4.1		14.76
3.3	7.3		24.09
3.3	7.3		24.09
3.3	7.3		24.09
			0
			0
			0
			0
length			
10	feet		
4	feet		
9	feet		
3.5	feet		
	feet		
	feet		
	feet		
	feet		

See RP NOTE 118 for details on use of this Spreadsheet

ACC/DEB Stairwells

stariwell #1, elevator type

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**2.50**	meters
Source Ter	**8061**	**mrem**
Leg 1 area=	**1.84**	m**2
Leg 2 area=	**1.84**	m**2
Leg 3 area	**2.37**	m**2
Leg 4 area	**1.84**	m**2
Leg 5 area	**2.24**	m**2
Leg 6 area	**2.37**	m**2
Leg 7 area	**2.24**	m**2
Leg 8 area	**2.24**	m**2
Leg 1 lengt	**3.05**	meters
Leg 2 lengt	**2.90**	meters
Leg 3 lengt	**0.61**	meters
Leg 4 lengt	**1.68**	meters
Leg 5 lengt	**1.22**	meters
Leg 6 lengt	**1.37**	meters
Leg 7 lengt	**2.74**	meters
Leg 8 lengt	**1.07**	meters
Leg 1 ("units	2.25	
Leg 2 ("units	2.13	
Leg 3 ("units	0.40	
Leg 4 ("units	1.24	
Leg 5 ("units	0.81	
Leg 6 ("units	0.89	
Leg 7 ("units	1.83	
Leg 8 ("units	0.71	
	Atten.Fact.	
Leg 1	1.47E-01	
Leg 2	2.88E-02	
Leg 3	2.05E-01	
Leg 4	6.18E-02	
Leg 5	9.43E-02	
Leg 6	8.64E-02	
Leg 7	3.70E-02	
Leg 8	1.08E-01	
	D.E. After Leg	
	(mrem)	
Leg 1	**1187.59**	
Leg 2	**34.16**	
Leg 3	**7.01**	
Leg 4	**0.43**	
Leg 5	**0.04**	
Leg 6	**0.00**	
Leg 7	**0.00**	
Leg 8	**0.00**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

8.2 feet

width (feet)	height (feet)	radius	area ft^2)
3.3	6		19.8
3.3	6		19.8
3.5	7.3		25.55
3.3	6		19.8
3.3	7.3		24.09
3.5	7.3		25.55
3.3	7.3		24.09
3.3	7.3		24.09

length

10	feet
9.5	feet
2	feet
5.5	feet
4	feet
4.5	feet
9	feet
3.5	feet

See RP NOTE 118 for details on use of this Spreadsheet ACC/DEB Stairwells

stariwell #2, non-elevator type

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**2.50**	meters
Source Ter	**8061**	**mrem**
Leg 1 area=	**1.84**	m**2
Leg 2 area=	**1.84**	m**2
Leg 3 area	**2.37**	m**2
Leg 4 area	**1.84**	m**2
Leg 5 area	**2.24**	m**2
Leg 6 area	**2.37**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**3.05**	meters
Leg 2 lengt	**2.90**	meters
Leg 3 lengt	**0.61**	meters
Leg 4 lengt	**1.68**	meters
Leg 5 lengt	**2.44**	meters
Leg 6 lengt	**1.22**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	2.25	
Leg 2 ("units	2.13	
Leg 3 ("units	0.40	
Leg 4 ("units	1.24	
Leg 5 ("units	1.63	
Leg 6 ("units	0.79	
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	1.47E-01	
Leg 2	2.88E-02	
Leg 3	2.05E-01	
Leg 4	6.18E-02	
Leg 5	4.40E-02	
Leg 6	9.70E-02	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**1187.59**	
Leg 2	**34.16**	
Leg 3	**7.01**	
Leg 4	**0.43**	
Leg 5	**0.02**	
Leg 6	**0.00**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

