

Status of cables - definition and procurement

- The status is summarized by the document “*MB and RB UXC55’s CABLES STATUS*”
- News
 - **MB.LV.mc:** It was defined, connectors at detector side too.
PRR is under working, Fire test IEC 332-3 to be done.
 - **RB.CA.sgn:** (~75Km, ~260K euro)
It was defined. Connectors was already defined.
PRR is under working, Fire test IEC 332-3 done by NOVACAVI.
 - **MB.LV.fe:** In order to make the fire-test IEC 332-3 INTERCOND asks 1000€, IMQ asks 3000€
- Still open questions
 - **MB.CA.tr & MB.CA.ro:** Cables is **not defined**. Problems in connectorizing CAT6 using RJ45 connectors.
 - **Alignment:** no ALIGNMENT cables was specified to me.
 - **LV and control connectors for CAEN EASY** power supply are still under discussion.
- Manufacture of cables for first sectors installation test (1-2 sectors)
 - We haven’t any estimation about procurement and manufacture time for both **DT** and **RPC trigger cables**.
I asked responsible persons to investigate the possibility to perform fast purchasing of little quantity but this seems to be very difficult because they are special productions. **They could be very late.**
 - Minicrate’s LV cable (**MB.LV.mc**) could be late too.

Concerning others cables, it seems possible to get them in about 3 weeks since defining of cutting lengths.
See table for manufacture time and details.

MB and RB UXC55's CABLES STATUS - short description (*NOTE: None Alignment cables was specified to now*)

CABLE NAME	NR. CABLES	TOT. LENGTH (ESTIMATION)	TECHNICAL STATUS	LOGICAL ROUTING	CUTTING LENGTHS	PRR STATUS	SUPPLIER / PRODUCTION STATUS OF RAW CABLE	MANUFACTURE TIME FOR FIRST 2 SECTORS INSTALLATION	CABLE COULD BE BOUGHT THROUGH CERN
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LV cables – inner cables-tray

MB.LV.mc	250 + 20 SPARES	~4.3 KM	DEFINED	DEFINED	TO BE DONE	WORKING ON PRR PREPARATION (PREPARING IS41 REQUEST)	NOVACAVI / TO BE ORDERED	OPEN QUESTION	NO
MB.LV.fe	250 + 20 SPARES	~4.3 KM	DEFINED	DEFINED	TO BE DONE	It's almost done. The PRR will be approved as soon as we will get the INTERCOND's safety docs.	NOVACAVI /PRODUCED & DELIVERED AT CERN	1-2 WEEKS, AT ISR-IHEP	-
RB.LV.fe-8, RB.LV.fe-12	370 + 40 SPARES	~6.6 KM	DEFINED	DEFINED	TO BE DONE	APPROVED by the Committee	NOVACAVI /PRODUCED & DELIVERED AT CERN	2 WEEKS, AT INFN BA&NA	-

HV cables – central cables-tray

MB.HV	680 + 20 SPARES	~11.2 KM	DEFINED	DEFINED	~ 85 % DONE	APPROVED by the Committee	KERPEN / CUTTING AND PUTTING CONNECTORS	ALREADY DONE	-
RB.HV	480 + 20 SPARES	~11 KM	DEFINED	DEFINED	TO BE DONE	APPROVED by the Committee	NOVACAVI /PRODUCED & DELIVERED AT CERN	2 WEEKS, AT INFN BA&NA	-

