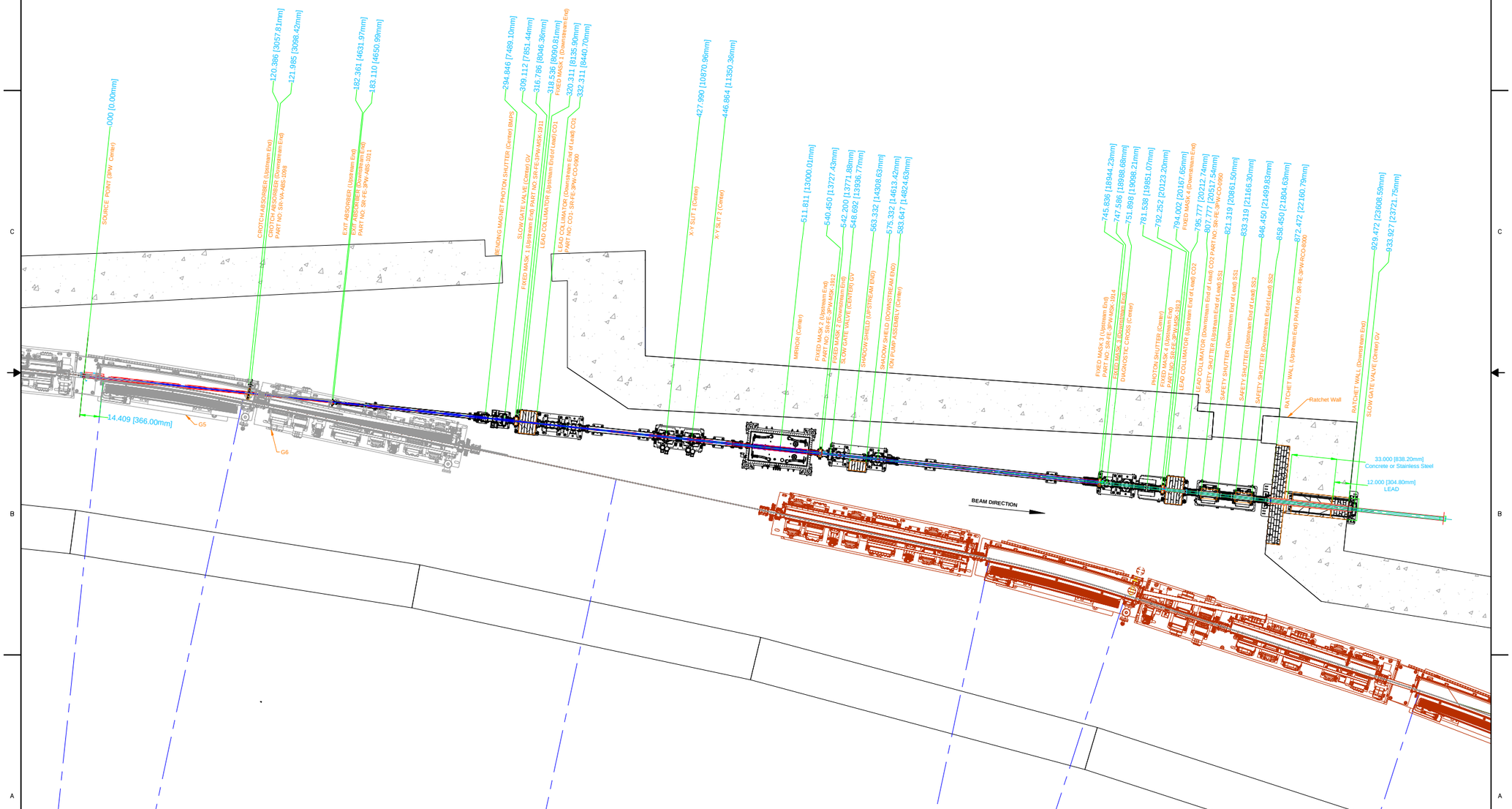
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-003342	8/2015	J.FABIJANIC	C STELMACH	F.DEPOALA
B	REVISED PER ECO-003500	12/2015	J.FABIJANIC	C.A. / C.S.	C.AMUNDSEN
C	REVISED PER ECO-004366	9/2016	J TUDZZOLO	C.A. / C.S.	G DACOS