8.2 feet

width (feet)	height (feet)	radius	area ft^2)
3.3	6		19.8
3.3	6		19.8
3.5	7.3		25.55
3.3	6		19.8
3.3	7.3		24.09
3.5	7.3		25.55
			0
			0

length

10	feet
9.5	feet
2	feet
5.5	feet
8	feet
4	feet
	feet
	feet

See RP NOTE 118 for details on use of this Spreadsheet

Transport Stairway

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**0.94**	meters
Source Term=	**394789**	**mrem**
Leg 1 area=	**2.12**	m**2
Leg 2 area=	**1.84**	m**2
Leg 3 area =	**1.84**	m**2
Leg 4 area =	**1.84**	m**2
Leg 5 area =	**0.00**	m**2
Leg 6 area =	**0.00**	m**2
Leg 7 area =	**0.00**	m**2
Leg 8 area =	**0.00**	m**2
Leg 1 length=	**4.27**	meters
Leg 2 length=	**5.18**	meters
Leg 3 length=	**3.12**	meters
Leg 4 length=	**5.49**	meters
Leg 5 length=	**0.00**	meters
Leg 6 length=	**0.00**	meters
Leg 7 length=	**0.00**	meters
Leg 8 length=	**0.00**	meters
Leg 1 ("units")=	2.93	
Leg 2 ("units")=	3.82	
Leg 3 ("units")=	2.30	
Leg 4 ("units")=	4.05	
Leg 5 ("units")=		
Leg 6 ("units")=		
Leg 7 ("units")=		
Leg 8 ("units")=		
	Atten.Fact.	
Leg 1	1.04E-01	
Leg 2	7.20E-03	
Leg 3	2.50E-02	
Leg 4	6.02E-03	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg (mrem)	
Leg 1	**41196.64**	
Leg 2	**296.82**	
Leg 3	**7.42**	
Leg 4	**0.04**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

3.1 feet

width (feet)	height (feet)	radius	area ft^2)
3.3	6.9		22.77
3.3	6		19.8
3.3	6		19.8
3.3	6		19.8
			0
			0
			0
			0

length	
14	feet
17	feet
10.25	feet
18	feet
	feet
	feet
	feet
	feet

NOTE: Source Term increased by factor of 7 to account for secondary flux due to stacking. Use ratio of measurement at IB1 to arrive at this factor.

See RP NOTE 118 for details on use of this Spreadsheet

F27 Kicker Building to Transport Penetrations

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**0.85**	meters
Source Ter	**483919**	**mrem**
Leg 1 area=	**0.05**	m**2
Leg 2 area=	**0.05**	m**2
Leg 3 area	**0.00**	m**2
Leg 4 area	**0.00**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**0.91**	meters
Leg 2 lengt	**40.23**	meters
Leg 3 lengt	**0.00**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	4.06	
Leg 2 ("units	178.74	
Leg 3 ("units		
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	6.57E-02	
Leg 2	1.99E-18	
Leg 3	#VALUE!	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**31790.61**	
Leg 2	**0.00**	
Leg 3	**#VALUE!**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

2.8 feet

width (feet)	height (feet)	radius	area ft^2)
		0.4166667	0.5454154
		0.4166667	0.5454154
			0
			0
			0
			0
			0
			0

length

3	feet
132	feet
	feet
	feet
	feet
	feet
	feet
	feet
	feet

NOTE: Source Term increased by factor of 7 to account for secondary flux due to stacking. Use ratio of measurement at IB1 to arrive at this factor.

