End-Cap constraints from the existing BaBar Barrel

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See http://www.ph.qmul.ac.uk/~bevan/EMC for the set of BaBar EMC schematics.

EMC Barrel

- Defines maximum dimensions for the End-Cap.

Forward End-Cap Calorimeter Fits in here.
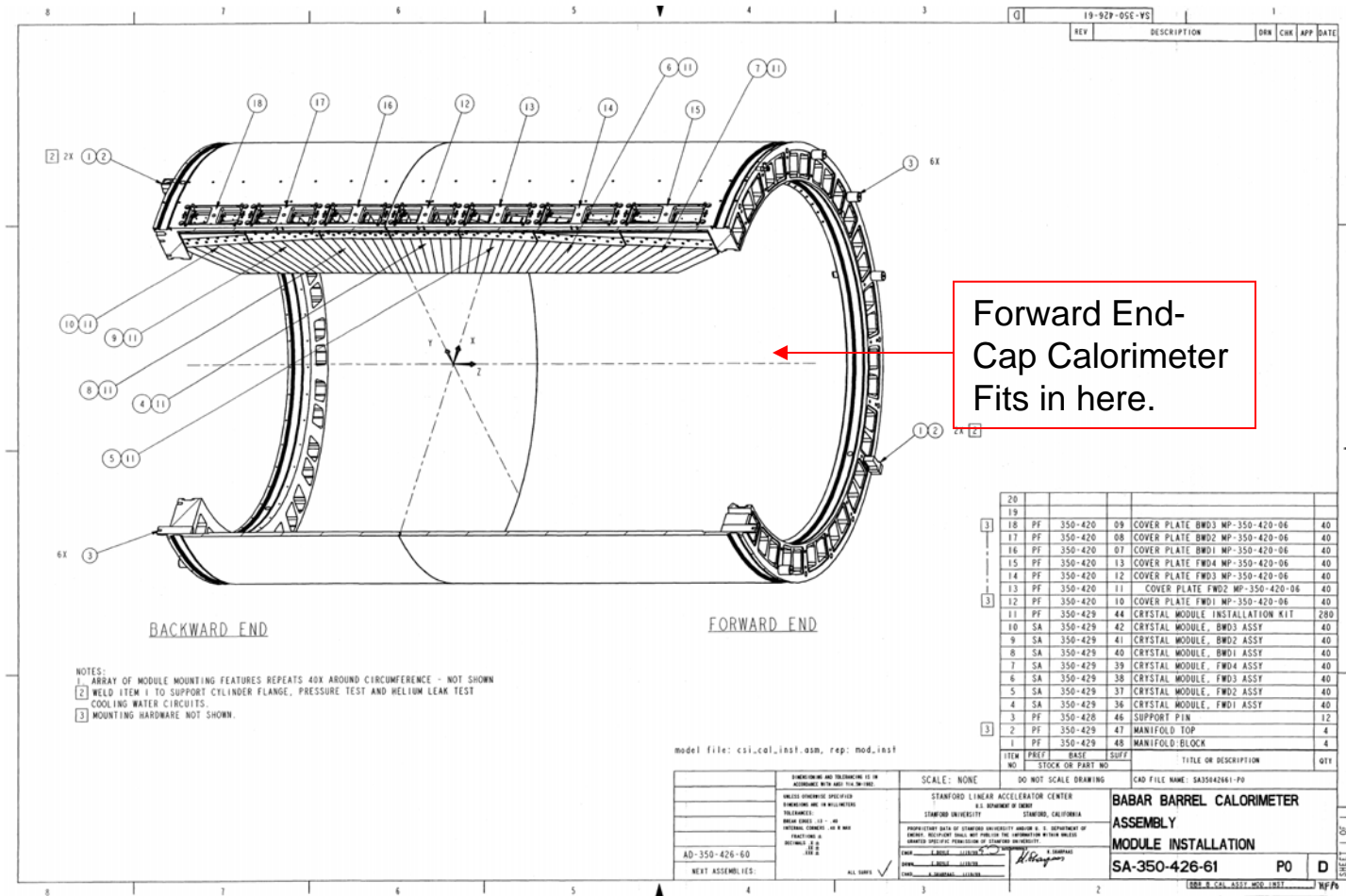
Inner Dimensions (in mm)

No Backward
Calorimeter

4 R 910

3024.29

387.12

R 1129.5 4

Forward End-
Cap Calorimeter
Fits in here.