PLAN VIEW
SCALE: 1:25

BMM, CELL 6 BM, COMPONENT LAYOUT

HATCH LEGEND	
	Lead
	Concrete or Stainless Steel
	Lead (SS)

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS [mm] ARE EXACTLY EQUIVALENT AND VALIDATED ARE USE FOR REFERENCE ONLY
DESIGNED DRAWING AS PER ANSI Y14.5-2009 OR YELLOW

DIMENSIONAL TOLERANCE: X ± 0.060, X.X ± 0.030, XX ± 0.015, XXX ± 0.005
REGULAR TOLERANCE ± 5
FINISH 125
BREAK EDGES & SHARP CORNERS 0.200 MIN. TO 0.500 MAX.

NEXT ASSY: N/A
PROJECT: NSLS-II
THIRD ANGLE PROJECTION
SCALE: SEE DWG VIEW
WBS# 7.03.05.01

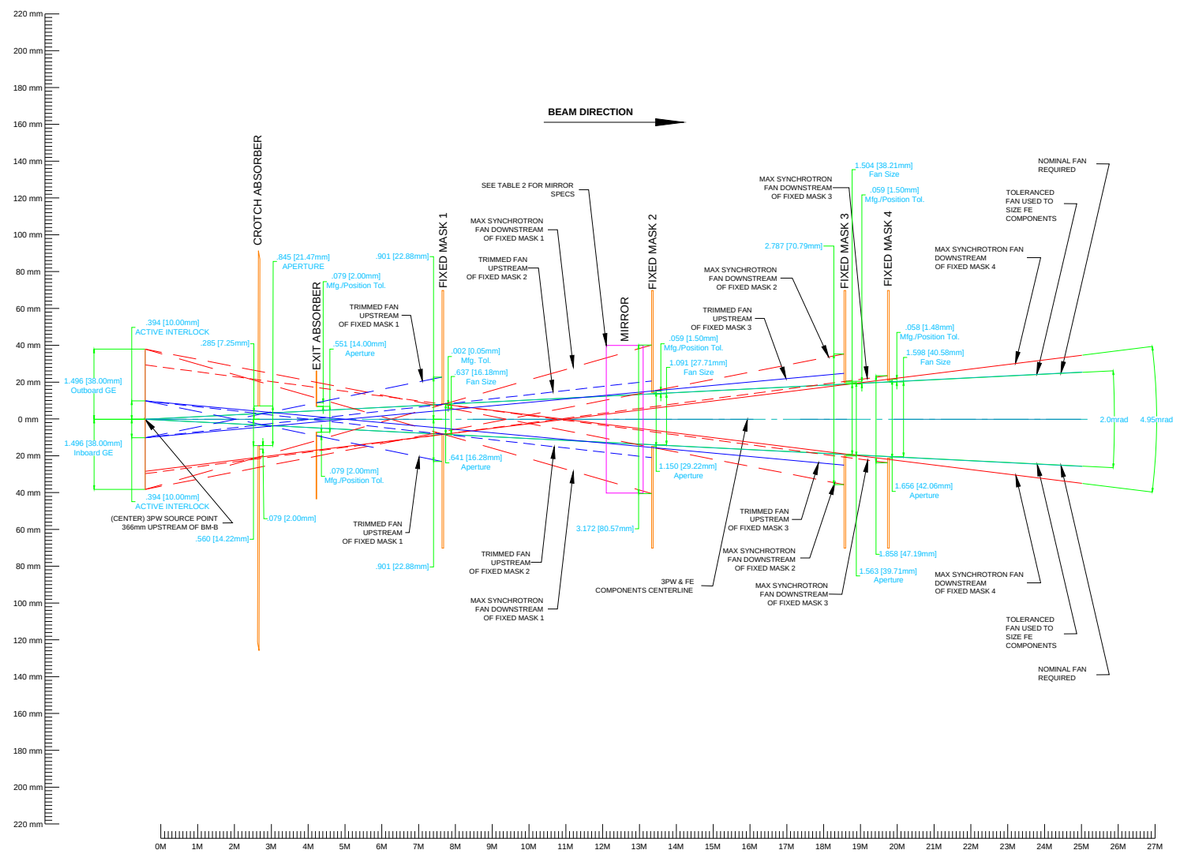
BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
UPTON, NEW YORK 11973
Exploring Life's Mysteries, Fostering the Future
NSLS II NATIONAL SYNCHROTRON LIGHT SOURCE II

