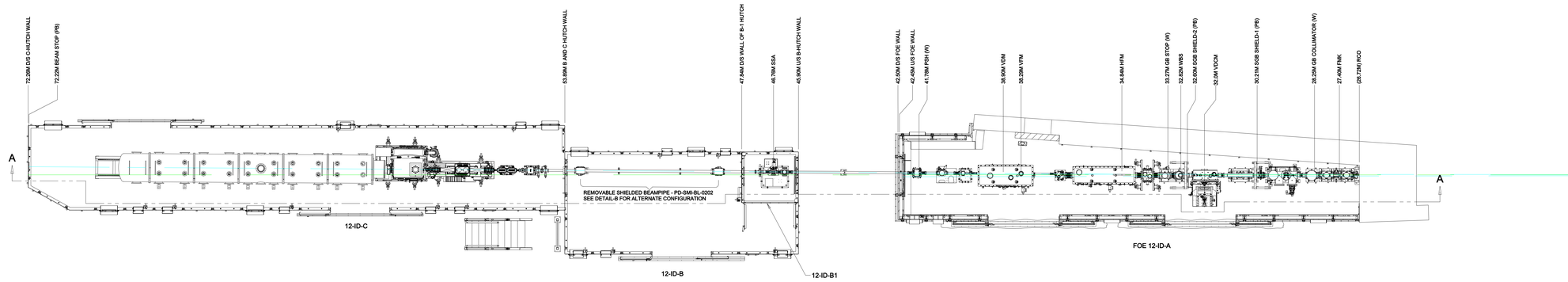
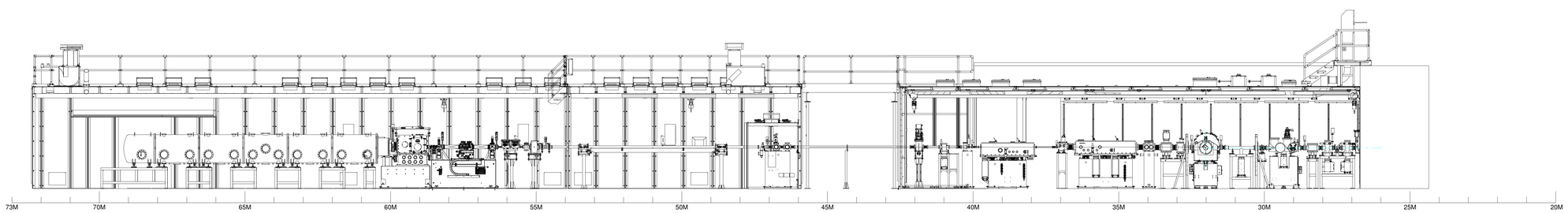
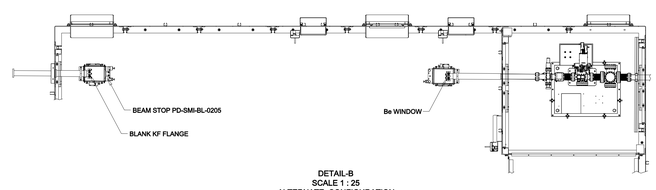
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASED PER ECO-003489	07/2016	C. STELMACH	J. FABIJANIC	S. COBURN



Beam Direction



SECTION A-A
SCALE 1 / 50



DETAIL-B
SCALE 1 : 25
ALTERNATE CONFIGURATION
SHIELDED BEAMPIPE REMOVED
Be WINDOW, BEAM STOP AND BLANK FLANGE INSTALLED

NOTES:
1. FE REFERENCE DRAWING SR-FE-IVU12-1001 REV B.
2. THE CENTER OF STRAIGHT IS THE ORIGIN FOR ALL DIMENSIONS UNLESS OTHERWISE NOTED.
3. BLUE AND MAGENTA COLORED RAYS ARE DETERMINED BY TOLERANCED APERTURES.
4. GREEN COLORED RAYS ARE DETERMINED BY NOMINAL APERTURES.

SPECIFICATIONS		REFERENCE
Project	NEXT PROJECT	NX-C-XFD-RSI-001 (VERSION 5)
Source	IVU23-2.8m	NX-C-XFD-RSI-001 (VERSION 5)
Beam Line Name	Soft Matter Interfaces	NX-C-XFD-RSI-001 (VERSION 5)
Abbreviation	SMI	NX-C-XFD-RSI-001 (VERSION 5)
Period of Insertion Device	D/S: 23mm, U/S: Not Installed	NX-C-XFD-RSI-001 (VERSION 5)
Long / Short Straight / Cell	LONG, 12-ID	NX-C-XFD-RSI-001 (VERSION 5)
Canting Angle	2 mrad asymmetric: D/S 0.641 mrad I/B, U/S: 1.359 mrad O/B	SR-ID-SMI-IVU-1000 (REV. B)
Length of Source	2800 mm	NX-C-XFD-RSI-001 (VERSION 5)
Location of Center of Sources (from Center of Straight)	D/S: 0.601m, U/S: -2.676m	SR-ID-SMI-IVU-1000 (REV. B)
Ray Tracing Procedure		PS-C-XFD-PRC-008 (Version 2)
Front End Ray Tracing Drawing		SR-FE-IVU12-1001 (REV. B)

