

EE & SE services in 53° crack

16 + 2 = **18 sectors**

3 & 9 O'clock for SE cooling

+

some EE cooling tubes

Cbl Tray dim : 200 x 20 mm

= > 40 cm² x 2 = **80 cm² / sector**

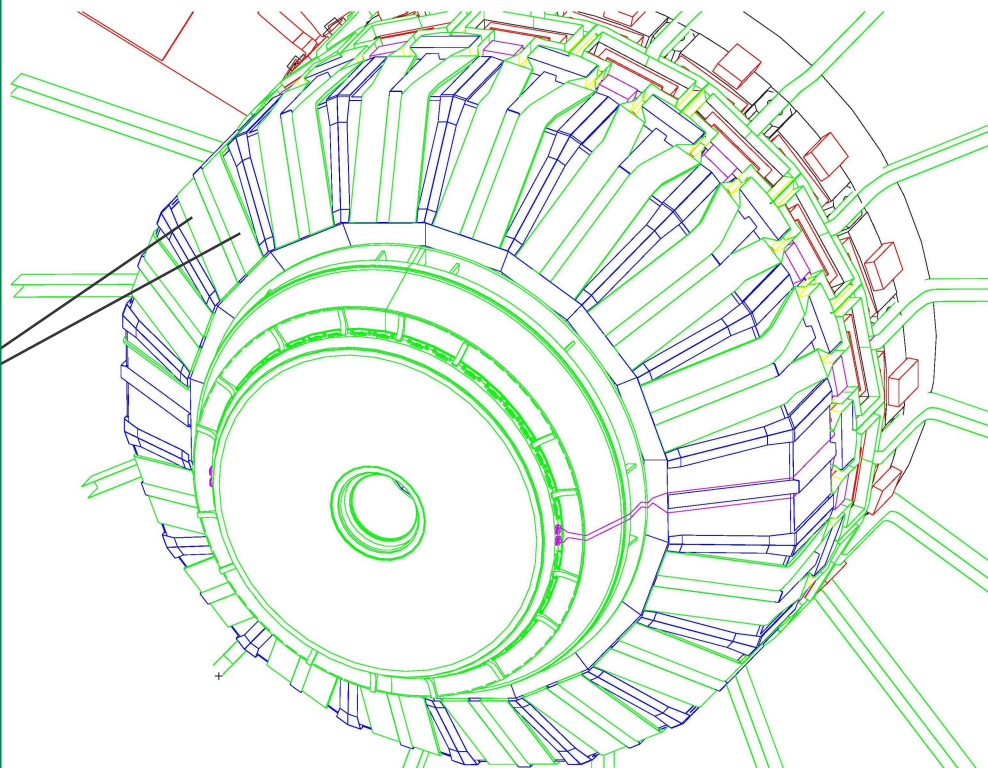
Services distribution :

EE

50 cm²

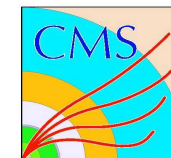
SE

30 cm²



Ecal End Cap list of services

Ecal	dimension	cross-section cm ²	tot cross-sect cm ²	per PP	per endcap	per sector (16) / worse case	sector cross-sect cm ²	Square X-section cm ²	Tot. Square X-section cm ²
Optical fiber (12 fibers)	2.3x4.9 mm	0.1127	90.16	50	800	50	5.635	0.1127	90.16
LV	ø 16 mm	2.01	321.6	10	160	10	25.6	2.56	409.6
HV	ø 4 mm	0.126	80.64	40	640	40	6.4	0.16	102.4
Slow controls	ø 10 mm	0.79	12.64		16	1	1	1	16
Monitoring & control fibers	ø 8 mm	0.5	2		4	1	0.64	0.64	2.56
Monitoring cables to MEM boxes	ø 2 mm	0.03	0.72		24	2	0.08	0.04	0.96
Monitoring bus to MEM boxes	13x1.6 mm	0.208	0.416		2	1	0.208	0.208	0.416
		3.7767	508.176	100	1646	105	39.563	4.7207	622.096
Dry nitrogen	ø 10 mm	0.79	4.74		6	1	1	1	6
Smoke detection	ø 8 mm	0.5	3		6	1	0.64	0.64	3.84
		1.29	7.74		12	2	1.64	1.64	9.84
Inner cone									
Outer cone	ø 11/13+3=19 mm	2.83	22.64		8			3.61	28.88
Front Panel	ø 11/13+3=19 mm	2.83	11.32		4	1	3.61	3.61	14.44
Back Plate	ø 11/13+1.5=16 mm	2.01	64.32		32	4	10.24	2.56	81.92
Power Circuit (in)	ø 12/14 mm	1.54	24.64		16			1.96	31.36
Power Circuit (out)	ø 12/14 mm	1.54	24.64		16	1	1.96	1.96	31.36
		10.75	147.56		76	6	15.81	13.7	187.96



