

REVISION HISTORY		
ZONE	REV	DESCRIPTION

NOTES

1 ELEMENTS CROSS THE ELECTRON BEAM AS READ (FROM LEFT-TO-RIGHT)

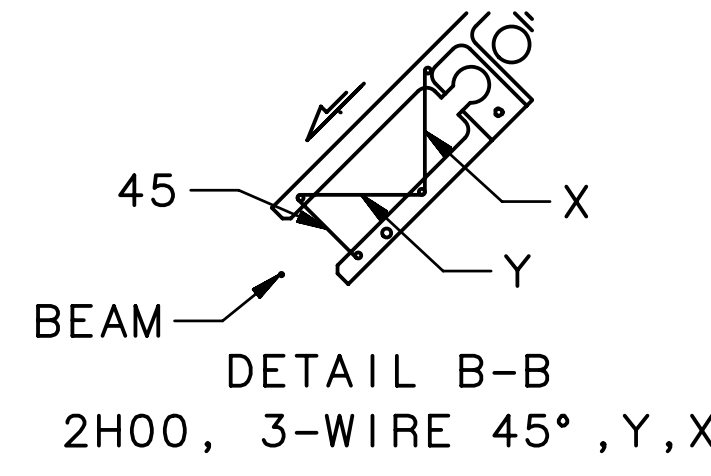
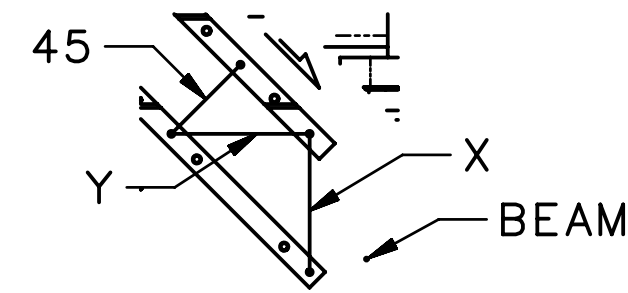
2 MACHINE CENTER IS 400.0948 METERS UPSTREAM OF \*HALL CENTER\*

3 CONTENTS:

- PAGE 1: COMPONENT POSITIONING FOR REFERENCE BY COUNTING-ROOM & MCC OPERATORS
- PAGE 2: COMPONENT IDENTIFICATION FOR INSTALLATION BY TECHNICAL STAFF
- PAGE 3: IDENTIFICATION OF MATERIALS IN THE BEAM, & BEAMLINE SHIELDING

4 BEAM-TUBE IDENTIFICATION:

- FORMAT: A - B - C, L
- A = UPSTREAM FLANGE SIZE
- B = TUBE OD
- C = DOWNSTREAM FLANGE SIZE
- L = LENGTH
- CONFLAT FLANGES UNLESS SPECIFIED



FOR CONTINUATION  
SEE DRAWING NO.  
28405-0034

FOR CONTINUATION  
SEE ELEVATION 2-5C

- 24.195 M : SHIELD WALL, UPSTREAM ALCOVE
- 23.758 M : 2C03H RASTER MAGNET, 66844-02226
- 23.250 M : 2C03V RASTER MAGNET, 66844-02226
- 22.769 M : 2C24 TAGGER HARP: 3-WIRE, 45°, Y,X
- 22.592 M : 50 OHM STRIPLINE BPM, DIA-007-0100-0038
- 22.253 M : 2X COUNTERS, UPSTREAM
- 22.005 M : VALVE #VBV2C24A
- 21.925 M : PUMP-SET : VTP2C24A

- 16.213 M : COLL IMATOR BOX : EMPTY, 20mm, NO HOLE, 12mm
- 15.827 M : VALVE #VBV2H00

- 14.003 M : 2H00 BPM PM-M15 ASSY, 58432-0156
- 13.645 M : 2H00 QA MAGNET ASSY, 22232-0001
- 13.201 M : 2H00 QA MAGNET ASSY, 22232-0001
- 12.859 M : 2H00 BD MAGNET ASSY, MAG-002-0003-0001
- 12.636 M : 2H00 BD MAGNET ASSY, MAG-002-0003-0001
- 12.388 M : 2H00 PUMP-SET : VTP2H00

- 9.458 M : 2H01 BPM : IPM2H01
- 9.180 M : 2H01 BPM : IPM2H01V
- 8.882 M : 2H01 BPM : IPM2H01H

- 8.521 M : 2H01 HARP : 3-WIRE, X,Y,45°
- 8.221 M : 50 OHM STRIPLINE BPM, DIA-007-0100-0038
- 6.102 M : VALVE #VBF2H01A
- 5.978 M : VALVE #VBV2H01A
- 5.868 M : 4X COUNTERS, MIDSTREAM
- 4.771 M : SACLAY PUMP-SET : VTP2H01A