ABBREVIATIONS:
DS - DOWNSTREAM
FMK - FIXED MASK
FOE - FRONT OPTICS ENCLOSURE
GB - GASEOUS BREMSSTRAHLUNG
HFM - HORIZONTAL FOCUSING MIRROR
PB - LEAD
PPS - PERSONAL PROTECTION SYSTEM
PSH - PHOTON SHUTTER
RCO - RATCHET WALL COLLIMATOR
SGB - SECONDARY GASEOUS BREMSSTRAHLUNG
SSA - SECONDARY SOURCE APERTURE
US - UPSTREAM
VDCM - VERTICAL OFFSET DOUBLE CRYSTAL MONOCHROMATOR (SMI)
VDM - VERTICAL DEFLECTION MIRROR
VFM - VERTICAL FOCUSING MIRROR
W - TUNGSTEN
WBS - WHITE BEAM STOP

SMI BEAMLINE LAYOUT 12-ID

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS [mm] ARE DERIVED FROM DIMENSIONS IN INCHES UNLESS OTHERWISE INTERPRET DRAWING AS PER ANSI Y14.5-1994 OR YA5.5-1973
DIMENSIONAL TOLERANCES: X ± 0.080, X ± 0.030, XX ± 0.015, XXX ± 0.005
ANGULAR TOLERANCE: ± .5°
FINISH: 125
BREAK EDGES & SHARP CORNERS 0.005 MIN. TO 0.030 MAX.
THIRD ANGLE PROJECTION
SCALE: NOTED

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973
Exploring Life's Mysteries
Meeting Challenges to Future

DRAWN BY	C. STELMACH	03/2016
CHECKED BY	J. FABAJANIC	04/2016
VACUUM TECHNOLOGY ENGINEER APPROVAL	S. COBURN	04/2016
SUPERVISOR APPROVAL	E. DIMASI	04/2016
ESH&Q APPROVAL	L. STEIGLER	04/2016
QA APPROVAL	J. ZIPPER	04/2016

NSLS II NATIONAL SYNCHROTRON LIGHT SOURCE II

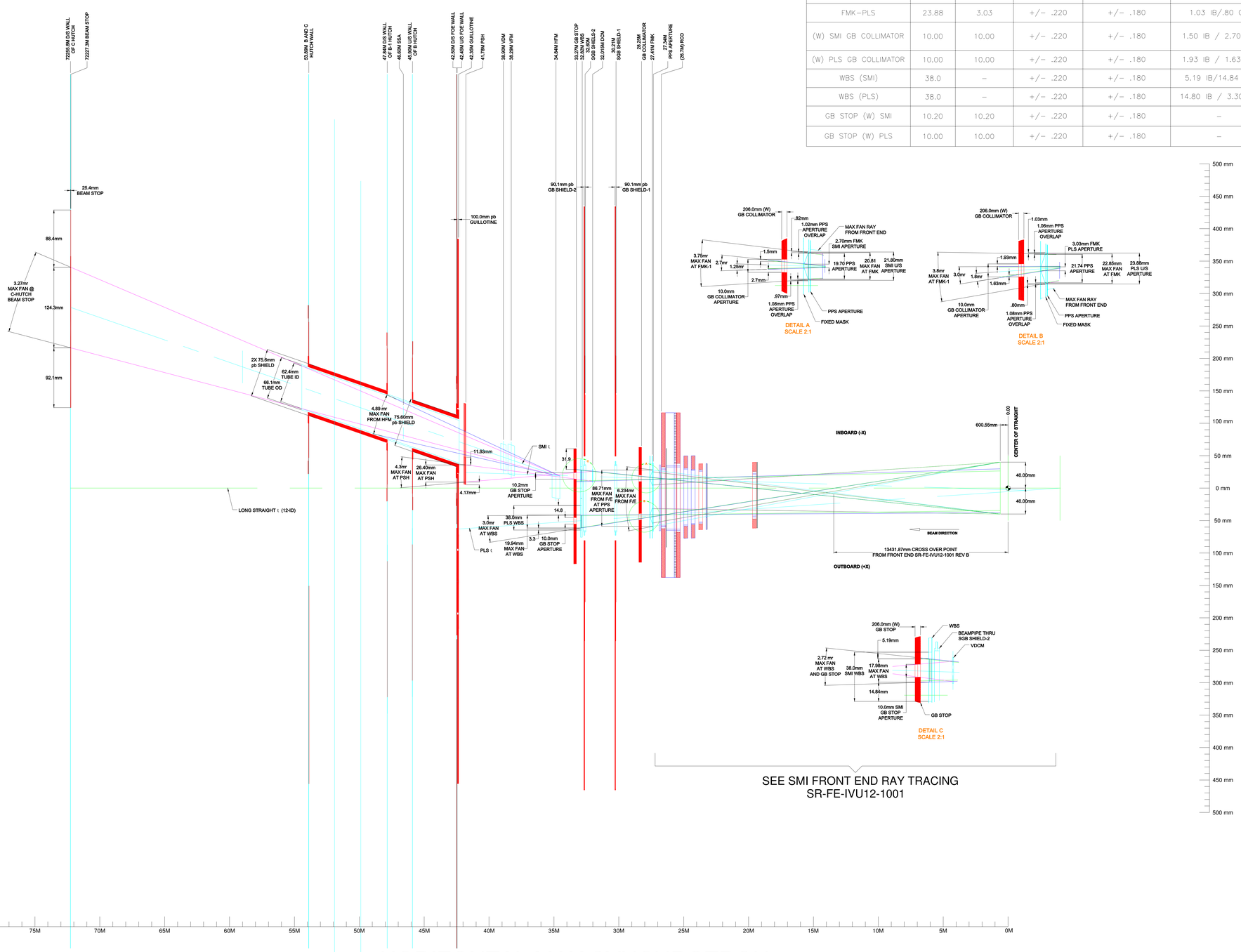
PHOTON DIVISION
SMI RAY TRACING
SMI BEAMLINE RAYTRACING

