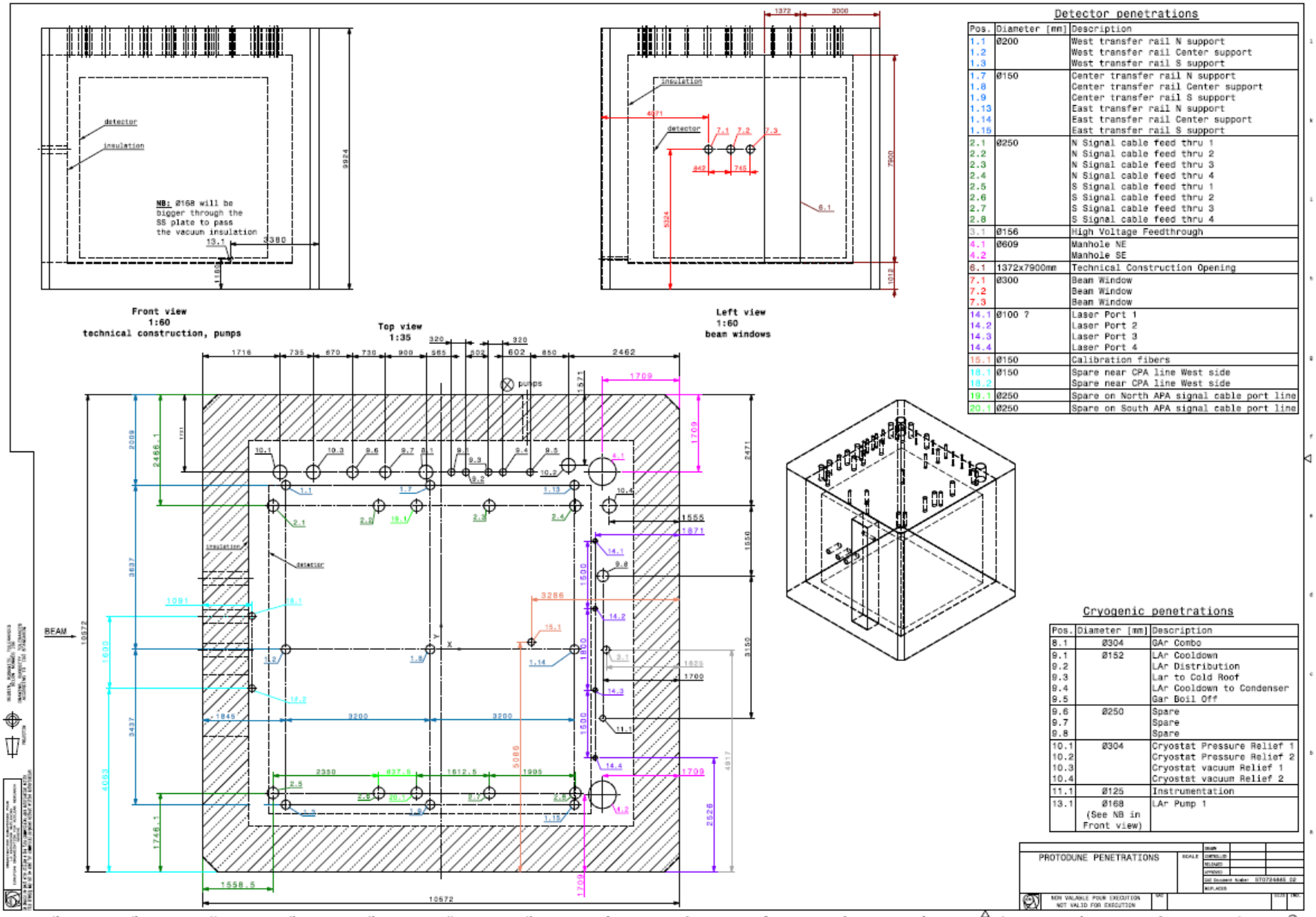
ProtoDUNE cryostat penetrations update

Jack Fowler

Info from Diamanto Smargianaki and Benoit Lacarelle

Current drawing (20-Nov-2015)

