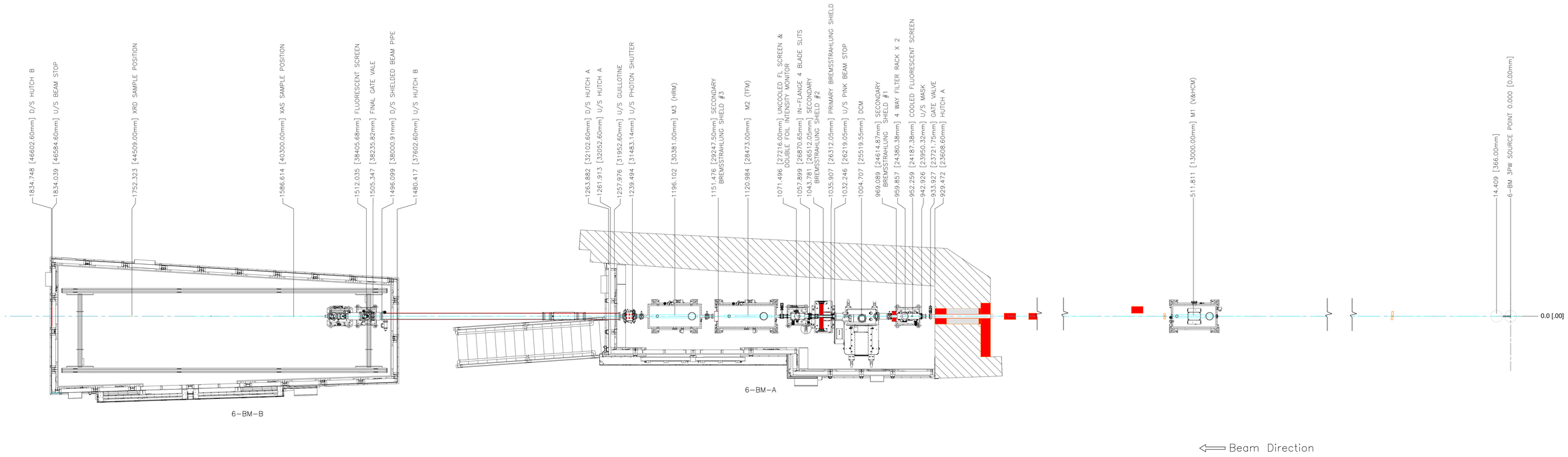
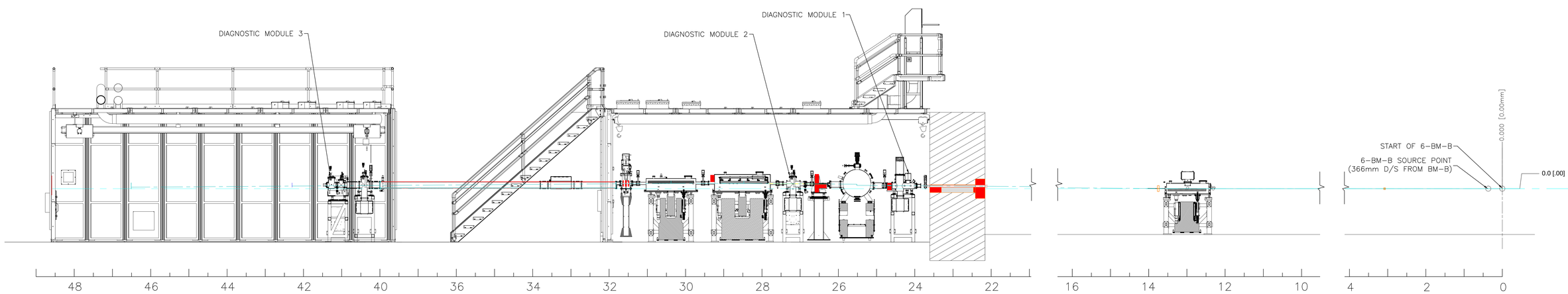
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-004404	8/2016	J.FABIJANIC	C. STELMACH	A.BROADBENT





NOTES:

1. REFERENCE FRONT END DRAWING SR-FE-3PW-8001 REV C.
2. UNLESS OTHERWISE SPECIFIED THE BM SOURCE POINT IS THE ORIGIN FOR ALL ORDINATE DIMENSIONS.
3. UNLESS OTHERWISE SPECIFIED ALL ORDINATE DIMENSIONS ARE TO THE CENTER OF EACH COMPONENT.
4. SHEET 1 COMPONENT LAYOUT REFERENCE FMB OXFORD DM-1 MODEL AQM0114 RECEIVED ON 12/16/16
5. SHEET 1 COMPONENT LAYOUT REFERENCE FMB OXFORD BEAMLINE MODEL ABM0038 RECEIVED ON 11/2/16

BMM (6-BM)
BEAMLINE LAYOUT
SCALE: 1:40

SPECIFICATIONS		REFERENCE
Project	PBN PROJECT	PS-C-XFD-RSI-SST-BMM-001 VERSION 1
Source	THREE POLE WIGGLER (TPW)	LT-C-ASD-RSI-003
Beam Line Name	BEAMLINE FOR MATERIALS MEASUREMENTS	PS-C-XFD-RSI-SST-BMM-001 VERSION 1
Abbreviation	BMM	PS-C-XFD-RSI-SST-BMM-001 VERSION 1
Period of insertion device	N/A	N/A
Cell	6-BM	PS-C-XFD-RSI-SST-BMM-001 VERSION 1
Length of Source	N/A	N/A
Location of Source (from Start of Bending Magnet)	366.0 mm	PS-C-XFD-RSI-SST-BMM-001 VERSION 1
Ray Tracing Procedure		PS-C-XFD-PRC-008 VERSION 2
Front End Ray Tracing Drawing		SR-FE-3PW-8001 REV C

ABBREVIATIONS:

V & HCM - VERTICAL & HORIZONTAL COLLIMATING MIRROR.
DCM - DOUBLE CRYSTAL MONOCHROMATOR
TFM - TOROIDAL FOCUSING MIRROR
HRM - HARMONIC REJECTION MIRROR
U/S - UPSTREAM
D/S - DOWNSTREAM
BM - BENDING MAGNET
3PW - 3 POLE WIGGLER
IB - INBOARD
OB - OUTBOARD

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN MILLIMETERS
DIMENSIONS IN BRACKETS [xx.xx] (WHERE PRESENT) ARE INCHES AND ARE FOR REFERENCE ONLY
INTERPRET DRAWING AS PER ANSI Y14.5-1994 OR Y32.2-1975

DIMENSIONAL TOLERANCES: X: ± 1.500, .X ± 0.750, .XX ± 0.400, .XXX ± 0.120
ANGULAR TOLERANCE: ± .5°
FINISH: 3.2
BREAK EDGES & SHARP CORNERS 0.120 MIN. TO 0.750 MAX

THIRD ANGLE PROJECTION
SCALE: SEE VIEW

BROOKHAVEN NATIONAL LABORATORY
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BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973
Exploring Life's Mysteries, Protecting its Future

DRAWN BY	J.FABIJANIC	7/2016
CHECKED BY	C. STELMACH	7/2016
VACUUM APPROVAL		
ENGINEER APPROVAL	A.BROADBENT	7/2016
SUPERVISOR APPROVAL	D.FISCHER	7/2016
ES&H APPROVAL	L. STIEGLER	7/2016
QA APPROVAL	J. ZIPPER	7/2016