NEXT ASSY:
PROJECT: PHOTON DIVISION
WBS# 2.10.02
SHEET SIZE: E
DRAWING/PART NUMBER: PD-SMI-RAYT-0001
REVISION: A
ESH&Q RISK LEVEL: A-1
SHEET 1 OF 10

PD-SMI-RAYT-PD-SMI-RAYT-0001

RELEASED – EFFECTIVE

DESCRIPTION	U/S APERTURE	D/S APERTURE	POSITIONAL TOL	MANUFACTURING TOL	CLEARANCE/DISTANCE
PPS APERTURE–SMI	19.70	–	+/– .220	+/– .180	–
PPS APERTURE–PLS	21.74	–	+/– .220	+/– .180	–
FMK–SMI	21.80	2.70	+/– .220	+/– .180	.82 IB/.97 OB
FMK–PLS	23.88	3.03	+/– .220	+/– .180	1.03 IB/.80 OB
(W) SMI GB COLLIMATOR	10.00	10.00	+/– .220	+/– .180	1.50 IB / 2.70 OB
(W) PLS GB COLLIMATOR	10.00	10.00	+/– .220	+/– .180	1.93 IB / 1.63 OB
WBS (SMI)	38.0	–	+/– .220	+/– .180	5.19 IB/14.84 OB
WBS (PLS)	38.0	–	+/– .220	+/– .180	14.80 IB / 3.30 OB
GB STOP (W) SMI	10.20	10.20	+/– .220	+/– .180	–
GB STOP (W) PLS	10.00	10.00	+/– .220	+/– .180	–



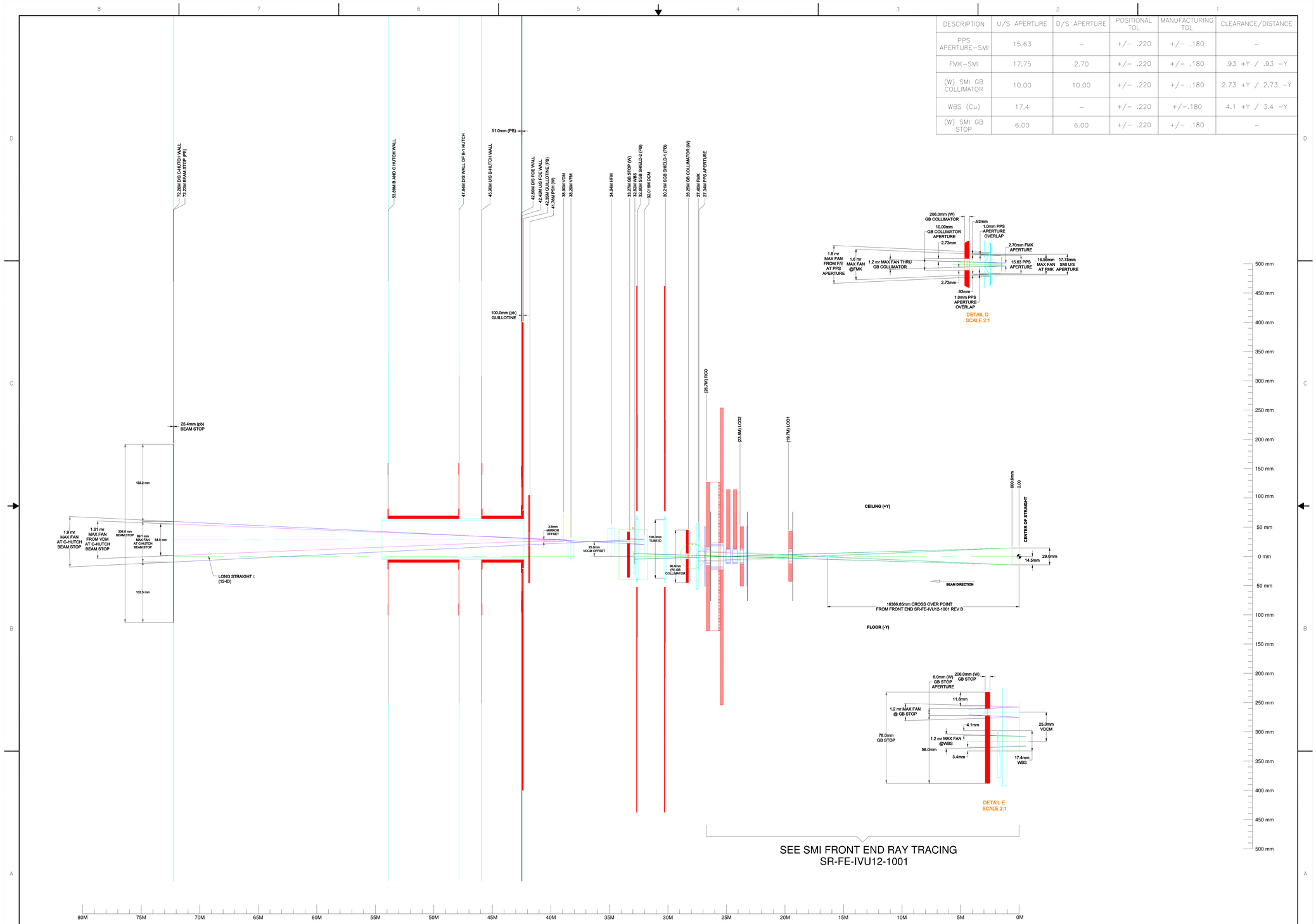
HORIZONTAL MAX SYNCHROTRON
SCALE: X:Z = 1:100