- 1.303 M : SOLENOID CENTER
- .000 M : HALL CENTER

- 7.923 M : 4X COUNTERS, DOWNSTREAM

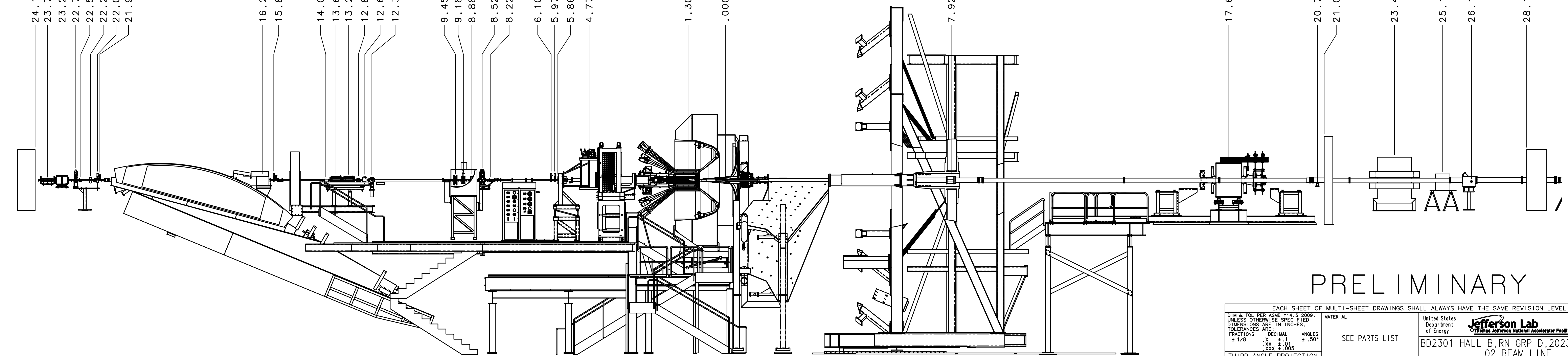
- 17.658 M : HPS DIPOLE MAGNET (OFF BEAMLINE)

- 20.764 M : 2H02 PUMP-SET : VTP2H02
- 21.000 M : SHIELD WALL, DOWNSTREAM ALCOVE

- 23.463 M : MAGNET (DECOMMISSIONED)