NSLS II NATIONAL SYNCHROTRON LIGHT SOURCE II

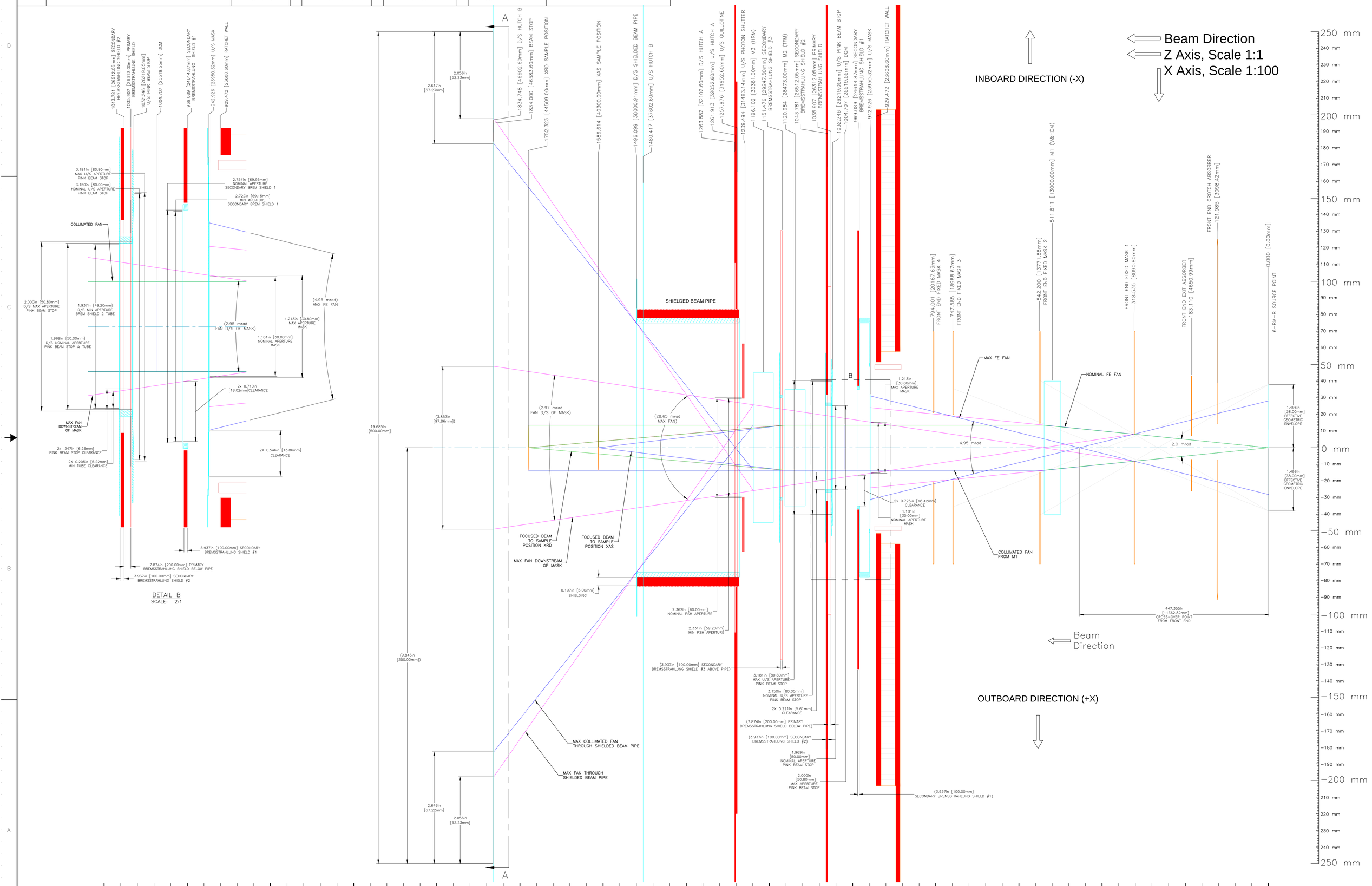
PHOTON DIVISION
BMM BEAMLINE
BMM BEAMLINE RAYTRACE

SHEET SIZE: E
DRAWING/PART NUMBER: PD-BMM-RAYT-0001
REVISION: A

NEXT ASSY: N/A
PROJECT: PBN
WBS# 7.03.02
ES&H RISK LEVEL: A-1
SHEET 1 OF 6

TABLE OF TOLERANCED DIMENSIONS (mm)									
LINE	DESCRIPTION	NOMINAL	±	FABRICATION	±	POSITION	=	TOTAL	CLEARANCE/DISTANCE
1	U/S MASK APERTURE	30.00	+	2 x 0.18	+	2 x 0.22	=	30.80 MAX	13.86 IB / 13.86 OB
2	U/S PINK BEAM STOP APERTURE	80.00	+	2 x 0.18	+	2 x 0.22	=	80.80 MAX	6.26 IB / 6.26 OB
3	PINK BEAM STOP NOMINAL APERTURE	50.00	+	2 x 0.18	+	2 x 0.22	=	50.80 MAX	5.61 IB / 5.61 OB
4	PHOTON SHUTTER APERTURE	60.00	–	2 x 0.18	–	2 x 0.22	=	59.20 MIN	–

