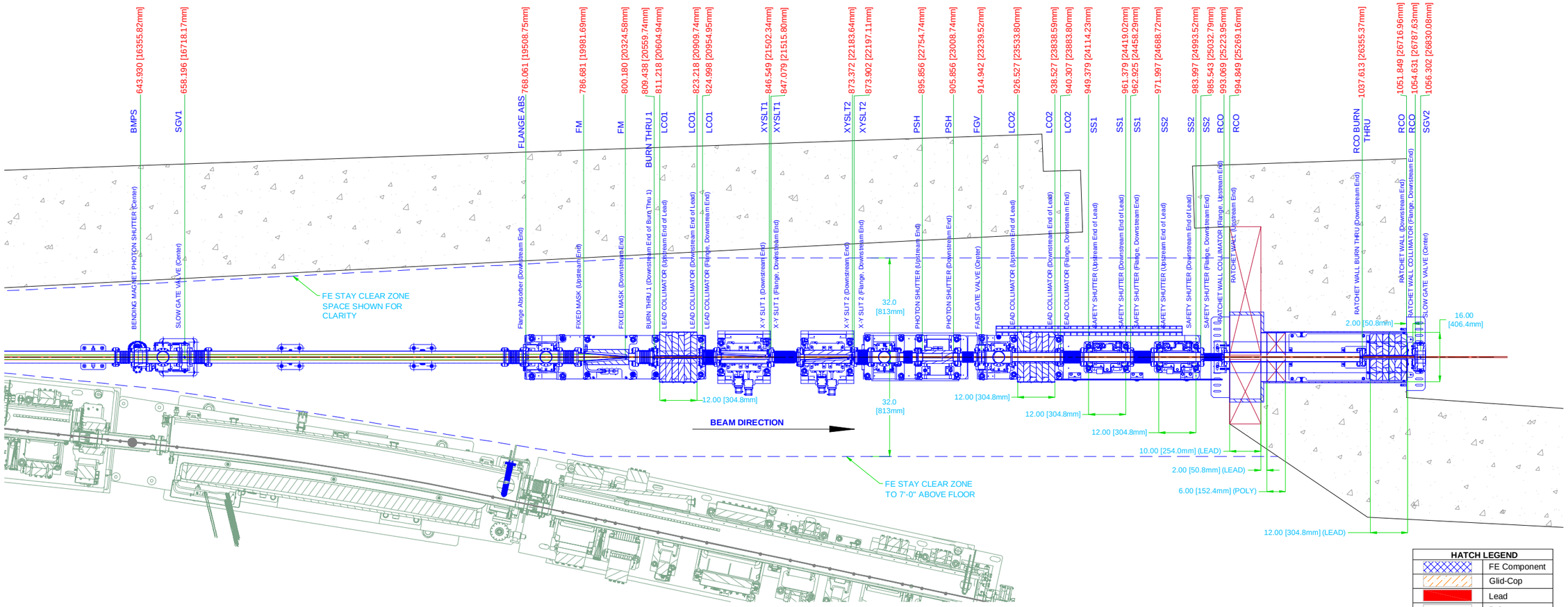
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-001788	2/2014	J.FABIJANIC	R.FAUSSETE	A. HUSSAIN
B	RELEASE PER ECO-002948	3/2015	J.FABIJANIC	C.AMARITO	C.AMUNDSEN



HATCH LEGEND	
	FE Component
	Glid-Cop
	Lead
	Poly
	Lead (SS)

NOTE:
1. THE CENTER OF STRAIGHT IS THE ORIGIN FOR ALL DIMENSIONS UNLESS OTHERWISE NOTED.
2. BENDING MAGNET FAN NOT SHOWN, LAYOUT TO BE SUPPLIED BY VACUUM GROUP.