E	PD-SMI-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 2 OF 10	

PD-SMI-RAYT-0001

RELEASED – EFFECTIVE

DESCRIPTION	U/S APERTURE	D/S APERTURE	POSITIONAL TOL	MANUFACTURING TOL	CLEARANCE/DISTANCE
PPS APERTURE–SMI	15.63	–	+/– .220	+/– .180	–
FMK–SMI	17.75	2.70	+/– .220	+/– .180	.93 +Y / .93 –Y
(W) SMI GB COLLIMATOR	10.00	10.00	+/– .220	+/– .180	2.73 +Y / 2.73 –Y
WBS (Cu)	17.4	–	+/– .220	+/–.180	4.1 +Y / 3.4 –Y
(W) SMI GB STOP	6.00	6.00	+/– .220	+/– .180	–



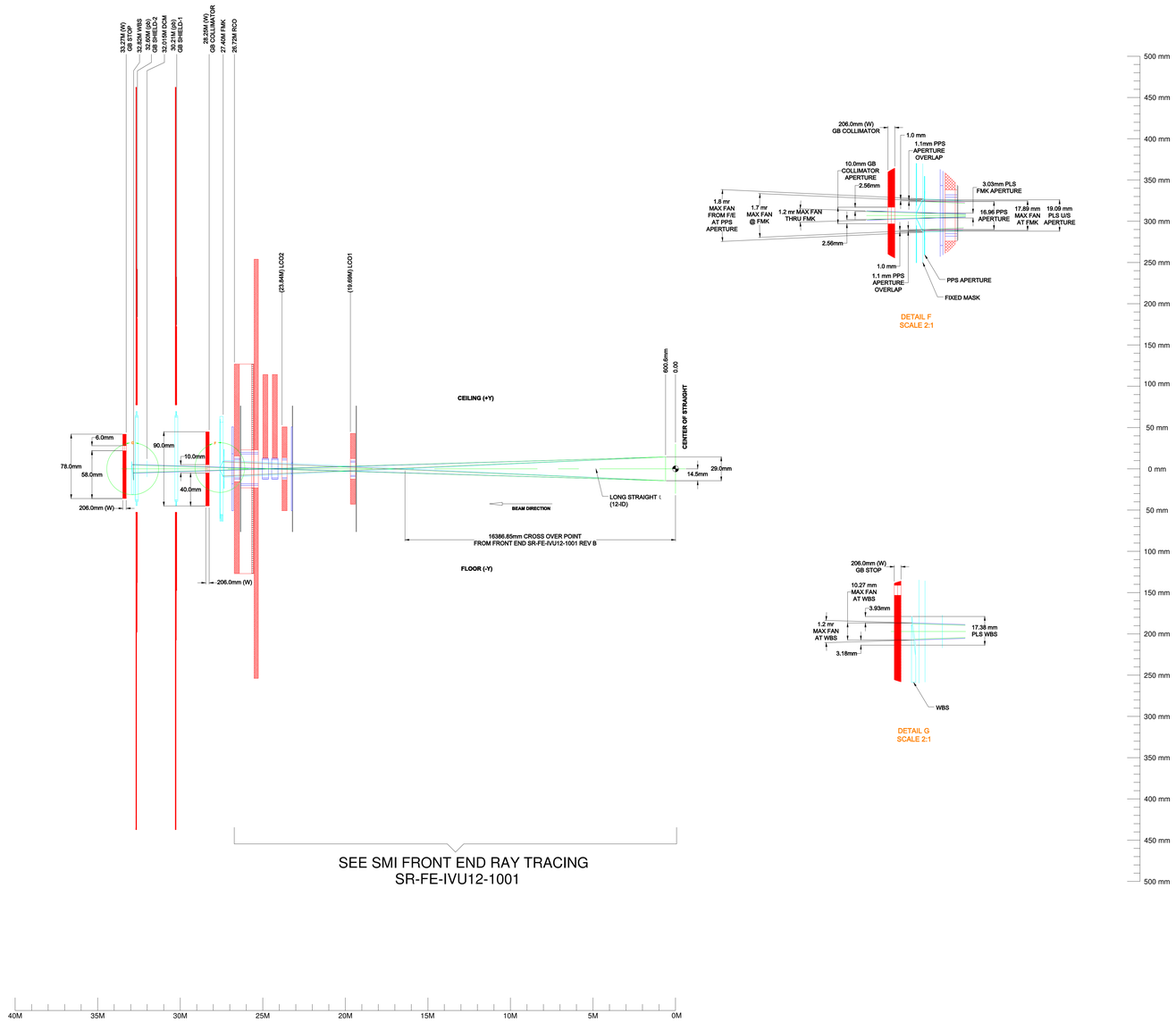
VERTICAL MAX SYNCHROTRON-SMI
SCALE: Y:Z = 1:100