FORWARD END

SEE DETAIL END

SECTION A-A

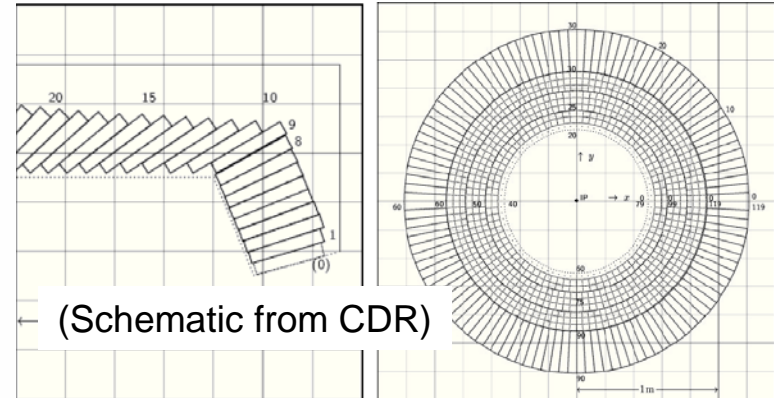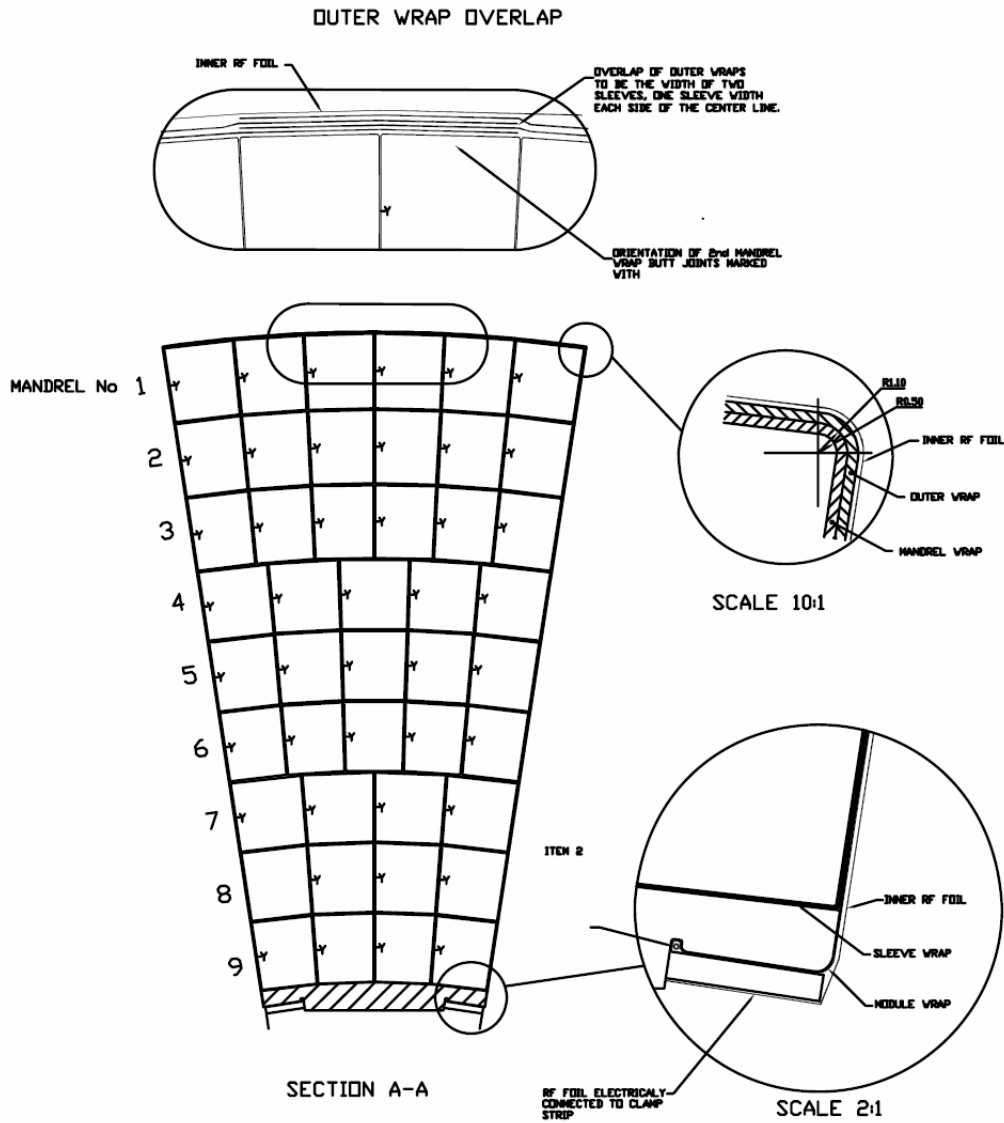SEE DETAIL CORNER