	All per Dee	Nbr	square X-sect \ tube (cm²)	12 O'clock	45	3 O'clock	-45	6 O'clock
	Inner cone							
ø 11/13+3=19 mm	Outer cone	4	3.61		7.22		7.22	
ø 11/13+3=19 mm	Front Panel	2	3.61		2.25		2.25	
ø 11/13+1.5=16 mm	Back Plate	16	2.56	5.12	10.24	10.24	10.24	5.12
ø 12/14 mm	Power Circuit (in)	8	1.96		1 tube per sector 8 in total			
ø 12/14 mm	Power Circuit (out)	8	1.96		1 tube per sector 8 in total			

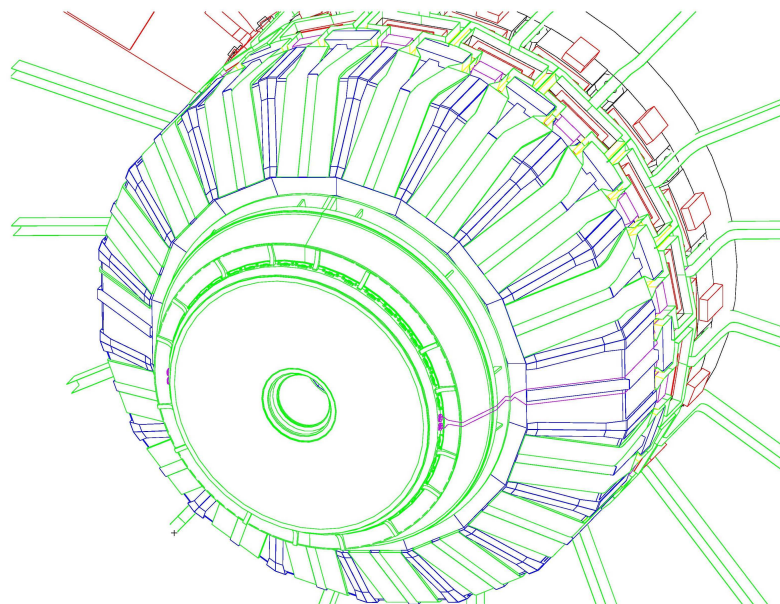
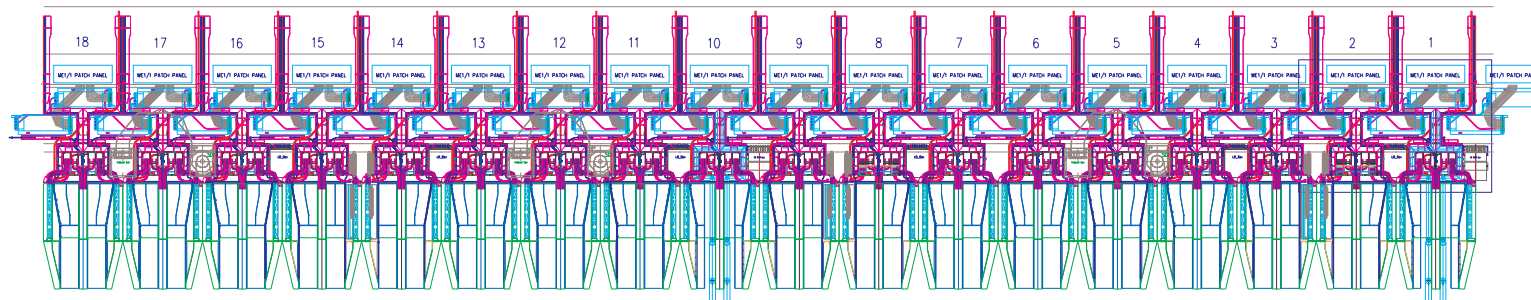
Cooling :
Cross section and quantity per sector

EE tubes (quantity per sector)								
	Inner cone	Outer cone	Front Panel	Back Plate		Power Circuit (in)	Power Circuit (out)	
sector 5 (12 O'clock)				2		1	1	4
sector 4						1	1	2
sector 3 (+45)		2		4		1	1	8
sector 2						1	1	2
sector 1 (3 O'clock)			2	4				6
sector 18						1	1	2
sector 17 (-45)		2		4		1	1	8
sector 16						1	1	2
sector 15 (6 O'clock)				2		1	1	4
	0	4	2	16		8	8	38
EE tubes (square cross section per sector)								
	Inner cone	Outer cone	Front Panel	Back Plate		Power Circuit (in)	Power Circuit (out)	Tot.Tubes X-Sect.cm²
sector 5 (12 O'clock)				5.12		1.96	1.96	9.04
sector 4						1.96	1.96	3.92
sector 3 (+45)		7.22		10.24		1.96	1.96	21.38
sector 2						1.96	1.96	3.92
sector 1 (3 O'clock)			7.22	10.24				17.46
sector 18						1.96	1.96	3.92
sector 17 (-45)		7.22		10.24		1.96	1.96	21.38
sector 16						1.96	1.96	3.92
sector 15 (6 O'clock)				5.12		1.96	1.96	9.04
	0	14.44	7.22	40.96		15.68	15.68	93.98
								315.968

