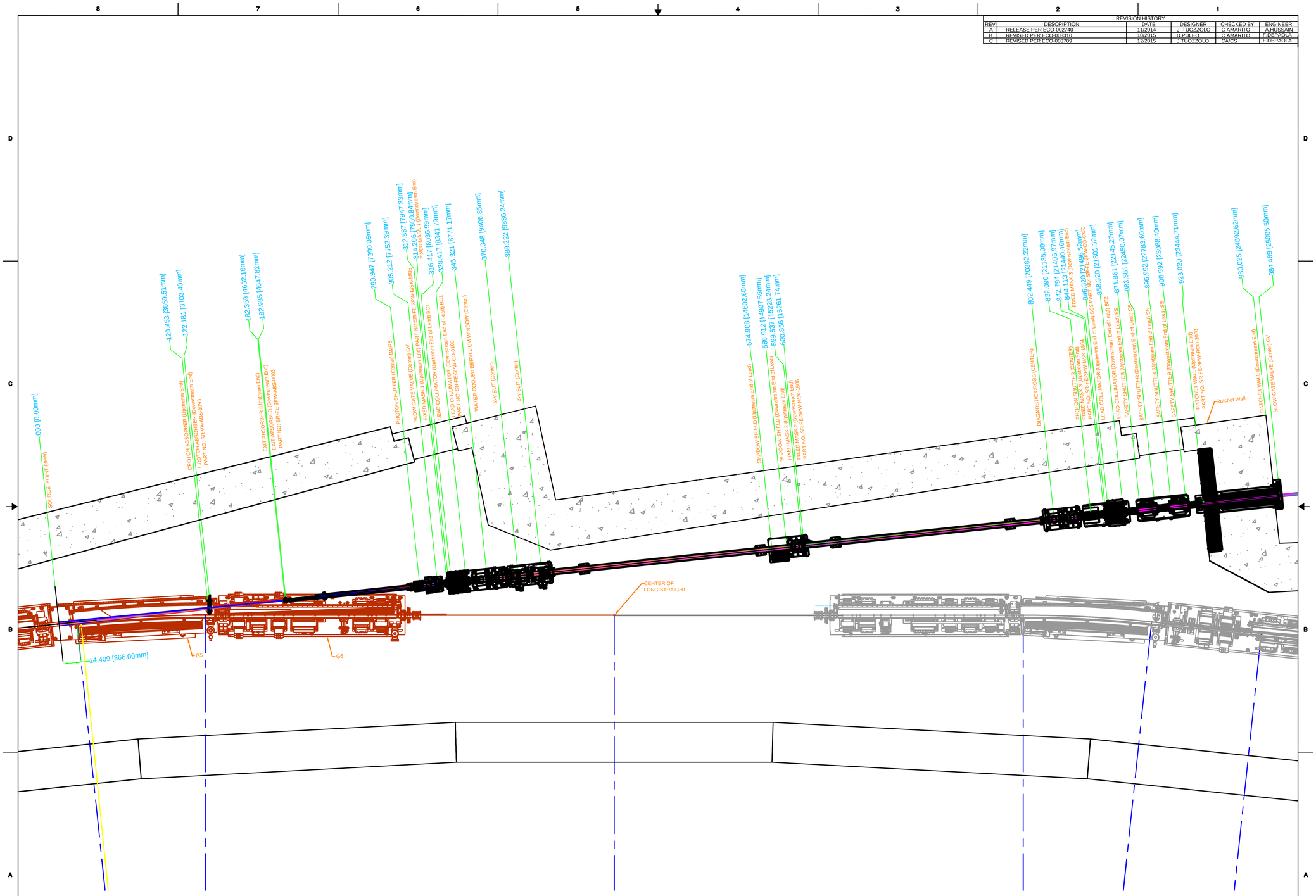
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-002740	11/2014	J. TUOZZOLO	C AMARITO	A HUSSAIN
B	REVISED PER ECO-003310	10/2015	D.PULEO	C.AMARITO	F.DEPAOLA
C	REVISED PER ECO-003709	12/2015	J TUOZZOLO	CA/CS	F.DEPAOLA