E	PD-SMI-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 3 OF 10	

PD-SMI-RAYT-PD-SMI-RAYT-0001

RELEASED – EFFECTIVE

DESCRIPTION	U/S APERTURE	D/S APERTURE	POSITIONAL TOL	MANUFACTURING TOL	CLEARANCE/DISTANCE
PPS APERTURE-PLS	16.96	–	+/- .220	+/- .180	–
FMK-PLS	19.09	3.03	+/- .220	+/- .180	1.00 +Y/ 1.00 -Y
(W) PLS GB COLLIMATOR	10.00	10.00	+/- .220	+/- .180	2.56 +Y/ 2.56 -Y
WBS (PLS)	17.38	–	+/- .220	+/- .180	3.93 +Y/ 3.12 -Y



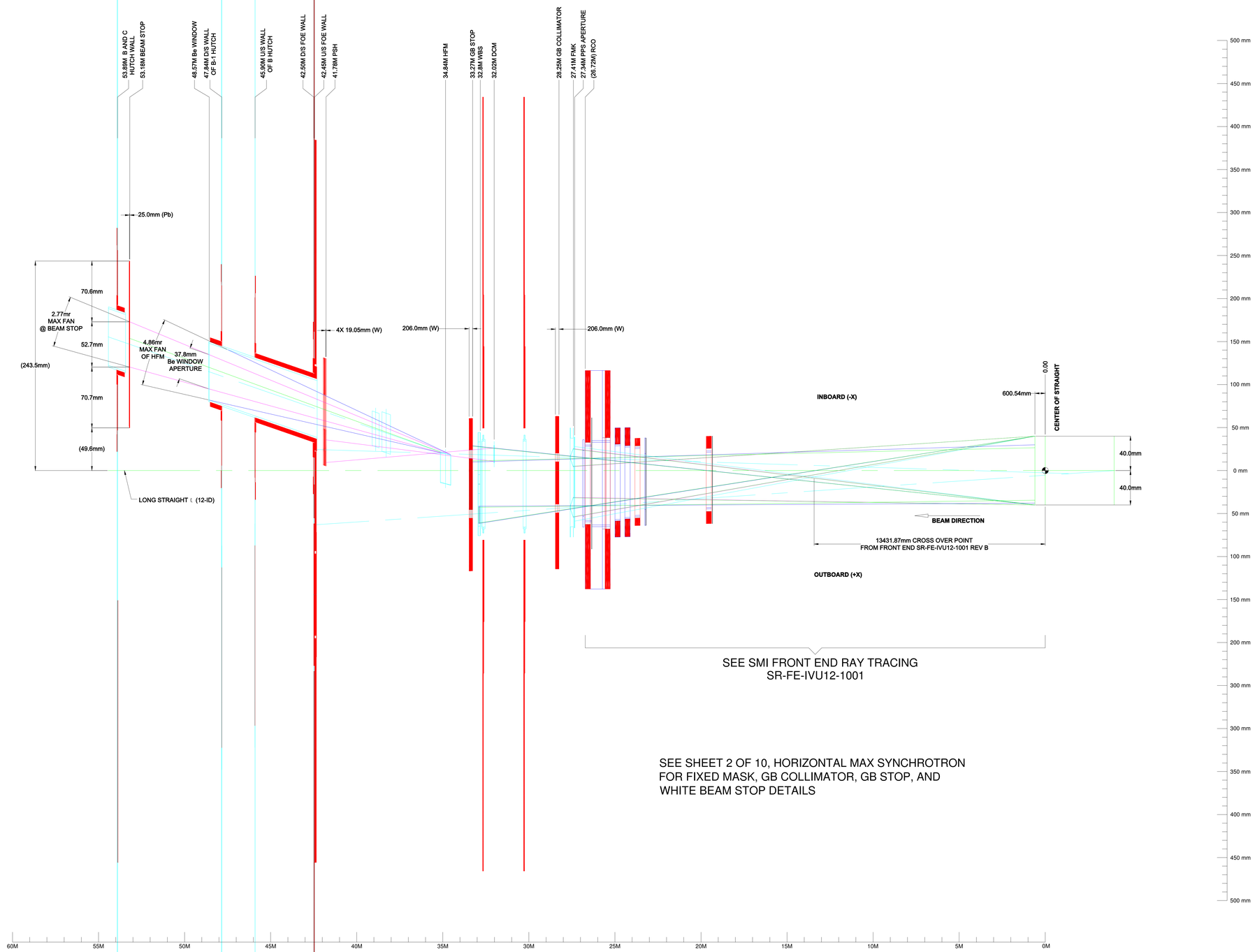
SEE SMI FRONT END RAY TRACING
SR-FE-IVU12-1001