See RP NOTE 118 for details on use of this Spreadsheet

AP0 PreVault Stairwell

Ep=	**120.00**	GeV				
Np=	**1.80E+16**	Protons	dimensions in feet			
R=	**3.41**	meters	11.2	feet		
Source Term=	**18853735**	**mrem**				
			width (feet)	height (feet)	radius	area ft^2)
Leg 1 area=	**2.18**	m**2	3.3	7.1		23.43
Leg 2 area=	**2.15**	m**2	3.3	7		23.1
Leg 3 area =	**2.15**	m**2	3.3	7		23.1
Leg 4 area =	**1.84**	m**2	3.3	6		19.8
Leg 5 area =	**1.84**	m**2	3.3	6		19.8
Leg 6 area =	**1.95**	m**2	3.5	6		21
Leg 7 area =	**0.00**	m**2				0
Leg 8 area =	**0.00**	m**2				0
			length			
Leg 1 length=	**0.61**	meters	2	feet		
Leg 2 length=	**4.11**	meters	13.5	feet		
Leg 3 length=	**1.37**	meters	4.5	feet		
Leg 4 length=	**5.33**	meters	17.5	feet		
Leg 5 length=	**3.20**	meters	10.5	feet		
Leg 6 length=	**5.49**	meters	18	feet		
Leg 7 length=	**0.00**	meters		feet		
Leg 8 length=	**0.00**	meters		feet		
Leg 1 ("units")	0.41					
Leg 2 ("units")	2.81					
Leg 3 ("units")	0.94					
Leg 4 ("units")	3.93					
Leg 5 ("units")	2.36					
Leg 6 ("units")	3.93					
Leg 7 ("units")						
Leg 8 ("units")						
	Atten.Fact.					
Leg 1	5.96E-01					
Leg 2	1.64E-02					
Leg 3	8.22E-02					
Leg 4	6.59E-03					
Leg 5	2.38E-02					
Leg 6	6.61E-03					
Leg 7	#VALUE!					
Leg 8	#VALUE!					
	D.E. After Leg					
	(mrem)					
Leg 1	**11240084.04**					
Leg 2	**184614.73**					
Leg 3	**15181.35**					
Leg 4	**99.99**					
Leg 5	**2.38**					
Leg 6	**0.02**					
Leg 7	**#VALUE!**					
Leg 8	**#VALUE!**					
Parameters:						
ro=	1.40					
r1=	0.17					
r2=	1.17					
r3=	5.25					
K=	0.21					
J =	0.00147					

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**0.61**	meters
Source Ter	**135497**	**mrem**
Leg 1 area=	**5.95**	m**2
Leg 2 area=	**0.00**	m**2
Leg 3 area =	**0.00**	m**2
Leg 4 area =	**0.00**	m**2
Leg 5 area =	**0.00**	m**2
Leg 6 area =	**0.00**	m**2
Leg 7 area =	**0.00**	m**2
Leg 8 area =	**0.00**	m**2
Leg 1 lengt	**7.01**	meters
Leg 2 lengt	**3.08**	meters
Leg 3 lengt	**0.00**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	2.88	
Leg 2 ("units	45.17	
Leg 3 ("units		
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	1.07E-01	
Leg 2	2.23E-07	
Leg 3	#VALUE!	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**14531.63**	
Leg 2	**0.00**	
Leg 3	**#VALUE!**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

See RP NOTE 118 for details on use of this Spreadsheet

Stub Room 18 inch penetrations

dimensions in feet

20-2, 10-2, 40-1, 50-1 and 60-1

2 feet

width (feet)	height (feet)	radius	area ft^2)
8	8		64.0
		0.75	0.1
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0

length

23	feet
10.1	feet
	feet
	feet
	feet
	feet
	feet
	feet

Stub room	penetration elevation	Ra	L1	W1	H1	L2	dia.	dose rate
10-2	742.25	2	22	8	8	8.25	1.5	19
10-2	745.6	2	16.5	8	8	11.5	1	2
20-2	741	2	20.5	8	8	7	1.5	40
40-1	743.9	2	23	8	8	9.9	1.5	9
50-1	744	2	18.25	8	8	10	1.5	11
60-1	744	2	23	8	8	10.1	1.5	8