TABLE OF TOLERANCED DIMENSIONS (mm)									
LINE	DESCRIPTION	NOMINAL	±	FABRICATION	±	POSITION	=	TOTAL	CLEARANCE/DISTANCE
5	D/S TUBE SECONDARY BREMSSTRAHLUNG SHIELD #1	69.95	–	2 x 0.18	–	2 x 0.22	=	69.15 MIN	18.02 IB / 18.02 OB
6	D/S TUBE SECONDARY BREMSSTRAHLUNG SHIELD #2	50.00	–	2 x 0.18	–	2 x 0.22	=	49.20 MAX	5.22 IB / 5.22 OB



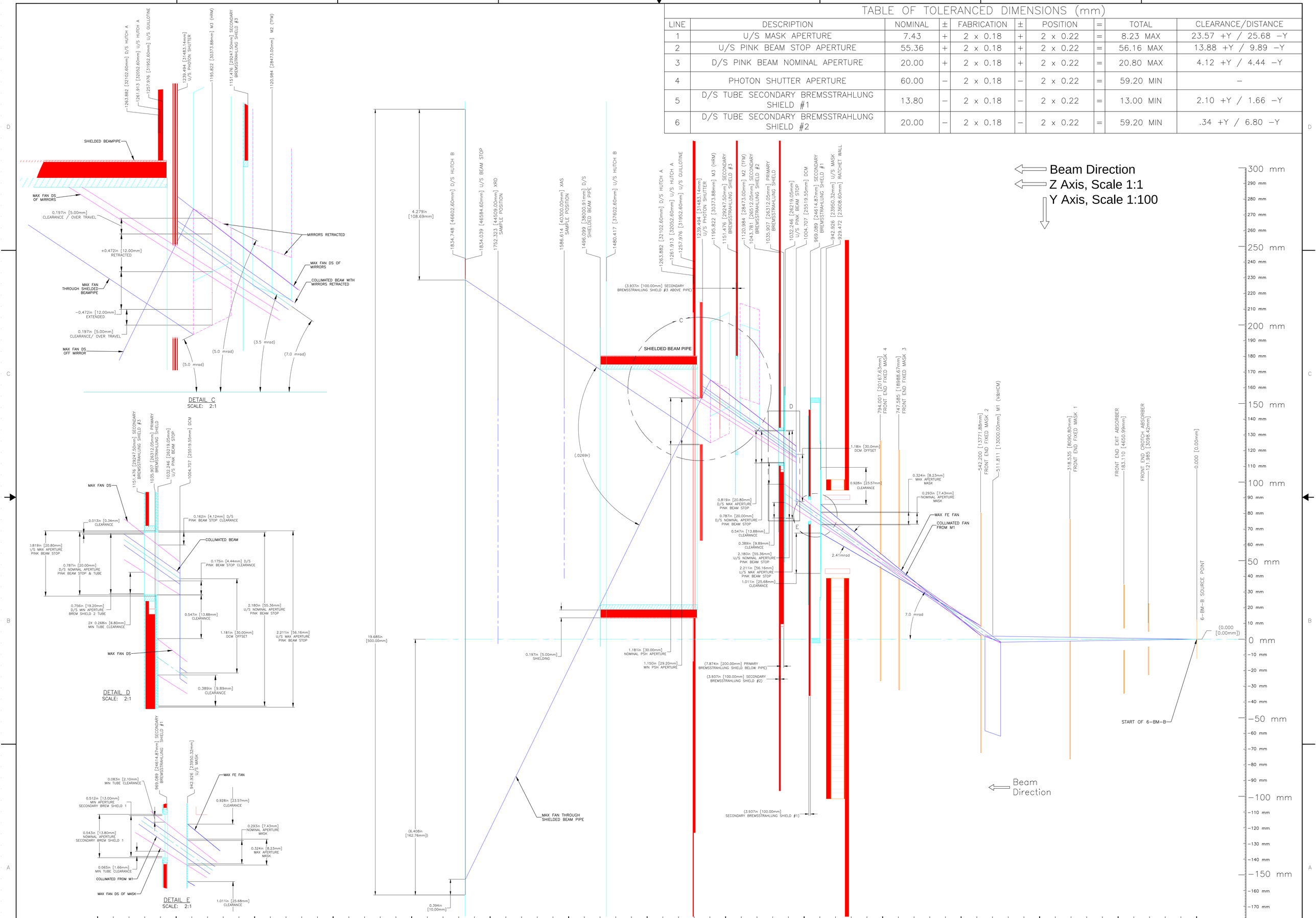
MAXIMUM SYNCHROTRON RAY TRACING - HORIZONTAL

