TRIUMF	Engineering Change Order			ECO- 3508
Title	ARIEL EABD MB0 Optics			
Originator	Rick Baartman		**Date**	1/Oct/2014
Account		**Tracking #**	**Date req'd**	

Change requested:
Beam trajectory radius to be changed from R354mm to R221mm. This will change Vacuum box design. See ECO-3509.
Related documents - REA, Design Review, design inputs, interim design outputs:
Attached E-mail

Affected documents review

Reviewer	Role	Scope	Signature	Date
Tim Emmens	Author			1/Oct/2014.
Thomas Planche				1-oct-2014
Shane Koscielniak				2014/Oct/01
Eric Guetre	Proj. Eng.	check radius		1-Oct-2014

Affected documents approval

Approver	Signature	Date
Rick Baartman		2014/Oct/01

Affected documents list

Document	Description	Revision	
		From	To
TMD0049	ARIEL EABD MB0 Optics geometry	A	B

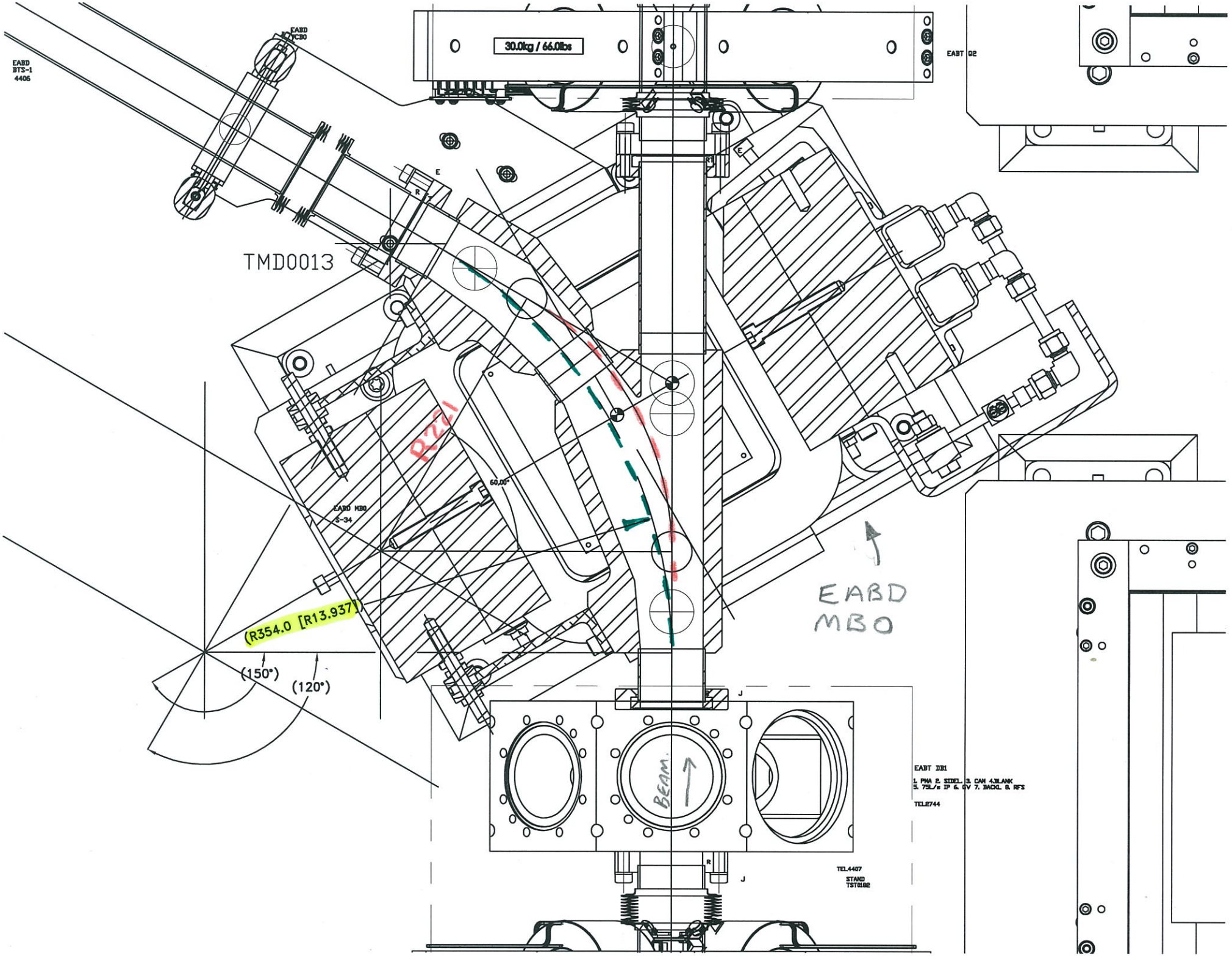
Affected documents release actions

Action	By	Date
Update document repository		

Distribution

Comments

EG: A Radius of 221mm is per Fig. 9 of TRI-DN-12-22.


30.0kg / 66.0lbs
EABD BTS-1 4406
EABD MOVCB0
EABT Q2
TMD0013
R221
60.00°
EABD MBO S-34
(R354.0 [R13.937])
(150°)
(120°)
EABD MBO
BEAM
EABT DB1
1. PMA 2. SIDEL 3. CAN 4.BLANK
5. TSL/= IP 6. CV 7. BACKL 8. RFS