VERTICAL MAX SYNCHROTRON-PLS
SCALE: Y:Z = 1:100

E	PD-SMI-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 4 OF 10	

PD-SMI-RAYT-PD-SMI-RAYT-0001

RELEASED – EFFECTIVE



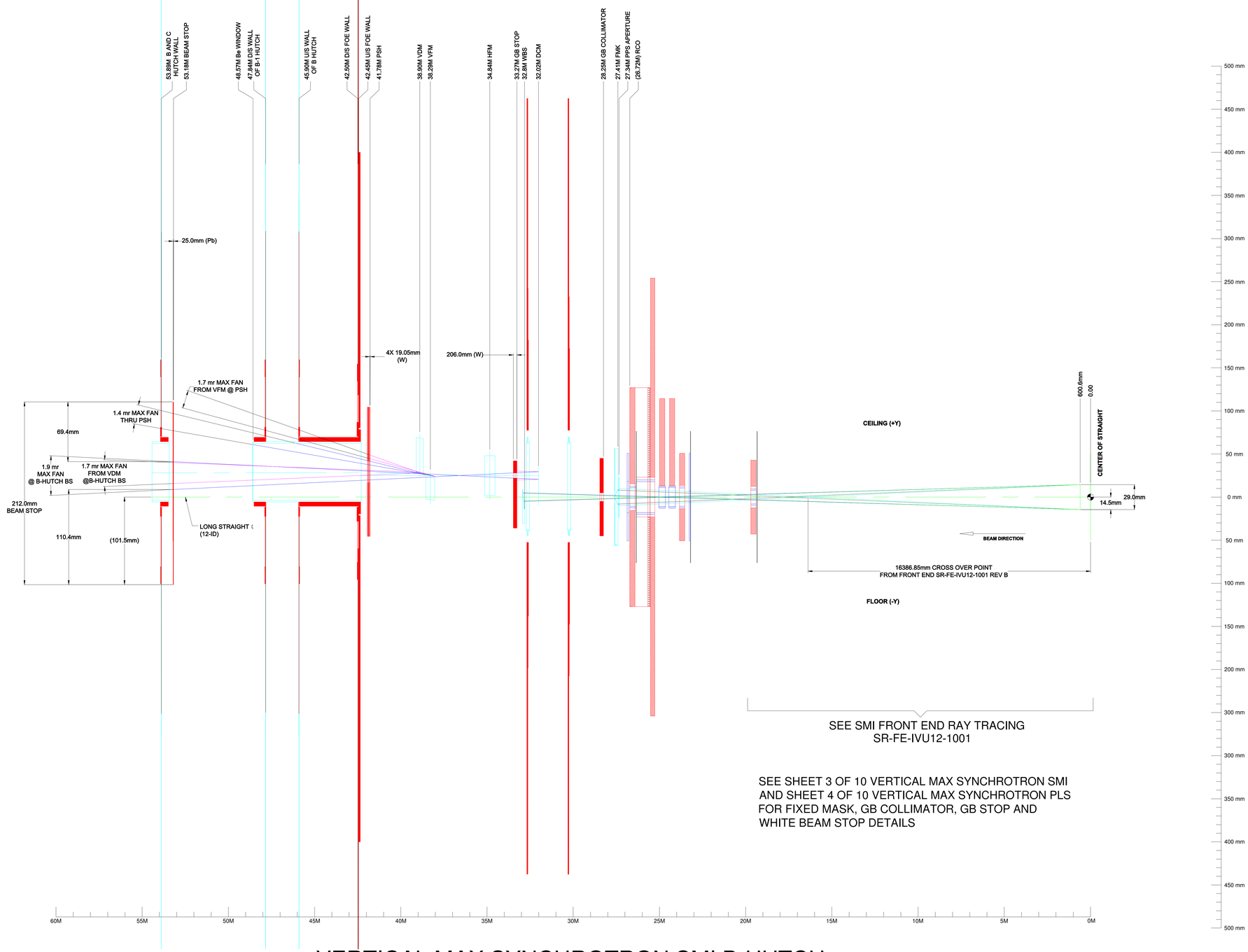
HORIZONTAL MAX SYNCHROTRON B-HUTCH

SCALE: X:Z = 1:75

E (SHEET SIZE)	PD-SMI-RAYT-0001 (DRAWING/PART NUMBER)	A (REVISION)
ESH&Q RISK LEVEL A-1	SHEET 5 OF 10	