CMS, CELL 11, COMPONENT LAYOUT

HATCH LEGEND	
	Lead
	Concrete or Stainless Steel
	Lead (SS)

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS [in.m] [MM]ARE METRIC AND ARE FOR REFERENCE ONLY
INTERPRET DRAWING AS PER ANSI Y14.5-2009 OR Y32.2-1975
DIMENSIONAL TOLERANCES
X ± 0.060
.X ± 0.030
.XX ± 0.015
.XXX ± 0.005
ANGULAR TOLERANCE ± 5
125
REMOVE EDGES & SHARP CORNERS 0.005 MIN. TO 0.030 MAX.

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
P.O. BOX 5000
UPTON, NEW YORK 11973
Exploring Life's Mysteries
Protecting the Future
NSLS II
NATIONAL SYNCHROTRON LIGHT SOURCE II

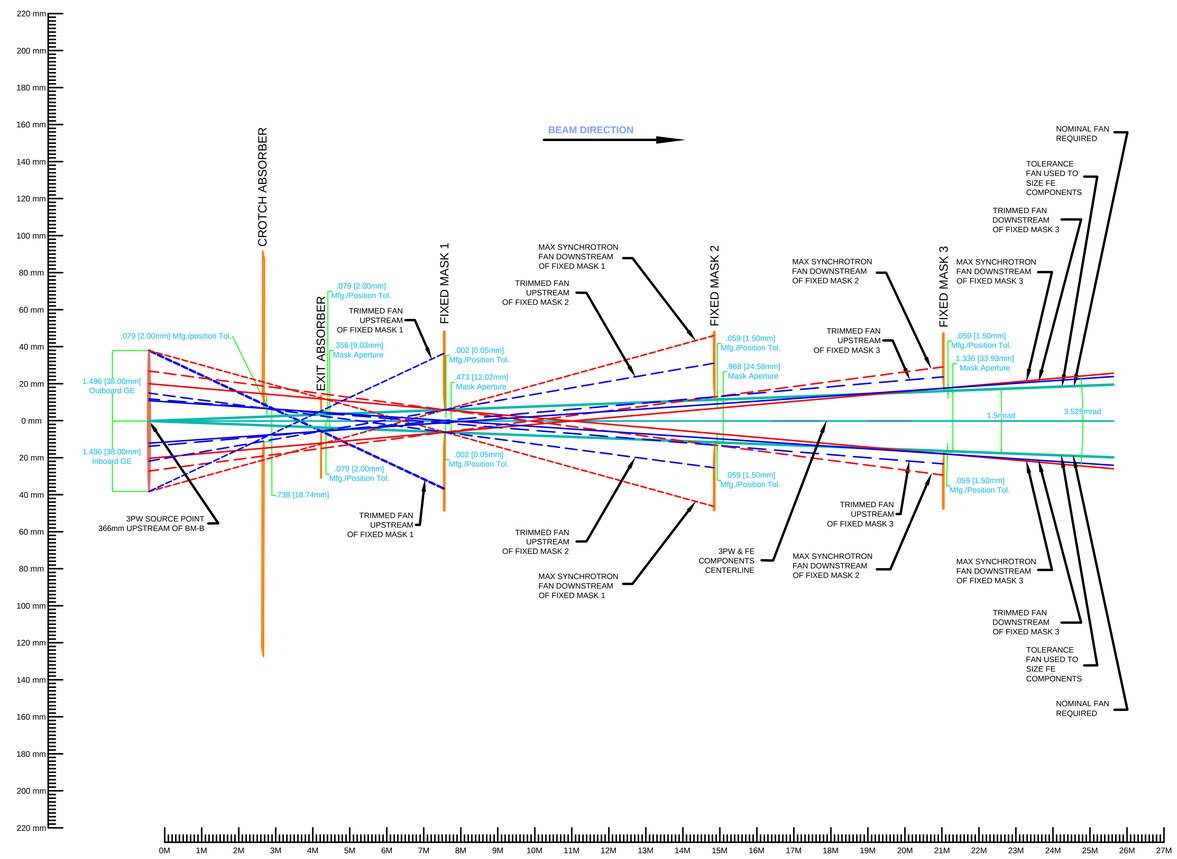
DRAWN BY	J TUOZZOLO	11/2014
CHECKED BY	C AMARITO	11/2014
ENGINEER	Z ZHONG	11/2014
DESIGNER	F DEPAOLA	11/2014
CHECKED BY	S SHARMA	11/2014
CHIEF ENGINEER	M ANERELLA	RELEASE DATE
MECHANICAL	M ANERELLA	RELEASE DATE
ELECTRICAL	M ANERELLA	RELEASE DATE
ENGINEERING	M ANERELLA	RELEASE DATE