- 25.157 M : HPS PHOTON DUMP
- 26.165 M : DOWNSTREAM VIEWER

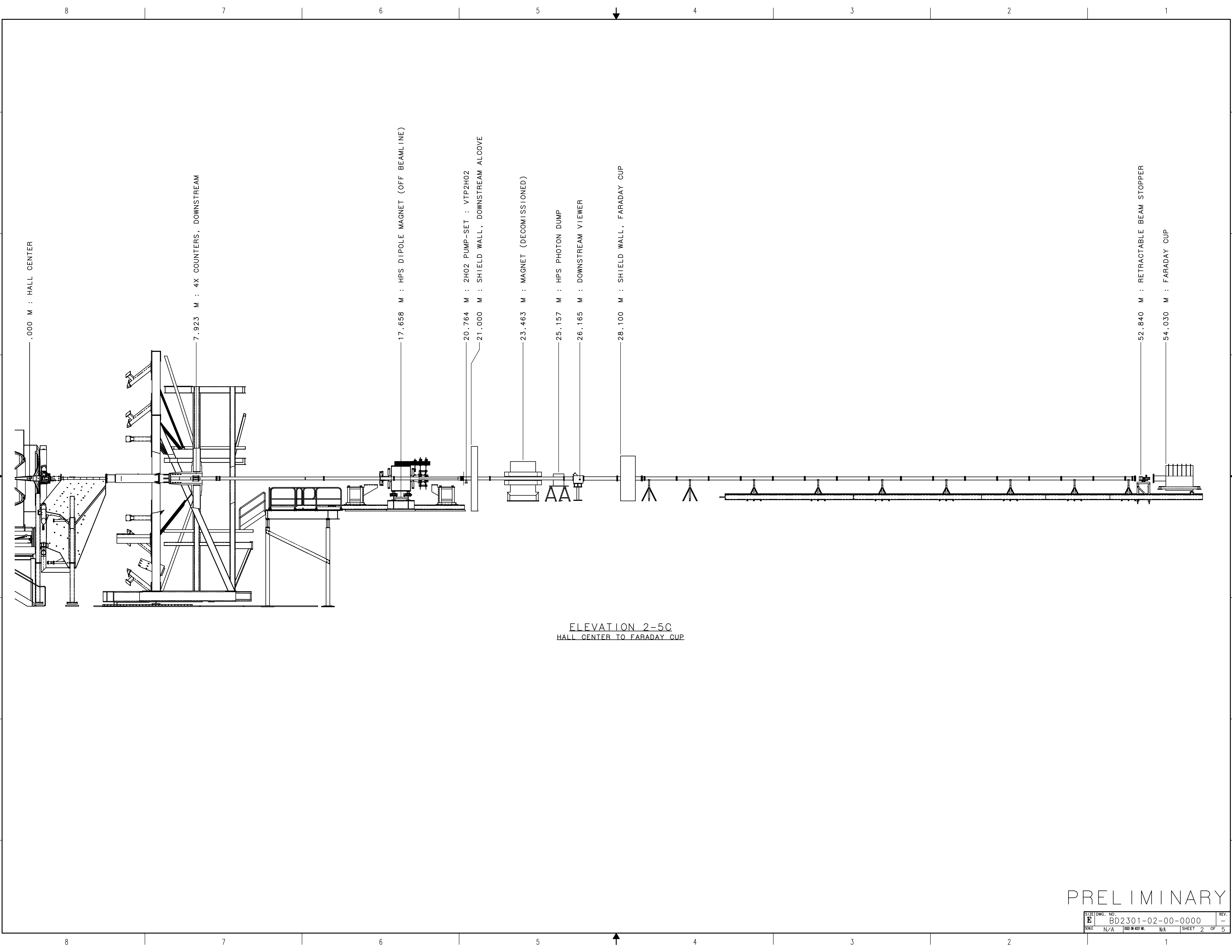
- 28.100 M : SHIELD WALL FARADAY CUP



ELEVATION 1-5A  
UPSTREAM ALCOVE TO DOWNSTREAM ALCOVE  
(SHOWN IN LIQUID TARGET CONFIG.)

PRELIMINARY

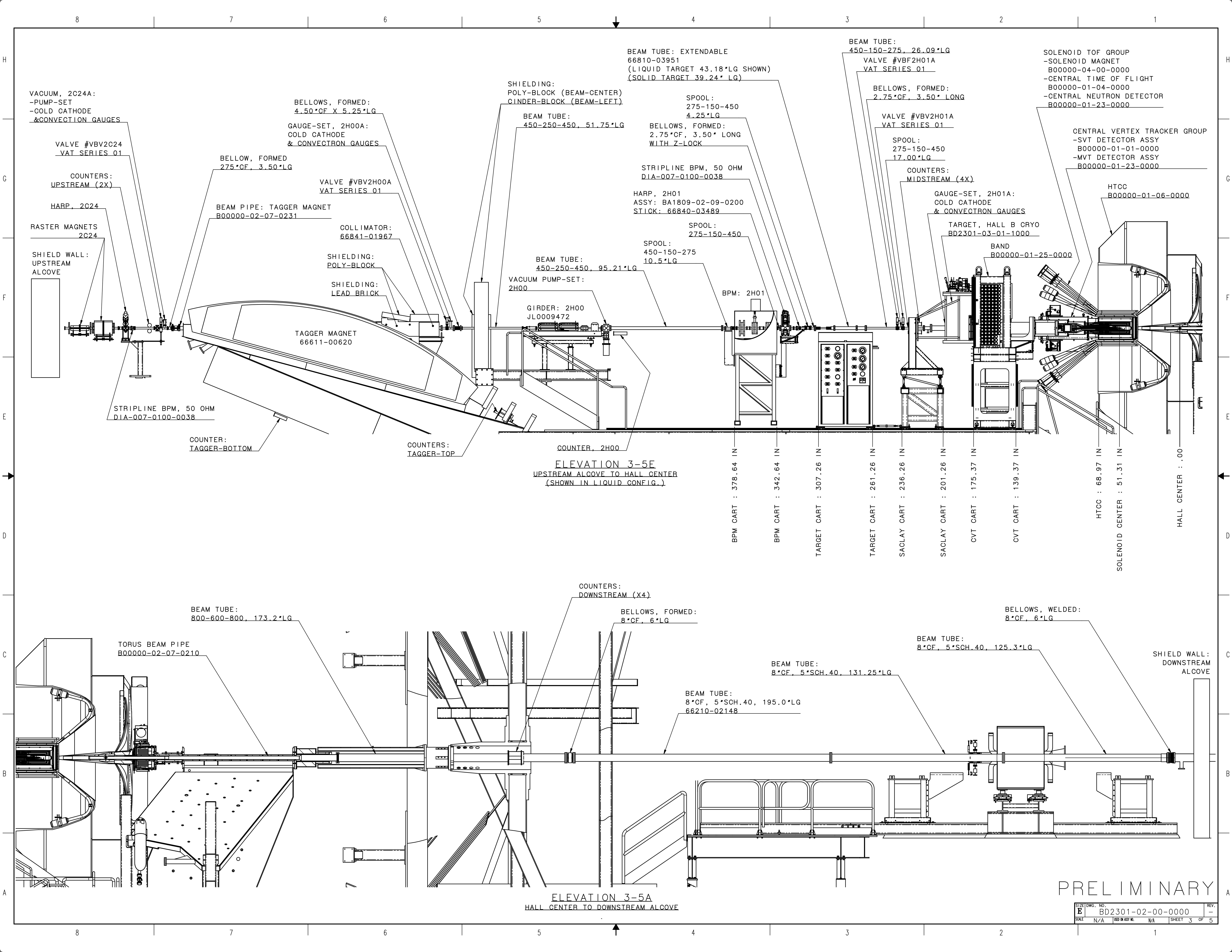
EACH SHEET OF MULTI-SHEET DRAWINGS SHALL ALWAYS HAVE THE SAME REVISION LEVEL.		United States Department of Energy	
<small>           DIM &amp; TOL PER ASME Y14.5 2009.            UNLESS OTHERWISE SPECIFIED            DIMENSIONS ARE IN INCHES.            TOLERANCES ARE:            FRACTIONS DECIMAL ANGLES            ± 1/16 ± .01 ± 30°            XX ± .01 ± .50°            XXX ± .005 ± .50°         </small>		<small>           FINISH MACHINED SURFACES DEBURR &amp; BREAK ALL SHARP EDGES            UNLESS OTHERWISE NOTED         </small>	
THIRD ANGLE PROJECTION	SEE PARTS LIST	<small>           TITLE: BD2301 HALL B, RN GRP D, 2023 CNFG 01            02 BEAM LINE            00 INSTALLATION TEMPLATE            0000 BEAMLINE ASSEMBLY         </small>	<small>           SHEET 1 OF 5         </small>
<small>           DRAWN: CHRIS GUTHRIE            DATE: DUMMY            SCALE: N/A            (RFD OR ASSY NO.): N/A         </small>	<small>           SIZE: E            DWG. NO.: BD2301-02-00-0000         </small>	<small>           REV. -         </small>	<small>           SHEET 1 OF 5         </small>