DRAWN BY	J.FABIJANIC	8/2015
CHECKED BY	C STELMACH	8/2015
DESIGN FOR ASSEMBLY	J. ZHONG	8/2015
DESIGN FOR FABRICATION	J.KEPOKA	8/2015
SUPERVISOR	S.SHARMA	8/2015
CONTROLS ENGINEER		
SR-FE-3PW-MSK-1011		8/2015
SR-FE-3PW-CO-0000		8/2015
SR-FE-3PW-RCO-8000		8/2015

STORAGE RING
FRONT END, BMM, CELL 6
RAY TRACING

SHEET SIZE: E
DRAWING/PART NUMBER: SR-FE-3PW-8001
REVISION: C
ESH&Q RISK LEVEL: A-1
SHEET 1 OF 7

RELEASED – EFFECTIVE



HORIZONTAL
SCALE: X:Z = 1:50

TABLE 1

BMM FRONT END RAYTRACE TOLERANCE

	STANDARD TOLERANCE				
	mm		inches		Comments
	+	-	+	-	
Crotch Absorber	2.0	2.0	0.079	0.079	Manufacturing & Position
Exit Absorber	2.0	2.0	0.079	0.079	Manufacturing & Position
FM at C01	0.1	0.0	0.004	0.000	Manufacturing
FM 2 Vertical	.65	.65	0.026	0.026	Manufacturing & Position
FM 4 Horizontal	.74	.74	0.029	0.029	Manufacturing & Position
FM	.75	.75	0.030	0.030	Manufacturing & Position
CO tube	1.5	1.5	0.059	0.059	Manufacturing & Position
Collimator lead Horizontal	1.5	0.0	0.059	0.000	Manufacturing & Assembly
Collimator lead Vertical	2.5	0.0	0.098	0.000	Manufacturing, Assembly, Heater tape & Heater Tape Clearance
Shadow Shield	3.0	3.0	0.118	0.118	Manufacturing & Position
RCO upstream lead Horizontal	7.85	0.0	.309	0.000	Clearance, Mfg & Position
RCO upstream lead Vertical	8.85	0.0	.348	0.000	Clearance, Mfg & Position
RCO tube (minimum)	4.0	-	0.157	-	Manufacturing & Position

TABLE 2

BMM BEAMLINE FE MIRROR SPECIFICATIONS

Mirror system length, between flanges	1190 mm
Length of mirror substrate	1000 mm
Orientation	Bounce up
Material	Silicon
Mirror figure	Paraboloidal
Beam incidence angle	3.5mrad
Mirror acceptance (H/V)	2.1 mrad (H) x 0.24 mrad (V)
Mirror system center position	13m from source
Mirror operating limits (max incidence angle *).	5 mrad
Water flow rate for the mirror	Ideally 1.5 gpm (6 l/min). First component in any cooling chain; followed by slits, mask, PSH.