Scale 1:75

SEE FRONT END RAY TRACING
SR-FE-3PW-8001

E	PD-BMM-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 2 OF 6	

TABLE OF TOLERANCED DIMENSIONS (mm)									
LINE	DESCRIPTION	NOMINAL	±	FABRICATION	±	POSITION	=	TOTAL	CLEARANCE/DISTANCE
1	U/S MASK APERTURE	7.43	+	2 x 0.18	+	2 x 0.22	=	8.23 MAX	23.57 +Y / 25.68 −Y
2	U/S PINK BEAM STOP APERTURE	55.36	+	2 x 0.18	+	2 x 0.22	=	56.16 MAX	13.88 +Y / 9.89 −Y
3	D/S PINK BEAM NOMINAL APERTURE	20.00	+	2 x 0.18	+	2 x 0.22	=	20.80 MAX	4.12 +Y / 4.44 −Y
4	PHOTON SHUTTER APERTURE	60.00	−	2 x 0.18	−	2 x 0.22	=	59.20 MIN	−
5	D/S TUBE SECONDARY BREMSSTRAHLUNG SHIELD #1	13.80	−	2 x 0.18	−	2 x 0.22	=	13.00 MIN	2.10 +Y / 1.66 −Y
6	D/S TUBE SECONDARY BREMSSTRAHLUNG SHIELD #2	20.00	−	2 x 0.18	−	2 x 0.22	=	59.20 MIN	.34 +Y / 6.80 −Y