ELEVATION 2-5C  
HALL CENTER TO FARADAY CUP

PRELIMINARY

SIZE	DWG. NO.	REV.
E	BD2301-02-00-0000	-
SCALE	REQ'D OR ASSY NO.	SHEET
N/A	N/A	2 OF 5



VACUUM, 2C24A:  
-PUMP-SET  
-COLD CATHODE  
& CONVECTION GAUGES

VALVE #VBV2C24  
VAT SERIES 01

COUNTERS:  
UPSTREAM (2X)

HARP, 2C24

RASTER MAGNETS  
2C24

SHIELD WALL:  
UPSTREAM  
ALCOVE

BELLOWS, FORMED:  
4.50\*CF X 5.25\*LG

GAUGE-SET, 2H00A:  
COLD CATHODE  
& CONVECTRON GAUGES

VALVE #VBV2H00A  
VAT SERIES 01

BELLOW, FORMED  
2.75\*CF, 3.50\*LG

BEAM PIPE: TAGGER MAGNET  
B00000-02-07-0231

COLLIMATOR:  
66841-01967

SHIELDING:  
POLY-BLOCK

SHIELDING:  
LEAD BRICK

TAGGER MAGNET  
66611-00620

SHIELDING:  
POLY-BLOCK (BEAM-CENTER)  
CINDER-BLOCK (BEAM-LEFT)

BEAM TUBE:  
450-250-450, 51.75\*LG

BEAM TUBE: EXTENDABLE  
66810-03951  
(LIQUID TARGET 43.18\*LG SHOWN)  
(SOLID TARGET 39.24\* LG)

SPOOL:  
275-150-450  
4.25\*LG

BELLOWS, FORMED:  
2.75\*CF, 3.50\* LONG  
WITH Z-LOCK

STRIPLINE BPM, 50 OHM  
DIA-007-0100-0038

HARP, 2H01  
ASSY: BA1809-02-09-0200  
STICK: 66840-03489

SPOOL:  
275-150-450

SPOOL:  
450-150-275  
10.5\*LG

BEAM TUBE:  
450-250-450, 95.21\*LG

VACUUM PUMP-SET:  
2H00

GIRDER: 2H00  
JL0009472

BPM: 2H01

BEAM TUBE:  
450-150-275, 26.09\*LG

VALVE #VBF2H01A  
VAT SERIES 01

BELLOWS, FORMED:  
2.75\*CF, 3.50\* LONG

VALVE #VBV2H01A  
VAT SERIES 01

SPOOL:  
275-150-450  
17.00\*LG

COUNTERS:  
MIDSTREAM (4X)