Cables :

Cross section and quantity per sector

<u>EE cables (quantity per sector)</u>									
	Optical Fiber	LV	HV	Slow control	Monit.control fiber	Monit.cbl MEMbox	Monit.bus MEMbox	Dry Nitrogen	Smoke detection
sector 5 (12 O'clock)		13	54					1	1
sector 4		13	53		1	6	1		
sector 3 (+45)	200								
sector 2		14	53	4					
sector 1 (3 O'clock)								1	1
sector 18		14	53	4					
sector 17 (-45)	200								
sector 16		13	53		1	6			
sector 15 (6 O'clock)		13	54					1	1
	400	80	320	8	2	12	1	3	3
<u>EE cables (square cross section per sector)</u>									
	Optical Fiber	LV	HV	Slow control	Monit.control fiber	Monit.cbl MEMbox	Monit.bus MEMbox	Dry Nitrogen	Smoke detection
sector 5 (12 O'clock)		33.28	8.64					1	0.64
sector 4		33.28	8.48		0.64	0.24	0.208		
sector 3 (+45)	22.54								
sector 2		35.84	8.48	4					
sector 1 (3 O'clock)								1	0.64
sector 18		35.84	8.48	4					
sector 17 (-45)	22.54								
sector 16		33.28	8.48		0.64	0.24			
sector 15 (6 O'clock)		33.28	8.64					1	0.64
	45.08	204.8	51.2	8	1.28	0.48	0.208	3	1.92



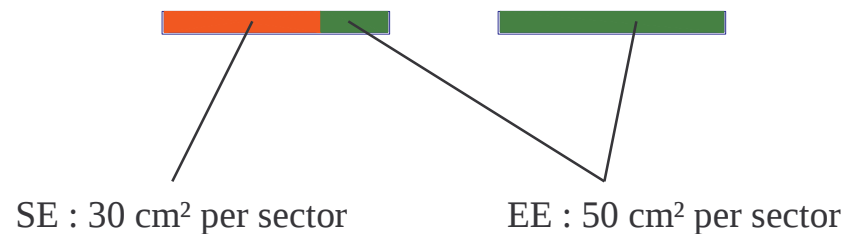
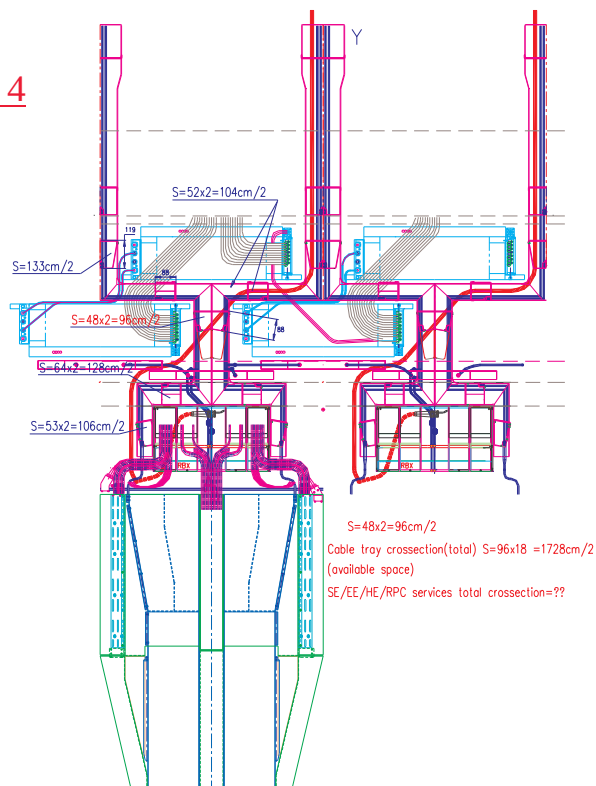
End cap 53° crack