Signal & Optical cables – outer cables-tray

MB.OF.sc	250 + 20 SPARES	~4.3 KM	DEFINED	DEFINED	TO BE DONE	APPROVED by the Committee	UNIFIBRE / NEEDS LENGTHS BEFORE ORDER	3-4 WEEKS (TBV), AT UNIFIBRE	NO
MB.OF.ttc-mc	250 + 20 SPARES	~4.3 KM	DEFINED	DEFINED	TO BE DONE, ONLY WORST L	TO BE DONE	CERN /TO BE ORDERED AT CERN STORE	1-2 WEEKS, ALL SAME LENGTH	YES, ~ 25000 CHF
MB.CA.sc	260 + 10 SPARES	~1.8 KM	DEFINED	DEFINED	TO BE DONE	TO BE DONE	CERN /TO BE ORDERED AT CERN STORE	1-2 WEEKS, AT INFN PD	YES, ~ 2500 CHF
MB.CA.veto	250 + 20 SPARES	~4.3 KM	DEFINED	DEFINED	TO BE DONE	TO BE DONE	CERN /TO BE ORDERED AT CERN STORE	1-2 WEEKS, AT INFN PD	YES, ~ 15000 CHF
MB.CA.tr, MB.CA.ro	1000 + 20 SPARES	~16.3 KM	NOT DEFINED CONNECTORIZE PROBLEMS	DEFINED	TO BE DONE	WAITING FULL DOCUMENTATION FROM RESPONSIBLE PERSON		OPEN QUESTION	
RB.CA.t-sens, RB.CA.dcs-7, RB.CA.dcs-12	680 + 60 SPARES	~12 KM	DEFINED	DEFINED	TO BE DONE	t-sens: UNDER APPROVAL deadline was 17.05.04 others: WORKING ON	CERN /TO BE ORDERED AT CERN STORE	3 WEEKS, AT INFN BA&NA	YES, ~ 55000 CHF
RB.CA.sgn	4720 + 60 SPARES	~76.5 KM	DEFINED	DEFINED	TO BE DONE	WORKING ON PRR PREPARATION. (WAITING TIS REPLIES: 1,IEC332)	NOVACAVI / TO BE ORDERED	OPEN QUESTION	~ 400 000 CHF (~ 3.34 €/m)

TOTAL 9440 + 157 KM
FOR ALL 5 WHEELS 330

~ 500 000 CHF

Procurement status for MB & RB cables - between DETECTOR and UXC55's towers

(None **ALIGNMENT** cable is foreseen here because **no final specification was received**)