TEL2744
TEL4407
STAND TST0102

Subject: EABD optics
From: Rick Baartman <baartman@lin12.triumf.ca>
Date: 9/30/2014 5:02 PM
To: Thomas Planche <tplanche@triumf.ca>, Suresh Saminathan <suresh@triumf.ca>, Dobrin Kaltchev <kaltchev@triumf.ca>
CC: Tim Emmens <temmens@triumf.ca>

Tim: The drawing TEL1814 has an incorrect circular arc for EABD:MB0. You have it as 354mm, but it should be 221mm. But the crossover point is correct, so just change the trajectory you have. Start (and end) the arc 221mm/sqrt(3) = 127.6mm from the crossover point.

Others: A simple bend with parameters rho=22.1cm, entrance and exit 30 degrees bend angle 60 degrees, K1=0.28, K2=0., xg=5.2 (that may be the wrong gap, but no matter; only K1 times gap matters.) reproduces Thomas' COSY calculated matrix beautifully:

TRANSOPTR:

x(m)	th(rad)	y(m)	ph(rad)	[g/(1+g)]l(m)	dK/K(rad)
1.000000	-0.372529E-06	0.00000	0.00000	1.13568	0.00000
0.629023	1.000000	0.00000	0.00000	0.357184	0.00000
0.00000	0.00000	-0.166604	-3.14525	0.00000	0.00000
0.00000	0.00000	0.309115	-0.166604	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	1.00000	0.00000
-0.357184	-1.13568	0.00000	0.00000	-0.385493E-01	1.00000