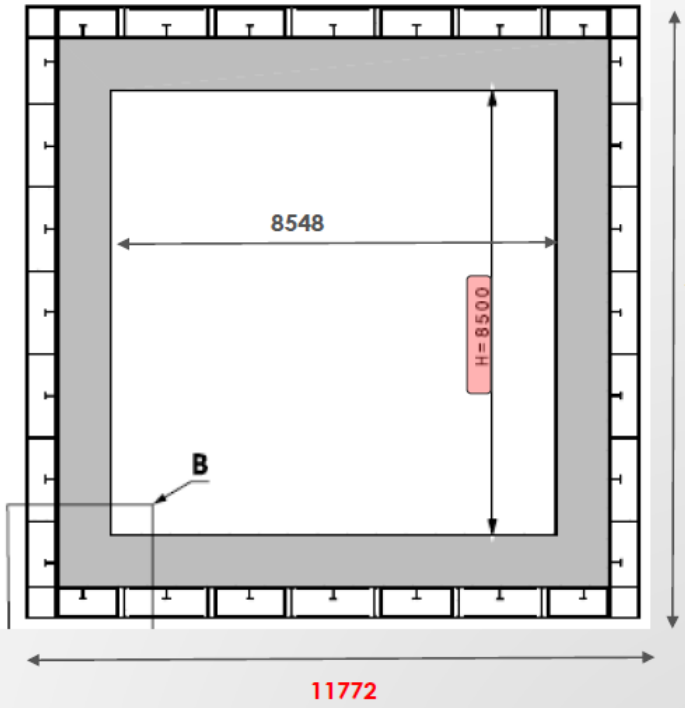


https://edms.cern.ch/document/1543241/1

Cryostat changes

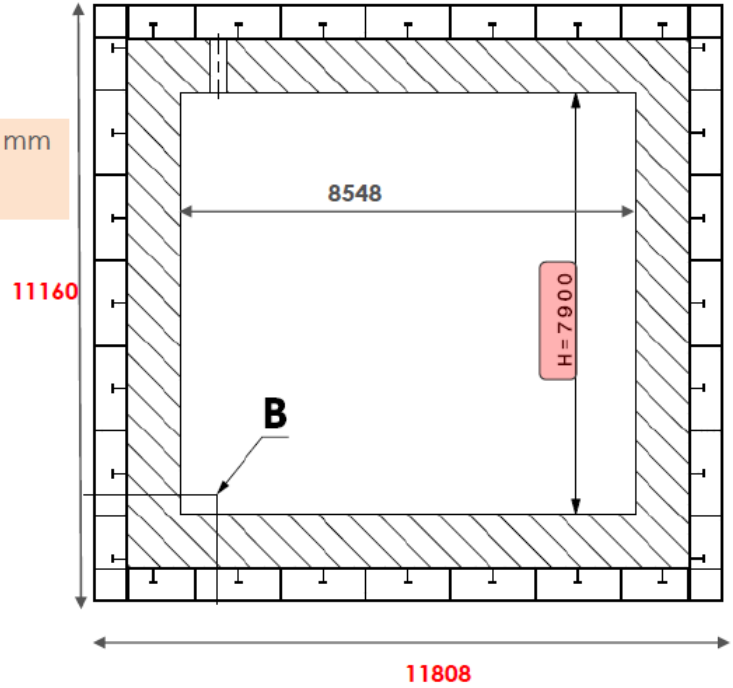
CHANGE OF THE HEIGHT

Previous



- Inner Height : Reduced by 600 mm
- Change of IPE profiles

New



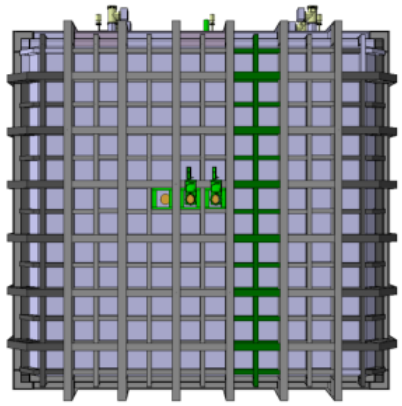
	Length [mm]	Width [mm]	Height [mm]
Membrane Flat Internal dimensions	8548	8548	8500
SS Plate Internal Dimensions	10552	10552	10504
External Dimensions of the Structure	11772	11772	11724

	Length [mm]	Width [mm]	Height [mm]
Membrane Flat Internal dimensions	8548	8548	7900
SS Plate Internal Dimensions	10552	10552	9904
External Dimensions of the Structure	11808	11808	11160