Cable's name Responsible persons <small>Responsible person delivered basic documentation</small>		MB <small>NEWS: Added a DCS cable named MB.CA.veto</small>							RB								
		MB.LV.mc	MB.LV.fe	MB.HV	MB.OF.ttc-mc	MB.OF.sc	MB.CA.sc	MB.CA.veto	MB.CA.tr	MB.CA.ro	RB.LV.fe-8	RB.LV.fe-12	RB.HV	RB.CA.sgn	RB.CA.dcs-7	RB.CA.dcs-10	RB.CA.t-sens
		Willmott	Pegoraro	Borsato	Bellato	Bellato	Bellato/Castel	Bellato/Castel	Odorici	Willmott	Ranieri	Ranieri	Ranieri	Ranieri	Ran./Paolucci	Ran./Paolucci	Ran./Paolucci
		yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes	
Components parts of a whole cable <small>NOTE *) The cost of cables and connectors is on sub-detector budget.</small>	Cable	Cable's SUPPLIER	Novacavi	Intercond	KERPEN	CERN	UNIFIBRE	CERN	CERN		Novacavi	Novacavi	Novacavi	Novacavi	CERN	CERN	CERN
	Supplier's internal reference		RCF1562/ST	SL-v2YCH	04.67.00	B255-MT/MT-X	04.21.51.055.	04.21.51.H			P0826_03	12R3117	P0825_03	40R3148	04.21.22.714.3	04.21.22.720.5	51.055.4-CAB-S
	Cable's PRODUCER	-	-	-	-	-	-	-	kerpen/Alcatel?	-	-	-	-	-	AMPHENOL	AMPHENOL	AMPHENOL
	Producer's internal reference	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Description of internal wires	RS-2w+2w+2t	RS-4w+4w+6w	RS-56w	1 fib/cable	2 fib/cable	RS-1t	RS-1t	CAT5/CAT5E/CAT 6	RS-8w	RS-12w	RS-4w	RST-20p	RST-7p	RST-10p	RST-1p	
	IS23 compliant [YES/should be NO]	YES	YES	YES	YES	should be	YES	YES	should be	YES	YES	YES	YES	YES	YES	YES	YES
	The COLOR is RIGHT (BLUE or RED for HV)	should be	YES	YES	NO	YES	NO	NO	should be	YES	YES	YES	YES	NO	NO	NO	NO
	Could be ordered through CERN* [yes/no]	see Aachen	no	no	yes	no	yes	yes		no	no	no	yes	yes	yes	yes	yes
	Estem. delivery time since order ~ [cost/m] value	7 weeks	DELIVERED	DELIVERED	CERN STORE	~10 week	CERN STORE	CERN STORE		5 weeks	2 months	8 weeks	4 months	CERN STORE	CERN STORE	CERN STORE	
	Tot. nr. of cables [All wheels, without spares]	250	250	680	250	250	260	250	500	310	60	480	4720	310	60	310	
Est. TOT Length with spares [m]	4400	4400	11200	4400	4400	2000	4400	8400	5400	1400	11000	76600	5400	1400	5400		
Q.ty to be ordered (see offers) [m]	5500	5500	-	-	-	-	-	500	500			need estim.					
Estimated TOT cost	21500	-	-	25000	-	2200	14000		7020	2940	6400	260000	37800	10920	5940		
Comment	waiting offer				costs include connect & work			TR and RO are identical testing sample in Bologna				Production rate 20Km/month					
Start connector (Detector's side)	Connector's SUPPLIER			-								CPEItalia (M)					
	Supplier's internal reference			-								28.002.512-0					
	Connector's PRODUCER			-		AMP				MOLEX		3M	3M	3M	3M		
	Producer's internal reference		DIN 41612-M	-	ST/P... plug	pn 280358-0			43025-1200	-	3417-6600	3473-6600	3473-6600	3473-6600			
	Description of the base material		PBT 30% GF	Noryl				Polyester / LCP	HDPE/MasterBa	PBT GF Polyester	PBT GF Polyester	PBT GF Polyester	PBT GF Polyester				
	IS41 compliant [YES/should be NO/other]		YES - UL 94V-0	YES		should be		YES - UL 94V-0	YES	UL 94V-0	UL 94V-0	UL 94V-0	UL 94V-0				
	Could be ordered through CERN* [yes/no]		no	-		no			no	no	no	no	no				
	Estem. delivery time since order ~ [cost/unit] value		12 weeks	-					a.o.	18.3	EURO	500	4720	800	310		
	TOT needed [units]	250	250	680	260	260	260	260	500	500	370	500	4720	800	310		
	Estimated TOT cost											9150					
Comment	AMP HD22, fem.	small q.ty	HV custom	the same in both sides	the same in both sides			same both side	CERN - 09.55.03.310.0	same both side	09.55.03.340.4-C	CERN - 09.55.03.310.0	CERN - 09.55.03.310.0	CERN - 09.55.03.310.0			
End connector (Tower's side)	Connector's SUPPLIER			-								CPEItalia (M)					
	Supplier's internal reference			-								28.002.512-0					
	Connector's PRODUCER			-		AMP				CAEN connector		3M	3M	3M	3M		
	Producer's internal reference			Radiall	ST/P... plug	pn 280358-0						3417-6600	3473-6600	3473-6600			
	Description of the base material			691802002				Noryl	HDPE/MasterBa	Glass Filled Poly	PBT GF Polyester	PBT GF Polyester	PBT GF Polyester				
	IS41 compliant [YES/should be NO/other]			YES		should be		should be	YES	UL 94V-0	UL 94V-0	UL 94V-0	UL 94V-0				
	Could be ordered through CERN* [yes/no]			-		no			no	no	no	no	no				
	Estem. delivery time since order ~ [cost/unit] value			-					a.o.	18.3	EURO	500	4720	800	310		
	TOT needed [units]			680	260	260	260	260	500	500	370	500	4720	800	310		
	Estimated TOT cost											9150					
Comment	up to the DT LV PatchPanel	up to the DT LV PatchPanel	52 pin	the same in both sides	the same in both sides			same both side	same both side	Up to Feet PP	09.55.03.340.4-C	CERN - 09.55.03.310.0	CERN - 09.55.03.310.0	CERN - 09.55.03.310.0			
SUMMARY																	
CABLE IS READY FOR PRR		working on	under approve waiting 332-3	APPROVED	to be prepared	APPROVED	to be prepared	to be prepared	NO cable is not defined!	APPROVED	APPROVED	APPROVED	Working on, waiting TIS	T sense is under approval deadline was 17.05.04			
Estimated needed time to manufacture cables for 2 sectors all 5 wheels cables			1-2 week 2 months	-	worst lenght 1-2 weeks	-	2 s. not blue 3-4 weeks ?	1-2 weeks	1-2 weeks	2 weeks 2 months	2 weeks 2 months	2 weeks 2 months	open question open question	cern store's delivery time + 2 weeks			
Date in which it's foresee to have at 1 Wheel				ready													
CERN 'READY TO INSTALL' cables. all Wheels				August '04													
comment		NOT YET ORDERED Special cable	PROCURED It's stored at ISR	Manufacturing in progress	NOT YET ORDERED CERN store	It needs cut. lengths in order to buy	NOT YET ORDERED CERN store	NOT YET ORDERED CERN store	NOT YET ORDERED CERN store	NOT YET ORDERED TR and RO are identical	PROCURED It's stored at ISR	PROCURED It's stored at ISR	PROCURED It's stored at ISR	NOT YET ORDERED Special cable	NOT YET ORDERED sold at CERN STORE		