Extract from dwg : Endcap005.dwg
21 Feb 2002
Done by A.Surkov

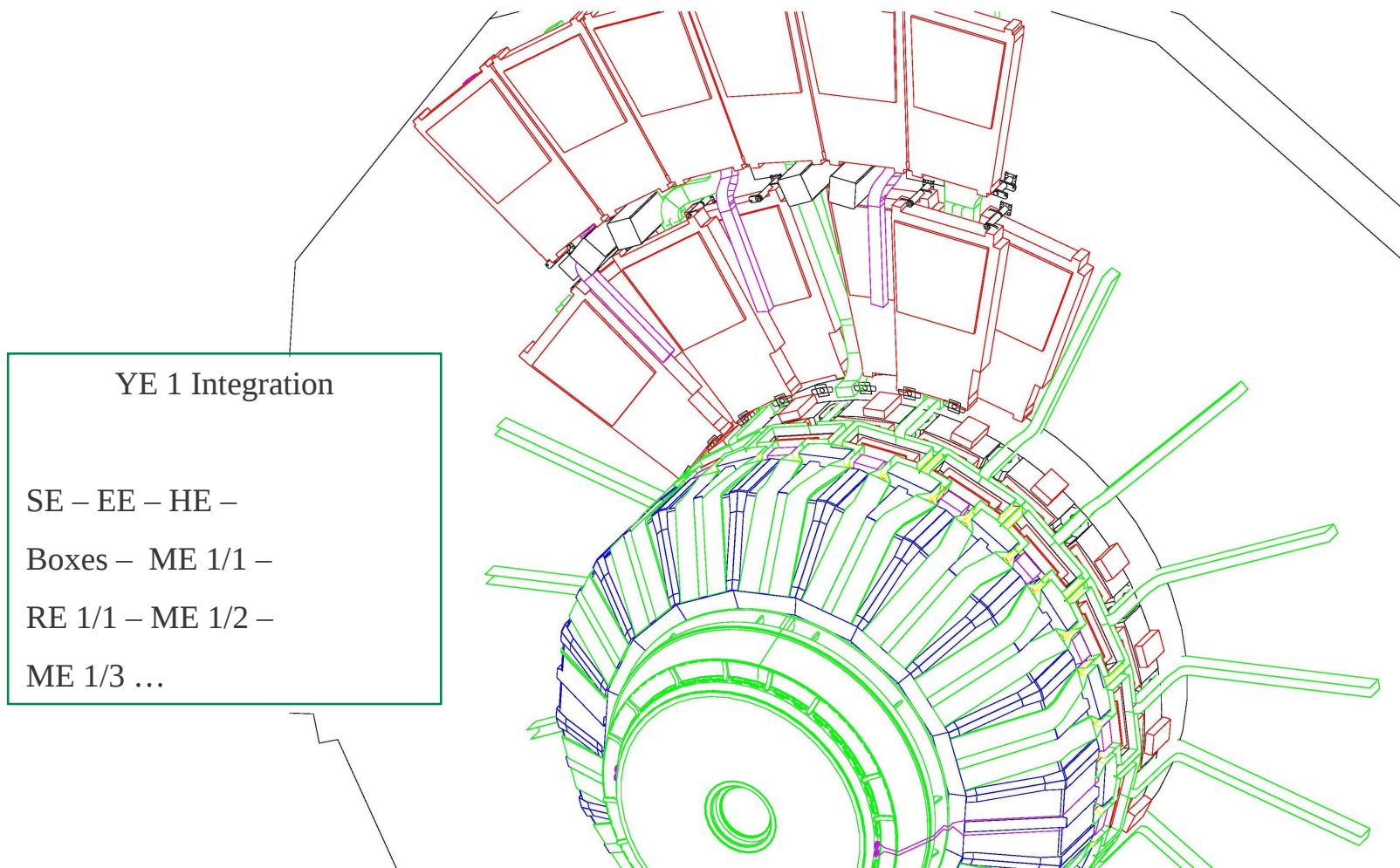
	Optical Fiber	LV	HV	Slow control	Monit.control fiber	Monit.cbl MEMbox	Monit.bus MEMbox	Dry Nitrogen	Smoke detection
sector 4		33.28	8.48		0.64	0.24	0.208		