MAXIMUM SYNCHROTRON RAY TRACING - VERTICAL

Scale 1:75

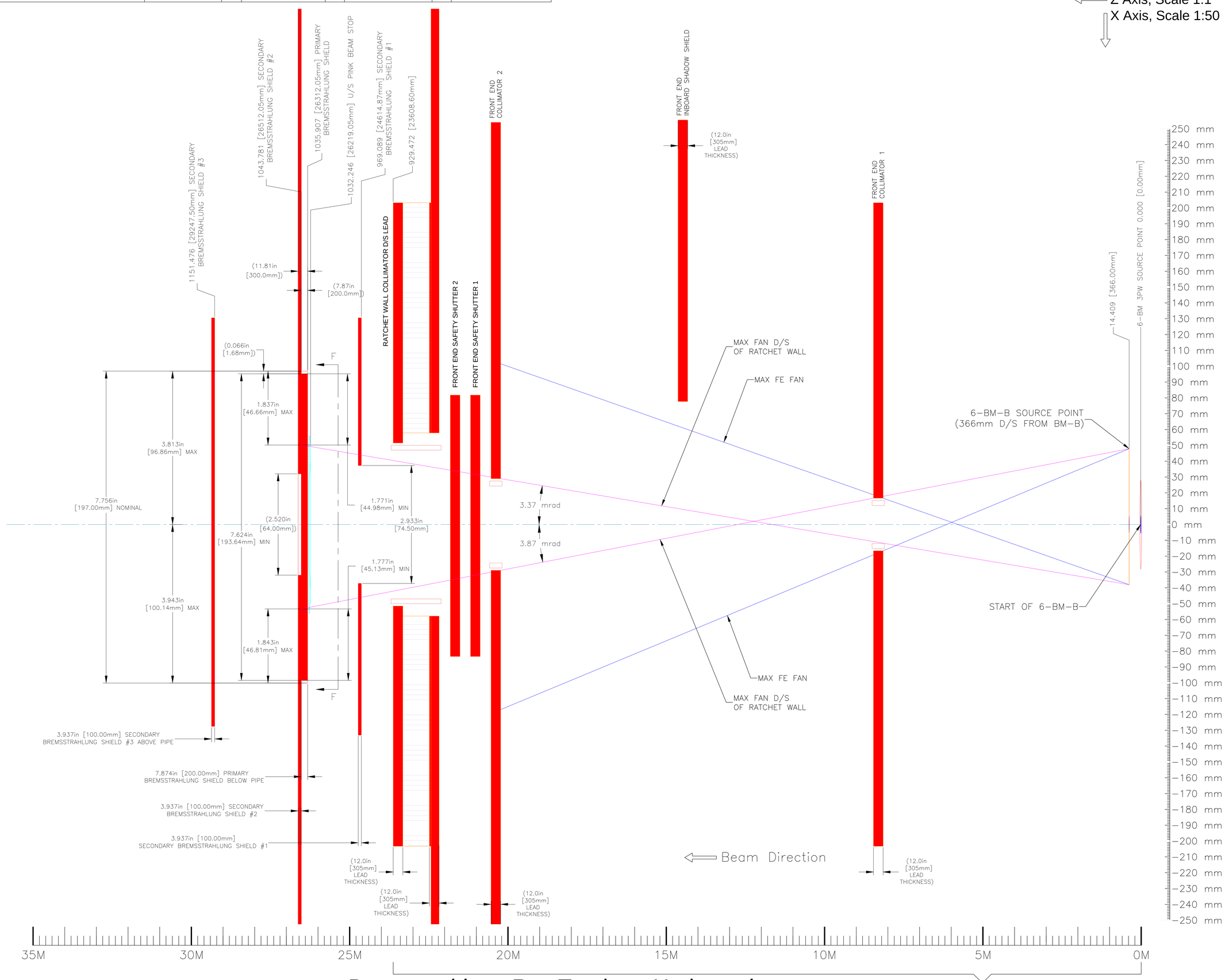
SEE FRONT END RAY TRACING
SR-FE-3PW-8001

E	PD-BMM-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION

ESH&Q RISK LEVEL A-1 | SHEET 3 OF 6

TABLE OF TOLERANCED DIMENSIONS (mm)

LINE	DESCRIPTION	NOMINAL	±	FABRICATION	±	POSITION	=	TOTAL
1	PRIMARY BREMSSTRAHLUNG SHIELD	197.00	–	2X .18	–	2X 1.50	=	193.64 MIN