* See NSLS-II Controlled Document: PS-C-XFD-RSI-SST-BMM-001 / RSI for the Sources and Front-Ends for the SST1&2 and BMM Beamlines (NIST)

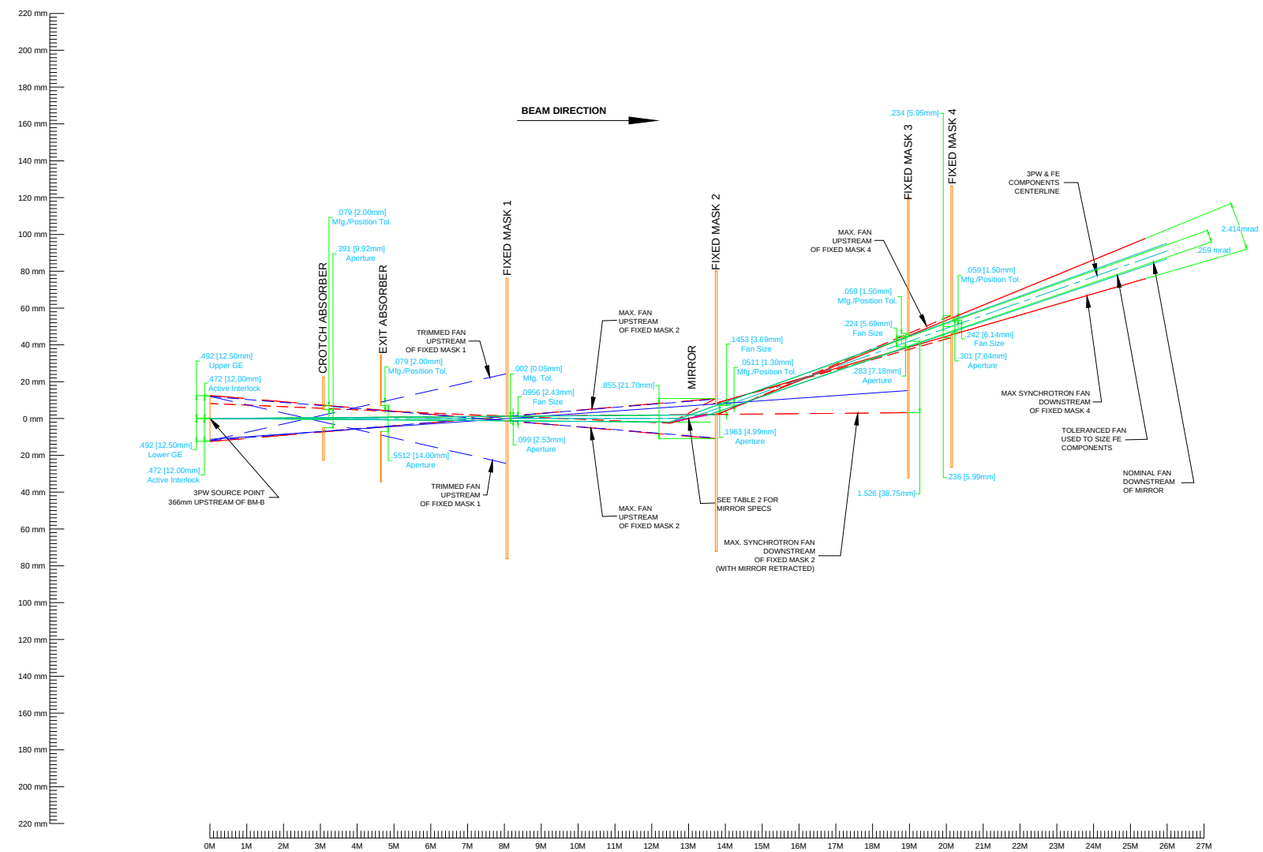
NOTE:

1. 3PW SOURCE POINT (ORIGIN) IS 366mm UPSTREAM OF BM-B.
2. MAX SYNCHROTRON FAN USES GEOMETRIC ENVELOPE AS ITS SOURCE AND IS INTERCEPTED ONLY BY AIR COOLED FIXED MASKS.
3. TRIMMED SYNCHROTRON FAN USES ACTIVE INTERLOCK ENVELOPE AS ITS SOURCE AND IS INTERCEPTED BY CROTCH ABSORBER, EXIT ABSORBER AND FIXED MASKS.
4. ALL MASK APERTURES SHOWN ARE NOMINAL VALUES WITH TOLERANCES SHOWN.
5. ALL APERTURES & TOLERANCES ARE ASSUMED TO BE SYMMETRIC ABOUT THE COMPONENT CENTERLINE UNLESS OTHERWISE SHOWN.

BMM, CELL 6 BM, SYNCHROTRON RAY TRACING HORIZONTAL

E	SR-FE-3PW-8001	C
ESHAQ RISK LEVEL	A-1	SHEET 2 OF 7

RELEASED – EFFECTIVE



VERTICAL
SCALE: Y:Z = 1:50

TABLE 1

BMM FRONT END RAYTRACE TOLERANCE

	STANDARD TOLERANCE				
	mm		inches		Comments
	+	-	+	-	
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Collimator lead Horizontal	1.5	0.0	0.059	0.000	Manufacturing & Assembly
Collimator lead Vertical	2.5	0.0	0.098	0.000	Manufacturing, Assembly, Heater tape & Heater Tape Clearance
Shadow Shield	3.0	3.0	0.118	0.118	Manufacturing & Position
RCO upstream lead Horizontal	7.85	0.0	.309	0.000	Clearance, Mfg & Position
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RCO tube (minimum)	4.0	-	0.157	-	Manufacturing & Position

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BMM BEAMLINE FE MIRROR SPECIFICATIONS

Mirror system length, between flanges	1190 mm
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4. ALL MASK APERTURES SHOWN ARE NOMINAL VALUES WITH TOLERANCES SHOWN.
5. ALL APERTURES & TOLERANCES ARE ASSUMED TO BE SYMMETRIC ABOUT THE COMPONENT CENTERLINE UNLESS OTHERWISE SHOWN.