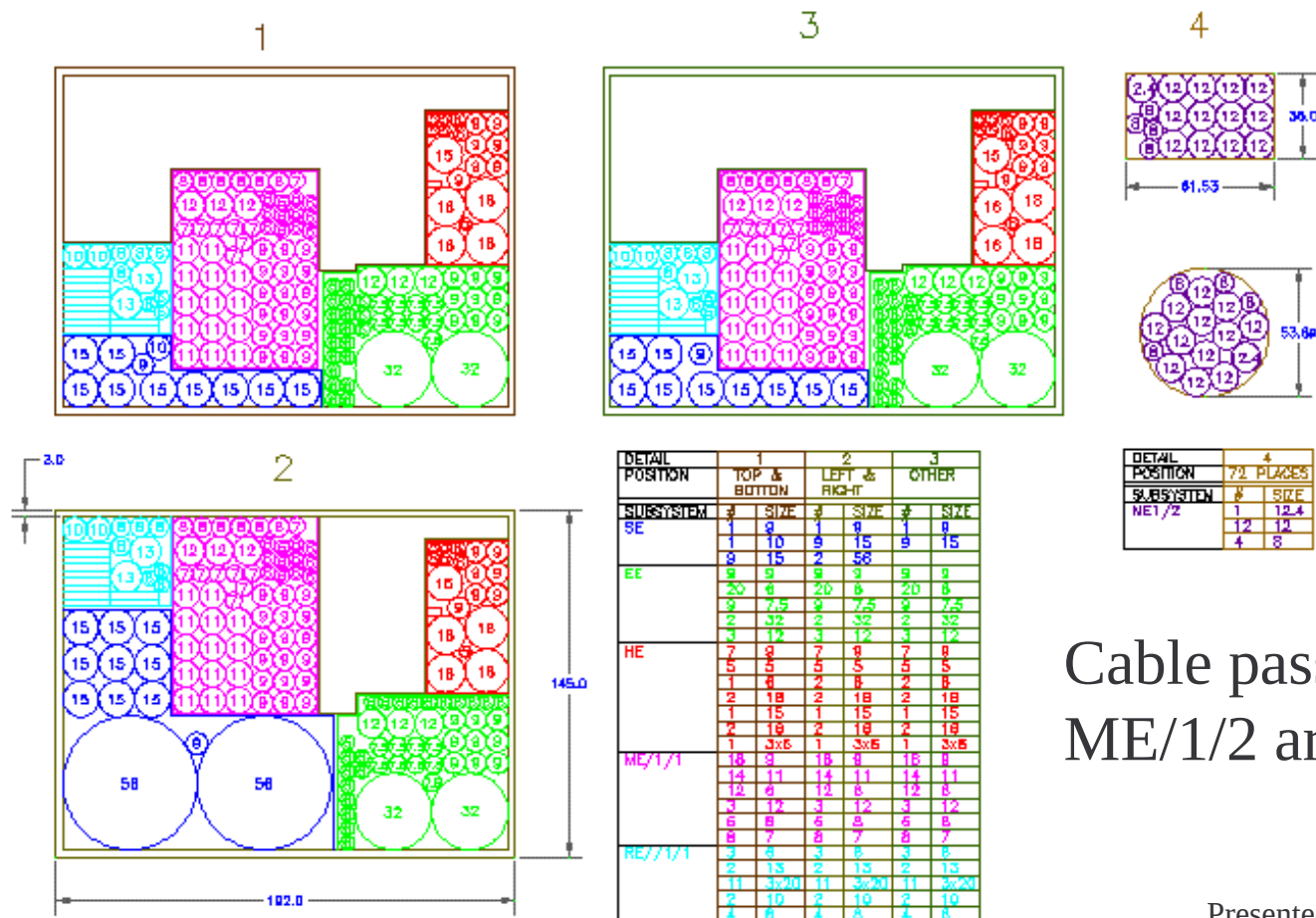
	Inner cone	Outer cone	Front Panel	Back Plate		Power Circuit (in)	Power Circuit (out)	Tot.Tubes X-Sect.cm ²	Tot.Cables X-Sect.cm ²
sector 4						1.96	1.96	3.92	42.848