See http://cern.ch/Fabio.Montecassiano/pub_doc/CABLES/cables_detector-towers-PRR.pdf for updates.

* **BLANK CELLS have to be filled ASAP !!**

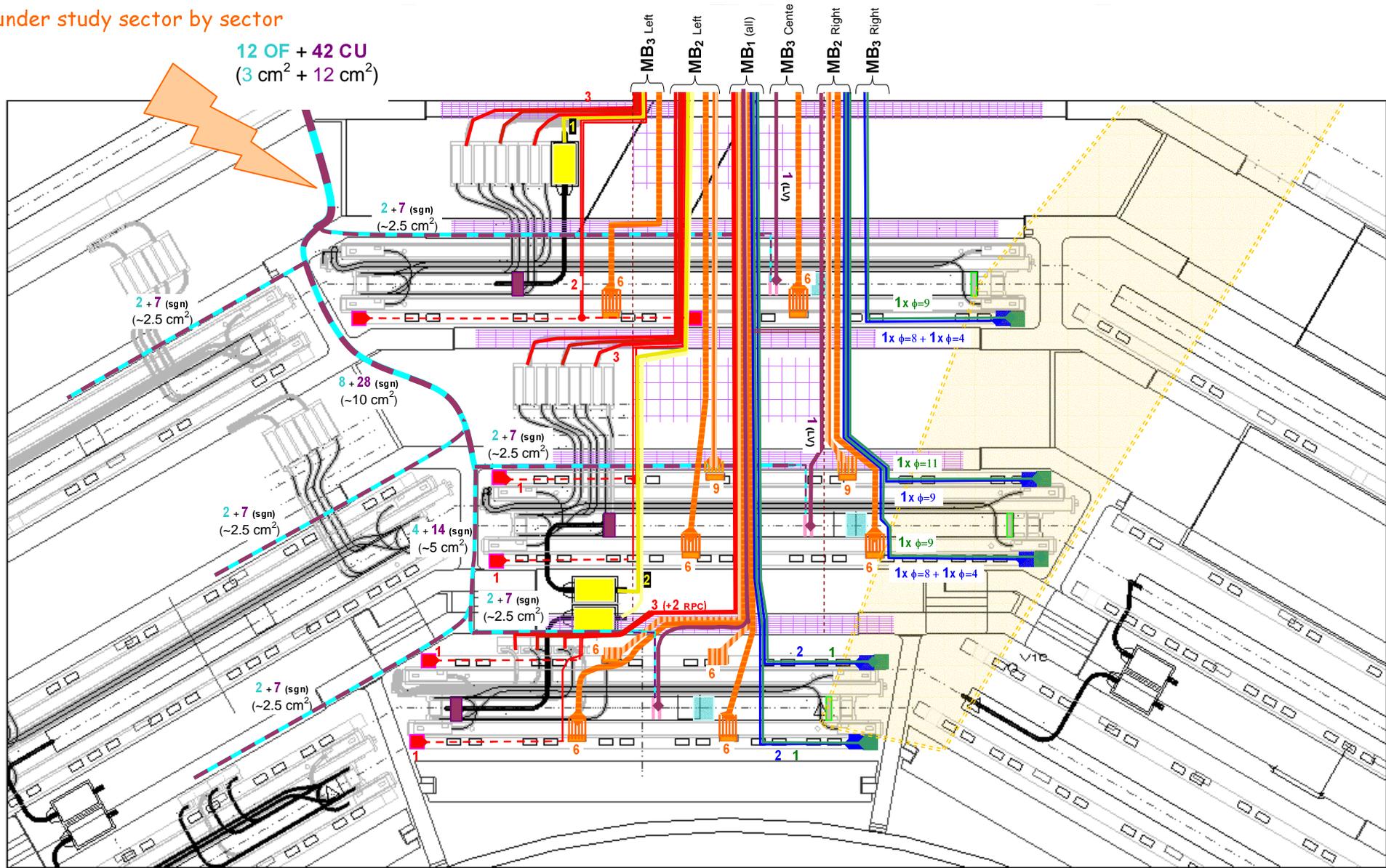
Status of cables – cutting lengths definition