BMM, CELL 6 BM, SYNCHROTRON RAY TRACING VERTICAL

E	SR-FE-3PW-8001	C
	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 3 OF 7	

RELEASED – EFFECTIVE

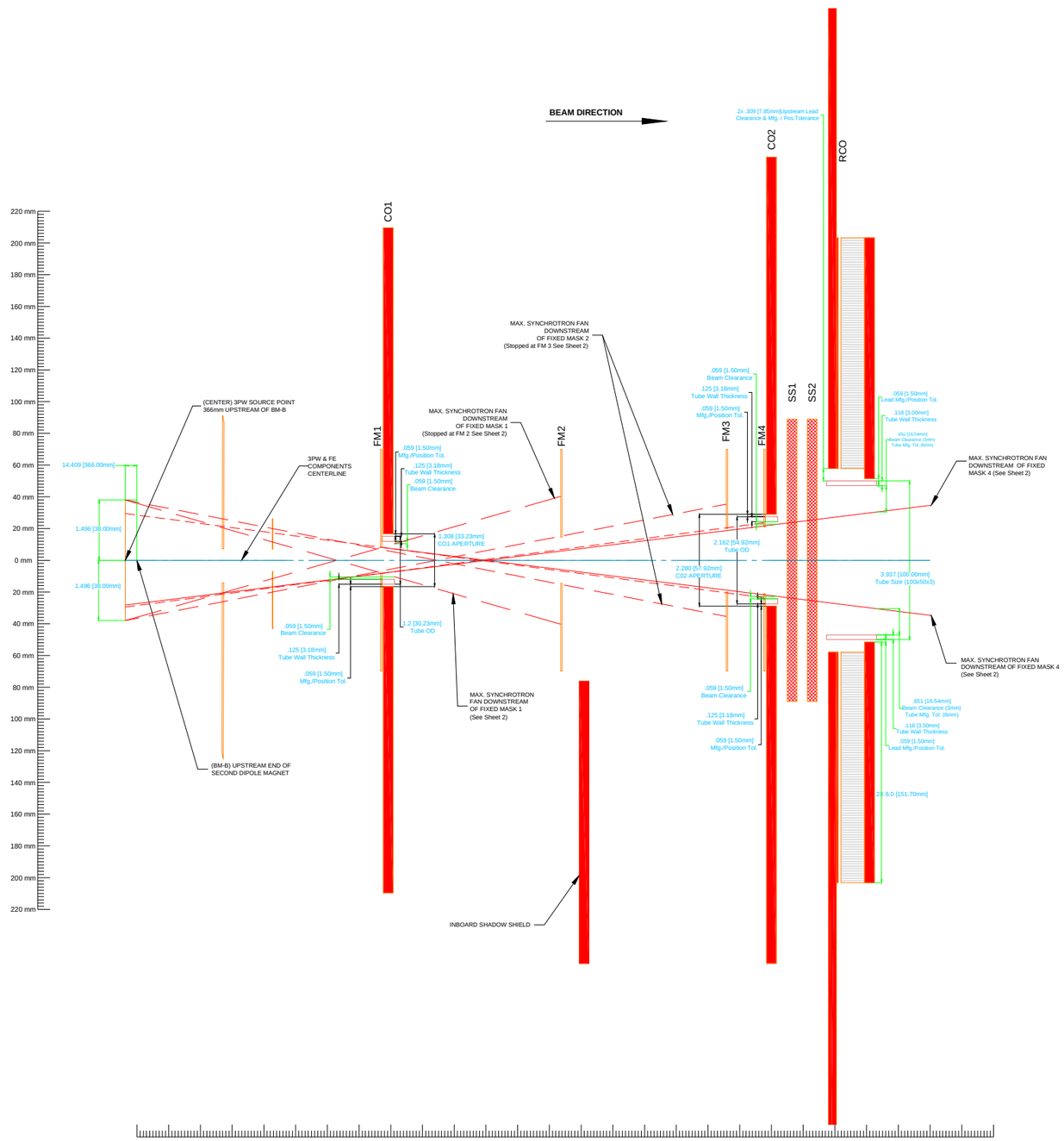

TABLE 1

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	STANDARD TOLERANCE				
	mm		inches		Comments
	+	-	+	-	
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CO tube	1.5	1.5	0.059	0.059	Manufacturing & Position
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Collimator lead Vertical	2.5	0.0	0.098	0.000	Manufacturing, Assembly, Heater tape & Heater Tape Clearance
Shadow Shield	3.0	3.0	0.118	0.118	Manufacturing & Position
RCO upstream lead Horizontal	7.85	0.0	.309	0.000	Clearance, Mfg. & Position
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RCO tube (minimum)	4.0	-	0.157	-	Manufacturing & Position

TABLE 2

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Mirror system length, between flanges	1190 mm
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Mirror system center position	13m from source
Mirror operating limits (max incidence angle *).	5 mrad
Water flow rate for the mirror	Ideally 1.5 gpm (6.1l/min). First component in any cooling chain; followed by slits, mask, PSH.

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NOTE:

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HORIZONTAL
SCALE: X:Z = 1:50