SPECIFICATIONS		SPEC REFERENCE
Project	"Project Beamline)	NX-C-XFD-RSI-001
Source	Elliptically Polarized Undulator (EPU)	NX-C-XFD-RSI-001
Beam Line Name	Soft Inelastic X-Ray Scattering	NX-C-XFD-RSI-001
Abbreviation	SIX	NX-C-XFD-RSI-001
Period of insertion device	57	NX-C-XFD-RSI-001
Long / Short Straight / Cell	LONG / 02-ID	NX-C-XFD-RSI-001
Canting Angle	NONE	NX-C-XFD-RSI-001
Length of Source	2x3500 mm	NX-C-XFD-RSI-001
Location of Center of Source 1	Center of Long Straight	SR-ID-SIX-EPU-1000
Location of Center of Source 2	N/A	N/A
Nominal Radiation Fan (Horizontal)	1.86 mrad (LH)	NX-C-XFD-RSI-001
Nominal Radiation Fan (Vertical)	1.73 mrad (C)	NX-C-XFD-RSI-001
Fixed Aperture Mask, (Outboard) Downstream, Aperture (Horizontal)	0.3 mrad	NX-C-XFD-RSI-001
Fixed Aperture Mask, (Outboard) Downstream, Aperture (Vertical)	0.3 mrad	NX-C-XFD-RSI-001
Fixed Aperture Mask, (Inboard) Downstream, Aperture (Horizontal)	N/A	N/A
Fixed Aperture Mask, (Inboard) Downstream, Aperture (Vertical)	N/A	N/A

SPECIFICATIONS		SPEC REFERENCE
Active Interlock Envelope	AIE-ID-B	PS-C-ASD-SRP-SPC-002
Ray Tracing Procedure		Doc. PS-C-ASD-PRC-147 (VERSION 2)
Manufacturing & Position Tolerance	±1.5 mm	Ray Tracing Procedure Doc. PS-C-ASD-PRC-147 (VERSION 2)
Bremsstrahlung Source Dimension (Vertical)	+/- 12.5 mm	NSLS-II Technical Note No. 00020
Bremsstrahlung Source Dimension (Horizontal - Outboard)	+ 37.5 mm	NSLS-II Technical Note No. 00020
Bremsstrahlung Source Dimension (Horizontal - Inboard)	See Spec Ref	Determined by FE Collimator Apertures
Bremsstrahlung Source Location (Long Straight)	+ 4000 mm	NSLS-II Technical Note No. 00020
Fixed Mask (Max Horizontal Beam Incidence Angle)	Angle ≤ 4.5°	FEA - Front End (Oct 15, 2010)
Fixed Mask (Max Vertical Beam Incidence Angle)	Angle ≤ 4.5°	FEA - Front End (Oct 15, 2010)

REFERENCES (NSLS II SHAREPOINT):
1. FRONT END SPECIFICATIONS: NSLS-II GROUP SITES > NSLS-II ACCELERATOR SYSTEMS > MECHANICAL DESIGN AND ENGINEERING > FRONT ENDS > FRONT END REQUIREMENTS.
2. NSLS II TECHNICAL NOTE NUMBER 00020 BREMSSTRAHLUNG RAY TRACING GUIDELINES OR NSLS II BEAMLINES AND FRONT ENDS.
3. NSLS II TECHNICAL NOTE NUMBER 014 PRELIMINARY SHIELDING ESTIMATES FOR NSLS II BEAMLINES AND FRONT ENDS.
4. NSLS II CONTROLLED DOCUMENT NO. NX-C-XFD-RSI-001, (VERSION 2) RSI FOR THE INSERTION DEVICES AND FRONT-ENDS FOR THE NEXT BEAMLINES.
5. ID GROUP INTERFACE CONTROL DRAWING: SR-ID-SIX-EPU-1000 REV1.
6. FRONT END RAY TRACING PROCEDURE DOC. PS-C-ASD-PRC-147 (VERSION 4)

SIX, COMPONENT LAYOUT

NEXT ASSY: N/A
PROJECT:

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS [xx.xx] (WHERE PRESENT) ARE MILLIMETERS AND ARE FOR REFERENCE ONLY
INTERPRET DRAWING AS PER ANSI Y14.5-1994 OR Y32.2-1975
DIMENSIONAL TOLERANCES: X. ` 0.060; .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: SEE DWG 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	2/2014
CHECKED BY	R.FAUSSETE	2/2014
RADIATION APPROVAL	PK.JOB/Z.ZHONG	2/2014
ENGINEER APPROVAL	A. HUSSAIN	2/2014
SUPERVISOR APPROVAL	S.SHARMA	2/2014
RAD SAFETY APP	P.ILINSKI	2/2014
TOP OFF SAFETY	Y.LI	2/2014
S&H APPROVAL	A. AOKI RMAN	2/2014
QA APPROVAL	E.CHESWICK	2/2014