Transport to AP0 Penetrations

See RP NOTE 118 for details on use of this Spreadsheet

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**1.52**	meters
Source Ter	**151757**	**mrem**
Leg 1 area=	**0.05**	m**2
Leg 2 area=	**0.05**	m**2
Leg 3 area	**0.00**	m**2
Leg 4 area	**0.00**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**2.44**	meters
Leg 2 lengt	**3.81**	meters
Leg 3 lengt	**0.00**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	10.83	
Leg 2 ("units	16.93	
Leg 3 ("units		
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	1.31E-02	
Leg 2	4.84E-05	
Leg 3	#VALUE!	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**1987.83**	
Leg 2	**0.10**	
Leg 3	**#VALUE!**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

5 feet

width (feet)	height (feet)	radius	area ft^2)
		0.4166667	0.5454154
		0.4166667	0.5454154
			0
			0
			0
			0
			0
			0

length

8	feet
12.5	feet
	feet
	feet
	feet
	feet
	feet
	feet

NOTE: Source Term increased by factor of 7 to account for secondary flux due to stacking. Use ratio of measurement at IB1 to arrive at this factor.

See RP NOTE 118 for details on use of this Spreadsheet

PreVault to AP0 Penetrations

Ep=	**120.00**	GeV
Np=	**1.80E+16**	Protons
R=	**1.01**	meters
Source Ter	**2.E+08**	**mrem**
Leg 1 area=	**0.05**	m**2
Leg 2 area=	**0.05**	m**2
Leg 3 area	**0.00**	m**2
Leg 4 area	**0.00**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**2.44**	meters
Leg 2 lengt	**3.81**	meters
Leg 3 lengt	**0.00**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	10.83	
Leg 2 ("units	16.93	
Leg 3 ("units		
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	1.31E-02	
Leg 2	4.84E-05	
Leg 3	#VALUE!	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**3.E+06**	
Leg 2	**137.63**	
Leg 3	**#VALUE!**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet — SE corner of building

3.3 feet

width (feet)	height (feet)	radius	area ft^2)
		0.4166667	0.5454154
		0.4166667	0.5454154
			0
			0
			0
			0
			0
			0

length	
8	feet
12.5	feet
	feet
	feet
	feet
	feet
	feet
	feet

See RP NOTE 118 for details on use of this Spreadsheet

PreVault to F23 Penetrations

Ep=	**120.00**	GeV				
Np=	**1.80E+16**	Protons	dimensions in feet			SE corner of building
R=	**1.01**	meters	3.3	feet		
Source Ter	**2.E+08**	**mrem**				
			width (feet)	height (feet)	radius	area ft^2)
Leg 1 area=	**0.05**	m**2			0.4166667	0.5454154
Leg 2 area=	**0.05**	m**2			0.4166667	0.5454154
Leg 3 area	**0.05**	m**2			0.4166667	0.5454154
Leg 4 area	**0.00**	m**2				0
Leg 5 area	**0.00**	m**2				0
Leg 6 area	**0.00**	m**2				0
Leg 7 area	**0.00**	m**2				0
Leg 8 area	**0.00**	m**2				0
			length			
Leg 1 lengt	**2.44**	meters	8	feet		
Leg 2 lengt	**7.62**	meters	25	feet		
Leg 3 lengt	**3.05**	meters	10	feet		
Leg 4 lengt	**0.00**	meters		feet		
Leg 5 lengt	**0.00**	meters		feet		
Leg 6 lengt	**0.00**	meters		feet		
Leg 7 lengt	**0.00**	meters		feet		
Leg 8 lengt	**0.00**	meters		feet		
Leg 1 ("units	10.83					
Leg 2 ("units	33.85					
Leg 3 ("units	13.54					
Leg 4 ("units						
Leg 5 ("units						
Leg 6 ("units						
Leg 7 ("units						
Leg 8 ("units						
	Atten.Fact.					
Leg 1	1.31E-02					
Leg 2	1.92E-06					
Leg 3	9.37E-05					
Leg 4	#VALUE!					
Leg 5	#VALUE!					
Leg 6	#VALUE!					
Leg 7	#VALUE!					
Leg 8	#VALUE!					
	D.E. After Leg					
	(mrem)					
Leg 1	**3.E+06**					
Leg 2	**5.47**					
Leg 3	**0.00**					
Leg 4	**#VALUE!**					
Leg 5	**#VALUE!**					
Leg 6	**#VALUE!**					
Leg 7	**#VALUE!**					
Leg 8	**#VALUE!**					
Parameters:						
ro=	1.40					
r1=	0.17					
r2=	1.17					
r3=	5.25					
K=	0.21					
J =	0.00147					