Each cutting lengths is 'logically' subdivided in 3 parts.

- Radial length (Domenico, Fabio, Lorenzo)
 - . A proposal 'by channel' was presented at the end of the April. It's under test at P5 and still under discussion. One open question which could change radically the layout (and the lengths) is related to RPC trigger cables (50% of all MU barrel cables) and its bending radius. The problem is how to exit with these cables from the front carter. It's to be chose between two possibilities; to peel cables or re-work the carter. RPC community will communicate soon their decision.
- Peripheral length (Boki, Domenico, Fabio, Martinus, Stephane)
 - . A lot of work was done in order to calculate peripheral lengths for DT's HV cables (MB.HV). From this work we can extract many useful information for other cables but we need further work to complete the study.
 - . All the engineers working on this 'heavy' aspects share their time among many others urgent jobs.
- Balcony length (Fabio, Lorenzo)
 - . A updated layout was proposed. After it will be accepted by community, further (minor) changes should be inside racks of the same balcony. Some recovery could be possible (but not wanted) using the extra safety length, which is about 1 [m] (near balcony).

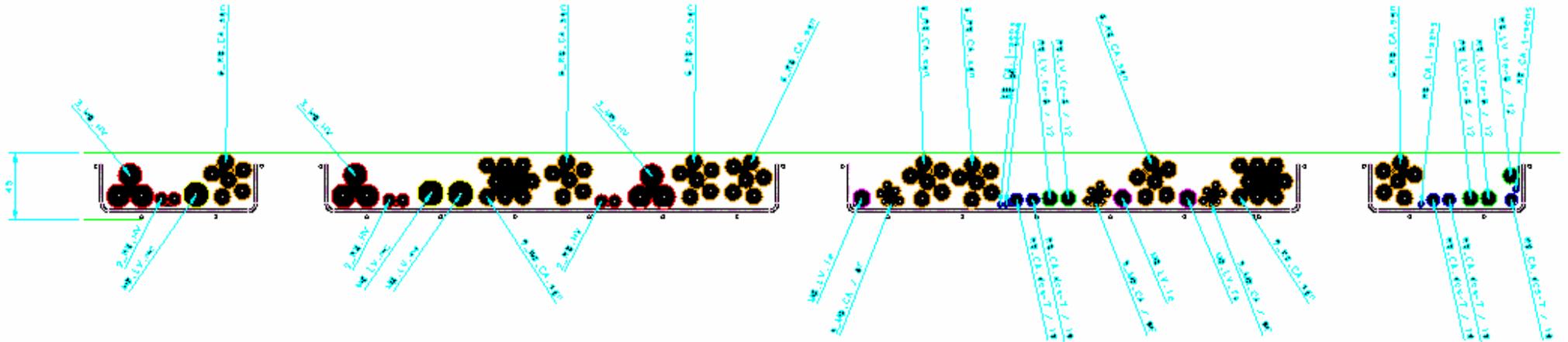
MB₁₂₃ and RB₁₂₃ ZpL's Radial Cabling by channels (First proposal to be used in Wheel +2 Sector 4)