WBS# 1.03.04.07.03

NSLS II NATIONAL SYNCHROTRON LIGHT SOURCE II

STORAGE RING
FRONT END, SIX BEAMLINE
RAY TRACING

SHEET SIZE: D
DRAWING/PART NUMBER: SR-FE-EPU02-1001
REVISION: B
ESH&Q RISK LEVEL: A1
SHEET 1 OF 7

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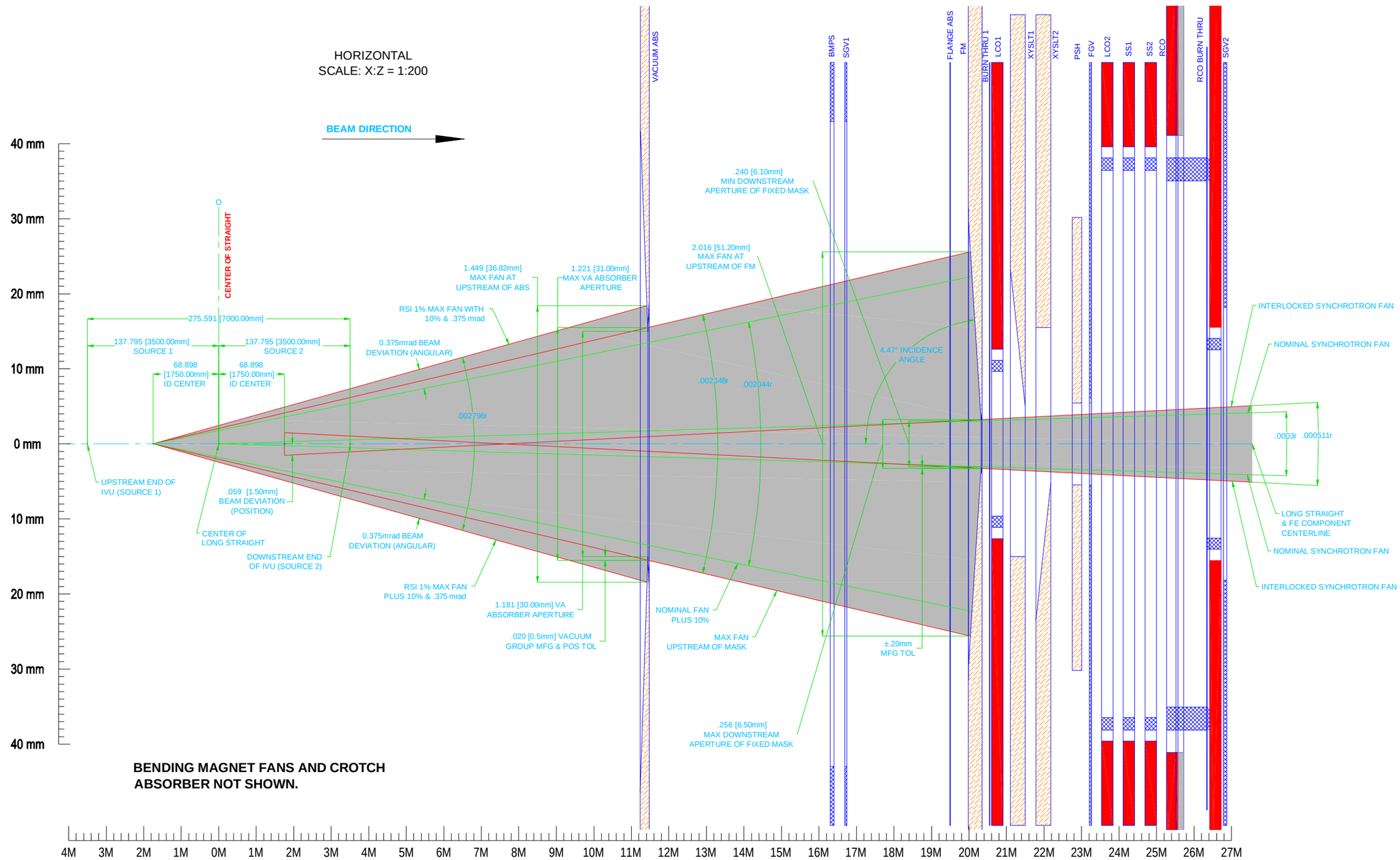

BENDING MAGNET FANS AND CROTCH ABSORBER NOT SHOWN.