See RP NOTE 118 for details on use of this Spreadsheet

32 Vault Penetrations

Ep=	**120.00**	GeV
Np=	**1.80E+16**	Protons
R=	**3.05**	meters
Source Ter	**2.E+01**	**mrem**
Leg 1 area=	**0.05**	m**2
Leg 2 area=	**0.05**	m**2
Leg 3 area	**0.00**	m**2
Leg 4 area	**0.00**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**3.25**	meters
Leg 2 lengt	**1.22**	meters
Leg 3 lengt	**0.00**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	14.45	
Leg 2 ("units	5.42	
Leg 3 ("units		
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	7.80E-03	
Leg 2	2.12E-03	
Leg 3	#VALUE!	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**2.E-01**	
Leg 2	**0.00**	
Leg 3	**#VALUE!**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet — west of vault enclosure

10 feet

Reduced by 6 orders of magnitude due to module shielding

width (feet)	height (feet)	radius	area ft^2)
		0.4166667	0.5454154
		0.4166667	0.5454154
			0
			0
			0
			0
			0
			0

length

10.67	feet
4	feet
	feet
	feet
	feet
	feet
	feet
	feet

See RP NOTE 118 for details on use of this Spreadsheet

Sweeping Magnet Penetrations

Ep=	**120.00**	GeV				
Np=	**1.80E+16**	Protons	dimensions in feet			
R=	**1.22**	meters	4	feet		
Source Ter	**1.E+08**	**mrem**				
			width (feet)	height (feet)	radius	area ft^2)
Leg 1 area=	**0.05**	m**2			0.4166667	0.5454154
Leg 2 area=	**0.05**	m**2			0.4166667	0.5454154
Leg 3 area	**0.05**	m**2			0.4166667	0.5454154
Leg 4 area	**0.00**	m**2				0
Leg 5 area	**0.00**	m**2				0
Leg 6 area	**0.00**	m**2				0
Leg 7 area	**0.00**	m**2				0
Leg 8 area	**0.00**	m**2				0
			length			
Leg 1 lengt	**0.30**	meters	1	feet		
Leg 2 lengt	**1.22**	meters	4	feet		
Leg 3 lengt	**5.18**	meters	17	feet		
Leg 4 lengt	**0.00**	meters		feet		
Leg 5 lengt	**0.00**	meters		feet		
Leg 6 lengt	**0.00**	meters		feet		
Leg 7 lengt	**0.00**	meters		feet		
Leg 8 lengt	**0.00**	meters		feet		
Leg 1 ("units	1.35					
Leg 2 ("units	5.42					
Leg 3 ("units	23.02					
Leg 4 ("units						
Leg 5 ("units						
Leg 6 ("units						
Leg 7 ("units						
Leg 8 ("units						
	Atten.Fact.					
Leg 1	2.58E-01					
Leg 2	2.12E-03					
Leg 3	1.51E-05					
Leg 4	#VALUE!					
Leg 5	#VALUE!					
Leg 6	#VALUE!					
Leg 7	#VALUE!					
Leg 8	#VALUE!					
	D.E. After Leg					
	(mrem)					
Leg 1	**4.E+07**					
Leg 2	**81154.97**					
Leg 3	**1.23**					
Leg 4	**#VALUE!**					
Leg 5	**#VALUE!**					
Leg 6	**#VALUE!**					
Leg 7	**#VALUE!**					
Leg 8	**#VALUE!**					
Parameters:						
ro=	1.40					
r1=	0.17					
r2=	1.17					
r3=	5.25					
K=	0.21					
J =	0.00147					