SEE DETAIL CONE
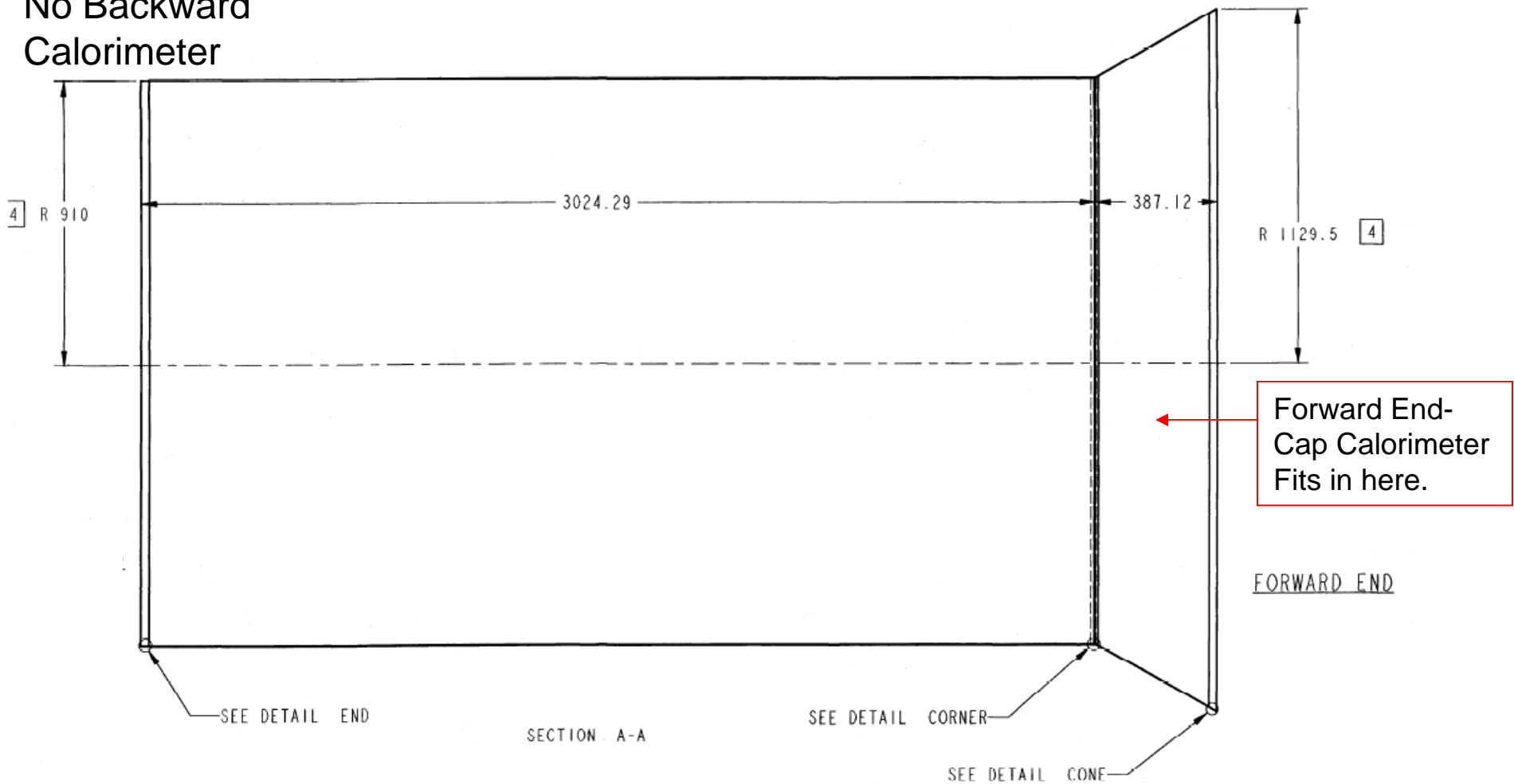
EMC End-Cap

- **Back plate dimensions:** (see np30-03-61_1.pdf)