All dimensions are taken at downstream flange of device unless otherwise noted.

1	MIN APERTURE OF BMPS (Center)	45.55 mm
2	MIN APERTURE OF SGV1 (Center)	46.41 mm
3	~~MIN APERTURE OF XBPM1 (Center)~~ NOT USED	------- mm
4	~~MIN APERTURE OF XBPM2 (Center)~~ NOT USED	------- mm
5	MAX UPSTREAM APERTURE OF ABSF	54.20 mm
6	MIN UPSTREAM APERTURE OF FM	57.20 mm
7	MIN DOWNSTREAM APERTURE OF FM	6.10 mm
8	MAX DOWNSTREAM APERTURE OF FM	6.50 mm
9	MAX APERTURE OF SHADOW DEVICE 1	11.62 mm
10	NOM INTERNAL TUBE APERTURE OF LCO1	SEE SHEET 6

11	MIN APERTURE OF XYSLT1	10.11 mm
12	MIN APERTURE OF XYSLT2	10.45 mm
13	MIN APERTURE OF PSH	10.89 mm
14	MIN APERTURE OF FGV (Center)	10.99 mm
15	NOM INTERNAL TUBE APERTURE OF LCO2	SEE SHEET 6
16	MIN TUBE APERTURE OF SS1	11.61 mm
17	MIN TUBE APERTURE OF SS2	11.90 mm
18	MAX APERTURE OF SHADOW DEVICE 2	19.09 mm
19	NOM INTERNAL TUBE APERTURE OF DS RCO	SEE SHEET 6
20	MIN APERTURE OF SGV2	12.85 mm