GAUGE-SET, 2H01A:  
COLD CATHODE  
& CONVECTRON GAUGES

TARGET, HALL B CRYO  
BD2301-03-01-1000

BAND  
B00000-01-25-0000

SOLENOID TOF GROUP  
-SOLENOID MAGNET  
B00000-04-00-0000  
-CENTRAL TIME OF FLIGHT  
B00000-01-04-0000  
-CENTRAL NEUTRON DETECTOR  
B00000-01-23-0000

CENTRAL VERTEX TRACKER GROUP  
-SVT DETECTOR ASSY  
B00000-01-01-0000  
-MVT DETECTOR ASSY  
B00000-01-23-0000

HTCC  
B00000-01-06-0000

STRIPLINE BPM, 50 OHM  
DIA-007-0100-0038

COUNTER:  
TAGGER-BOTTOM

COUNTERS:  
TAGGER-TOP

COUNTER, 2H00

ELEVATION 3-5E  
UPSTREAM ALCOVE TO HALL CENTER  
(SHOWN IN LIQUID CONFIG.)

BPM CART : 378.64 IN

BPM CART : 342.64 IN

TARGET CART : 307.26 IN

TARGET CART : 261.26 IN

SACLAY CART : 236.26 IN

SACLAY CART : 201.26 IN

CVT CART : 175.37 IN

CVT CART : 139.37 IN

HTCC : 68.97 IN

SOLENOID CENTER : 51.31 IN

HALL CENTER : .00

BEAM TUBE:  
800-600-800, 173.2\*LG

TORUS BEAM PIPE  
B00000-02-07-0210

COUNTERS:  
DOWNSTREAM (X4)