Sector 4



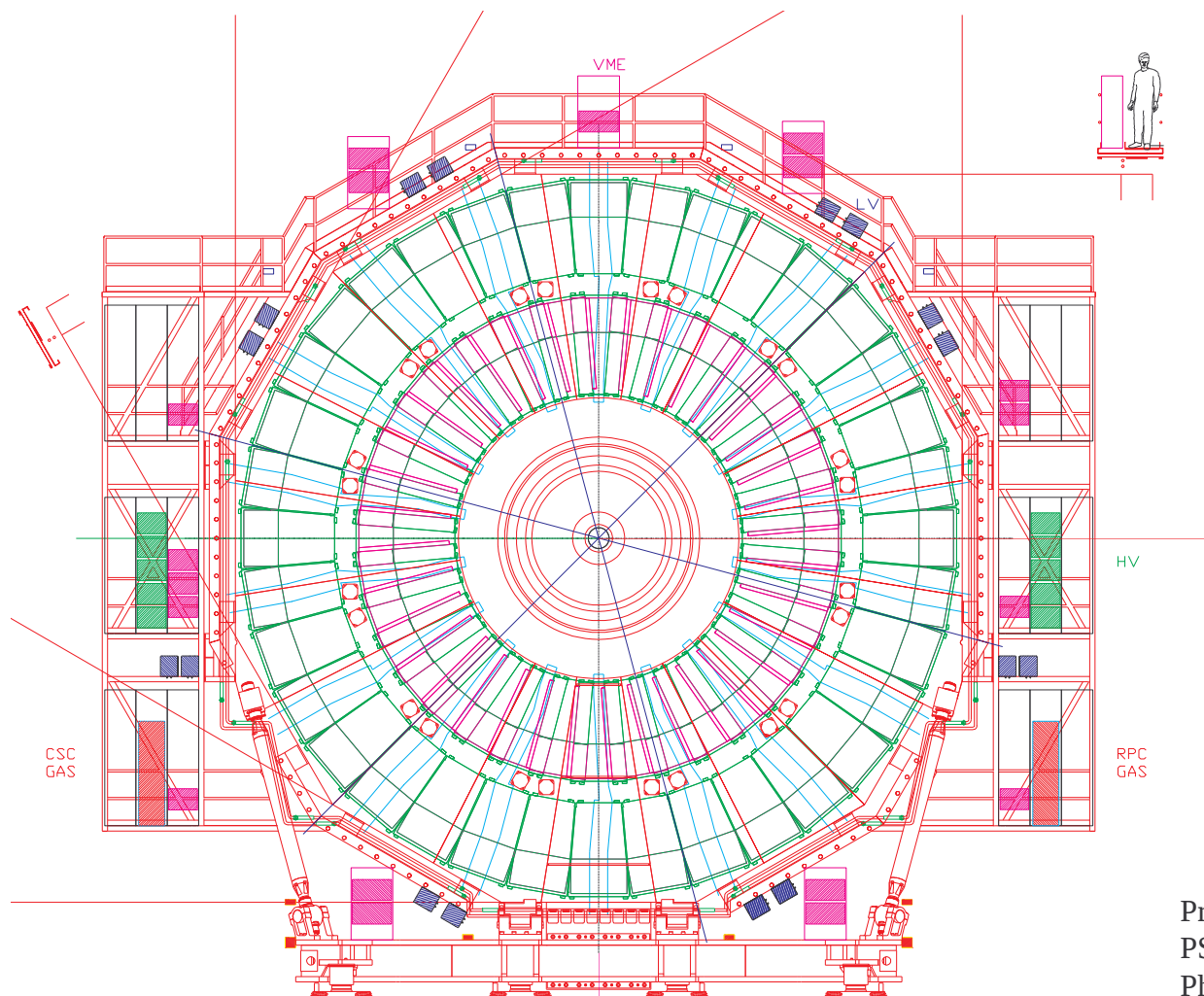
Extract from dwg : Endcap005.dwg
21 Feb 2002
Done by A.Surkov





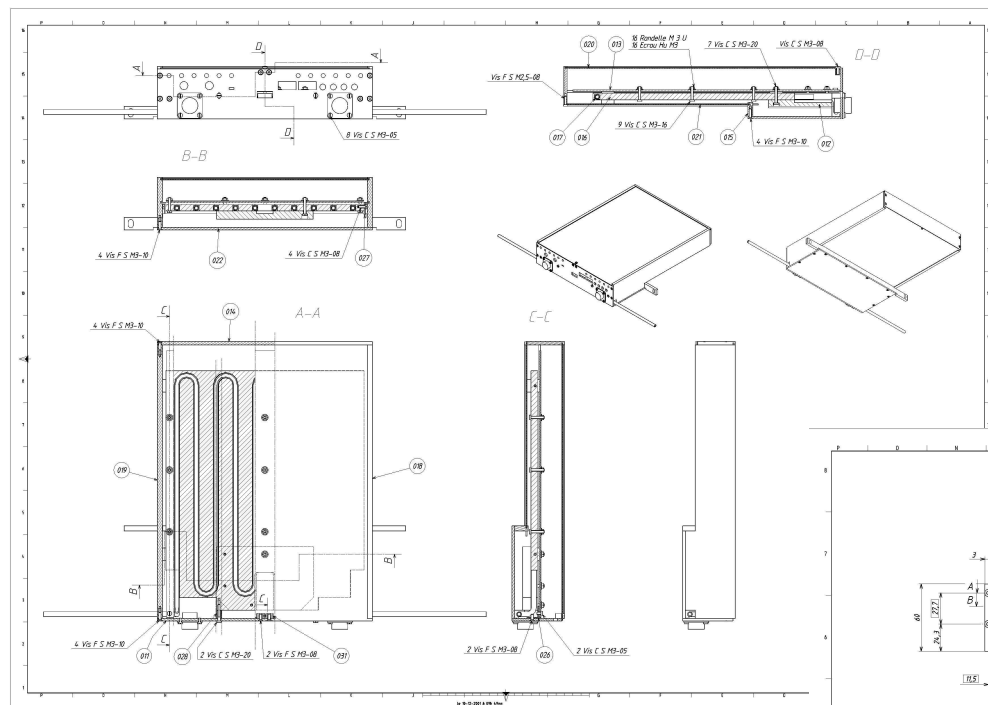
Cable passages in
ME/1/2 area

Presented by F. Feyzi
PSL-University of Wisconsin-Madison
Physical Sciences Laboratory
11 Mar 2001