SIX, INTERLOCKED SYNCHROTRON RAY TRACING HORIZONTAL

D (SHEET SIZE)	SR-FE-EPU02-1001 (DRAWING/PART NUMBER)	B (REVISION)
ESH&Q RISK LEVEL A1	SHEET 2 OF 7	

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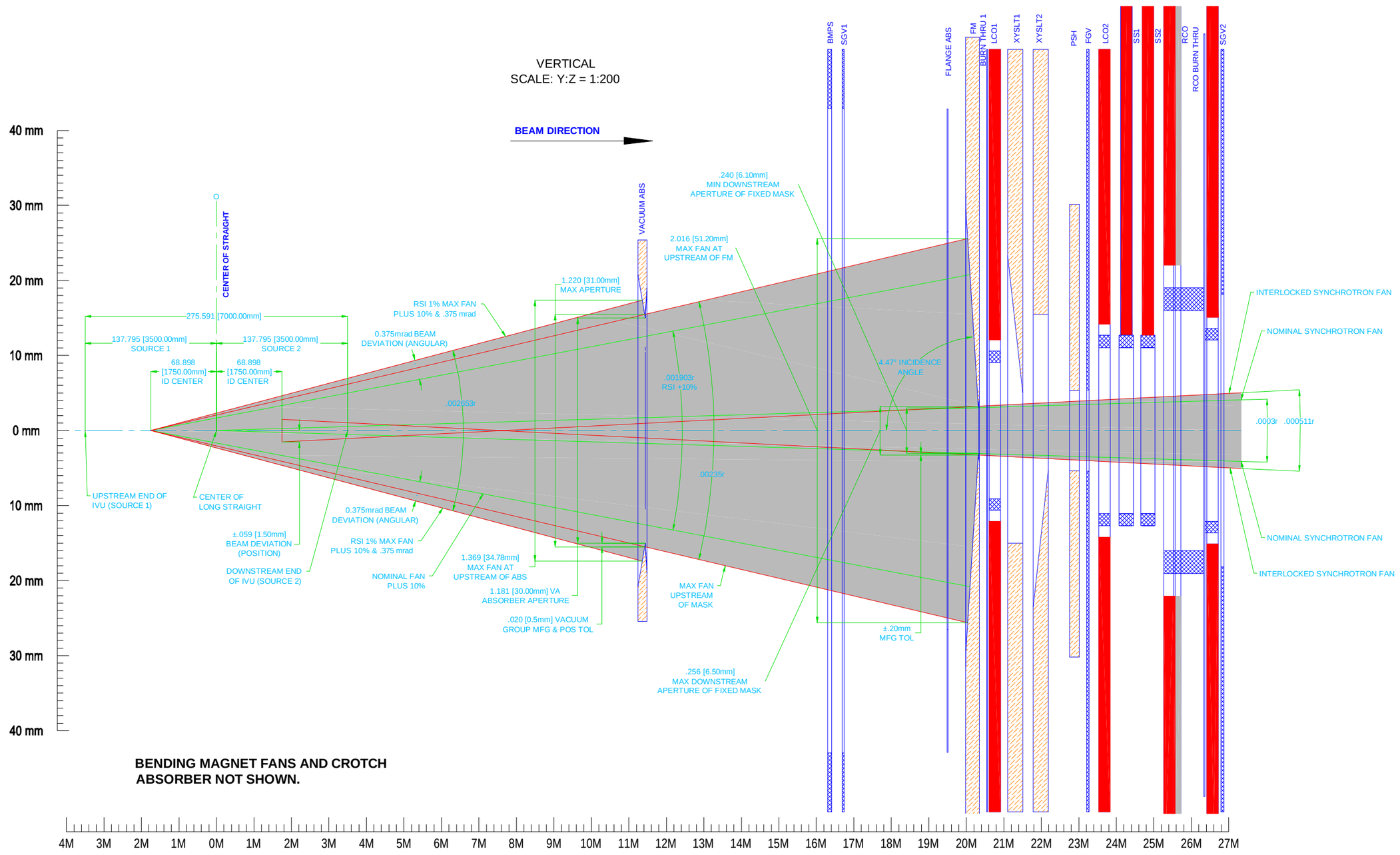

BENDING MAGNET FANS AND CROTCH ABSORBER NOT SHOWN.

All dimensions are taken at downstream flange of device unless otherwise noted.

1	MIN APERTURE OF BMPS (Center)	45.55 mm
2	MIN APERTURE OF SGV1 (Center)	46.40 mm
3	~~MIN APERTURE OF XBPM1 (Center)~~ NOT USED	------- mm
4	~~MIN APERTURE OF XBPM2 (Center)~~ NOT USED	------- mm
5	MAX UPSTREAM APERTURE OF ABSF	54.20 mm
6	MIN UPSTREAM APERTURE OF FM	57.20 mm
7	MIN DOWNSTREAM APERTURE OF FM	6.10 mm
8	MAX DOWNSTREAM APERTURE OF FM	6.50 mm
9	MAX APERTURE OF SHADOW DEVICE 1	11.62 mm
10	NOM INTERNAL TUBE APERTURE OF LCO1	SEE SHEET 7

11	MIN APERTURE OF XYSLT1	10.11 mm
12	MIN APERTURE OF XYSLT2	10.45 mm
13	MIN APERTURE OF PSH	10.89 mm
14	MIN APERTURE OF FGV (Center)	10.99 mm
15	NOM INTERNAL TUBE APERTURE OF LCO2	SEE SHEET 7
16	MIN TUBE APERTURE OF SS1	11.61 mm
17	MIN TUBE APERTURE OF SS2	11.90 mm
18	MAX APERTURE OF SHADOW DEVICE 2	19.09 mm
19	NOM INTERNAL TUBE APERTURE OF DS RCO	SEE SHEET 7
20	MIN APERTURE OF SGV2	12.82 mm