  - Inner 1600mm, outer 2278mm
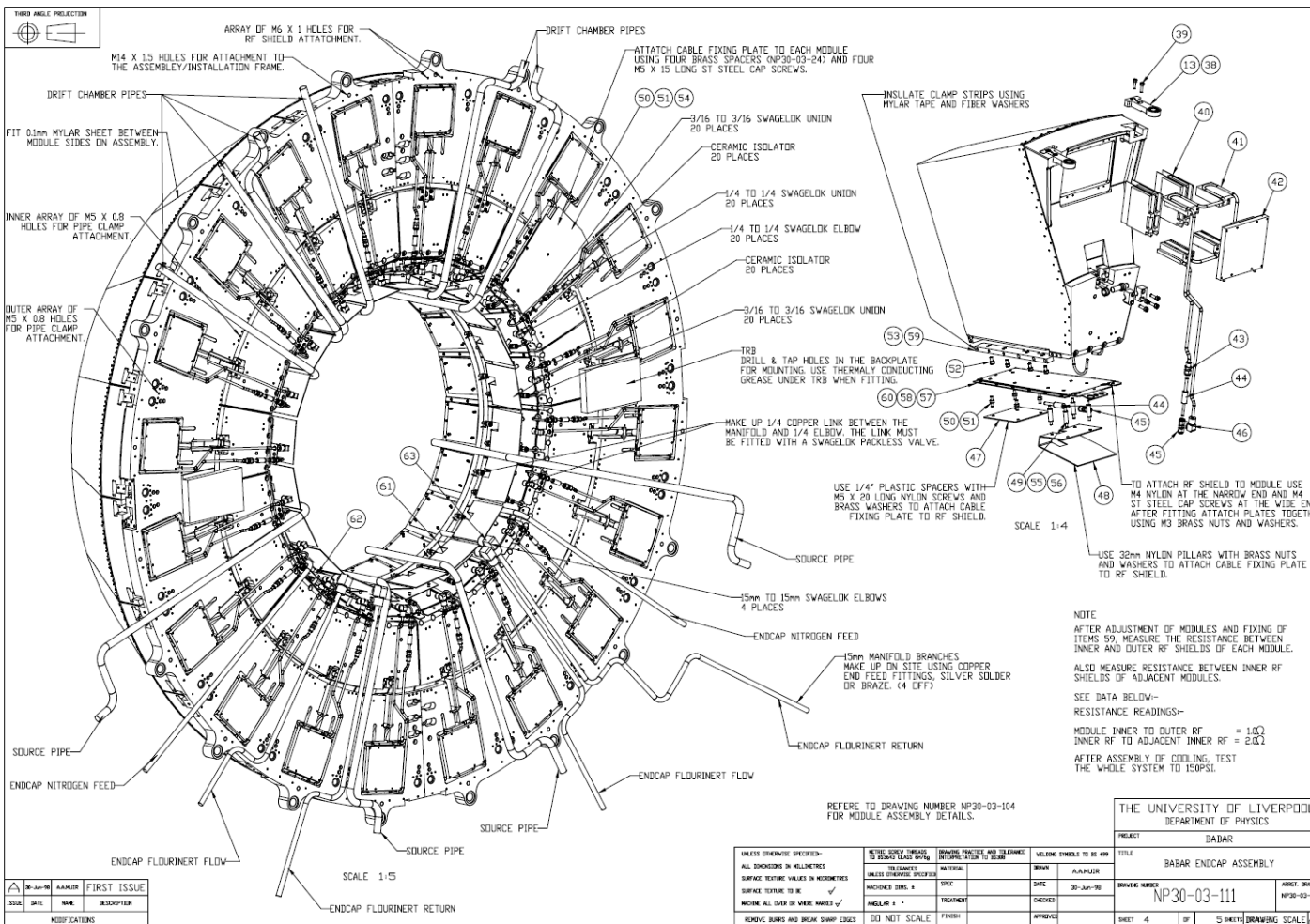
•Two Halves, made up of modules of crystals.