See RP NOTE 118 for details on use of this Spreadsheet

Transport Vent Duct

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**0.94**	meters
Source Ter	**4.E+05**	**mrem**
Leg 1 area=	**2.12**	m**2
Leg 2 area=	**0.29**	m**2
Leg 3 area	**0.29**	m**2
Leg 4 area	**0.29**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**1.22**	meters
Leg 2 lengt	**1.22**	meters
Leg 3 lengt	**4.57**	meters
Leg 4 lengt	**2.74**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	0.84	
Leg 2 ("units	2.26	
Leg 3 ("units	8.46	
Leg 4 ("units	5.08	
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	3.91E-01	
Leg 2	2.60E-02	
Leg 3	3.67E-04	
Leg 4	2.72E-03	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**2.E+05**	
Leg 2	**4012.75**	
Leg 3	**1.47**	
Leg 4	**0.00**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

3.1 feet

	width (feet)	height (feet)	radius	area ft^2)
	3.3	6.9		22.77
			1	3.1415927
			1	3.1415927
			1	3.1415927
				0
				0
				0
				0

length

4	feet	
4	feet	
15	feet	
9	feet	
	feet	
	feet	
	feet	
	feet	

NOTE: Source Term increased by factor of 7 to account for secondary flux due to stacking. Use ratio of measurement at IB1 to arrive at this factor.

See RP NOTE 118 for details on use of this Spreadsheet

AP0 water Pipe Penetrations

Ep=	**8.00**	GeV
Np=	**3.60E+13**	Protons
R=	**1.68**	meters
Source Ter	**125419**	**mrem**
Leg 1 area=	**0.04**	m**2
Leg 2 area=	**0.04**	m**2
Leg 3 area	**0.00**	m**2
Leg 4 area	**0.00**	m**2
Leg 5 area	**0.00**	m**2
Leg 6 area	**0.00**	m**2
Leg 7 area	**0.00**	m**2
Leg 8 area	**0.00**	m**2
Leg 1 lengt	**0.30**	meters
Leg 2 lengt	**3.81**	meters
Leg 3 lengt	**0.00**	meters
Leg 4 lengt	**0.00**	meters
Leg 5 lengt	**0.00**	meters
Leg 6 lengt	**0.00**	meters
Leg 7 lengt	**0.00**	meters
Leg 8 lengt	**0.00**	meters
Leg 1 ("units	1.56	
Leg 2 ("units	19.54	
Leg 3 ("units		
Leg 4 ("units		
Leg 5 ("units		
Leg 6 ("units		
Leg 7 ("units		
Leg 8 ("units		
	Atten.Fact.	
Leg 1	2.23E-01	
Leg 2	2.93E-05	
Leg 3	#VALUE!	
Leg 4	#VALUE!	
Leg 5	#VALUE!	
Leg 6	#VALUE!	
Leg 7	#VALUE!	
Leg 8	#VALUE!	
	D.E. After Leg	
	(mrem)	
Leg 1	**27989.88**	
Leg 2	**0.82**	
Leg 3	**#VALUE!**	
Leg 4	**#VALUE!**	
Leg 5	**#VALUE!**	
Leg 6	**#VALUE!**	
Leg 7	**#VALUE!**	
Leg 8	**#VALUE!**	
Parameters:		
ro=	1.40	
r1=	0.17	
r2=	1.17	
r3=	5.25	
K=	0.21	
J =	0.00147	

dimensions in feet

5.5 feet

penetrations filled with 2 inch diameter water pipes

width (feet)	height (feet)	radius	area ft^2)
		0.4166667	0.4090615
		0.4166667	0.4090615
			0
			0
			0
			0
			0
			0

length

1	feet
12.5	feet
	feet
	feet
	feet
	feet
	feet
	feet

NOTE: Source Term increased by factor of 7 to account for secondary flux due to stacking. Use ratio of measurement at IB1 to arrive at this factor.