SIX, INTERLOCKED SYNCHROTRON RAY TRACING, VERTICAL

D (SHEET SIZE)	SR-FE-EPU02-1001 (DRAWING/PART NUMBER)	B (REVISION)
ESH&Q RISK LEVEL	A1	SHEET 3 OF 7

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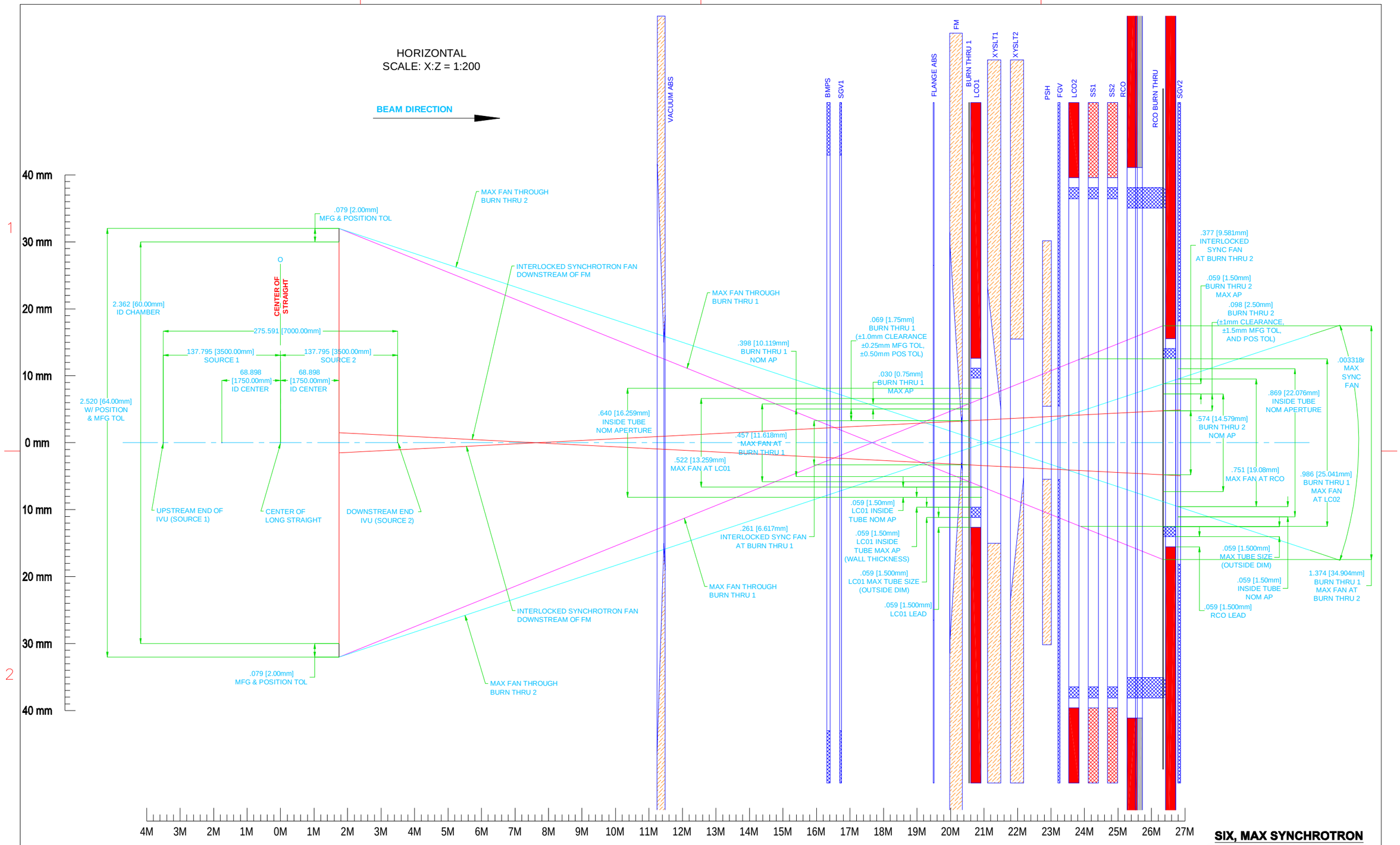