D.Smargianaki 2

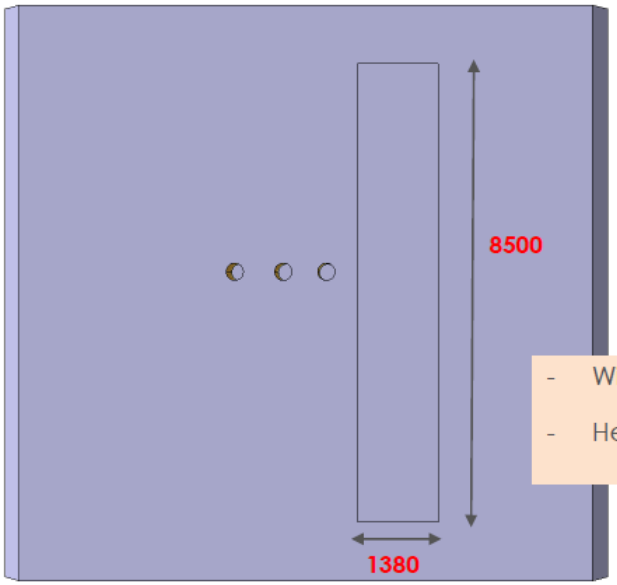
TCO for installation moved to side with beam window