•Cooling manifolds go inside the innermost part of the calorimeter; so does the SVT, DCH and DIRC cabling etc.

End-Cap Module

OUTER WRAP OVERLAP

INNER RF FOIL

OVERLAP OF OUTER WRAPS
TO BE THE WIDTH OF TWO
SLEEVES, ONE SLEEVE WIDTH
EACH SIDE OF THE CENTER LINE.

ORIENTATION OF 2nd MANDREL
WRAP BUTT JOINTS MARKED
WITH

(Schematic from CDR)

MANDREL No 1
2
3
4
5
6
7
8
9

R1.10
R0.50

INNER RF FOIL

OUTER WRAP

MANDREL WRAP

SCALE 10:1

ITEM 2

INNER RF FOIL

SLEEVE WRAP

MODULE WRAP

SECTION A-A

RF FOIL ELECTRICALLY
CONNECTED TO CLAMP
STRIP

SCALE 2:1

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CDR 'Setup'

Table 4-5. *A possible design for an L(Y)SO forward endcap. All crystals are 200mm long, and the endcap is angled at 20° to the vertical as in the current BABAR detector.*

Ring in ϕ	Radius (mm)	Crystal Face (mm)	Crystal Volume (cc)	# Crystals
1	597-620	24.4× 31.9	171	120
2	620-643	24.4× 33.1	178	120
3	643-666	24.4× 29.4	158	140
4	666-689	24.4× 30.5	164	140
5	689-712	24.4× 27.5	148	160
6	712-735	24.4× 28.4	152	160
7	735-758	24.4× 26.1	140	180
8	758-781	24.4× 26.9	144	180
9	781-804	24.4× 24.9	134	200
10	804-827	24.4× 25.6	137	200
11	827-850	24.4× 23.9	128	220
12	850-873	24.4× 24.6	132	220
13	873-896	24.4× 23.2	125	240
14	896-919	24.4× 23.8	128	240

INCREASING RADIUS

p375 of the printed CDR

- Do we want to just flip the segmentation to get finer granularity nearer the beam-pipe as a starting point?

- Innermost circumference is 3751mm.
  - ❏ 240 crystals, would mean an inner face of 15.6 mm for the first layer of crystals (assuming no other material in-between crystals).

- Outermost circumference is 5774mm.
  - ❏ 180 crystals would mean an outer face of 32mm for the last layer of crystals (assuming no other material in-between crystals).

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