BMM, CELL 6 BM, MAX SYNCHROTRON COLLIMATOR LAYOUT HORIZONTAL

E	SR-FE-3PW-8001	C
ESH&Q RISK LEVEL A-1	SHEET 4 OF 7	

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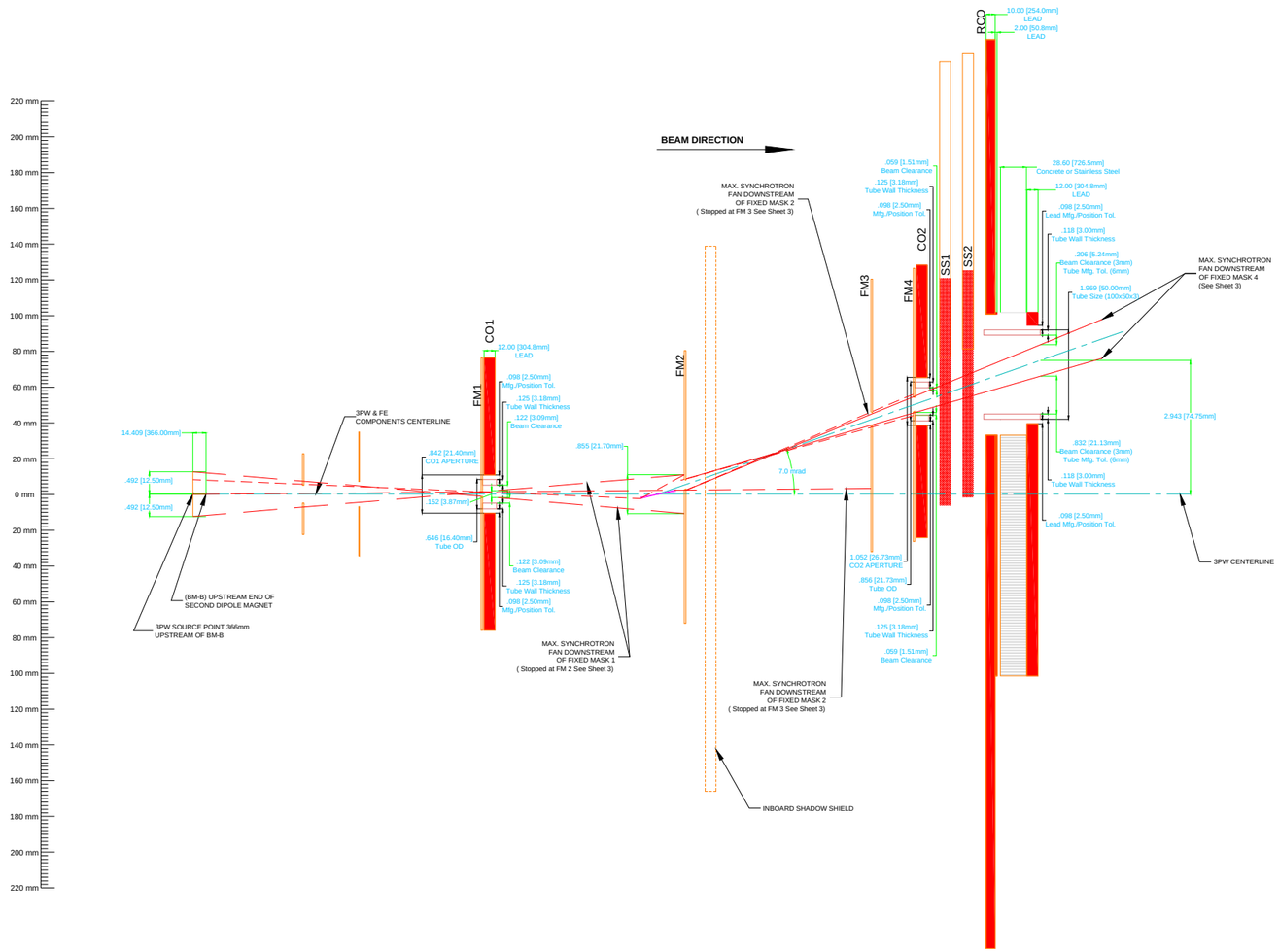

VERTICAL
SCALE: X:Z = 1:50

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BMM, CELL 6 BM, MAX SYNCHROTRON COLLIMATOR LAYOUT VERTICAL

E	SR-FE-3PW-8001	C
	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 5 OF 7	

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