PROTODUNE - TCO



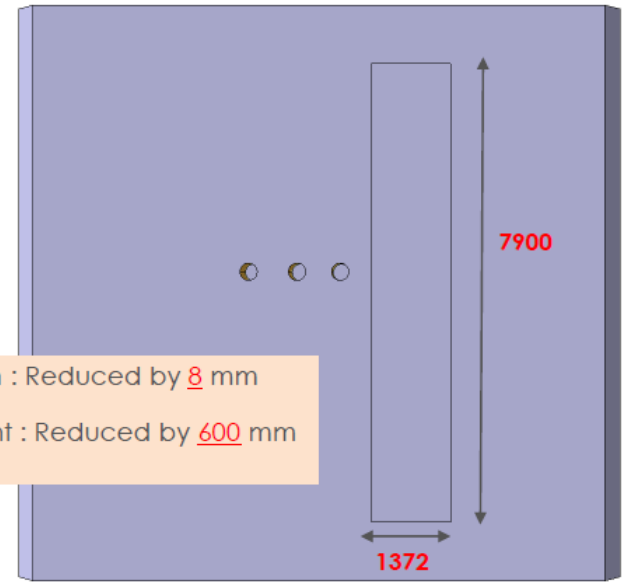
TCO Cryostat – Side View
Current model

Previous



TCO Stainless Steel
Plate – Side View

New

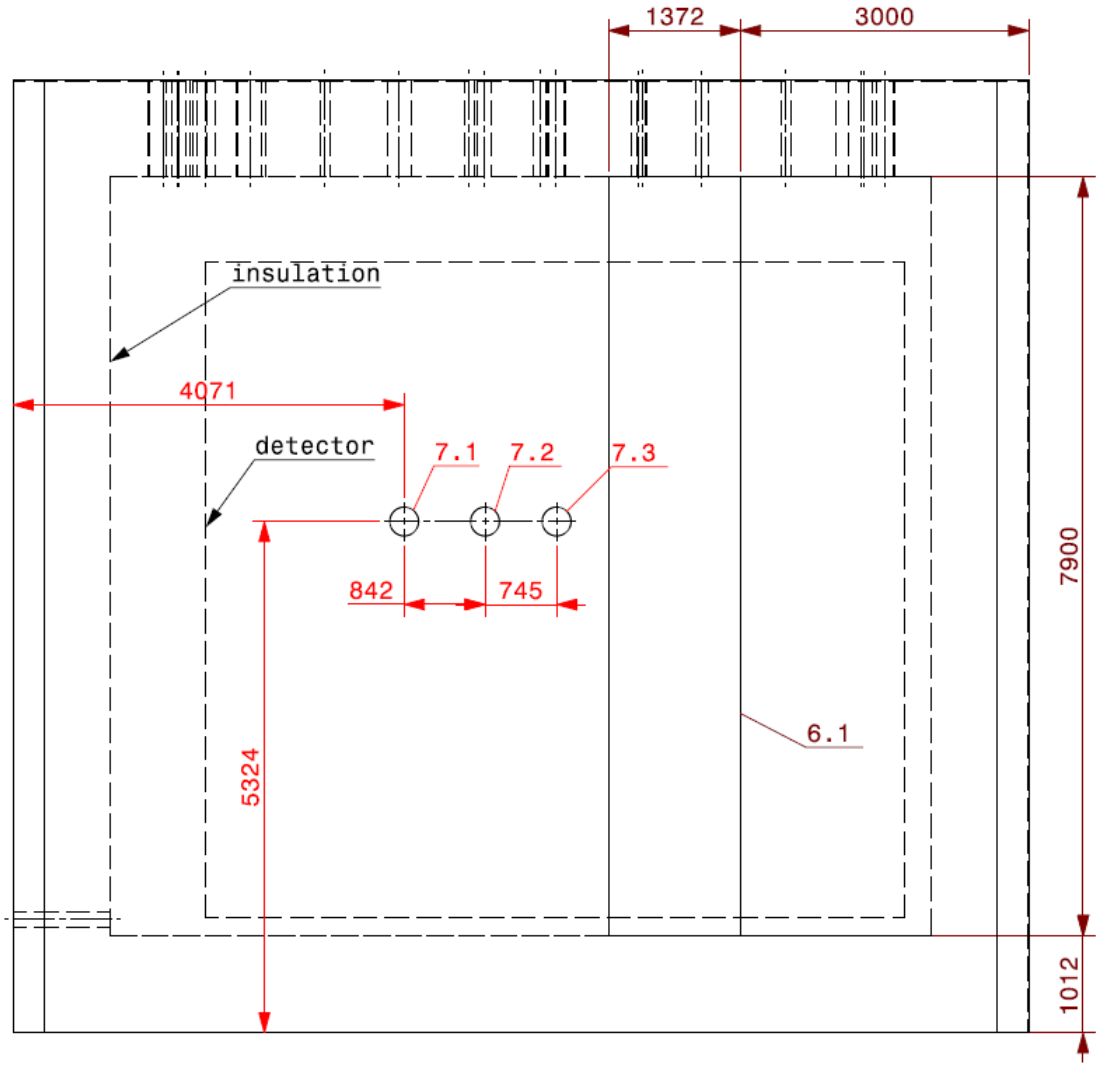


TCO Stainless Steel
Plate – Side View

- Width : Reduced by 8 mm
- Height : Reduced by 600 mm

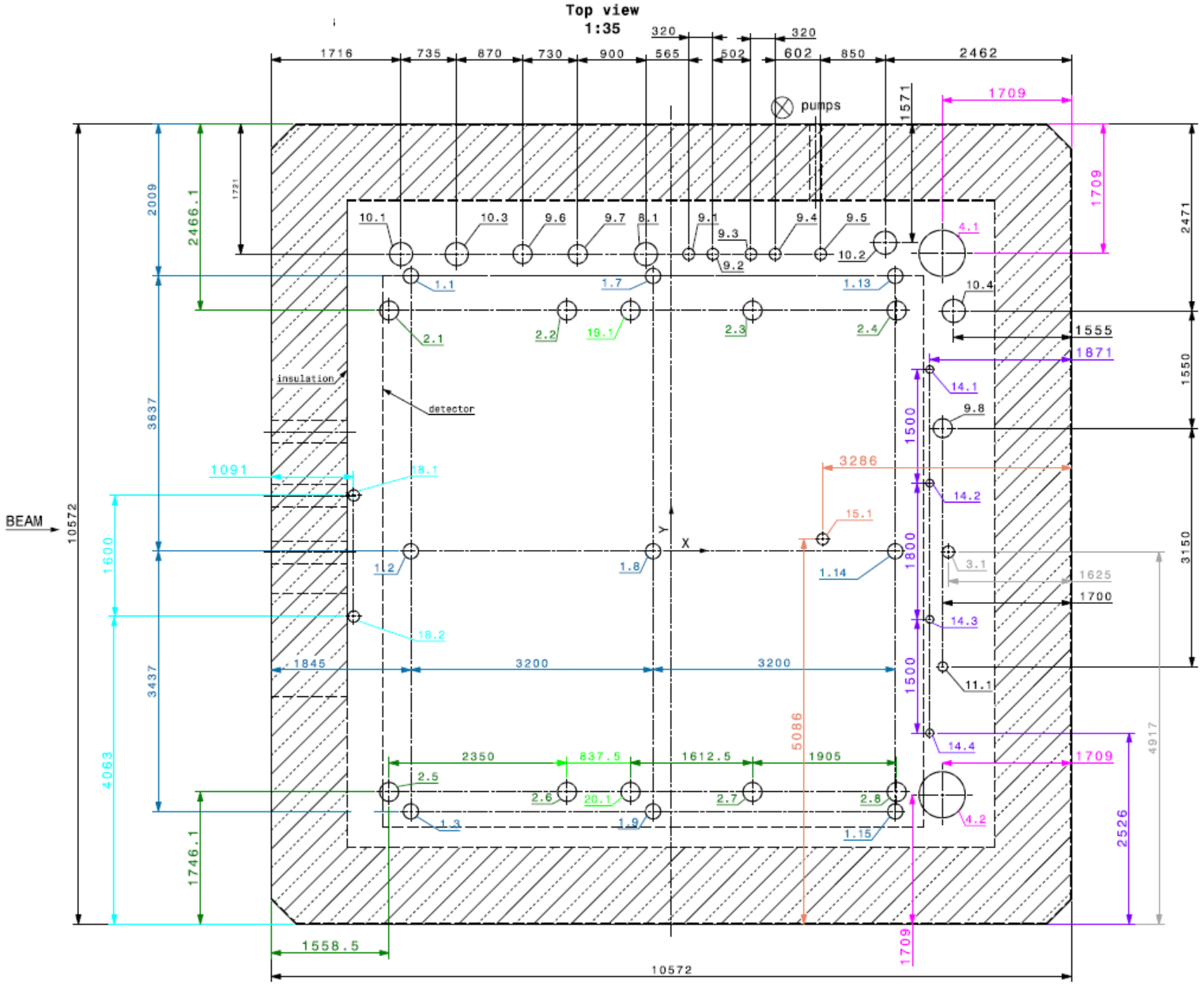
D.Smargianaki 4

Beam window / TCO layout



Left view
1:60
beam windows

Plan view cryostat



Port labels and descriptions

Detector penetrations

Pos.	Diameter [mm]	Description
1.1	Ø200	West transfer rail N support
1.2		West transfer rail Center support
1.3		West transfer rail S support
1.7	Ø150	Center transfer rail N support
1.8		Center transfer rail Center support
1.9		Center transfer rail S support
1.13		East transfer rail N support
1.14		East transfer rail Center support
1.15		East transfer rail S support
2.1	Ø250	N Signal cable feed thru 1
2.2		N Signal cable feed thru 2
2.3		N Signal cable feed thru 3
2.4		N Signal cable feed thru 4
2.5		S Signal cable feed thru 1
2.6		S Signal cable feed thru 2
2.7		S Signal cable feed thru 3
2.8		S Signal cable feed thru 4
3.1	Ø156	High Voltage Feedthrough
4.1	Ø609	Manhole NE
4.2		Manhole SE
6.1	1372x7900mm	Technical Construction Opening
7.1	Ø300	Beam Window
7.2		Beam Window
7.3		Beam Window
14.1	Ø100 ?	Laser Port 1
14.2		Laser Port 2
14.3		Laser Port 3
14.4		Laser Port 4
15.1	Ø150	Calibration fibers
18.1	Ø150	Spare near CPA line West side
18.2		Spare near CPA line West side
19.1	Ø250	Spare on North APA signal cable port line
20.1	Ø250	Spare on South APA signal cable port line

Cryogenic penetrations

Pos.	Diameter [mm]	Description
8.1	Ø304	GAr Combo
9.1	Ø152	LAr Cooldown
9.2		LAr Distribution
9.3		Lar to Cold Roof
9.4		LAr Cooldown to Condenser
9.5		Gar Boil Off