SIX, MAX SYNCHROTRON RAY TRACING HORIZONTAL

D (SHEET SIZE)	SR-FE-EPU02-1001 (DRAWING/PART NUMBER)	B (REVISION)
ESH&Q RISK LEVEL A1		SHEET 6 OF 7

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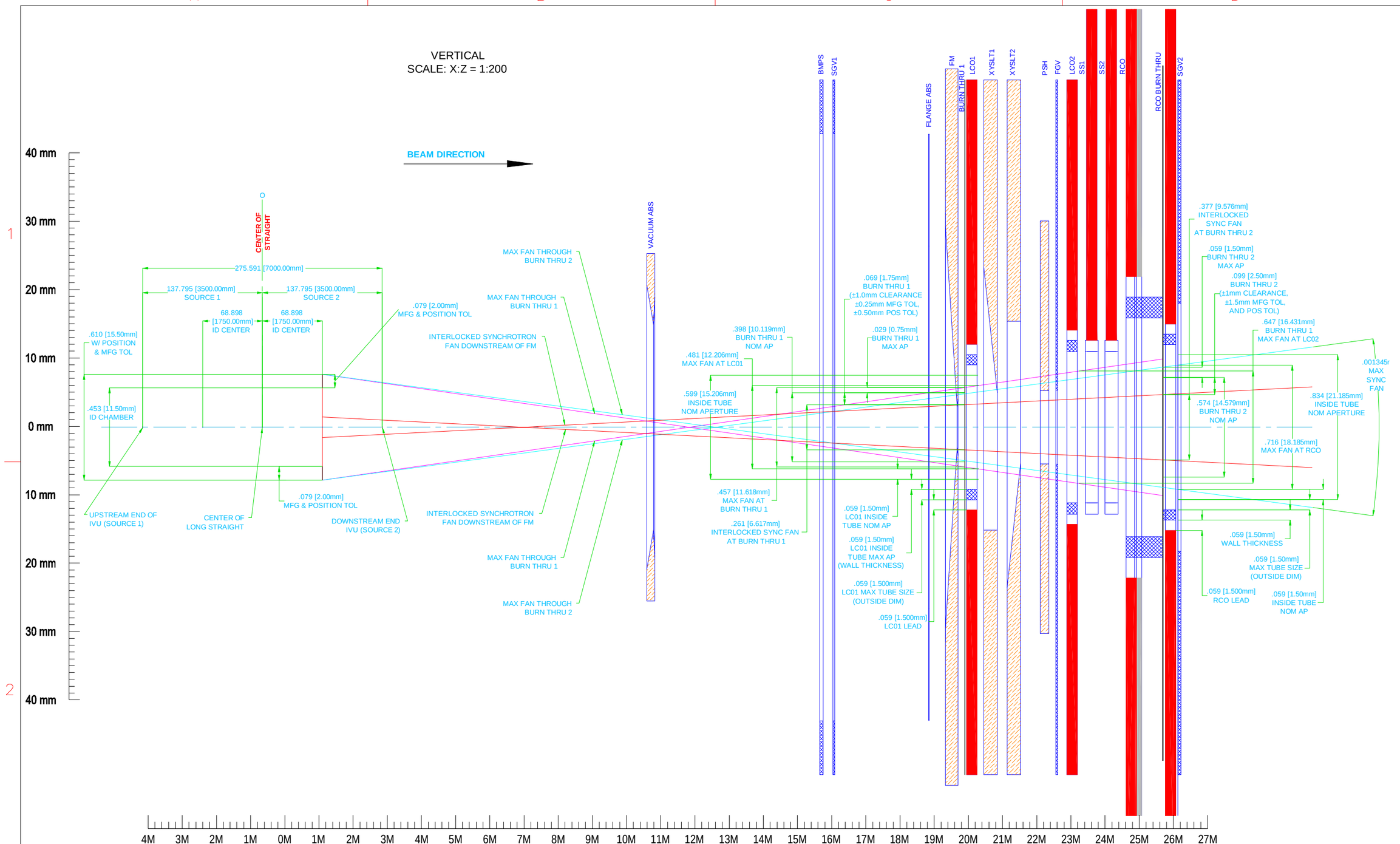

SIX, MAX SYNCHROTRON RAY TRACING, VERTICAL

D (SHEET SIZE)	SR-FE-EPU02-1001 (DRAWING/PART NUMBER)	B (REVISION)
ESH&Q RISK LEVEL A1	SHEET 7 OF 7	

RELEASED – EFFECTIVE