Bremsstrahlung Ray Tracing - Horizontal

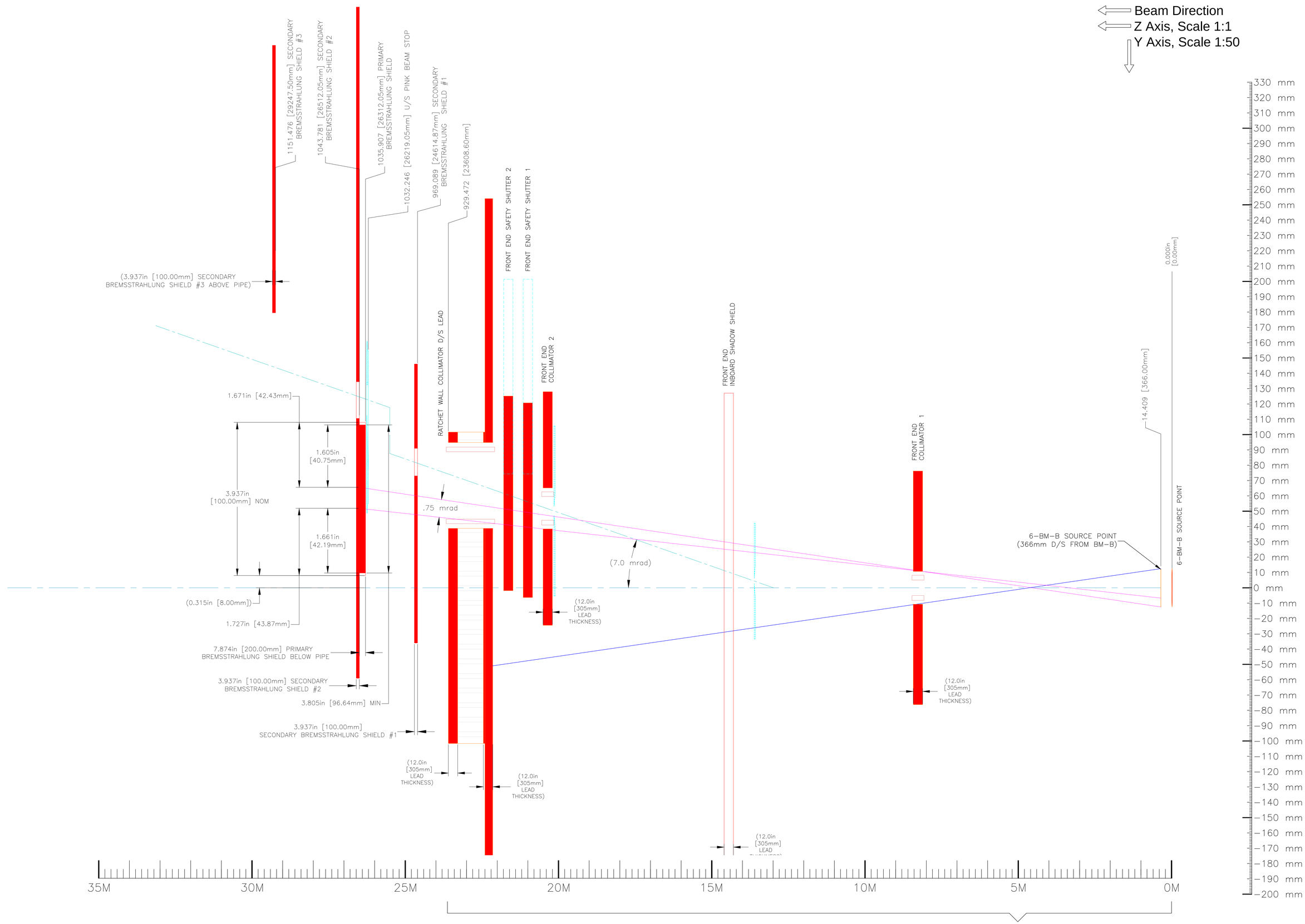
Scale 1:40

SEE FRONT END RAY TRACING
SR-FE-3PW-8001

SHEET SIZE	DRAWING/PART NUMBER	REVISION
E	PD-BMM-RAYT-0001	A

ESH&Q RISK LEVEL A-1 SHEET 4 OF 6

TABLE OF TOLERANCED DIMENSIONS (mm)								
LINE	DESCRIPTION	NOMINAL	±	FABRICATION	±	POSITION	=	TOTAL
1	PRIMARY BREMSSTRAHLUNG SHIELD	100.00	–	2X .18	–	2X 1.50	=	96.64 MIN