YE1

Presented by F. Feyzi
PSL-University of Wisconsin-Madison
Physical Sciences Laboratory
11 Mar 2001



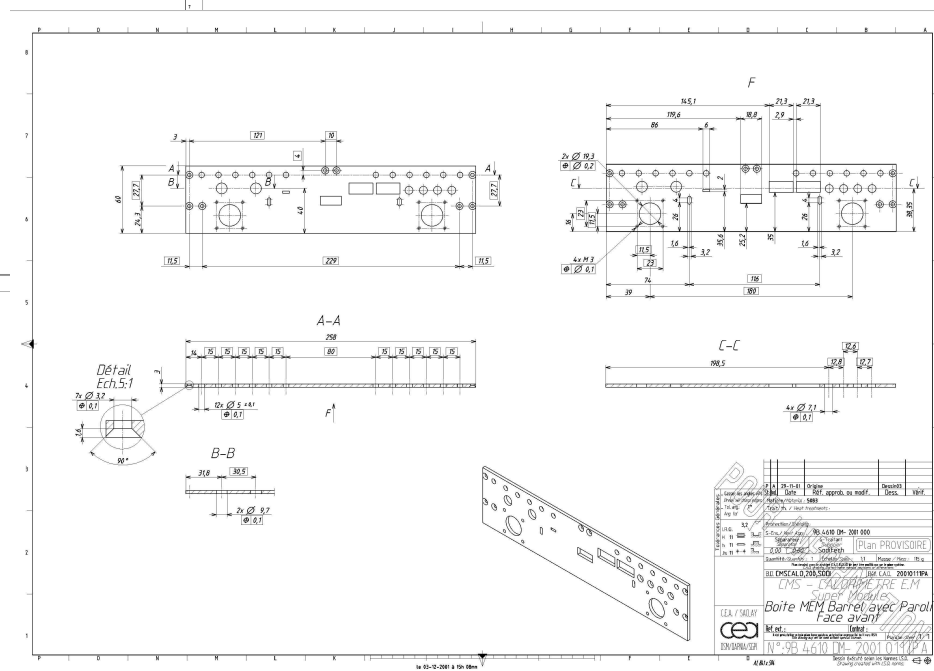
Ecal MEM Box

Barrel :

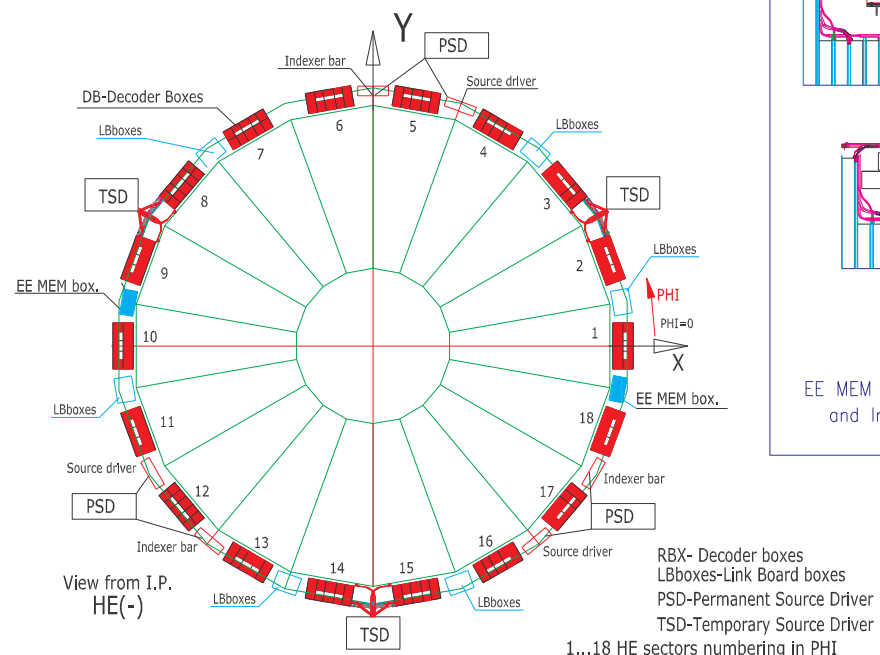
1 MEM box per Supermodule = **36**

End cap :