BELLOWS, FORMED:  
8\*CF, 6\*LG

BELLOWS, WELDED:  
8\*CF, 6\*LG

BEAM TUBE:  
8\*CF, 5\*SCH.40, 131.25\*LG

BEAM TUBE:  
8\*CF, 5\*SCH.40, 195.0\*LG  
66210-02148

BEAM TUBE:  
8\*CF, 5\*SCH.40, 125.3\*LG

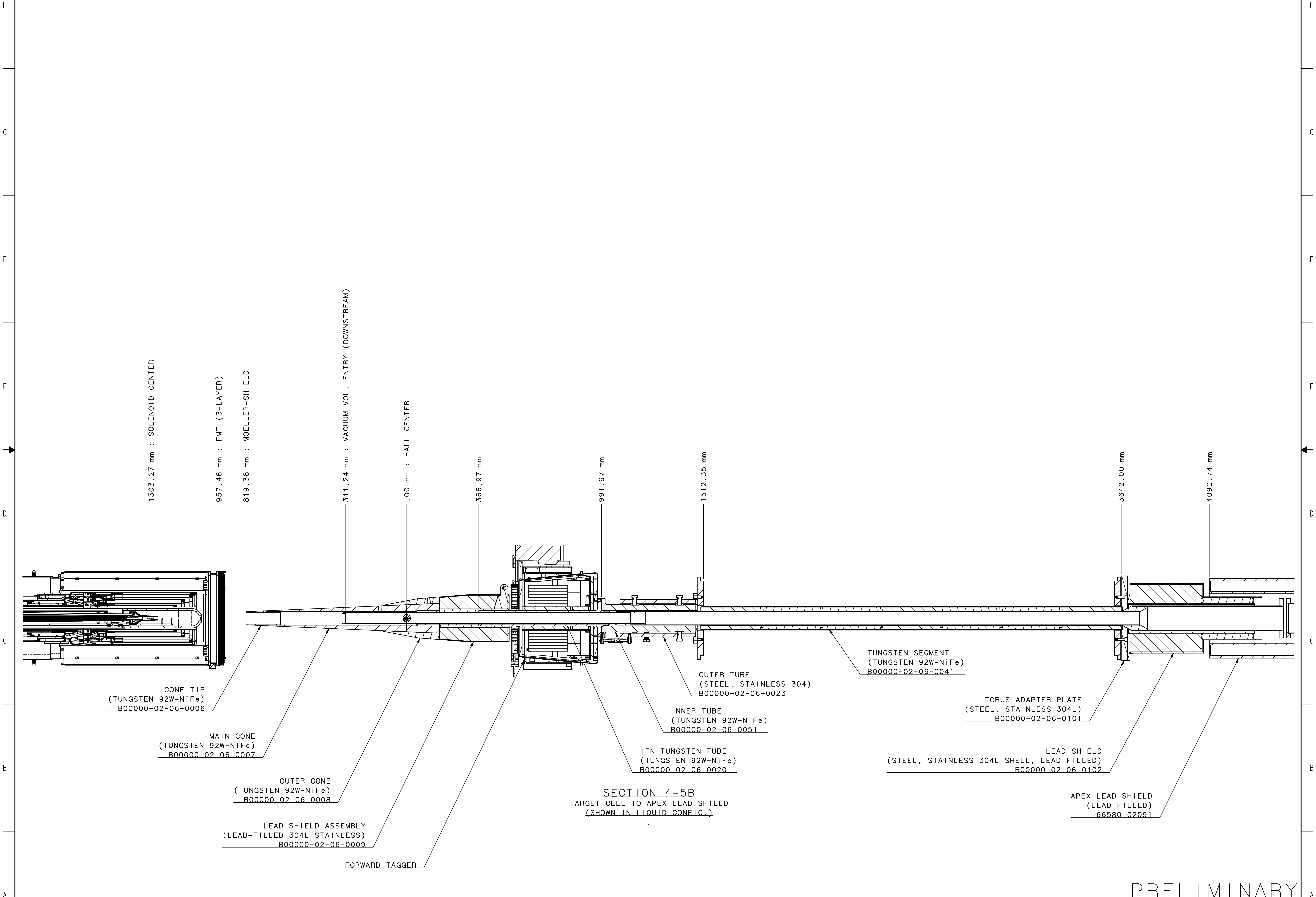
SHIELD WALL:  
DOWNSTREAM  
ALCOVE

ELEVATION 3-5A  
HALL CENTER TO DOWNSTREAM ALCOVE

PRELIMINARY

SIZE	DWG. NO.	REV.
E	BD2301-02-00-0000	-
SCALE	DATE OR ASSY NO.	SHEET
N/A	N/A	3 OF 5

8 7 6 5 4 3 2 1



1303.27 mm : SOLENOID CENTER

957.46 mm : FMT (3-LAYER)

819.38 mm : MOELLER-SHIELD

311.24 mm : VACUUM VOL. ENTRY (DOWNSTREAM)

.00 mm : HALL CENTER

366.97 mm

991.97 mm

1512.35 mm

3642.00 mm

4090.74 mm

CONE TIP  
(TUNGSTEN 92W-NiFe)  
B00000-02-06-0006

MAIN CONE  
(TUNGSTEN 92W-NiFe)  
B00000-02-06-0007

OUTER CONE  
(TUNGSTEN 92W-NiFe)  
B00000-02-06-0008

LEAD SHIELD ASSEMBLY  
(LEAD-FILLED 304L STAINLESS)  
B00000-02-06-0009

FORWARD TAGGER

SECTION 4-5B  
TARGET CELL TO APEX LEAD SHIELD  
(SHOWN IN LIQUID CONFIG.)