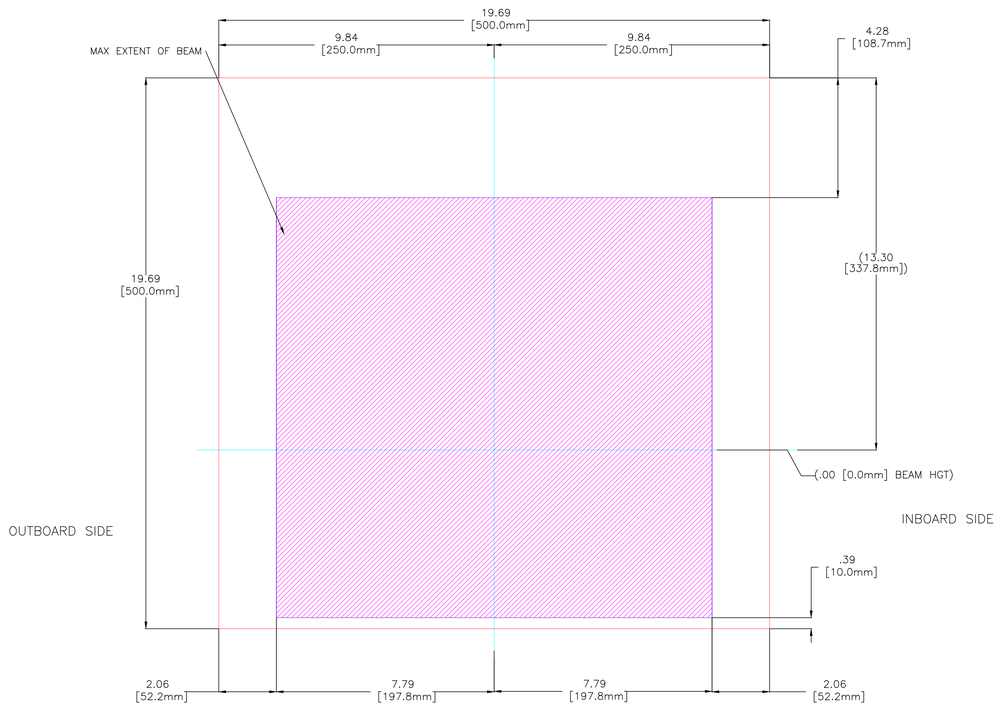
Bremsstrahlung Ray Tracing - Vertical

Scale 1:40

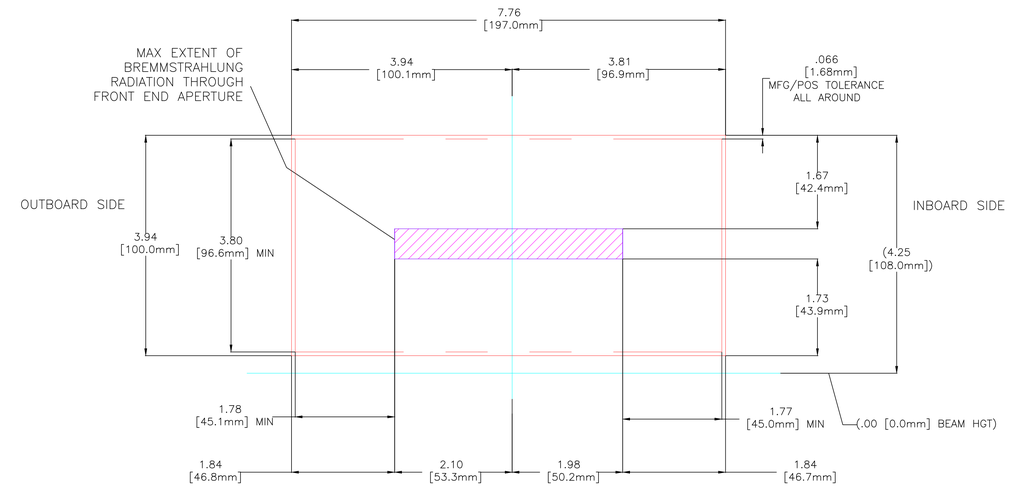
SEE FRONT END RAY TRACING
SR-FE-3PW-8001

E	PD-BMM-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION

ESH&Q RISK LEVEL A-1 SHEET 5 OF 6



DETAIL A–A BEAM STOP
SCALE: 1:2



DETAIL F–F BREMSSTRAHLUNG STOP
SCALE: 1:1

NOTE:
VIEW ON 'F–F' – FRONT FACE OF FIRST BREMMSTRAHLUNG COLLIMATOR, IN AIR, LEAD LENGTH 300mm AT 26.312 m

E (SHEET SIZE)	PD-BMM-RAYT-0001 (DRAWING/PART NUMBER)	A (REVISION)
ESH&Q RISK LEVEL A-1		SHEET 6 OF 6