STORAGE RING
FRONT END, CMS, CELL 11
RAY TRACING

SIZE	DWG NO.	REVISION
E	SR-FE-3PW-3001	C
ESH&Q RISK LEVEL	A-1	SHEET 1 OF 7

NEXT ASSY: N/A
PROJECT: NSLS-II
THIRD ANGLE PROJECTION
SCALE: SEE DWG VIEW
WBS# 6.12

RELEASED – EFFECTIVE



HORIZONTAL
SCALE: X:Z = 1:50

TABLE 1

CMS 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 LCLS	0.1	0.0	0.004	0.000	Manufacturing
FM	1.5	1.5	0.059	0.059	Manufacturing & Position
LCLS tube	1.5	1.5	0.059	0.059	Manufacturing & Position
Calibrator lead Horizontal	1.5	0.0	0.059	0.000	Manufacturing & Assembly
Calibrator 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
RCD upstream lead Horizontal	7.85	0.0	309	0.000	Clearance, Mfg & Position
RCD upstream lead Vertical	8.85	0.0	348	0.000	Clearance, Mfg & Position
RCD tube (minimum)	4.0	-	0.157	-	Manufacturing & Position

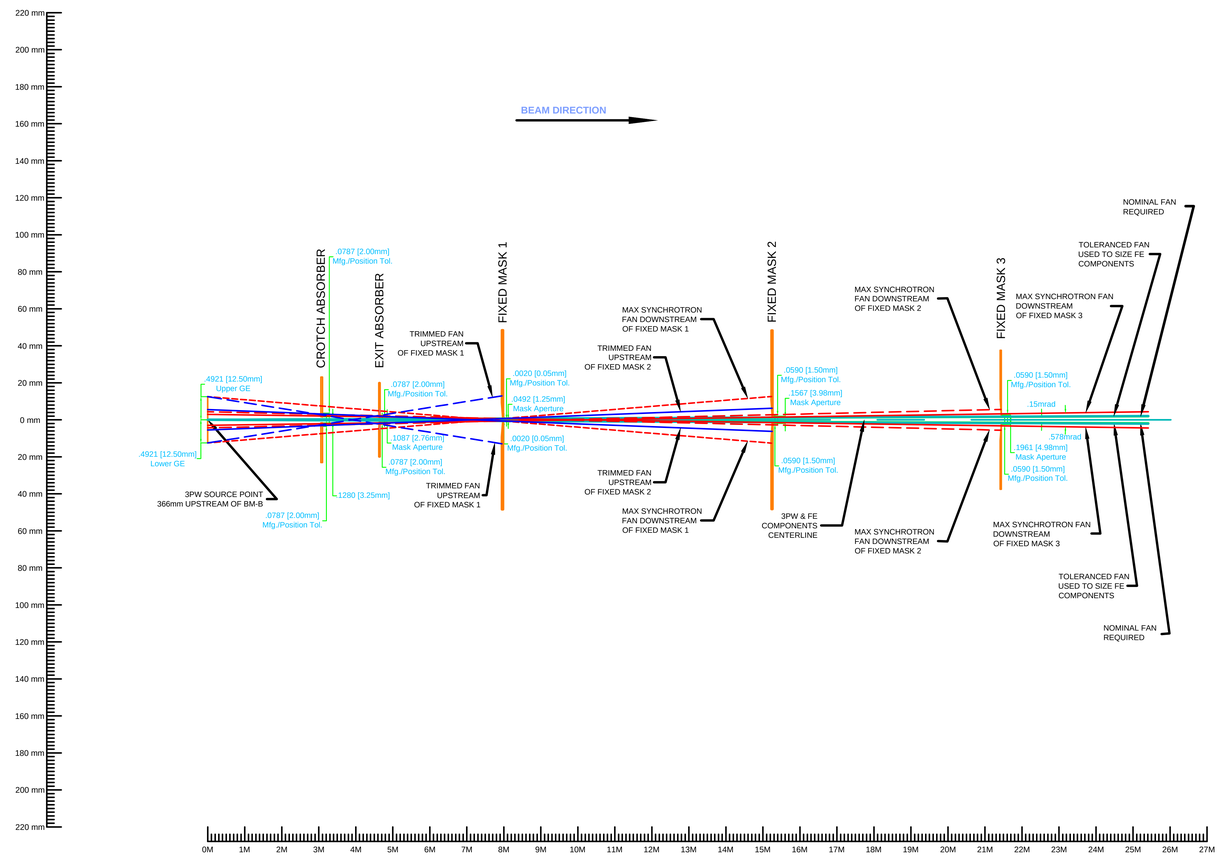
NOTE:

1. 3PW SOURCE POINT (ORIGIN) IS 366mm UPSTREAM OF BM-B.
2. MAX SYNCHROTRON FAN IS INTERCEPTED ONLY BY AIR COOLED FIXED MASKS.
3. TRIMMED SYNCHROTRON FAN IS INTERCEPTED BY CROTCH ABSORBER, EXIT ABSORBER AND FIXED MASKS.

CMS, CELL 11, SYNCHROTRON RAY TRACING HORIZONTAL

E	SR-FE-3PW-3001	C
ESH&Q RISK LEVEL A-1		SHEET 2 OF 7

RELEASED – EFFECTIVE



VERTICAL
SCALE: Y:Z = 1:50

TABLE 1

CMS 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 LCDS	0.1	0.0	0.004	0.000	Manufacturing
FM	1.5	1.5	0.059	0.059	Manufacturing & Position
LCD 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
RCD upstream lead Horizontal	7.85	0.0	309	0.000	Clearance, Mfg & Position
RCD upstream lead Vertical	8.85	0.0	348	0.000	Clearance, Mfg & Position
RCD tube (minimum)	4.0	-	0.157	-	Manufacturing & Position

NOTE:

1. 3PW SOURCE POINT (ORIGIN) IS 366mm UPSTREAM OF BM-B.
2. MAX SYNCHROTRON FAN IS INTERCEPTED ONLY BY AIR COOLED FIXED MASKS.
3. TRIMMED SYNCHROTRON FAN IS INTERCEPTED BY CROTCH ABSORBER, EXIT ABSORBER AND FIXED MASKS.

CMS, CELL 11, SYNCHROTRON RAY TRACING VERTICAL

E	SR-FE-3PW-3001	C
SHEET NO.	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 3 OF 7	