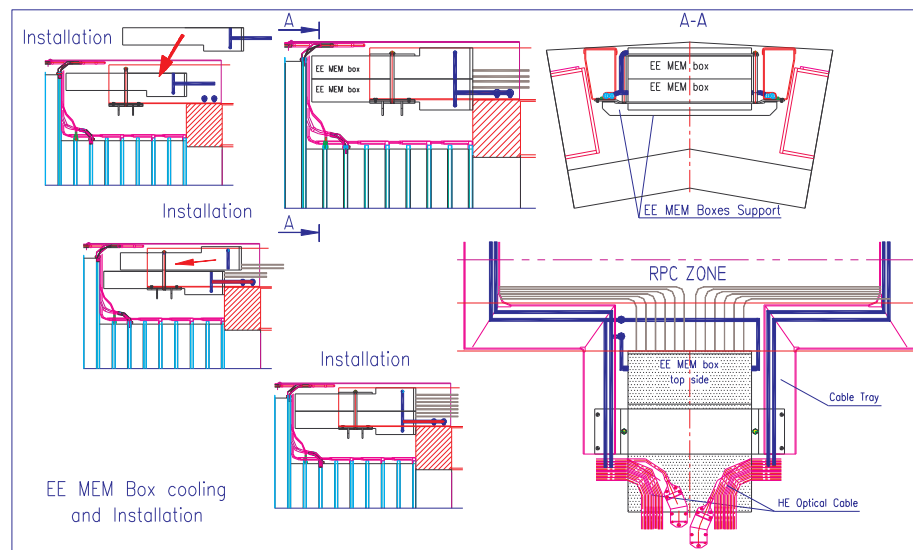
2 Boxes per Dee = **8**



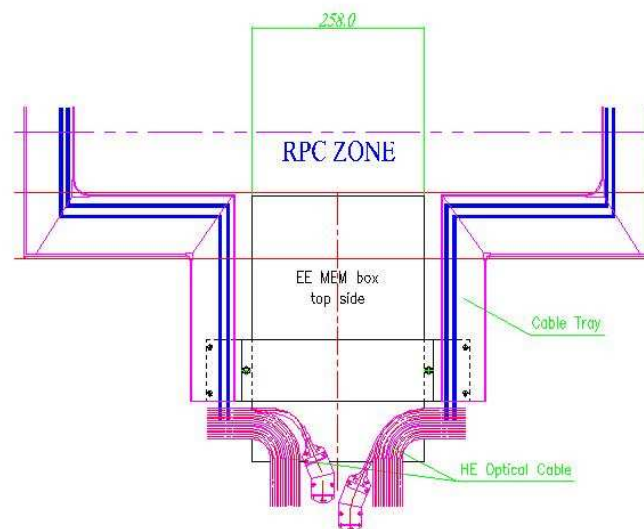
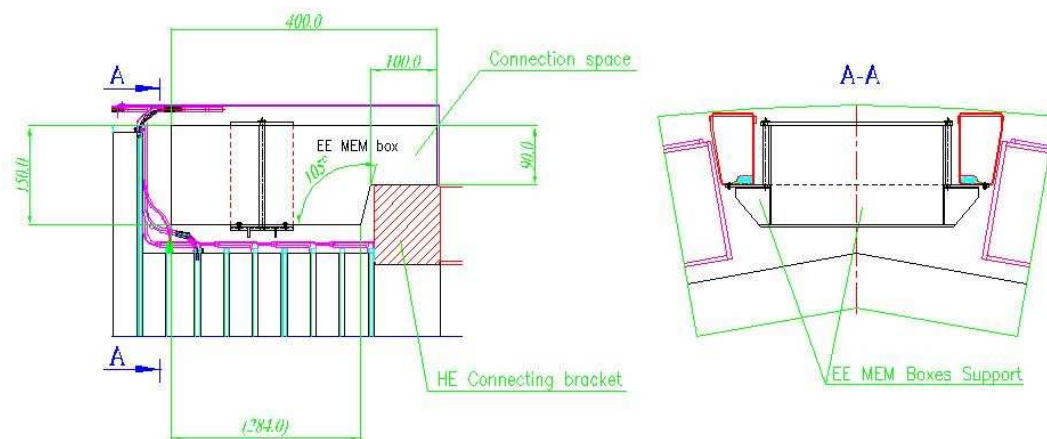
Send by M.Anfreville 28 Feb 2002



EE MEM Box cooling
and Installation



Extract from dwg : Endcap_MEM_Box.dwg
31 Jan 2002
Done by A.Surkov



CMS Integration PROPOSAL
One MEM box per Dee
A.Surkov - P.Ingenito
12 march 2002