PD:SMI:RAYT:PD-SMI-RAYT-0001

RELEASED – EFFECTIVE



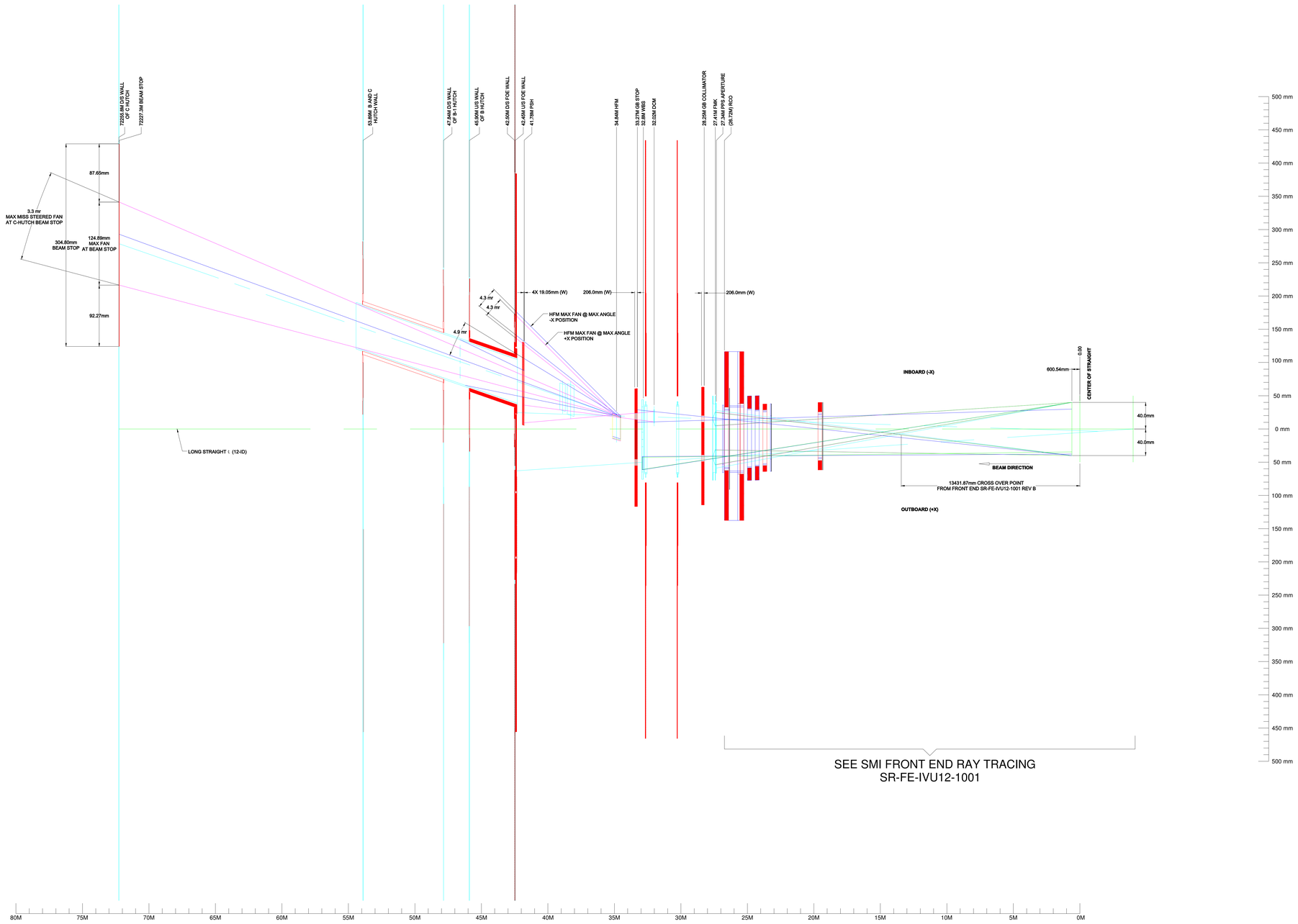
VERTICAL MAX SYNCHROTRON SMI B-HUTCH

SCALE: Y:Z = 1:100

E	PD-SMI-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 6 OF 10	

PD-SMI-RAYT-PD-SMI-RAYT-0001

RELEASED – EFFECTIVE



SEE SMI FRONT END RAY TRACING
SR-FE-IVU12-1001

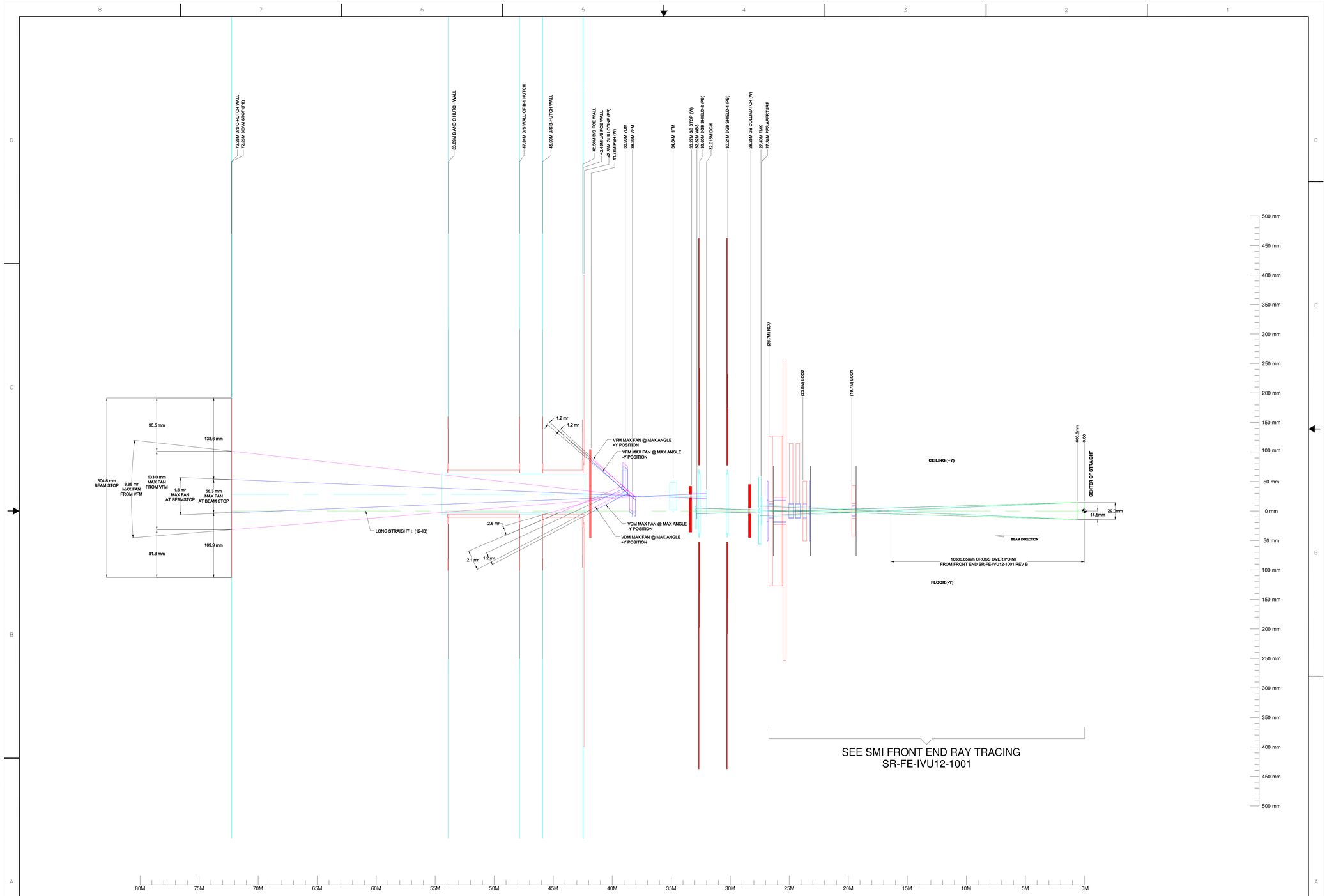
HORIZONTAL MAX SYNCHROTRON MISS STEERING

SCALE: X:Z = 1:100

E SHEET SIZE	PD-SMI-RAYT-0001 DRAWING/PART NUMBER	A REVISION
ESH&Q RISK LEVEL A-1		SHEET 9 OF 10

PD:\SMI\RAYT\PD-SMI-RAYT-0001

RELEASED – EFFECTIVE



VERTICAL MAX SYNCHROTRON
MISS STEERING
SCALE: X:Z = 1:100

E	PD-SMI-RAYT-0001	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1		SHEET 10 OF 10

PD-SMI-RAYT-PD-SMI-RAYT-0001

RELEASED — EFFECTIVE