9.6	Ø250	Spare
9.7		Spare
9.8		Spare
10.1	Ø304	Cryostat Pressure Relief 1
10.2		Cryostat Pressure Relief 2
10.3		Cryostat vacuum Relief 1
10.4		Cryostat vacuum Relief 2
11.1	Ø125	Instrumentation
13.1	Ø168 (See NB in Front view)	LAr Pump 1

Parameter table (beginning draft/partial view)

Description	Person Responsible	Crossing Tube Diameter (mm)	Which face	Flange type/OD (mm)	Clear space around (mm)	x location	y location	Z location Height over the beams (mm)?	Description Cold Side	Description Warm Side
West transfer rail N support	D Wenman	200	top							
West transfer rail center support	D Wenman	200	top							
West transfer rail S support	D Wenman	200	top							
Center transfer rail N support	D Wenman	150	top							
Center transfer rail center support	D Wenman	150	top							
Center transfer rail S support	D Wenman	150	top							
East transfer rail N support	D Wenman	150	top							
East transfer rail center support	D Wenman	150	top							
East transfer rail S support	D Wenman	150	top							
N Signal Cable feed thru 1	B Yu	250	top							
N Signal Cable feed thru 2	B Yu	250	top							
N Signal Cable feed thru 3	B Yu	250	top							
N Signal Cable feed thru 4	B Yu	250	top							
S Signal Cable feed thru 1	B Yu	250	top							
S Signal Cable feed thru 2	B Yu	250	top							
S Signal Cable feed thru 3	B Yu	250	top							
S Signal Cable feed thru 4	B Yu	250	top							
HV feed thru	B Yu	156	top							
Manhole NE	J Fowler	609	top	add purity monitor, get diameter						
Manhole SE	J Fowler	609	top							
Gar combo	D Montanari	304	top							
Lar Cooldown	D Montanari	152	top							
Lar Distributin	D Montanari	152	top							
Lar to cold roof	D Montanari	152	top							
Lar Cooldown to Condenser	D Montanari	152	top							
Gar Boil off	D Montanari	152	top							