IFN TUNGSTEN TUBE  
(TUNGSTEN 92W-NiFe)  
B00000-02-06-0020

INNER TUBE  
(TUNGSTEN 92W-NiFe)  
B00000-02-06-0051

OUTER TUBE  
(STEEL, STAINLESS 304)  
B00000-02-06-0023

TUNGSTEN SEGMENT  
(TUNGSTEN 92W-NiFe)  
B00000-02-06-0041

TORUS ADAPTER PLATE  
(STEEL, STAINLESS 304L)  
B00000-02-06-0101

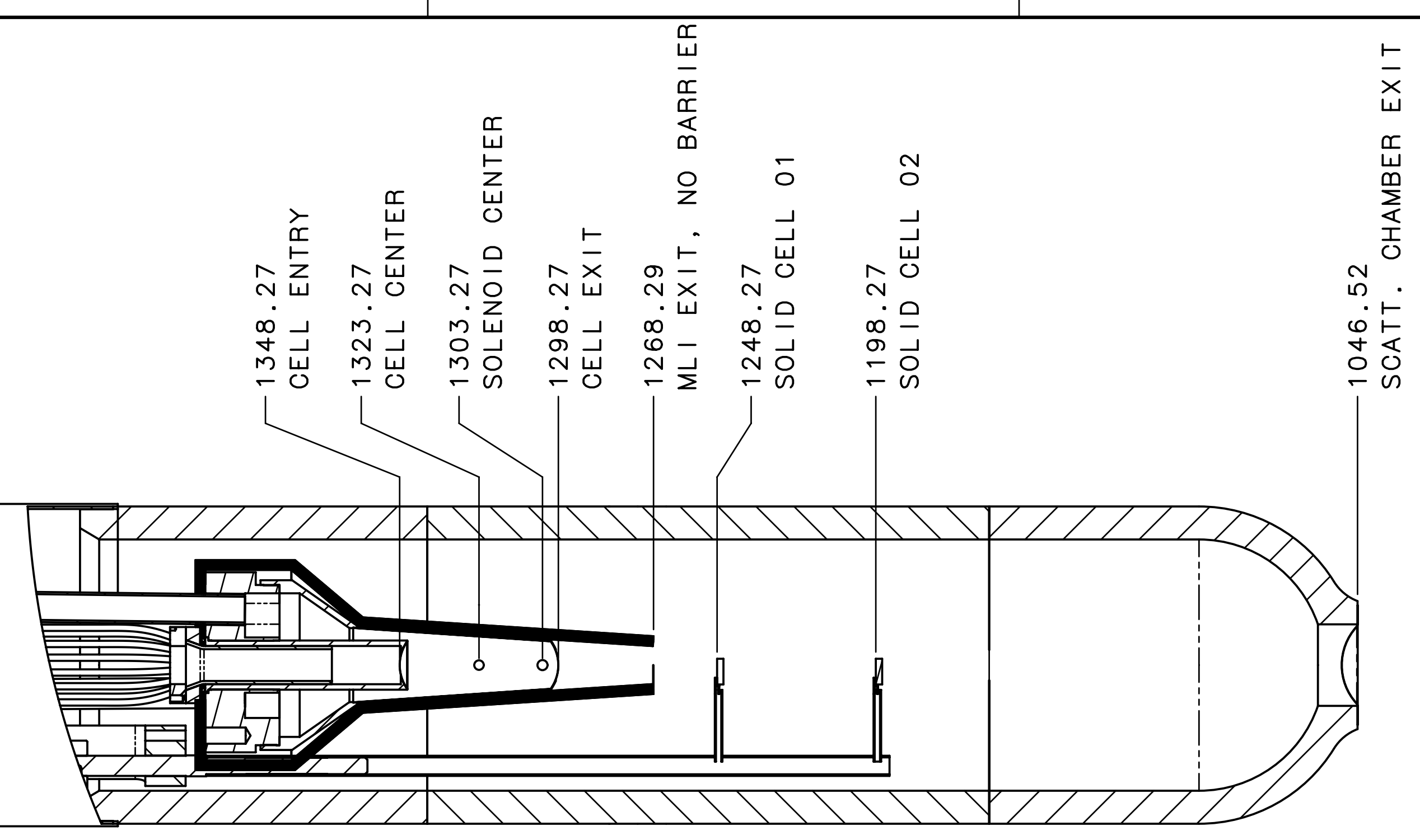
LEAD SHIELD  
(STEEL, STAINLESS 304L SHELL, LEAD FILLED)  
B00000-02-06-0102