This is the services corner.
 Available cross-section for cables
 is under study sector by sector



NB None alignment barrel cables are forecast to run in the radial c-tray.

Radial cables tray – *engineering drawing from proposal*



drawing by L. Roscilli INFN Napoli

CABLES LENGTHS from the ref. start point on MB3's iron corners up to the ref. end point at balconies' bases

WHEEL +2

Quadrant			Quadrant			Quadrant			Quadrant				Up to the balcony reference point		TOWER NEAREST USC55 (X>0)		
1	2	3	4	5	6	7	8	9	10	10	11	12	Length	Correction		Remark	TOP balcony
B - See 4	B - See 4	TB - See 4, 6															
T - See 7									B - See 5	B - See 5	B - See 3	B - See 2	Length	Correction	Remark	MIDDLE balcony	
									15520	17120	11250	5650	Corrected Length [mm]				
TB -	TB -	TB -	TB -	TB -	TB -	TB -	TB -	TB -	TB -	TB -	TB -	TB -	Length	Correction	Remark	BOTTOM balcony	
													Corrected Length [mm]				
													Length	Correction	Remark	Foot.P. Panel	
													Corrected Length [mm]				
			TB - See 4, 6	B - See 4	B - See 4								Length	Correction	Remark	TOP balcony	
						2950	4250	10250	14520	16120			Corrected Length [mm]				
					T - See 7	B - See 1	B - See 1, b, c	B - See 1, c	1000	1000			Length	Correction	Remark	MIDDLE balcony	
						2950	5650	11250	See 1, a, c	See 1, a, c			Corrected Length [mm]				
						B -	TB - See 6	B -	15520	17120			Length	Correction	Remark	BOTTOM balcony	
													Corrected Length [mm]				
													Length	Correction	Remark	Foot.P. Panel	
													Corrected Length [mm]				

Source
1 Direct measurement done by M. W. in Feb. 04 on W+2
2 mirrored from W+2 S8 --> MIDDLE X<0
3 mirrored from W+2 S9 --> MIDDLE X<0
4 The BOTTOM could be extracted from 3D models already done.
5 mirrored from W+2 S10 --> MIDDLE X<0
6 it needs 2 lengths, up to the BOTTOM and to the TOP (rpc)
7 it needs only the length up to RACK's TOP (rpc)

Correctionn applied
a S10 has 2 paths, 1 inside hole is shorter , the 2nd is on the foot's face, longer.
b +400 because the cable routed wasn't radial.
c +1000 because top GAS RACK is blocked by pipes, so It need to turn around it.

Legenda
T: cables enter from top
B: cables enter from the bottom
not used path

Conclusion

- It seems that not all cables can be procured soon, nor the little needed quantity for the installation test of 1 or 2 sector.

We have to choose between the following

PERFORM A FULL SECTOR TEST waiting the procurement of all cables

or

PERFORM A REDUCED SECTOR TEST without missing cables.

In this case the test will be not very useful in order to verify the design and the needed tools for the RADIAL PART.

- Cutting lengths are actual bottleneck