RELEASED – EFFECTIVE

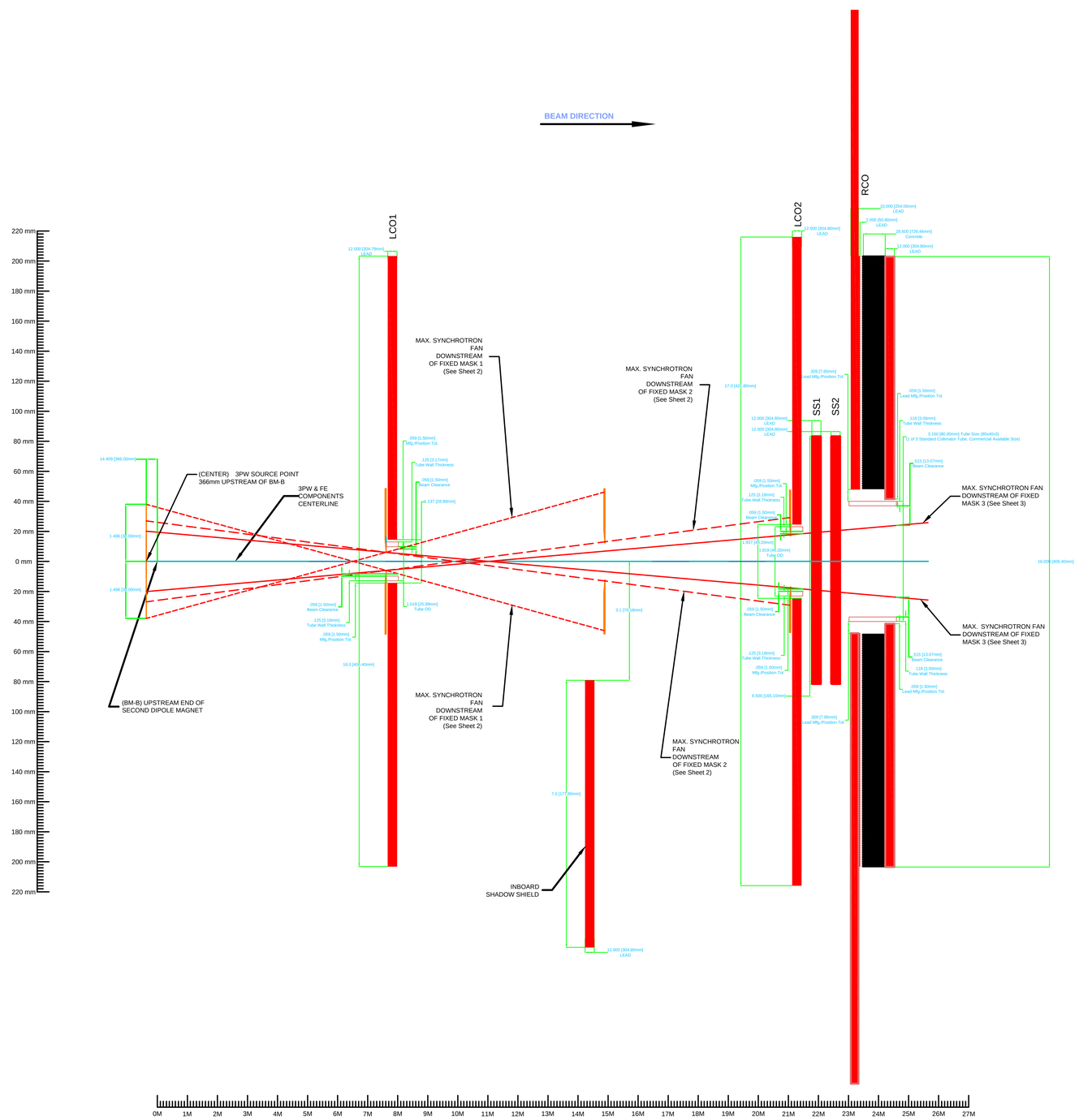


TABLE 1

CMS 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 LCO1	0.1	0.0	0.004	0.000	Manufacturing
FM	1.5	1.5	0.059	0.059	Manufacturing & Position
LCO1tube	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	.308	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

NOTE:

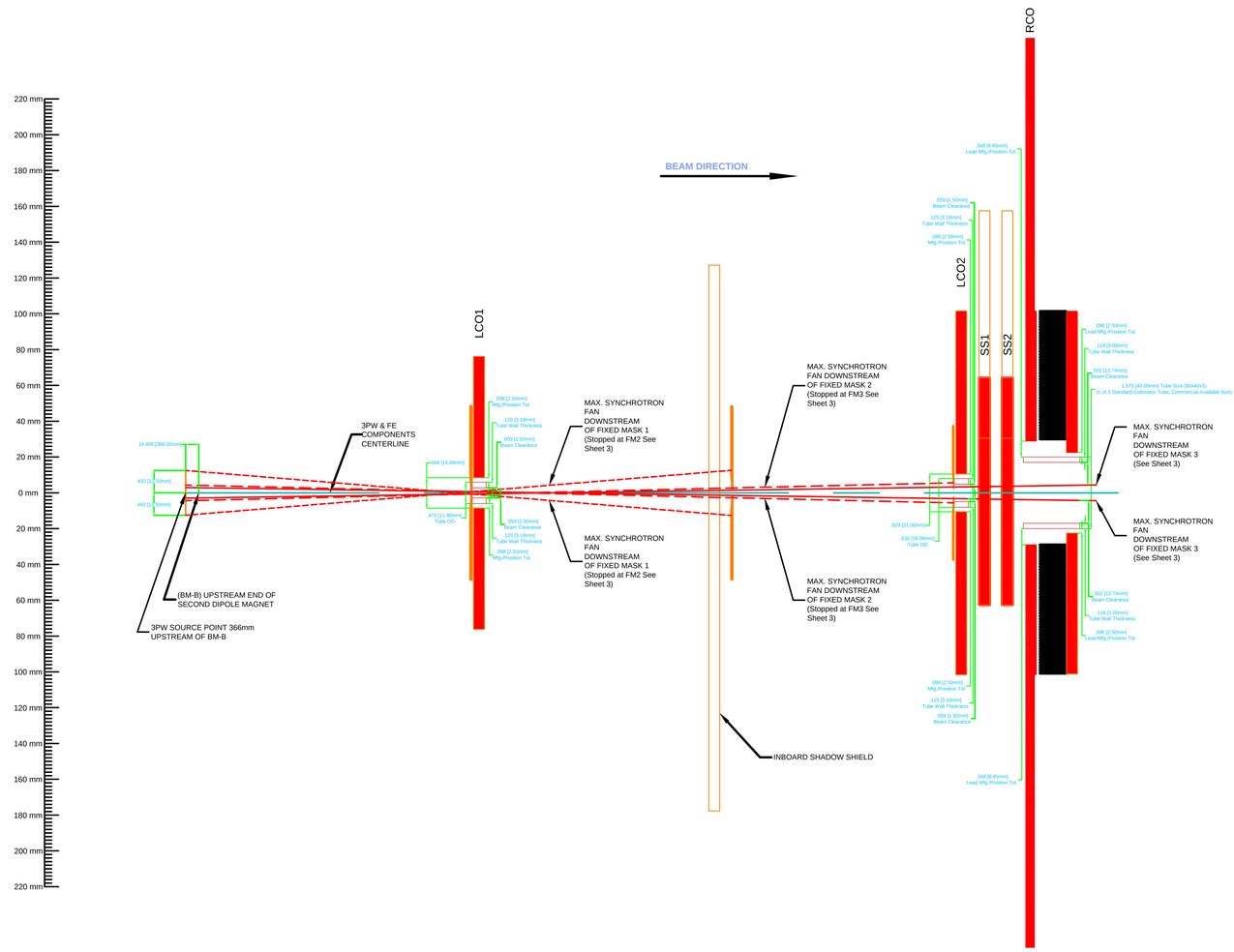
1. BREMSSTRAHLUNG SOURCE POINT (ORIGIN) IS UPSTREAM END OF BM-B.

HORIZONTAL
SCALE: X:Z = 1:50

CMS, CELL 11, MAX SYNCHROTRON COLLIMATOR LAYOUT HORIZONTAL

E	SR-FE-3PW-3001	C
SHEET SIZE	DOCUMENT NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 4 OF 7	

RELEASED – EFFECTIVE



VERTICAL
SCALE: X:Z = 1:50

TABLE 1

CMS FRONT END RAYTRACE TOLERANCE

	STANDARD TOLERANCE				Comments
	mm		inches		
	+	-	+	-	
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 LCO1	0.1	0.0	0.004	0.000	Manufacturing
FM	1.5	1.5	0.059	0.059	Manufacturing & Position
LCO 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

NOTE:

1. BREMSSTRAHLUNG SOURCE POINT (ORIGIN) IS UPSTREAM END OF BM-B

CMS, CELL 11, MAX SYNCHROTRON COLLIMATOR LAYOUT VERTICAL

E	SR-FE-3PW-3001	C
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-1	SHEET 5 OF 7	

RELEASED – EFFECTIVE