APEX LEAD SHIELD  
(LEAD FILLED)  
66580-02091

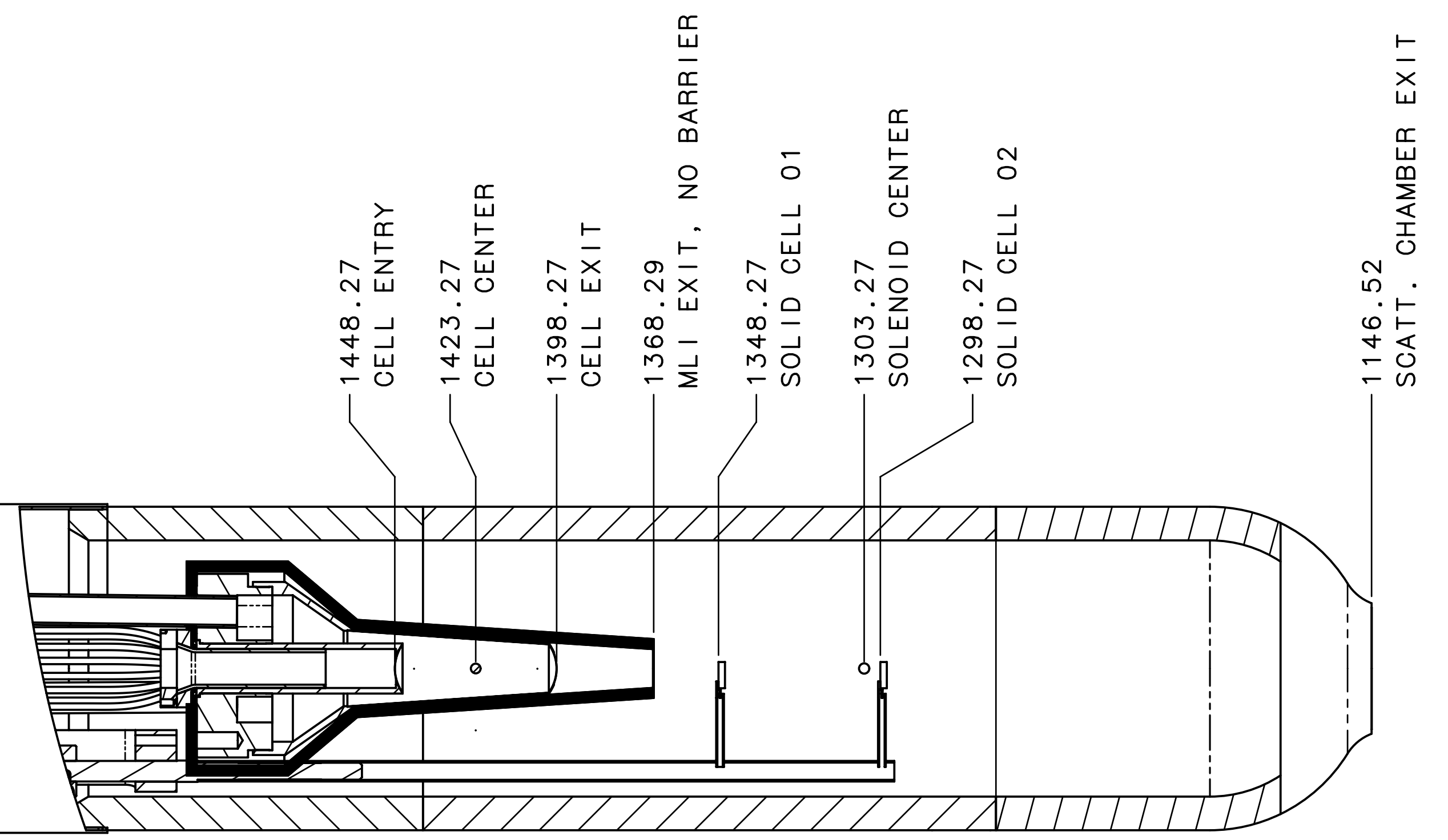
PRELIMINARY

SIZE	DWG. NO.	REV.
E	BD2301-02-00-0000	-
SCALE	ISS. OR ASSY NO.	SHEET
N/A	N/A	4 OF 5

8 7 6 5 4 3 2 1



SECTION 5-7E  
TARGET CELL TO HALL CENTER  
(SHOWN IN LIQUID CONFIG.)



SECTION 5-7D  
TARGET CELL TO HALL CENTER  
(SHOWN IN SOLID CONFIG.)

LIQUID CELL (50mm LONG)

TABLE -A-  
MATERIALS IN THE BEAM LINE

ITEM	DRAWING NO.	MATERIAL	THICKNESS
TARGET CELL ENTRY	BD2301-03-01-0100	ALUMINUM	30um
TARGET CELL EXIT		ALUMINUM	30um
SOLID FOIL 01 RIGHT	-	COPPER	93um
SOLID FOIL 02 RIGHT	-	TIN	171um
SOLID FOIL 01 LEFT	-	CARBON	2000um
SOLID FOIL 02 LEFT	-	CARBON	2000um
SCATTERING CHAMBER EXIT	B00000-03-01-0300	ALUMINUM	50um
VACUUM VOL. ENTRY (DOWNSTREAM)	B00000-02-07-0210	ALUMINUM	75um

TABLE -C-  
STEPPER MOTOR POSITIONS

LOCATION	DEGREES
RIGHT FOIL LIMIT	0
RIGHT FOIL BEAM	2.5
CENTER	30.0
LEFT FOIL BEAM	57.5
LEFT FOIL LIMIT	60.0

SOLID FOILS

TABLE -B-  
MATERIALS IN THE BEAM LINE

ITEM	DRAWING NO.	MATERIAL	THICKNESS
TARGET CELL ENTRY	BD2301-03-01-0100	ALUMINUM	30um
TARGET CELL EXIT		ALUMINUM	30um
SOLID FOIL 01 RIGHT	-	COPPER	93um
SOLID FOIL 02 RIGHT	-	TIN	171um
SOLID FOIL 01 LEFT	-	CARBON	2000um
SOLID FOIL 02 LEFT	-	CARBON	2000um
SCATTERING CHAMBER EXIT	B00000-03-01-0300	ALUMINUM	50um
VACUUM VOL. ENTRY (DOWNSTREAM)	B00000-02-07-0210	ALUMINUM	75um

TABLE -D-  
STEPPER MOTOR POSITIONS

LOCATION	DEGREES
RIGHT FOIL LIMIT	0
RIGHT FOIL BEAM	2.5
CENTER	30.0
LEFT FOIL BEAM	57.5
LEFT FOIL LIMIT	60.0

PRELIMINARY

SIZE	DWG. NO.	REV.
E	BD2301-02-00-0000	-
SCALE	REV. OR ASSY NO.	SHEET
N/A	N/A	5 OF 5