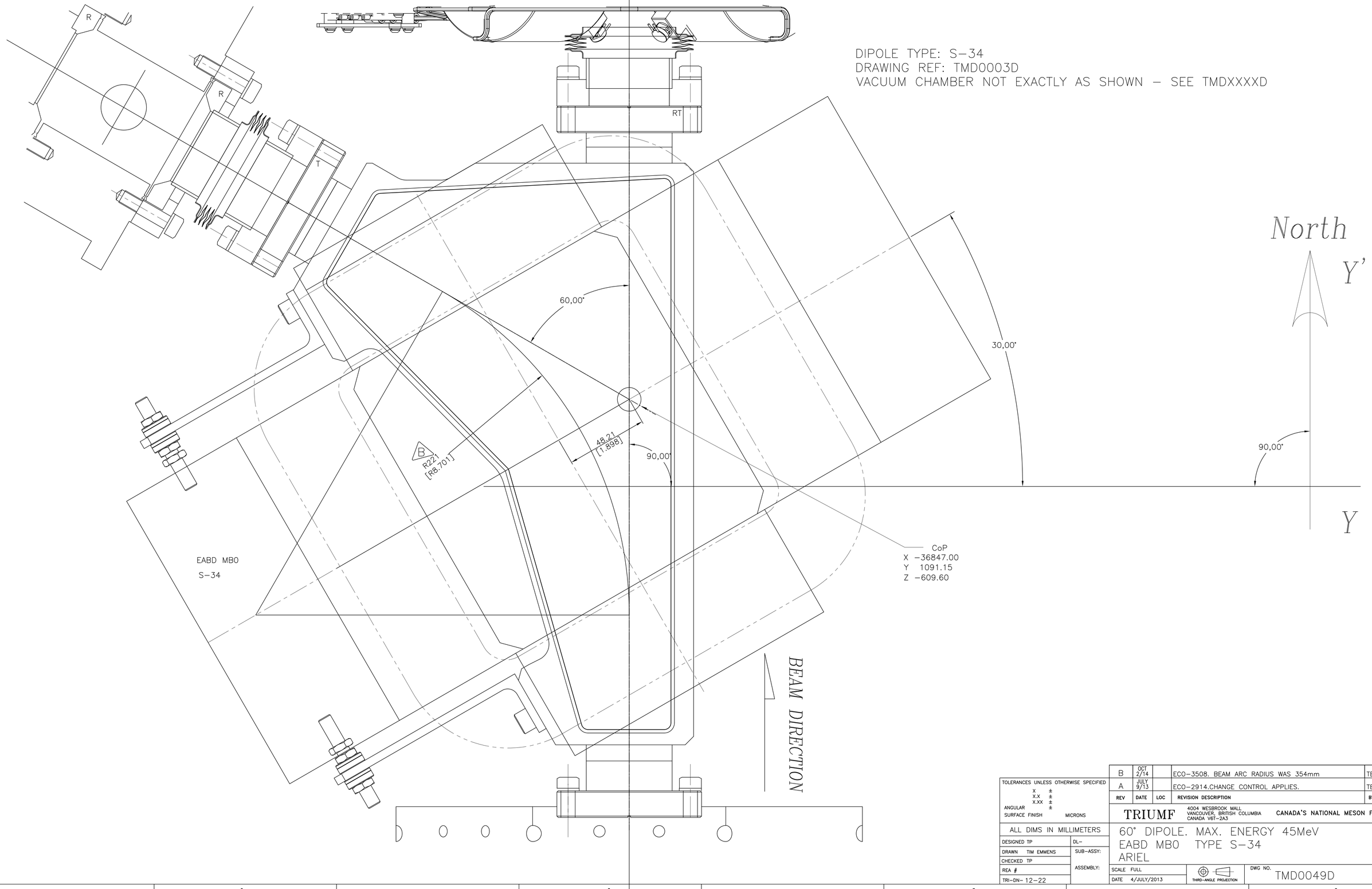
COSY from TRI-DN-12-22:

1.003586	0.1134623E-01	0.000000	0.000000	1.140618
0.6222334	1.003462	0.000000	0.000000	0.3535958
0.000000	0.000000	-0.1863676	-3.121929	0.000000
0.000000	0.000000	0.3094070	-0.1827221	0.000000
0.000000	0.000000	0.000000	0.000000	1.000000
-0.3548669	-1.140555	0.000000	0.000000	-0.4253877E-01

(This has to use 30MeV energy, or the dispersion terms are different.)
--
rick baartman

ITEM	REF No./DESCRIPTION	MATERIAL	QUAN

DIPOLE TYPE: S-34
DRAWING REF: TMD0003D
VACUUM CHAMBER NOT EXACTLY AS SHOWN - SEE TMDXXXXD



REV	DATE	LOC	REVISION DESCRIPTION	BY	APP'D
B	OCT 2/14		ECO-3508. BEAM ARC RADIUS WAS 354mm	TE	RB
A	JULY 9/13		ECO-2914.CHANGE CONTROL APPLIES.	TE	TP

TOLERANCES UNLESS OTHERWISE SPECIFIED
X ±
X.X ±
X.XX ±
ANGULAR ±
SURFACE FINISH MICRONS

ALL DIMS IN MILLIMETERS

DESIGNED TP	DL-
DRAWN TIM EMMENS	SUB-ASSY:
CHECKED TP	ASSEMBLY:
REA #	
TRI-DN- 12-22	

TRIUMF
4004 WESBROOK MALL
VANCOUVER, BRITISH COLUMBIA
CANADA V6T-2A3
CANADA'S NATIONAL MESON FACILITY

60° DIPOLE. MAX. ENERGY 45MeV
EABD MB0 TYPE S-34
ARIEL

SCALE FULL
DATE 4/JULY/2013
THIRD-ANGLE PROJECTION
DWG NO. TMD0049D
REV B