

Cable chain services				PER END CAP				Ian Crotty 16-Mar-17		Rect. packing	Hex Packing	Min stagg	Factor on dia =1	
										Section	Section			
										[cm3]	[cm3]			
<b>HV</b>	Channels		Total	Umbilical	Cables	Spares	Umbilical Section	Umbilical Cable dia	38	[mm]				
1 ch per chamber				10 x 2 ch			[cm3]	10 x 2 ch						
	RE3/1	RE4/1		2				Channels/cable	20					
Main cable chains	18	18	36	40	2	4	22.7				28.88	NA		
								Single ch HV cable dia	6	[mm]				
								Channels/cable	1					
Mini cable chains	18	18	36	NA	36	0	10.2				12.96	12.48	12.29	34.15
<b>LV</b>			Total	No control or Power (to MAO) cables required The MAO can handle the extra power.										
	RE3/1	RE4/1												
Main cable chains	0	0	0											
Mini cable chains	0	0	0											
<b>Fibre optics</b>			Total		Spares	Section	Optical Fibres inc conduit	20	[mm]					
	RE3/1	RE4/1				[cm3]	Quantity Conduits	2			8	NA	NA	NA
Main cable chains						0								
Mini cable chains	36	36	72		8		Conduit section	6.3	[cm3]		8	NA	NA	NA
<b>GAS</b>			Total		Spares	Section	Piping already installed for old RE3/1 to be removed and modified Bulkheads present for RE3/1 to be verified for routing compability. All bulkheads missing for RE4/1							
	RE3/1	RE4/1				[cm3]								
Main cable chains	0	0	0			0.0								
Mini cable chains	0	0	0			0.0								
<b>Cooling</b>			Total	Given the additional heat load of 1271Watts which is 10% increase over the present heat load( ~12kW) there will be no additional piping through the cable chains. Awaiting the approbation from P. Topea. Extra circuits for RE4/1 will be added to the RE4 Xmas trees. The RE3/2 circuit will be extended to the RE3/1 chamber.										
	RE3/1	RE4/1												
Main cable chains	0	0	0											
Mini cable chains	0	0	0											